

2023 TECHNICAL
PROGRAM

SPIE. PHOTONICS WEST

28 JANUARY-2 FEBRUARY 2023

THE MOSCONE CENTER | SAN FRANCISCO, CALIFORNIA USA



SPIE. PHOTONICS WEST

THE WORLD'S PREMIER LASERS, BIOMEDICAL OPTICS AND BIOPHOTONIC TECHNOLOGIES, QUANTUM, AND OPTOELECTRONICS EVENT

28 January–2 February 2023

Conferences and courses

28–29 January 2023

BiOS Expo

31 January–2 February 2023

Photonics West Exhibition

The Moscone Center • San Francisco, California, USA

Cutting-Edge Research

Two Exhibitions

Industry Program

Training and Education

CO-LOCATED EVENT:

SPIE AR | VR | MR

29 January–1 February 2023

SPIE AR | VR | MR Exhibition

31 January–1 February



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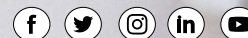
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SPIE, the international society for optics and photonics, brings engineers, scientists, students, and business professionals together to advance light-based science and technology. The Society, founded in 1955, connects and engages with our global constituency through industry-leading conferences and exhibitions; publications of conference proceedings, books, and journals in the SPIE Digital Library; and career-building opportunities. Over the past five years, SPIE has contributed more than \$22 million to the international optics community through our advocacy and support, including scholarships, educational resources, travel grants, endowed gifts, and public-policy development.

www.spie.org

FOR A SAFER MEETING

- » Wash or sanitize hands frequently
- » Respect the personal space of others
- » Do not attend if you are not feeling well
- » SPIE follows health guidelines from the San Francisco Public Health Department and CDC.

HARASSMENT

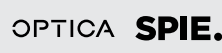
consists of unwanted, unwelcomed, and uninvited behavior that demeans, threatens, or offends another.

To report harassment you have witnessed or experienced at this meeting, contact any SPIE staff member or use the SPIE reporting hotline at 1-888-818-6898 or spie.ethicspoint.com.

More information:

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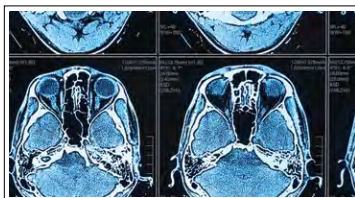


spie.org/pw
#photonicswest



Experience the energy of Photonics West

Get ready to enjoy real conversations, hear the latest breakthroughs, and make important connections in person. Hear cutting-edge research in biomedical optics, biophotonics, industrial lasers, optoelectronics, microfabrication, MOEMS-MEMS, displays, and more. Attend technical presentations, courses, two world-class exhibitions, plenary presentations, and a variety of networking activities.



BIOS

The most important biomedical optics conference

PAGES 41-45

Conference Listing

PAGES 66-260



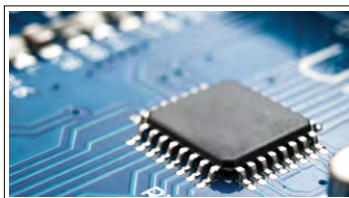
LASE

Advancements in laser sources and industrial laser applications

PAGES 46-47

Conference Listing

PAGES 261-327



OPTO

Developments in optoelectronic technologies and applications

PAGES 49-51

Conference Listing

PAGES 328-482



Quantum West

Explore the role that photonics plays as quantum technology moves from R&D to engineering products for the commercial marketplace

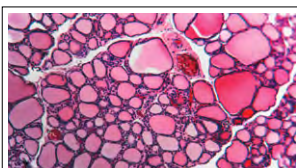
PAGES 52-55

Application tracks—PAGE 56

Application tracks list presentations on a specific topic together within the program so that participants can easily locate presentations in their area of interest. Browse the application track for listings.



Brain



Translational Research



3D Printing



AI/ML



Net Zero

See full details and updates at spie.org/pw or on the SPIE App



Plenary Sessions and Hot Topics—PAGES 10–13

Each year Photonics West features plenary speakers presenting on a wide range of important topics. Be in the room full of energy and inspiration as leaders in their respective fields take the stage to share their latest research and visions of the future.

Technical Events—PAGES 14–15

Meet peers interested in the same topics and explore the latest research, hear different perspectives, and participate in engaging discussions. Find old friends and discover new partnerships.

Industry Events—PAGES 16–26

Join an energized audience at these informative sessions focused on the business side of photonics. Industry experts and leaders from various fields share opportunities and challenges.

SPIE Startup Challenge—PAGE 27

See and hear pitches for the “best of the best” new photonics businesses. This pitch competition is a lively, interactive event showcasing the power of entrepreneurs to move photonics technology to the global marketplace.

Professional Development—PAGES 28–29

Gain insights and tips to help advance your career and workplace satisfaction. Hone valuable job skills and focus on career development at these informative and engaging events. Build your schedule and don't miss opportunities to make valuable connections.

Membership Events—PAGE 30

Your SPIE Membership is a valuable asset; join other SPIE Members at these informal get-togethers taking place in San Francisco.

Social and Networking Events—PAGES 32–33

Enjoy real conversations and make important connections in person. Take the opportunity to discuss optics and photonics and get to know other professionals from around the world.

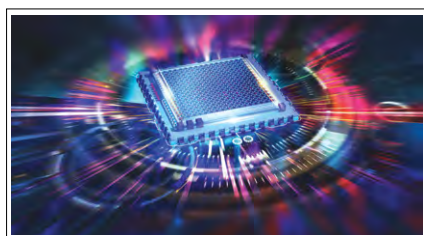
SPIE AR | VR | MR—PAGES 58–59

Full conference registration to Photonics West includes access to this co-located event focused on XR hardware, taking place at Moscone West 29 January–1 February. Full program is online (spie.org/avr) or in the SPIE App.

Facility Maps—PAGES 4–9

General Information—PAGES 66–67

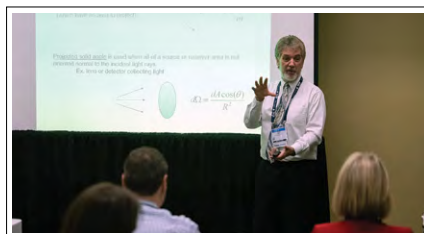
SPIE Policies—PAGE 68



Two Exhibitions—PAGES 34–40

Find the best solutions, components, instruments, and system providers from around the world. Companies offer an inside look into their portfolio of products and services—meet top suppliers, explore product and company capabilities, and build partnerships that will advance your work.

BiOS EXPO • Weekend Exhibition • January 28–29
Photonics West Exhibition • 31 January–2 February



Educational courses—PAGES 60–64

Receive live instruction directly from an expert and join a group of your peers with similar goals and challenges. Choose from more than 50 options on topics such as AR/VR/MR/HMD, optical system design, biophotonics, quantum, basic optics and more.

Courses priced separately.

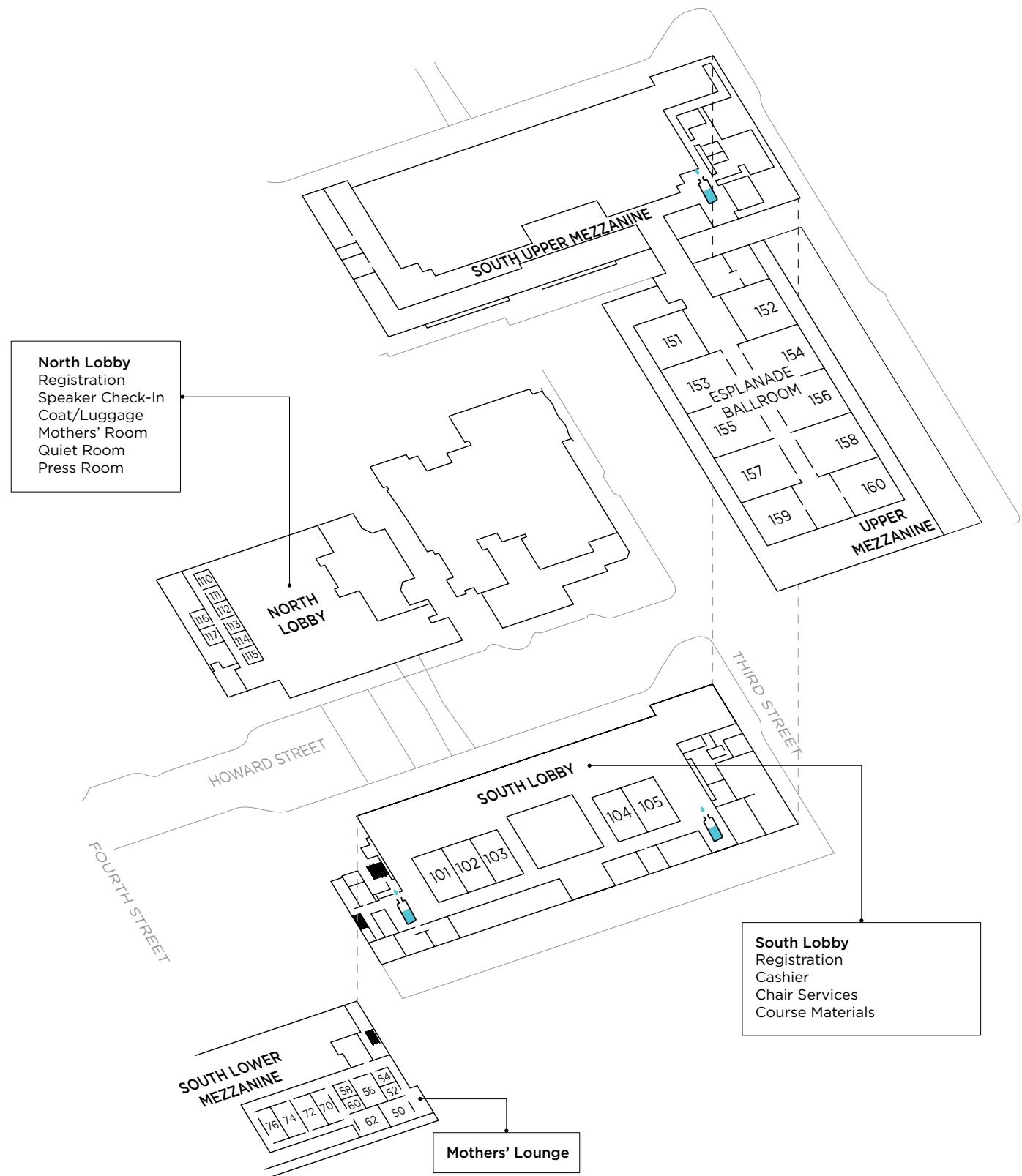
Stay Connected



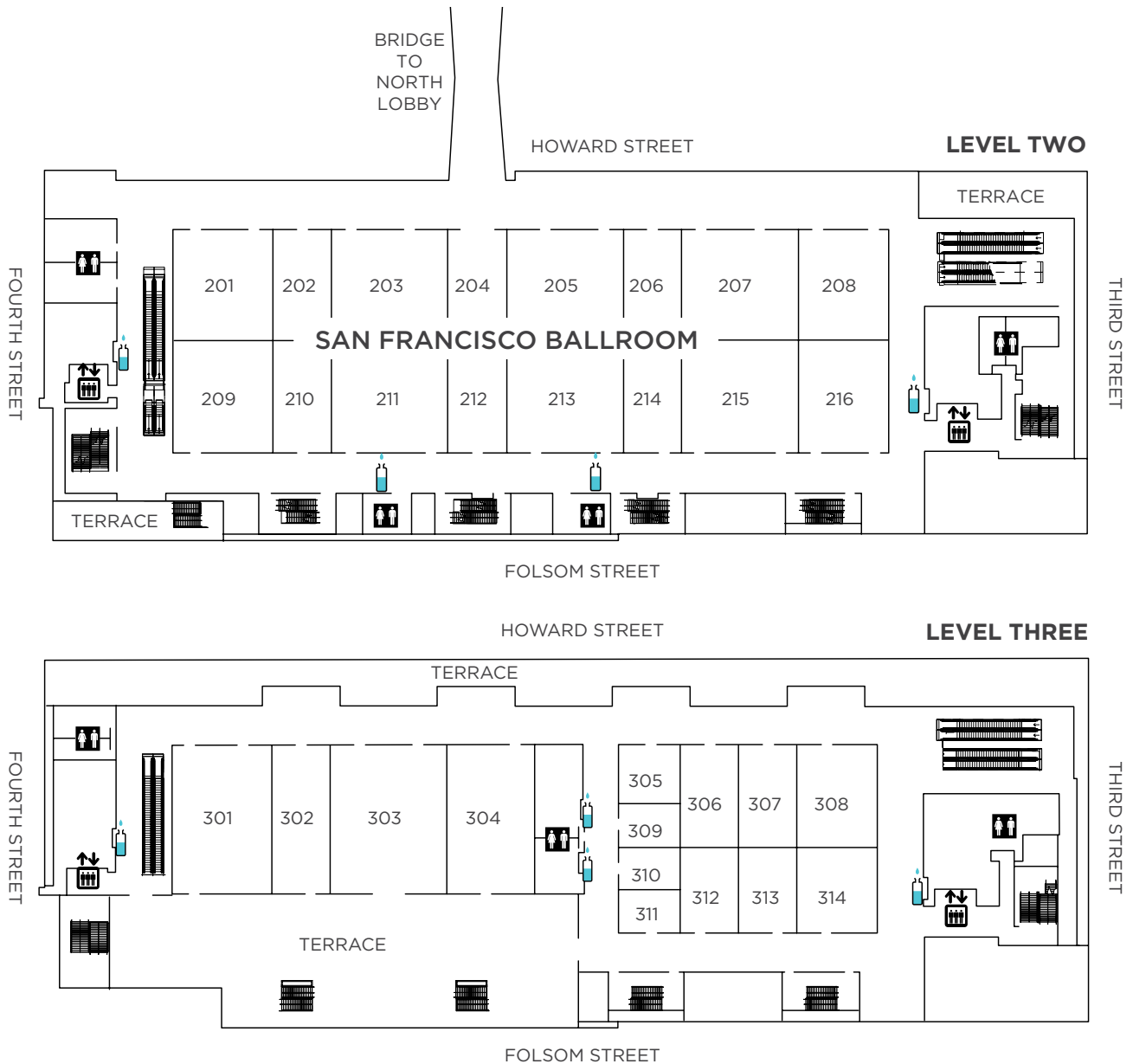
Get the App



THE MOSCONE CENTER NORTH/SOUTH LOBBIES AND MEZZANINES

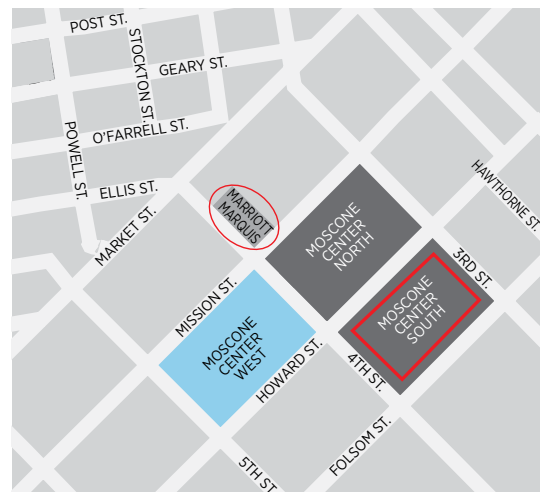


MOSCONE CENTER SOUTH LEVELS TWO AND THREE



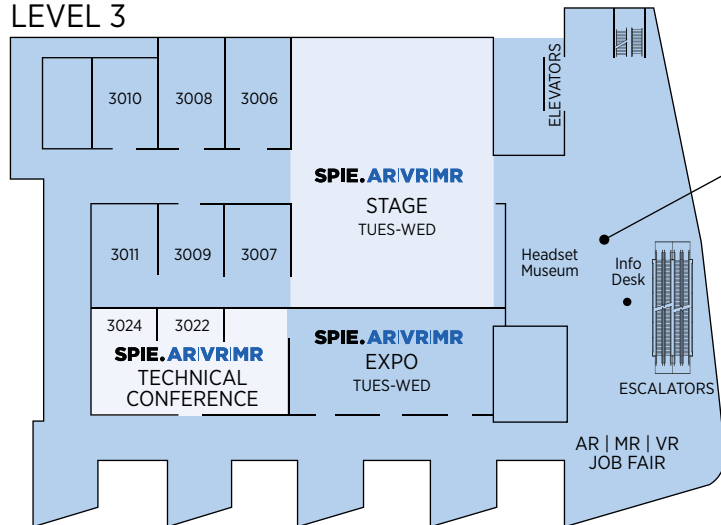
Water filling stations:
 Stop by Level Two or
 Upper Mezzanine
 each day before 9:30 AM
 to receive your free
 refillable water bottle
(while supplies last)

STREET MAP



THE MOSCONE CENTER WEST

LEVEL 3

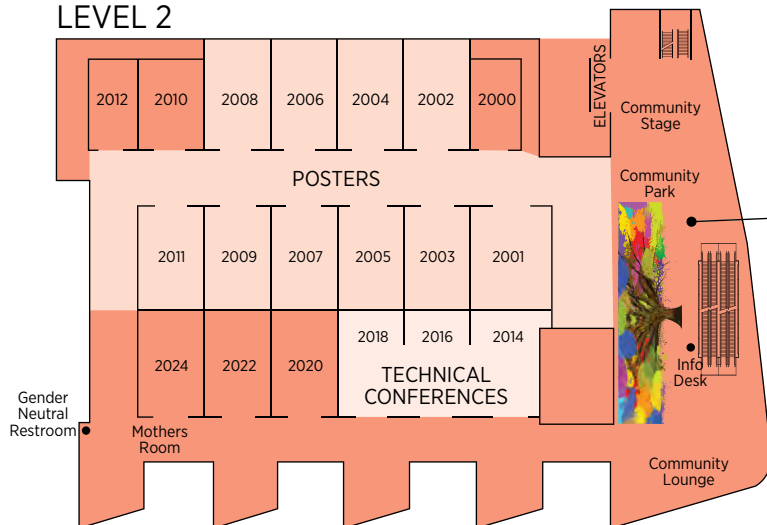


SPIE.AR|VR|MR

LEVEL 3 LOBBY:

INFO DESK
AV VR MR POSTERS

LEVEL 2

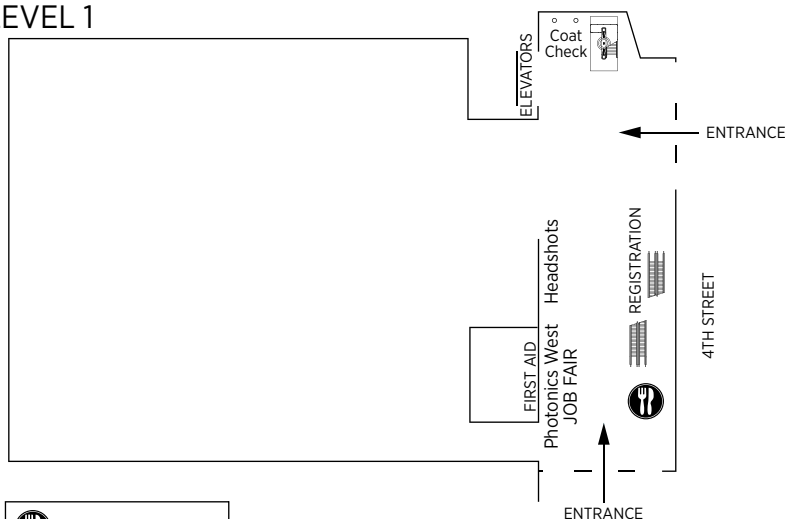


SPIE. PHOTONICS WEST

LEVEL 2 LOBBY:

COMMUNITY EVENTS
POSTERS
Sunday, Monday, Tuesday, and Wednesday

LEVEL 1



Events in Moscone West

SPIE.AR|VR|MR

SPIE. PHOTONICS WEST

POSTER SESSIONS
Sunday, Monday, Tuesday, Wednesday

JOB FAIR
Tuesday (AR VR MR Job Fair)
Tuesday and Wednesday (Photonics West Job Fair)

HEADSHOTS
Tuesday and Wednesday

CAREER HUB

= FOOD OUTLETS

Food Outlet Locations and Menu Highlights

All outlets offer beverages and a variety of snack foods.

South Upper Lobby

Sat 7:30 AM-1:30 PM
Sun-Wed 7:00 AM-3:00 PM
Thurs 8:00 AM-2:00 PM
M Coffee: Espresso, specialty coffee

North Lower Lobby, near Hall F entrance

Sat-Sun 8:00 AM-2:00 PM
Mon 7:30 AM-1:30 PM
Tue-Wed 7:00 AM-5:00 PM
Thurs 8:00 AM-3:00 PM
North Side Espresso: Espresso, specialty coffee and crepes

Back of Hall F

Tue-Thurs 10:00 AM-4:00 PM
Café Savor: Tri-tip turkey, plant-based sub sandwich, soup, sandwiches

Entrance to Hall A

Tue 7:00 AM-5:00 PM
Wed 7:00 AM-4:00 PM
Thurs 10:00 AM-4:00 PM
Chicken chow mein, salads, sandwiches

Entrance to Hall B

Tue-Wed 10:00 AM-4:00 PM
Thurs 10:00 AM-4:00 PM
Hall B Café: Burrito bowl, soup, sandwiches, salads
Poke Portable: Poke bowl, Caesar salads, soup

Back of Hall B

Tue-Wed 10:00 AM-4:00 PM
Savor Café & Bar: Pizza, paninis, soup, specialty coffee
Tue-Wed 10:00 AM-4:00 PM
Thurs 10:00 AM-2:00 PM
Savor Carvery: Cross rib and ham, plant-based meatball sub sandwich, soup, sandwiches, salads

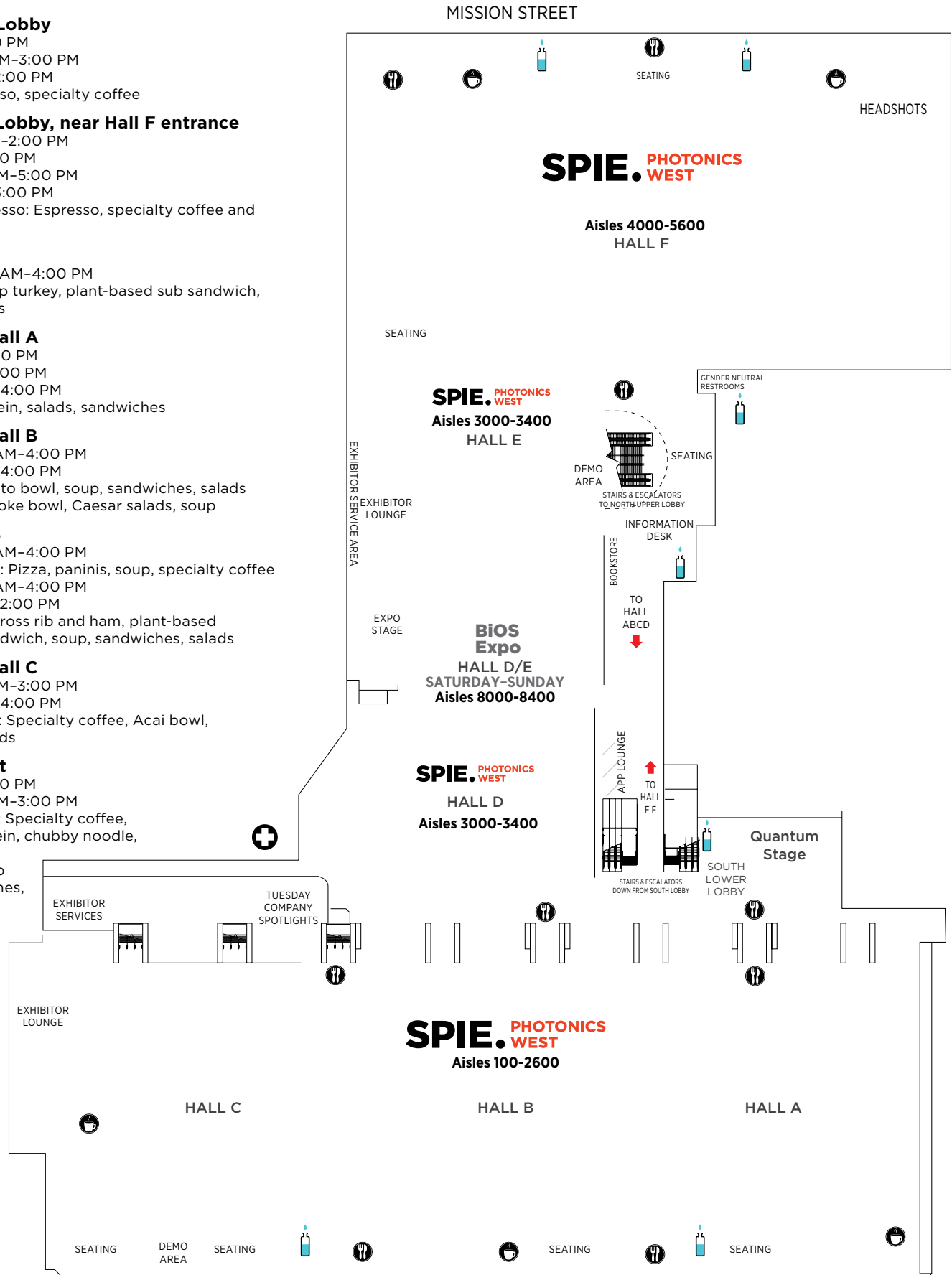
Entrance to Hall C

Tue-Wed 7:00 AM-3:00 PM
Thurs 10:00 AM-4:00 PM
Café @ Moscone: Specialty coffee, Acai bowl, sandwiches, salads

Moscone West

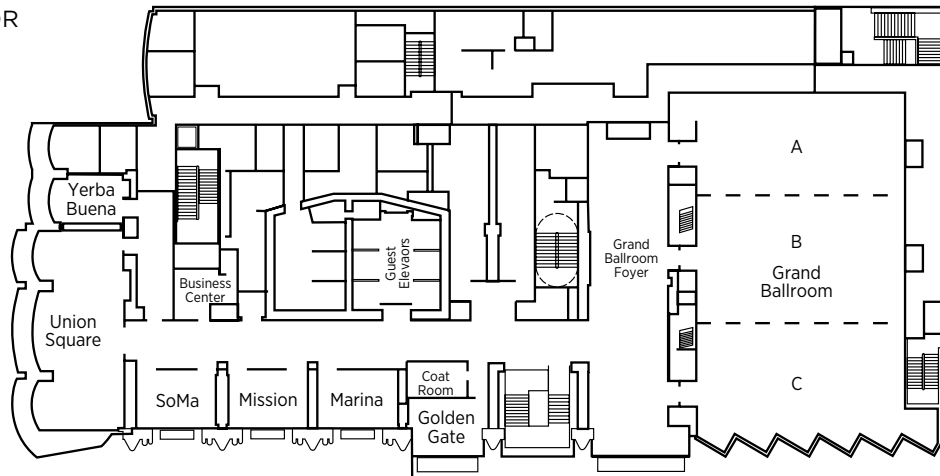
Mon 7:30 AM-1:30 PM
Tue-Wed 7:00 AM-3:00 PM
Corner Espresso: Specialty coffee, chicken chow mein, chubby noodle, garlic noodles, Thai curry shrimp noodle, sandwiches, salads

THE MOSCONE CENTER NORTH AND SOUTH EXHIBITION LEVEL

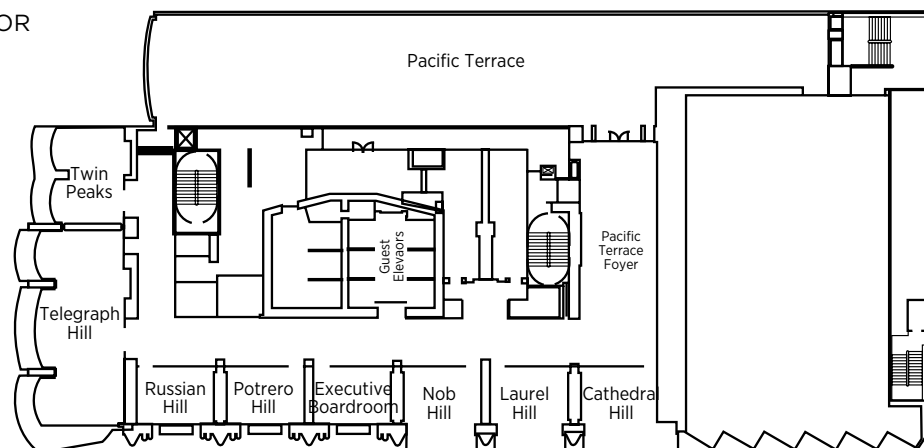


INTERCONTINENTAL HOTEL

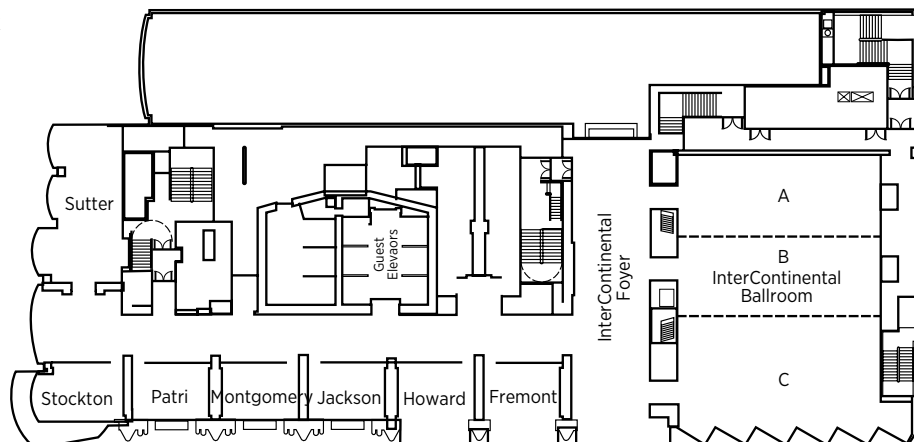
THIRD FLOOR



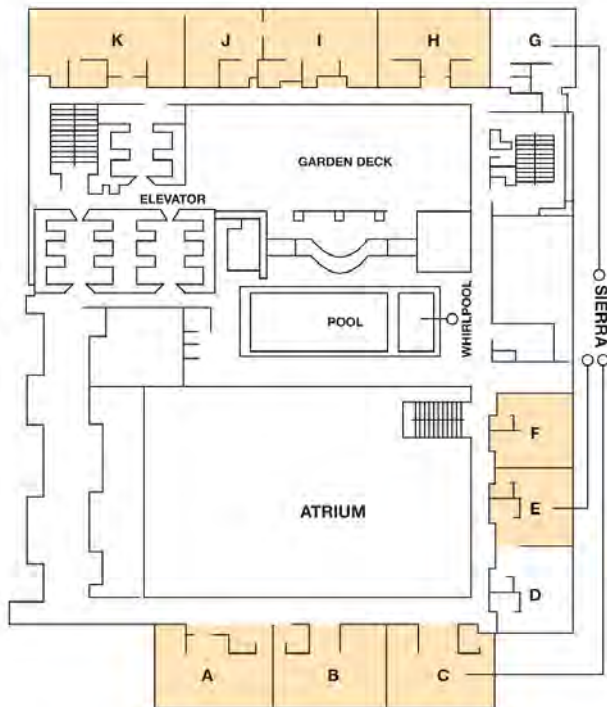
FOURTH FLOOR



FIFTH FLOOR



FIFTH FLOOR



MARK YOUR CALENDAR

2024 **PLAN TO ATTEND**

SPIE. PHOTONICS WEST

27 January-1 February 2024

The Moscone Center
San Francisco, California, USA

PHOTONICS WEST EXHIBITION
30 January-1 February 2024

BIOS EXPO
27-28 January 2024

**THE WORLD'S PREMIER LASERS, BIOMEDICAL OPTICS
AND BIOPHOTONIC TECHNOLOGIES, QUANTUM, AND
OPTOELECTRONICS EVENT**

spie.org/PW
#photonicswest

PLENARY AND HOT TOPICS SESSIONS

Presentations about breakthrough discoveries and new approaches are given by leading speakers from across the globe. Don't miss these sessions; add them to MySchedule.

Open to all paid conference attendees.

BiOS Hot Topics

28 January 2023 • 7:00 PM–9:00 PM
Moscone Center, Room 207 (Level 2 South)

Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers.



Welcome and Opening Remarks

Paola Taroni
BiOS 2023 Symposium Chair
Politecnico di Milano (Italy)



Sergio Fantini
BiOS 2023 Symposium Chair
Tufts Univ. (United States)

**Presentation of 2023 Britton Chance
Biomedical Optics Award**
Presented by **Sergio Fantini**, Tufts Univ.
(United States)



**Talk by 2023 Britton Chance Biomedical
Optics Award Recipient**
David Benaron
Spectros Corp. (United States)



Moderator Remarks and Introductions
Jennifer Barton
BiOS 2023 Symposium Co-Chair
The Univ. of Arizona (United States)



**Quantitative phase imaging and
artificial intelligence**
YongKeun Park
KAIST (Korea, Republic of)



**Sound of light: optoacoustic vs. optical
imaging**
Vasilis Ntziachristos
Technical Univ. of Munich School of Medicine
(Germany)
Institute of Biological and Medical Imaging,
Helmholtz Zentrum München (Germany)



**Non-genetic photoacoustic neural
stimulation**
Chen Yang
Boston Univ. (United States)



**Sound speed-corrected
photoacoustic full-breast imaging**
Srirang Manohar
Univ. of Twente (The Netherlands)



**Moderator Remarks and
Introductions**
Wolfgang Drexler
BiOS 2023 Symposium Co-Chair
Medical Univ. of Vienna (Austria)



**Photonic lanterns: shedding new light
on OCT**
Caroline Boudoux
Polytechnique Montreal (Canada)



**Optical elastography: an emerging tool
for tissue palpation**
Kirill Larin
Univ. of Houston (United States)

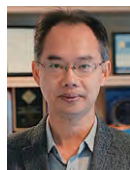


**Early identification of life-threatening
soft-tissue infection using dynamic
fluorescence imaging**
Eric Henderson
Dartmouth Hitchcock Medical Ctr. (United States)



**Optical image-guided autonomous
robotic surgery**
Jin Kang
Johns Hopkins Univ. (United States)

**Presentation of 2023 Biophotonics
Technology Innovator Award**
Presented by **Paola Taroni**, BiOS 2023
Symposium Chair, Politecnico di Milano (Italy)



**Talk by 2023 Biophotonics Technology
Innovator Award Recipient**
Wei Min
Columbia Univ. (United States)



Closing Remarks
Paola Taroni
BiOS 2023 Symposium Chair
Politecnico di Milano (Italy)



Sergio Fantini
BiOS 2023 Symposium Chair
Tufts Univ. (United States)



See full details and updates at
spie.org/pw or on the **SPIE App**

Neurotechnologies Plenary

29 January 2023 • 3:30 PM–5:30 PM
Moscone Center, Room 207 (Level 2 South)

This session highlights the breadth of advances in neurophotonic technologies.

MODERATORS



Anna Devor
Boston Univ. (United States)



Shy Shoham
New York Univ. (United States)

SPEAKERS:



A holistic approach for neural interfaces: transparent materials, neuromorphic computing, and computational co-designs

Duygu Kuzum
Univ. of California, San Diego (USA)



Beyond GCaMP: new high-performance genetically encoded biosensors for the neurotechnology toolbox

Robert Campbell
The Univ. of Tokyo (Japan)



Fast simultaneous 3D acousto-optical imaging and photostimulation with precise control of temporal sequences of large neuronal assemblies in a novel immersive virtual reality revealed competitive neuronal clusters during learning in behaving mice

Balázs Rózsa
Pázmány Péter Univ. (Hungary)



Multi-scale imaging of freely-moving animals reveals the behavioral and neural organization of ancestral sleep-like states

Jennifer Li
Max Planck Institute for Biological Cybernetics (Germany)



Drew Robson
Max Planck Institute for Biological Cybernetics (Germany)

Biophotonics Focus: AI/ML/DL Plenary

29 January 2023 • 7:00 PM–8:35 PM
Moscone Center, Room 207 (Level 2 South)

Artificial intelligence, machine learning, and deep learning are enabling intelligent systems across the biomedical and biophotonics sector.



Welcome and opening remarks

Aydogan Ozcan
Univ. of California, Los Angeles
(United States)

Presentation of Dennis Gabor Award in Diffractive Optics

The award recipient for 2023 is
Aydogan Ozcan, Univ. of California, Los Angeles (United States).



Presented by
Jennifer K. Barton
The Univ. of Arizona (United States)
Vice-President, SPIE
BiOS Symposium Cochair



Overview on deep-learning-enabled computational microscopy and diffractive imaging

Aydogan Ozcan
Univ. of California, Los Angeles (United States)

Followed by **Q&A**



Deep learning and photoacoustic image formation: promises and challenges

Mark A. Anastasio
Univ. of Illinois at Urbana-Champaign
(United States)

Followed by **Q&A**



MRI, radiology, and mammography

Maryellen L. Giger
Univ. of Chicago (United States)

Followed by **Q&A**



Deep2Deep: AI and deep learning for label-free 3D cell classification

Natan Shaked
Tel Aviv Univ. (Israel)

Followed by **Q&A**

PLENARY AND HOT TOPICS SESSIONS

Open to all paid conference attendees.

OPTO Plenary

30 January 2023 • 8:00 AM–10:00 AM
Moscone Center, Room 207 (Level 2 South)

Attend the OPTO plenary session to hear the latest from Rajeev Ram on high-performance electronic-photonic interfaces, Emily Warren on tandem photovoltaic devices, and Nicolas Grandjean on III-nitride semiconductors.



Welcome and Opening Remarks

Sonia García-Blanco
Univ. Twente (Netherlands)



Bernd Witzigmann
Friedrich-Alexander-Univ.
Erlangen-Nürnberg (Germany)

Announcement of the OPTO AI/ML and Net Zero Best Paper Awards



High-performance electronic-photonic interfaces: from AI to quantum

Rajeev Ram
Massachusetts Institute of Technology
(United States)



Tandem photovoltaic devices: more than one way to make a solar cell

Emily Warren
National Renewable Energy Laboratory
(United States)



Are III-nitride semiconductors also suitable for red emission?

Nicolas Grandjean
Ecole Polytechnique Fédérale de Lausanne
(Switzerland)

Quantum West Plenary

30 January 2023 • 1:00 PM–3:05 PM
Moscone Center, Room 207 (Level 2 South)

Quantum West showcases the future of applied quantum technologies that will bring about a quantum-enabled future. Hear outstanding leaders discuss their vision for achieving Quantum 2.0.



Welcome and Opening Remarks

Session Chair:
Halina Rubinsztein-Dunlop
Quantum Science Laboratory,
The University of Queensland (Australia)



Quantum imaging overview

Miles J. Padgett
University of Glasgow (United Kingdom)

Followed by **Q&A**



Scalable photonic integrated circuits for quantum information applications

Matt Eichenfield
The University of Arizona (United States) and
Sandia National Laboratories (United States)

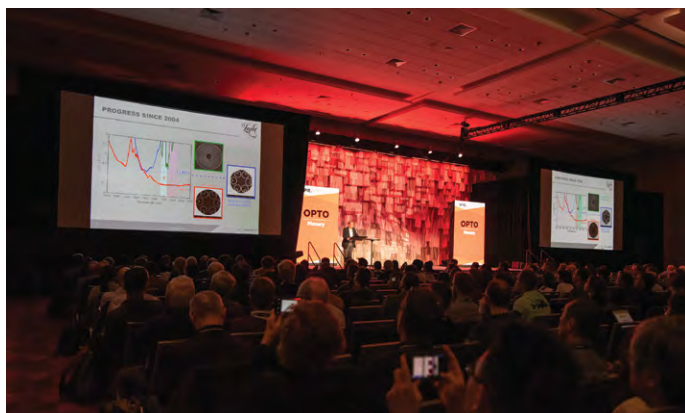
Followed by **Q&A**



Will quantum technology save the world?: an Australian perspective

Catherine P. Foley
Australia's Chief Scientist (Australia)

Followed by **Q&A**



LASE Plenary and Hot Topics

30 January 2023 • 3:45 PM–6:00 PM
Moscone Center, Room 207 (Level 2 South)

At the LASE Plenary session, hear from Arnan Mitchell on fully integrated photonic systems and from NIF on their recent fusion ignition breakthrough. Hot topics include the potential of laser AM for easing supply chains and our carbon footprint, innovations in lidar, and quantum computing with lasers.



Welcome and Opening Remarks

Stefan Kaierle

Laser Zentrum Hannover e.V. (Germany)



John Ballato

Clemson Univ. (United States)

Announcement of the 3D Printing, Fabrication, and Manufacturing Best Paper Awards

Announcement of the LASE AI/ML and Net Zero Best Paper Awards



PLENARY:

Status and potential of fully integrated photonic systems

Arnan Mitchell

RMIT Univ. (Australia)



HOT TOPIC:

How laser AM can help in the fight against supply chain issues and carbon footprint

Eliana Fu

TRUMPF North America (United States)



HOT TOPIC:

Innovations in lidar driving the next generation of autonomy and safety

Jason Eichenholz

Luminar Technologies, Inc. (United States)



HOT TOPIC:

Quantum computing with lasers

Jürgen Stuhler

TOPTICA Photonics AG (Germany)

PLENARY:

Recent success in laser-based inertial confinement fusion (ICF) at the National Ignition Facility (NIF)

Speaker to be announced.

Q&A for all speakers

Nano/Biophotonics Plenary

31 January 2023 • 10:30 AM–11:30 AM
Moscone Center, Room 207 (Level 2 South)

Join us for this year's nano/biophotonics plenary on porphyrinsome nanotechnology.



Welcome and Opening Remarks

Paras Prasad

Univ. at Buffalo (USA)



Porphyrinsome nanotechnology: from discovery toward first-in-patients

Gang Zheng

Univ. of Toronto (Canada) and
Princess Margaret Cancer Ctr. (Canada)

TECHNICAL EVENTS

Poster events, workshops, and networking with a technical focus provide an opportunity to connect more deeply with colleagues on topics critical to your work and interest areas.

Pascal Rol Keynote Address

28 January 2023 • 11:30 AM-12:30 PM
Moscone Center, Room 301 (Level 3 South)

Join the Ophthalmic Technologies conference for the 2023 Pascal Rol Keynote Address, given this year by National Eye Institute Director Dr. Michael Chiang.

Panel Discussion on Visualizing and Quantifying Drug Distribution in Tissue

28 January 2023 • 2:35 PM-3:35 PM
Moscone Center, Room 306 (Level 3 South)

Attend this informative panel discussion presented by the Visualizing and Quantifying Drug Distribution in Tissue VII conference.

Panel Discussion on Opportunities for Optics in Cardiovascular Medicine

28 January 2023 • 4:30 PM-5:00 PM
Moscone Center, Room 76 (Lower Mezzanine South)

Join the Diagnostic and Therapeutic Applications of Light in Cardiology 2023 conference for this exciting panel discussion.

Panel on Pathway to Impact: A Discussion of Limited Topics and Way Forward

29 January 2023 • 8:30 AM-11:00 AM
Moscone Center, Room 307 (Level 3 South)

Please join the Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic Therapy XXXI conference for this informative discussion.

Accredited Standards Committee for Optics (ASCOP)

TF7-Lasers

29 January 2023 • 9:00 AM-10:30 AM
InterContinental Hotel, Sutter (5th Floor)

TF2-Surface Imperfections

29 January 2023 • 11:00 AM-12:30 PM
InterContinental Hotel, Sutter (5th Floor)

ASCOP Business Meeting

29 January 2023 • 1:30 PM-3:00 PM
InterContinental Hotel, Sutter (5th Floor)

OEOSC Board and Membership Meeting

29 January 2023 • 3:30 PM-5:30 PM
InterContinental Hotel, Sutter (5th Floor)



Translational Research Forum

29 January 2023 • 12:30 PM-2:00 PM
Moscone Center, Room 153 (Upper Mezzanine South)

Join your colleagues in a discussion of outcomes-based studies that can change the lives of patients and visions for translating biophotonics technologies into novel healthcare solutions.

FDA Policies and Procedures: What Academic Investigators and Small Business Should Know

30 January 2023 • 1:30 PM-3:30 PM
Moscone Center, Room 204 (Level 2 South)

Come hear speakers from industry and regulatory agencies share their perspectives and advice on incorporating regulatory requirements into product development and how to achieve successful regulatory strategies.

Keynote and Panel Discussion on Optical Super-Resolved Imaging

30 January 2023 • 3:20 PM-4:50 PM
Moscone Center, Room 156 (Upper Mezzanine South)

Listen to experts in the field converse about optical super-resolved imaging in this panel put on by conference 12378, Dynamics and Fluctuations in Biomedical Photonics.

Panel Discussion and Awards Ceremony for Microfluidics, BioMEMS, and Medical Microsystems

30 January 2023 • 4:20 PM-5:20 PM
Moscone Center, Room 202 (Level 2 South)

Please join us to discuss microfluidics, bioMEMS, and medical microsystems and honor the best papers in the conference.



See full details and updates at
spie.org/pw or on the **SPIE App**

BiOS Student 3-Minute Poster Presentations

Sponsored by Neurophotonics and the Journal of Biomedical Optics

30 January 2023 • 4:30 PM-5:30 PM
Moscone Center, Level 2 West

Students present 3-minute rapid-fire overviews of their BiOS poster research. The top three presentations will receive cash prizes.

Frontiers in Ultrafast Optics Best Student Paper Competition and Awards Ceremony

31 January 2023 • 2:00 PM-3:20 PM
Moscone Center, Room 158 (Upper Mezzanine South)

Come watch the competition. A cash prize will be awarded to the best student presentation in the LASE conference on Frontiers in Ultrafast Optics.

Laser 3D Manufacturing 10th Anniversary Session: History and Future Trend and Panel Discussion

31 January 2023 • 3:10 PM-6:10 PM
Moscone Center, Room 215 (Level 2 South)

Invited talks from Khershed Cooper, Manyalibo Matthews, Martin Wegener, Uli Lemmer, and Henry Helvajian followed by a panel discussion with Bo Gu, Hongqiang Chen, Henry Helvajian, and Ruth Houbertz.

Holography Technical Event

31 January 2023 • 7:30 PM-9:00 PM
InterContinental Hotel, Intercontinental Ballroom B (5th Floor)

Join the holography technical group for a discussion on recent developments and directions in holography, focusing in particular on new materials, color display holography, digital holography, CGHs, and HOEs.

Laser Communications

31 January 2023 • 7:30 PM-9:00 PM
InterContinental Hotel, Intercontinental Ballroom C (5th Floor)

Join us for the annual meeting on Laser Communications. We invite all professionals involved in theory and applications of free-space laser communications, remote sensing and supporting technologies.

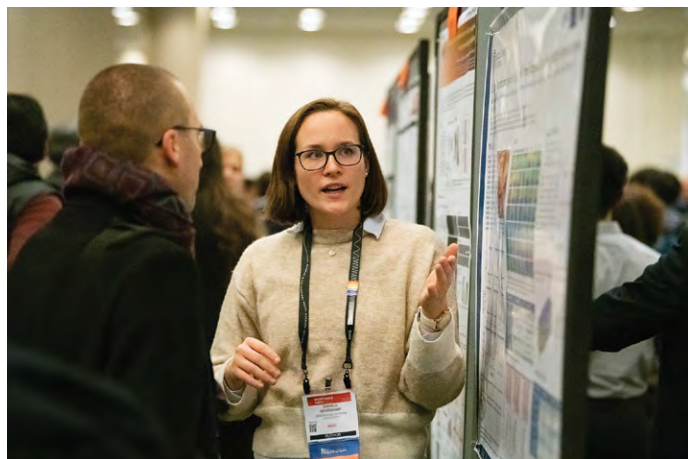
Innovation Awards in Quantum Sensing, Nano Electronics, and Photonics

31 January 2023 • 7:30 PM-9:00 PM
InterContinental Hotel, Intercontinental Ballroom A (5th Floor)

Workshop on Methods of Complex Light

1 February 2023 • 1:30 PM-3:00 PM
Moscone Center, Room 308 (Level 3 South)

Join us for small-group discussions on technologies related to complex light with a variety of experienced researchers in the field.



POSTER SESSIONS

Conference attendees are invited to attend the poster sessions. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

BiOS Poster Session (Sunday)

29 January 2023 • 5:30 PM-7:00 PM
Moscone Center, Level 2 West

Poster Setup: Sunday 10:00 AM-5:00 PM

BiOS Poster Session (Monday)

30 January 2023 • 5:30 PM-7:00 PM
Moscone Center, Level 2 West

Poster Setup: Monday 10:00 AM-5:00 PM

LASE and Select BiOS Poster Session (Tuesday)

31 January 2023 • 6:00 PM-8:00 PM
Moscone Center, Level 2 West

Poster Setup: Tuesday 10:00 AM-5:00 PM

OPTO and Select BiOS Poster Session (Wednesday)

1 February 2023 • 6:00 PM-8:00 PM
Moscone Center, Level 2 West

Poster Setup: Wednesday 10:00 AM-5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at
<https://spie.org/PWPosterGuidelines>

INDUSTRY EVENTS

Valuable information for anyone — from engineers to CEOs — looking for the latest industry insights

Enjoy events focused on the business side of photonics. These informative sessions feature industry experts and leaders sharing the latest industry opportunities and challenges.

BiOS Expo

SATURDAY

28 January 2023 • 10:00 AM–5:00 PM
Moscone Center, Hall DE (Exhibit Level)

SUNDAY

29 January 2023 • 10:00 AM–4:00 PM
Moscone Center, Hall DE (Exhibit Level)

BiOS Expo is the world's largest biomedical optics and biophotonics exhibition. Find the latest technologies from top companies supplying biomedical research and healthcare solutions.

Transforming Healthcare via AI and Deep Learning

28 January 2023 • 1:00 PM–2:30 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Come hear a panel of experts in the field as they advance the use of AI and deep learning in the healthcare industry. Learn how machine learning and AI are improving accuracy and efficiency in imaging, diagnostics, and therapeutics.



CHAIR
Kyle J. Myers
Independent Consultant
FDA (retired) (United States)

PANELISTS



Maryellen Giger
PI at MIDRC, Advisor at Qlarity
University of Chicago Department of Radiology
(United States)



Yair Rivenson
Co-founder and CEO
Pictor Labs (United States)



Zoltán Göröcs
CTO
Lucendi, Inc. (United States)
Zoltán Göröcs is the Chief Technology Officer at Lucendi Inc.



Charles Taylor
Founder and CSO
Heartflow, Inc. (United States)

The Rise of Hyperspectral Imaging as the New Imaging Modality in the Operating Theater

28 January 2023 • 2:45 PM–3:15 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

imec will present the technology and unique capabilities of their hyperspectral sensors for the use case of minimally invasive surgeries, for medical device and integration companies to use for next-gen surgical tools.



Wouter Charle
Manager, Hyperspectral Imaging Technology
imec (Belgium)

Panel Discussion on Disruption to Healthcare: the Impact of Point-of-Care and Wearable Technology

29 January 2023 • 11:15 AM–12:15 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Hear from the innovators who are disrupting traditional doctor-patient practices and the related healthcare markets at this *Photonics Focus*-sponsored panel discussion.



MODERATOR
Gwen Weerts
Editor in Chief of *Photonics Focus*
SPIE (United States)



PANELISTS
Rachel Kuperman
Founder and CEO
Eysz, Inc. (United States)



Paul Winstanley
CEO
CENSIS (United Kingdom)



Aaron Zilkie
Co-Founder and CTO Photonics
Rockley Photonics (United Kingdom)



Zane Arp
Director of the Division of Biomedical Physics
Center for Devices and Radiological Health
Food and Drug Administration (United States)



See full details and updates at
spie.org/pw or on the **SPIE App**

Healthcare Startups Panel

29 January 2023 • 1:00 PM–2:45 PM

Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Attend this informative panel composed of members of the healthcare startup ecosystem as they discuss their potential for influence and growth in a complex landscape of prototyping, partnerships, funding, and regulation.



CHAIR

Kyle J. Myers

Independent Consultant
FDA (retired) (United States)

PANELISTS



Rachel Kuperman

Founder and CEO
Eysz, Inc. (United States)



Bill Hyun

Venture Partner
Genoa Ventures (United States)



Ryan Shelton

Co-Founder and CEO
PhotoniCare (United States)



Francesco Tantussi

Scientific Advisor
Foresee Biosystems (Italy)

Amplifying The Healthcare Impact of Optics and Photonics

29 January 2023 • 3:00 PM–3:45 PM

Moscone Center, Expo Stage, Hall DE (Exhibit Level)

The National Institutes of Health sits at the intersection of academia, small businesses, and industry. Join SEED Director Matt McMahon to learn about NIH's small business programs supporting cutting edge innovations that impact patients' lives.



Matt McMahon

Director, SEED,
Office of Extramural Research (OER)
National Institutes of Health (United States)

Laser Focus World Executive Forum

30 January 2023 • 7:00 AM–6:30 PM

InterContinental Hotel

The Executive Forum is celebrating 35 years of providing market insights for laser and photonics professionals. This one-day forum gives executives the opportunity to network with peers while gaining indispensable information for their businesses. **IMPORTANT:** This event requires a separate registration from SPIE Photonics West. See the Laser Focus World Executive Forum website: <https://www.lfwexecutiveforum.com>

PRESENTED BY:

LaserFocusWorld

IN COOPERATION WITH:

SPIE.

Office Hours — Startup Challenge Teams and Mentors

30 January 2023 • 1:00 PM–5:00 PM

Advance sign-up is required to schedule meetings with mentors.

Industry professionals from a variety of expertise and backgrounds take 20 minute meetings with Startup Challenge teams to offer insight, advice, and networking opportunities.

Photonics Cluster Reception

30 January 2023 • 5:00 PM–7:00 PM

InterContinental Hotel, Intercontinental Ballroom C (5th Floor)

Join leaders from regional optics and photonics clusters at this annual SPIE-hosted reception. Connect with your peers from around the world to share ideas, increase collaboration, and measure the economic impact of our industry.

SPONSORED BY: **SPIE.**

Quantum West: Opening Welcome and Keynote + Market Report

31 January 2023 • 9:00 AM–10:30 AM

Moscone Center, Quantum Stage, Hall A Lobby
(Exhibit Level South)

Welcome to Quantum West 2023! Join us for opening remarks from Jay Lowell followed by a keynote address from Marco Pistoia, Global Technology Applied Research at JPMorgan Chase & Co, and a photonics in quantum market report from Yole Intelligence.



Welcome and introduction

Jay Lowell

Principal Senior Technical Fellow and Quantum Portfolio Manager
Boeing Research and Technology Disruptive Computing & Networks (United States)



Quantum technology for the financial industry (Keynote Presentation)

Marco Pistoia

Managing Director, Head of Research
JPMorgan Chase & Co. (United States)



How photonics will contribute to quantum technologies and applications

Eric Mounier

Fellow Analyst
Yole Intelligence (France)

Sensors and Instrumentation Technical Advisory Committee Open Session

31 January 2023 • 9:30 AM–11:00 AM

InterContinental Hotel, Intercontinental Ballroom C (5th Floor)

The Sensors and Instrumentation Technical Advisory Committee is an official federal advisory committee within the US Bureau of Industry and Security. Any SPIE Photonics West attendee is welcome during the open session of this meeting.



CHAIR
Jennifer Douris O'Bryan
Director, Government Affairs
SPIE (United States)

Photonics West Exhibition–Tuesday

31 January 2023 • 10:00 AM–5:00 PM

Moscone Center, North-South (Exhibit Level)

Opening Day! Photonics West Exhibition is the most important show in the industry. Start the year off right by connecting with customers, clients, and prospects at the Photonics West Marketplace.

Startup Challenge: Investing in Photonics Panel

31 January 2023 • 10:15 AM–11:15 AM

Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Hear from leading venture capitalists about emerging trends, common problems, and how founders can build successful companies in the photonics space.



MODERATOR
Ian Tracey
Founder
Anchored In, Ltd. (United Kingdom)



PANELISTS
Laura Smoliar
Founding Partner
Berkeley Catalyst Fund (United States)



Darius Sankey
General Partner and Managing Director
Innovation Acceleration Capital (United States)



Richard Oberreiter
Managing Executive
Hamamatsu Ventures (United States)



Sujatha Ramanujan
Managing Director
NextCorps Luminare (USA)



Company Spotlights

31 January 2023 • 11:00 AM–4:00 PM

Moscone Center, Room 05 (Exhibit Level South)

Listen to exciting company highlights from exhibitors who are hiring in our industry.

Visit the SPIE App for a complete, up-to-date list of Company Spotlight presentations.

Company Spotlight—Thorlabs

31 January 2023 • 11:00 AM–11:15 AM

Moscone Center, Room 05 (Exhibit Level South)

Thorlabs is hiring! Attend their Company Spotlight presentation to hear more.

Company Spotlight—Edmund Optics

31 January 2023 • 11:15 AM–11:30 AM

Moscone Center, Room 05 (Exhibit Level South)

Edmund Optics is hiring! Attend their Company Spotlight presentation to learn more.

Company Spotlight—JML Optical

31 January 2023 • 11:30 AM–11:45 AM

Moscone Center, Room 05 (Exhibit Level South)

JML Optical is hiring! Visit their Company Spotlight presentation to learn more.

Company Spotlight—Sciton

31 January 2023 • 11:45 AM–12:00 PM

Moscone Center, Room 05 (Exhibit Level South)

Sciton is hiring! Attend their Company Spotlight presentation to learn more.



See full details and updates at
spie.org/pw or on the **SPiE App**

Quantum West: A Global View of Quantum in Industry Keynote + Panel

31 January 2023 • 11:00 AM-12:30 PM

Moscone Center, Quantum Stage, Hall A Lobby (Exhibit Level South)

Gain a more balanced global view of quantum in industry from this keynote address by Taro Shimada, President and CEO of Toshiba Corp., and a panel discussion on industry initiatives in quantum technologies.



Introductory remarks

Jay Lowell

Principal Senior Technical Fellow and Quantum Portfolio Manager
Boeing Research and Technology Disruptive Computing & Networks (United States)



Toward the future of quantum economy (Keynote Presentation)

Taro Shimada

President and CEO
Toshiba Corp. (Japan)



Panel Discussion on Industry Initiatives in Quantum Technologies

MODERATOR

Jay Lowell

Chief Engineer, Senior Technical Fellow

PANELISTS



Taro Shimada

President and CEO
Toshiba Corp. (Japan)



Celia Merzbacher

Executive Director
SRI International / QED-C
(United States)



Catherine P. Foley

Australia's Chief Scientist (Australia)



Thierry Botter

Executive Director
European Quantum Industry Consortium e.V. (Germany)



Richard Murray

Co-founder and CEO
ORCA Computing Ltd.
(United Kingdom)

Startup Challenge Fundraising Series A/B Pitches

31 January 2023 • 11:30 AM-12:30 PM

Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Come hear the finalists in the SPIE Start-Up Challenge series A and B rounds, where photonics-based startups pitch their growth stage business.

Executive Insights Panel

31 January 2023 • 1:15 PM-2:15 PM

Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Join us for a thought-provoking session as executives from leading photonics companies take to the stage to share their thoughts and insights on opportunities and challenges guiding the future of the industry.



MODERATOR

John R. Lincoln

Chief Executive,
Photonics Leadership Group



PANELISTS

Donis G. Flagello

President and CEO
Nikon Research Corp. of America
(United States)



Karin Hinzer

Professor and Vice-Dean,
Photonic Devices for Energy
Univ. of Ottawa (Canada)



Dr. Stefan Traeger

President and CEO
Jenoptik AG (Germany)



John T. C. Lee

President and CEO
MKS Instruments, Inc.
(United States)

Startup Challenge Finals

31 January 2023 • 2:30 PM-4:15 PM

Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Come hear the live pitches of these photonics-based startup finalists as they present to a team of expert judges in focus areas in deep tech and healthcare, as each aim to take home the \$10,000 prize.

Quantum West: QED-C Quantum Marketplace and Solutions for Deployed Quantum 2.0

31 January 2023 • 2:30 PM–4:15 PM
Moscone Center, Quantum Stage, Hall A Lobby
(Exhibit Level South)

What are you in the market for? Join this panel discussion on the QED-C Quantum Marketplace™ and solutions for deployed quantum 2.0 and quantum-related technology needs.



PM EMCEE:
Jonathan Felbinger
QED-C Deputy Director
SRI International (United States)

Introductory remarks

Session Chair: **Mark Wippich**, MPW (United States)

Introductions and remarks from the panelists

Before the discussion, we will hear from each panelist as they deliver a brief introduction.

Panel discussion on the quantum marketplace and solutions for deployed Quantum 2.0



MODERATOR
Mark Wippich
Principal
MPW LLC (United States)



PANELISTS
Marco Arrigoni
Director of Strategic Marketing
Coherent Corp. (United States)



Mark Tolbert
CEO
TOPTICA Photonics, Inc. (United States)



Sascha Häuser
Vice President Sales
NKT Photonics (Denmark)



Scott Davis
CEO and Founder
Vescent Photonics Inc. (United States)



Gordon Morrison
Vice President of Engineering
Freedom Photonics LLC (United States)



Chris Wood
Chief Technology Officer
Infleqtion (United States)



Leonie Mueck
Chief Product Officer
Riverlane (United States)

Quantum West Networking Reception

31 January 2023 • 4:15 PM–5:45 PM
Moscone Center, Quantum Stage, Hall A Lobby
(Exhibit Level South)

Help us wind down a day of Quantum West with this sponsored networking reception.

SPONSORED BY:



TOPTICA



VESCENT



Infleqtion

Startup Challenge Awards and Reception

31 January 2023 • 4:30 PM–5:00 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Come see which innovative team takes home the \$10,000 check and first-place title for SPIE Startup Challenge 2023.

SPIE/Spectaris Wassenaar Laser Working Group

1 February 2023 • 9:00 AM–10:00 AM
InterContinental Hotel, Sutter (5th Floor)

This Wassenaar Laser Working Group discusses proposed changes to international export control agreements brought forward by the affected global industry stakeholders. Open to all participants.



CHAIR
Jennifer Douris O'Bryan
Director, Government Affairs
SPIE (United States)

Quantum West: Funding Commercial Advances in Quantum Technologies

1 February 2023 • 9:00 AM–10:45 AM

Moscone Center, Quantum Stage, Hall A Lobby
(Exhibit Level South)

Gain important insights about funding commercial quantum advances with presentations from representatives of UK Research and Innovation, Sonnenberg Harrison Partnership, and USAF/Air Force Research Lab. A panel discussion will follow.



Introductory remarks

Anke Lohmann

Founder and Director
Anchored In Ltd. (United Kingdom)



The quantum summer of 2022: success stories from the UK's National Quantum Technologies Programme

Roger McKinlay

Challenge Director
UK Research and Innovation (United Kingdom)



Sonnenberg Harrison Partnership

Robert Harrison

Partner
Sonnenberg Harrison (United Kingdom)



Quantum research program funding and objectives in the Air Force Research Lab.

Michael Fanto

Senior Research Physicist,
Quantum Technologies Branch
USAF/Air Force Research Lab. (United States)

Panel Discussion on Funding Commercial Advances in Quantum Technologies

MODERATOR

Anke Lohmann

Founder and Director
Anchored In Ltd. (United Kingdom)

PANELISTS

Roger McKinlay

Challenge Director
UK Research and Innovation (United Kingdom)

Robert Harrison

Partner
Sonnenberg Harrison (United Kingdom)

Michael Fanto

Senior Research Physicist, Quantum Technologies Branch
USAF/Air Force Research Lab. (United States)

Photonics West Exhibition–Wednesday

1 February 2023 • 10:00 AM–5:00 PM

Moscone Center, North-South (Exhibit Level)

Visit Photonics West Exhibition on its second day. Connect with customers, clients, and prospects at the most important show in the photonics industry.

Panel Discussion on Disruption to the Automotive Industry: the Impact of Automation and Connectivity

1 February 2023 • 10:15 AM–11:15 AM

Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Learn how startups and industry stalwarts are using optics and photonics in their efforts to disrupt the automotive industry in this panel discussion sponsored by *Photonics Focus*.



MODERATOR

William Schulz

Managing Editor of *Photonics Focus*
SPIE (United States)



PANELISTS

Marcus Dahlem

Program Manager for Optical 3D Sensing
imec (Belgium)



Chuck Gershman

Co-Founder and CEO
Owl Autonomous Imaging (United States)



Shauna McIntyre

CEO and Board Member
(United States)

Quantum West: Executive Insights Panel

1 February 2023 • 11:15 AM–12:15 PM

Moscone Center, Quantum Stage, Hall A Lobby
(Exhibit Level South)

Gain valuable insights from this Quantum West executive insights panel with Celia Merzbacher, QED-C; Scott Faris, Infleqtion; Carmen Palacios-Berraquero, Nu Quantum; Denise Ruffner, Atom Computing; and Kaniah Konkoly-Thege, Quantinuum.



Introductions and Panel Discussion

MODERATOR

Celia Merzbacher

Executive Director

SRI International / QED-C (United States)



PANELISTS

Scott Faris

CEO

Infleqtion (United States)



Carmen Palacios-Berraquero

CEO and Co-Founder

Nu Quantum (United Kingdom)



Denise Ruffner

Chief Business Officer

Atom Computing, Inc. (United States)



Kaniah Konkoly-Thege

Chief Legal Officer and

Sr. VP Government Relations

Quantinuum Ltd. (United States)



Co-Packaged Optics and Silicon Photonics for Data Center Applications

1 February 2023 • 11:30 AM–12:45 PM

Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Hear how co-packaged optics are inching closer to reality and how silicon photonics is a key enabling technology for further development of optical interconnect solutions needed to address growing traffic.

Welcome and opening remarks



Co-packaged optics are inching closer to reality

Martin Vallo

Senior Analyst, Photonics

Yole Intelligence (France)



Chiplets enabled by silicon photonics

Eric Mounier

Director of Market Research and Fellow Analyst

Yole Intelligence (France)



CPO opportunities and challenges: a transceiver implementer's perspective

Vipul Bhatt

VP of Marketing, Datacom Vertical

Coherent Corp. (United States)



Accelerating the adoption of co-packaged optical interconnects

Manish Mehta

VP of Marketing and Operations

Broadcom Inc. (United States)



Challenges and opportunities for optics in cloud datacenters

Jake Joo

Site Leader and Senior Technical Manager

Dupont (United States)

MicroLEDs for Consumer Applications

1 February 2023 • 1:30 PM–2:30 PM

Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Money and resources are flowing into microLEDs, fueling a virtuous circle with faster developments, and improving prospects that are attracting further investments.

Welcome and opening remarks



MicroLEDs are reaching escape velocity

Eric Virey

Principal Market and Technology Analyst

Yole Intelligence (France)

Quantum West: Quantum Workforce Development

1 February 2023 • 1:30 PM–3:15 PM

Moscone Center, Quantum Stage, Hall A Lobby (Exhibit Level South)

The field of quantum information science and technology is rapidly expanding. Attend this event to better understand the challenges we face to build a diverse, inclusive, and sustainable quantum information science and technology (QIST) workforce.



PM EMCEE
Anjul Loiacono
VP Quantum Dynamics Platforms
Infleqion (United States)



Introductory remarks
Philip Makotyn
Executive Director
CUbit Quantum Initiative,
Univ. of Colorado Boulder (United States)



Workforce needs and education activities: a USG State Department and University perspective
Lincoln D. Carr
Associate Professor
Colorado School of Mines (United States)



Discovering and diversifying quantum talent
Connor Teague
CEO and President
Quantum Futures (United States)



Takeaways from training 20,000 students in quantum
Kiera Peltz
Founder and Executive Director
Qubit by Qubit, The Coding School (United States)



Education and Training in Photonics Quantum Sciences and Technologies: peer-reviewed reports from the global community
Matthew Posner
Workforce and Photonics Education Director
Optonique (Canada)

Panel Discussion on quantum workforce development

MODERATOR: **Philip Makotyn**, Executive Director
CUbit Quantum Initiative, Univ. of Colorado Boulder (United States)

PANELISTS:

Lincoln D. Carr, Associate Professor
Colorado School of Mines (United States)

Connor Teague, President, Quantum Computing Talent Partner
Quantum Futures (United States)

Kiera Peltz, ounder and Executive Director
Qubit by Qubit, The Coding School (United States)

Matthew Posner
Workforce and Photonics Education Director
Optonique (Canada)

AmeriCOM Panel: Where Have All the Technicians Gone? How Optics Ecosystems Are Bringing Them Back

1 February 2023 • 2:45 PM–3:45 PM

Moscone Center, Expo Stage, Hall DE (Exhibit Level)

In this session a panel of optics ecosystem collaborators from industry, education, and nonprofit sectors will discuss how their partnership with AmeriCOM is raising awareness of the optics industry and building back the technician workforce.



PANELISTS
Navid Entezarian
Business Development Manager
Thorlabs Inc. (United States)



Amanda Meier
Program Director and Faculty,
Optics Technology Program
Front Range Community College
(United States)



Alexis Vogt
Workforce and Higher Education
Executive Director
AmeriCOM - the American Center for
Optics Manufacturing (United States)



Tom Battley
Vice President Government and Partnerships
AmeriCOM - the American Center
for Optics Manufacturing (United States)



Mike Hyman
Director of Technology
Optimax (United States)



Josanne DeNatale
National Marketing and Workforce
Development Operations Director
AmeriCOM—the American Center for
Optics Manufacturing (United States)

Quantum West: Quantum Demonstrators

1 February 2023 • 3:45 PM–5:25 PM
Moscone Center, Quantum Stage, Hall A Lobby
(Exhibit Level South)

Quantum West continues with this session on quantum demonstrators, where we will hear the latest on developments in quantum error correction, quantum memory, imaging systems, quantum processor, frequency combs, and quantum gravimeter.



Welcome and Introduction

Sara Diegoli
Quantum Programmes Director
Anchored In, Ltd. (United Kingdom)



Quantinuum's trapped ion quantum computer: architecture and quantum error correction

Lora Nugent
Quantinuum LLC (United States)



The Path to Practical Entanglement Distribution

Mehdi Namazi
Co-founder and Chief Science Officer
Qunnect Inc. (United States)



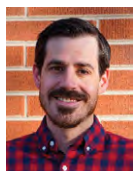
The "Quest" for Quantum 2.0: A peek inside the engineering of the ORCA-Quest quantitative CMOS camera and its potential role in quantum technologies

Stephanie Fullerton
Manager, Camera Products
Hamamatsu Corp. (United States)



Low-loss fully programmable quantum photonic processors

Devin H. Smith
Chief Technology Officer
QuiX Quantum BV (Netherlands)



Rugged and fieldable fiber frequency combs for enabling quantum applications

Henry Timmers
Staff Scientist
Vescent Photonics, LLC (United States)



Operational utilization of quantum gravity sensors

Peter Rosenbusch
Head of Quantum Gravimeters
exail Quantum Sensors (France)

3D Sensing for Consumer Applications

1 February 2023 • 4:00 PM–5:00 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Attend this session on 3D sensing to learn about lasers for advanced sensing, the dawn of the InP market in consumer applications, and the evolution of InP as a key enabler of sensing technology in consumer electronics.

Welcome and opening remarks



The dawn of the InP market in consumer applications

Ali Jaffal
Technology and Market Analyst
Yole Intelligence (France)



Lasers for advanced sensing in consumer electronics

Gerald Dahlmann
Senior Director of Marketing
Coherent Corp. (United States)



The evolution of InP as a key enabler of sensing technology in consumer electronics

Mark J. Furlong
Executive Vice President, Product Management
IQE (United Kingdom)

Quantum West: Fireside Chat

1 February 2023 • 5:25 PM–5:45 PM
Moscone Center, Quantum Stage, Hall A Lobby
(Exhibit Level South)

Help us wind down Quantum West 2023 with this fireside chat hosted by Celia Merzbacher, SRI International / QED-C, and Jay Lowell, Boeing Research and Technology Disruptive Computing & Networks.



Jay Lowell
Principal Senior Technical Fellow and
Quantum Portfolio Manager
Boeing Research and Technology Disruptive
Computing & Networks (United States)



Celia Merzbacher
Executive Director
SRI International / QED-C (United States)

2023 Prism Awards

1 February 2023 • 6:00 PM–9:00 PM
Marriott Marquis, Marriott Marquis Hotel, Yerba Buena
Ballroom (Lower Level)

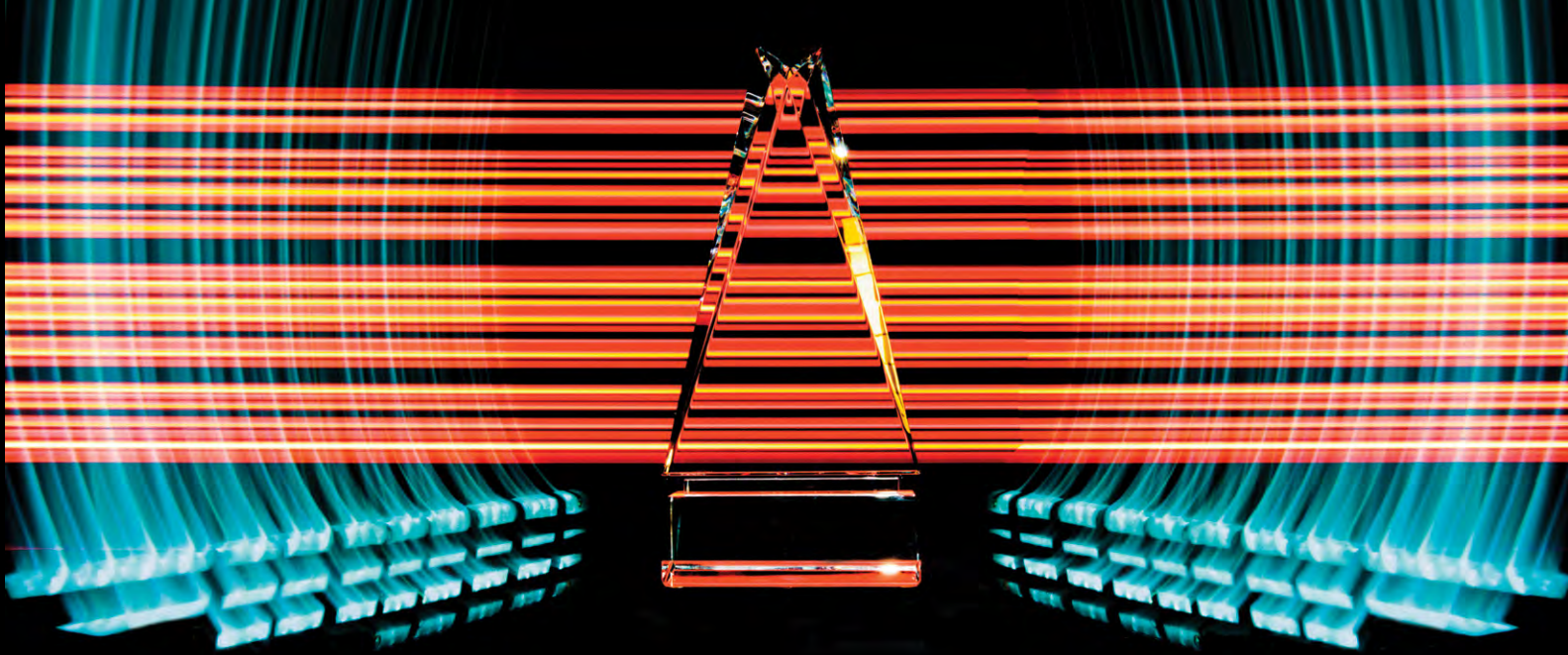
An annual international competition that honors the best new optics and photonics products on the market. Tickets required. See onsite Cashier to purchase tickets.

PRESENTED BY:

SPIE.

MEDIA SPONSOR:

PHOTONICS
MEDIA photonics.com



Congratulations Prism Awards 2023

Finalists

AR VR MR

Magic Leap
Porotech
TriLite Technologies

BIOMEDICAL

InnovaQuartz LLC
Norlase
Philophos

CAMERAS AND IMAGING

Metalenz
Neurescence
Printoptix

LASERS

EKSPLA
Kyocera SLD Laser
NKT Photonics

QUANTUM TECH

QuiX Quantum
Qunnect
Vexlum

SENSORS

NIL Technology
Ocean Insight
Stratio

SOFTWARE

Dotphoton
LightTrans International
Synopsys

TEST AND MEASUREMENT

4D Technology
Gamma Scientific
Precitec Optronik

SPIE.

PRISM²⁰
AWARDS²³



Photonics West Exhibition-Thursday

2 February 2023 • 10:00 AM–4:00 PM
Moscone Center, North-South (Exhibit Level)

Visit Photonics West Exhibition on its final day, share your latest solutions, and make important connections as your colleagues and peers continue to build an exciting year of collaboration and business growth.

Government Policy Update

2 February 2023 • 10:15 AM–10:45 AM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Open to all attendees. On the Expo Industry Stage (Hall E).



Jennifer Douris O'Bryan
Director, Government Affairs
SPIE (United States)

Photonics Market Update

2 February 2023 • 10:45 AM–11:15 AM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Open to all attendees. On the Expo Industry Stage (Hall E).



Andrew J. W. Brown
Sr. Director, Events and Global
Business Development
SPIE (United States)

Prism Awards Winners' Circle

2 February 2023 • 1:30 PM–3:00 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Join us to celebrate the winners of the 15th Annual Prism Awards. Let's raise a champagne toast to the winners!



2023 SPIE Startup Challenge

The SPIE Startup Challenge is an entrepreneurial pitch competition for new businesses that utilize optics and photonics to create innovative products, applications, and technologies. Ten early-stage startup companies from six countries have been selected to compete for a top prize of \$10,000 at the 13th annual SPIE Startup Challenge at Photonics West on 31 January.

2023 SPIE STARTUP CHALLENGE FINALISTS:

HEALTHCARE

- **Lighthanded Enterprises**
LasEar Laser Otoscope, to improve diagnosis of common causes of childhood hearing loss
- **PhosPrint P.C.**
A novel technology that repairs in vivo human tissue during surgery
- **PhoMedics Limited**
A histological imaging microscope offering real-time status during cancer surgery
- **PatenSee**
An innovative combination of machine learning and imaging technology for dialysis patients
- **QART Medical**
Utilizing biophotonics and data for 3D analysis of sperm cells during IVF

DEEP TECH

- **KostaCLOUD Inc.**
A cloud-based optical design and simulation tool enabling real-time, optical-mechanical design collaboration, dramatically improving design-optimization times
- **FluIDect GmbH**
Sensor technology combining the effects of whispering-gallery-modes (WGM) with functionalized fluorescent beads to detect pathogens in applications including food safety
- **Swave Photonics**
Enabling display-makers and content-creators with immersive holographic displays
- **Phosio**
Nanoimprintable, high-refractive-index transparent coatings, a critical tool for expanding optical designs in AR
- **Actoprobe**
A nonspectroscopy probe for advanced manufacturing and life science

FOUNDING PARTNER:



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WWW.SPIE.ORG/STARTUP

PROFESSIONAL DEVELOPMENT

Enjoy four powerful days of career development and job skills advancement with the SPIE Career Hub at Photonics West. Build these focused events and services into your schedule and use the opportunity to make valuable connections.

Lunch and Learn: Beaded Privilege

29 January 2023 • 12:00 PM–1:00 PM

Moscone Center, Community Lounge (Level 2 West)

Join us for lunch and learn about diversity and inclusion in the optics and photonics industry.



FACILITATOR
Jessica Wade

Survey Says These Skills Are Missing in Today's Workforce: A Workshop on Essential Career Skills Part A

30 January 2023 • 9:00 AM–12:00 PM

Moscone Center, Room 2000 (Level 2 West)

Learn from experts in the field what skills you need to excel in the job market. Attend Part A and B as a track or individually as your schedule allows.

Lunch and Learn: Drive Change—Start Where You're At

30 January 2023 • 12:00 PM–1:00 PM

Moscone West, Level 2 Community Lounge

Join us for lunch and learn how to use your sphere of influence to build a culture and a company you're proud of.



PRESENTER
Michele Nichols

Survey Says These Skills Are Missing in Today's Workforce: A Workshop on Essential Career Skills Part B

30 January 2023 • 1:00 PM–4:00 PM

Moscone Center, Room 2000 (Level 2 West)

Learn from experts in the field what skills you need to excel in the job market. Attend Part A and B as a track or individually as your schedule allows.

Resumes to Interviews: Student and Early Career Strategies for a Successful Job Search

31 January 2023 • 10:00 AM–12:00 PM

Moscone Center, Room 2000 (Level 2 West)

Open to technical attendees.

Whether you are about to graduate or are a professional looking for a new role, join us for this vital workshop on resume and interview must-dos and don'ts!

Lunch and Learn: Implicit Bias in STEM

31 January 2023 • 12:00 PM–1:00 PM

Moscone Center, Community Lounge (Level 2 West)

Join us for lunch and learn about how implicit bias affects us in both personally and professionally.



PRESENTER
Dr. Alexis J. Stokes

The Great Career Showdown! An Exploration of Careers in Optics and Photonics

31 January 2023 • 3:00 PM–4:00 PM

Moscone Center, Community Stage (Level 2 West)

Join us for this Jeopardy!-style showdown to ask questions of panelists of diverse career stages. Learn about their career-path choices using a fun and interactive gameshow format. Free snacks and drinks after! Sponsored by the **SPIE Career Lab**.

HOST: **Dr. Jessica Wade**, Research Fellow at Imperial College

CONTESTANTS:

Icel Sukovaty, Undergraduate Research Assistant at University of Rochester

Cory Boone, Technical Marketing Manager at Edmund Optics

Dr. Nishant Mohan, Vice President of Product at Notal Vision

Dr. Jennifer Barton, Professor and Director of the BIO5 Institute at The University of Arizona, 2023 SPIE President Elect

Impact and Intent: Effective Communication Skills for Scientists and Engineers

1 February 2023 • 8:50 AM–12:00 PM

Moscone Center, Room 2000 (Level 2 West)

Stand out from the crowd by polishing your communication skills through this interactive workshop.

SPEAKERS:

Anita Mahadevan-Jansen, Professor, Vanderbilt University and 2022 SPIE President

E. Duco Jansen, Professor and Senior Associate Dean, Vanderbilt University

Peter de Groot, Chief Scientist, Zygo Corporation and 2023 Vice President of SPIE

Lunch and Learn: Equity in the Optics and Photonics Industry

1 February 2023 • 12:00 PM–1:00 PM

Moscone Center, Community Lounge (Level 2 West)

Join us for lunch and hear from a panel of industry professionals on what their organizations are doing to make the optics and photonics industry more equitable.



See full details and updates at
spie.org/pw or on the **SPIE App**

Implicit Bias in the Scientific Community

1 February 2023 • 1:00 PM–4:00 PM
Moscone Center, Room 2000 (Level 2 West)

Unveil the layers of implicit bias in the scientific community and explore how you can make a difference.



PRESENTER

Dr. Alexis J. Stokes

Associate Chief Diversity and Inclusion Officer,
Office of Equity, Diversity, Inclusion, and Belonging,
Harvard University, Cambridge, MA

Resume Review

Bring your resume to receive tactical tips and tricks from a professional resume reviewer.

31 January 2023 • 10:00 AM–5:00 PM
Moscone Center, Level 1 West

1 February 2023 • 10:00 AM–5:00 PM
Moscone Center, Level 1 West

Free Professional Headshots

Come to the Career Hub in Moscone West Tuesday to get your free professional portrait taken during SPIE Photonics West.

31 January 2023 • 10:00 AM–5:00 PM
Moscone Center, Level 1 West

31 January 2023 • 10:00 AM–5:00 PM
Moscone Center, Hall F (Exhibit Level)

1 February 2023 • 10:00 AM–5:00 PM
Moscone Center, Level 1 West

1 February 2023 • 10:00 AM–5:00 PM
Moscone Center, Hall F (Exhibit Level)

2 February 2023 • 10:00 AM–4:00 PM
Moscone Center, Hall F (Exhibit Level)

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SPIE Job Fair

Tuesday 31 January • 10:00 AM–5:00 PM

Wednesday 1 February • 10:00 AM–5:00 PM

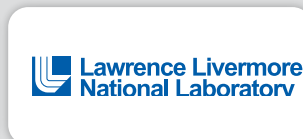
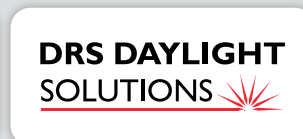
Moscone Center, Career Hub (Level 1 West)

Speak with hiring companies

Meet with companies seeking to hire professionals like you.

Bring your resume and put your best foot forward to land your dream job.

2023 JOB FAIR EXHIBITORS



Visit the SPIE App or the website for current list of Job Fair exhibitors

SPIE. CAREER CENTER

spiecareercenter.org

MEMBERSHIP EVENTS

Meet new people. Connect with friends.

Your SPIE Membership is a valuable asset. Join other SPIE Members at these informal get-togethers taking place in San Francisco.

'Ask me anything' opportunity: Come meet SPIE committee chairs and staff members

Moscone Center, Hall D (Exhibit Level), Membership Booth

Olivia Fehlberg

Chair of the SPIE Early Career and Students Subcommittee
Wednesday February 1 2:00 PM-3:00 PM

Maryellen Giger

Chair of the SPIE Membership and Communities Committee
Thursday February 2 10:00 AM-11:00 AM

Nelufar Mohajeri

Director, Membership and Community Development, SPIE
Sunday January 29 10:00 AM-12:00 PM
Tuesday January 31 10:00 AM-11:00 AM
Thursday February 2 10:00 AM-12:00 PM

Tasha Chicovsky

Manager, Community Development
Tuesday January 31 11:00 AM-12:00 PM
Wednesday February 1 11:00 AM-12:00 PM

Laura Sharik

Manager, Education
Tuesday January 31 10:30 AM-11:30 AM
Wednesday February 1 10:30 AM-11:30 AM

Felicia Andreotta

Course Coordinator
Saturday January 28 2:00 PM-3:00 PM
Tuesday January 31 3:00 PM-4:00 PM

SPIE Fellow Member Luncheon

30 January 2023 • 12:00 PM-1:30 PM
InterContinental Hotel, Intercontinental Ballroom (5th Floor)

All Fellow Members of SPIE are invited to join your colleagues for an SPIE hosted lunch. The new SPIE Fellows attending Photonics West will be introduced and recognized.

SPIE Senior Member Breakfast

31 January 2023 • 8:00 AM-9:00 AM
InterContinental Hotel, Intercontinental Ballroom AB (5th Floor)

All SPIE Senior Members are invited to join your colleagues for this SPIE-hosted buffet breakfast. Please join us for this informal gathering and a chance to interact with other Senior Members.

SPIE After-Dinner Member Reception

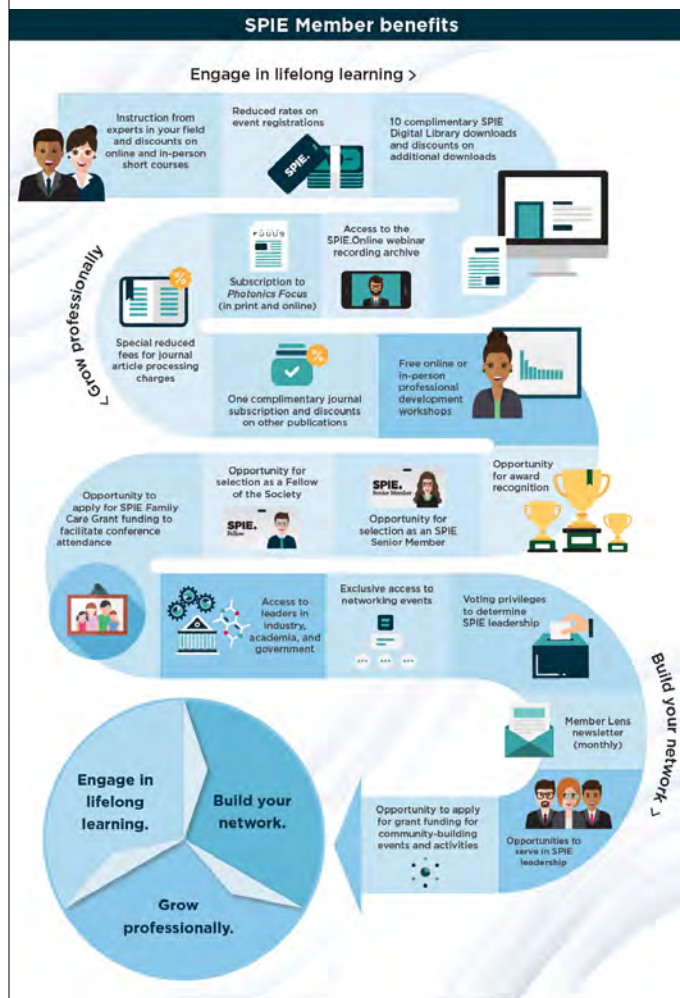
31 January 2023 • 8:00 PM-9:30 PM
661 Howard

SPIE Members are invited to an after-dinner reception. Enjoy beer, wine, coffee, and desserts.

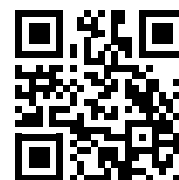
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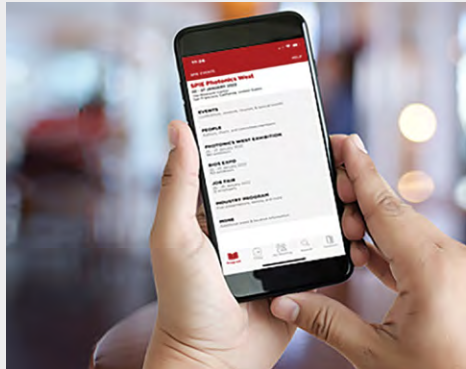


Join or renew today to make more progress toward your next career move



SPIE Conference and Exhibition App

Download the mobile app to enrich your meeting experience. View events, exhibitors and connect with participants all in the palm of your hand. The app is free, easy to use, and loaded with features designed for planning and connecting on the go.



SPIE App Lounge

Moscone Center, South Lower Lobby (Exhibit Level)

Join the SPIE App developer as he demonstrates different features of the app and offers tips and tricks for a successful week.

Tutorials are offered twice daily. Unable to attend the tutorial?

Stop by to ask a question, charge your phone, or take a break in the cozy lounge. Don't forget to pick up some free swag, as well.

SPIE App Lounge—Saturday

28 January 2023 • 7:15 AM–5:00 PM

Learn. Network. Relax. Discover how the SPIE App can enhance your Photonics West experience at the SPIE App Lounge.

SPIE App Tutorial | Introduction to the App

28 January 2023 • 10:15 AM–10:45 AM

If you're new to the app or want to learn about the new features, this is the session to attend. Includes an overview on exploring the conference and exhibition, building a schedule, and the new connect and chat features.

SPIE App Tutorial | Planning your Week

28 January 2023 • 3:15 PM–3:45 PM

For a deeper dive into My Schedule, attend this session and see how the app can assist with scheduling presentations, exhibitors, and connections into your busy week.

SPIE App Lounge—Sunday

29 January 2023 • 7:30 AM–5:00 PM

Learn. Network. Relax. Discover how the SPIE App can enhance your Photonics West experience at the SPIE App Lounge.

SPIE App Tutorial | Introduction to the App

29 January 2023 • 10:15 AM–10:45 AM

If you're new to the app or want to learn about the new features, this is the session to attend. Includes an overview on exploring the conference and exhibition, building a schedule, and the new connect and chat features.

SPIE App Tutorial | Planning your Week

29 January 2023 • 3:15 PM–3:45 PM

For a deeper dive into My Schedule, attend this session and see how the app can assist with scheduling presentations, exhibitors, and connections into your busy week.

APP LOUNGE SPONSORED BY



SPIE App Lounge—Tuesday

31 January 2023 • 7:30 AM–5:00 PM

Learn. Network. Relax. Discover how the SPIE App can enhance your Photonics West experience at the SPIE App Lounge.

SPIE App Tutorial | Introduction to the App

31 January 2023 • 10:15 AM–10:45 AM

If you're new to the app or want to learn about the new features, this is the session to attend. Includes an overview on exploring the conference and exhibition, building a schedule, and the new connect and chat features.

SPIE App Tutorial | Planning your Week

31 January 2023 • 3:15 PM–3:45 PM

For a deeper dive into My Schedule, attend this session and see how the app can assist with scheduling presentations, exhibitors, and connections into your busy week.

SPIE App Lounge—Wednesday

1 February 2023 • 7:45 AM–5:00 PM

Learn. Network. Relax. Discover how the SPIE App can enhance your Photonics West experience at the SPIE App Lounge.

SPIE App Tutorial | After the Conference

1 February 2023 • 10:15 AM–10:45 AM

The fun doesn't end with the event! Learn how the app can help you after the event; save a trip report, request a paper, export your connections, and more.

SPIE App Tutorial | Suggestions and Feedback

1 February 2023 • 3:15 PM–3:45 PM

Do you have suggestions for improvement of the SPIE App? We want to hear from you! Join us and share your feedback.

SPIE App Lounge—Thursday

2 February 2023 • 7:45 AM–4:00 PM

Learn. Network. Relax. Discover how the SPIE App can enhance your Photonics West experience at the SPIE App Lounge.

SPIE App Tutorial | After the Conference

2 February 2023 • 10:15 AM–10:45 AM

The fun doesn't end with the event! Learn how the app can help you after the event; save a trip report, request a paper, export your connections, and more.

Social and networking events

Network with colleagues

Enjoy real conversations and make important connections in person. Take the opportunity to discuss optics and photonics with other professionals from around the world.

BIOS Expo Networking Reception in the Exhibition

29 January 2023 • 2:30 PM–3:30 PM
Moscone Center, Hall DE (Exhibit Level)

Open to all attendees.

Come network and socialize with exhibitors!

Paws for a Break

29 January–1 February 2023 • 4:00 PM–6:00 PM DAILY
Moscone West, Level 2 Community Park

Paws for a break and join some of the most cuddly four-legged animals for a bit of self-care and animal love at the West Community Park.

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SPIE Community Development Showcase

29 January 2023 • 5:00 PM–6:00 PM
Moscone Center, Community Lounge (Level 2 West)

Interested in learning more about SPIE supported optics and photonics summer and winter schools? Join school organizers, past attendees, and other students in this fun informational session. Includes networking, snacks and refreshments.

Women in Optics Meetup

29 January 2023 • 6:30 PM–7:30 PM
Moscone Center, Community Lounge (Level 2 West)

Join other women in the field for informal discussions and networking.

Publications Reception—BIOS

29 January 2023 • 8:00 PM–9:00 PM
Room 2010, Level 2 West

This reception is for all volunteers who serve as Editors for the *Journal of Biomedical Optics* or *Neurophotonics*. Please join us!

Student and Early Career Networking Social

30 January 2023 • 5:00 PM–6:00 PM
Moscone Center, Level 2 West, Moscone West, Level 2 Community Stage

SPIE Student and Early Career Professional Member social and speed-networking extravaganza! Sponsored by the SPIE Career Lab.

Executive Women's Meetup

30 January 2023 • 6:30 PM–7:30 PM
InterContinental Hotel, Pacific Terrace Foyer (4th Floor)

Photonics West Welcome Reception

30 January 2023 • 7:00 PM–9:00 PM
Marriott Marquis, Yerba Buena Ballroom (Lower Level)

Don't miss our Welcome Reception and celebrate being together in person once again. Open to all paid attendees.



Whiskey Tasting at SPIE Booth

31 January 2023 • 1:00 PM–5:00 PM
Moscone Center, Hall D (Exhibit Level)

1 February 2023 • 1:00 PM–5:00 PM
Moscone Center, Hall D (Exhibit Level)

2 February 2023 • 12:00 PM–4:00 PM
Moscone Center, Hall D (Exhibit Level)

Sample specialty whiskeys while chatting with colleagues at SPIE Booth #3239.

CO-SPONSORED BY



Career Networking Mixer

31 January 2023 • 4:00 PM–5:00 PM
Level 1, Moscone West, Career Hub

A casual mixer to chat with recruiters from the Job Fair and other industry and academia professionals about careers in the optics industry.

Publications Reception—OPTO and LASE

31 January 2023 • 5:00 PM–6:00 PM
Moscone Center, Room 2010 (Level 2 West)

This reception is for all volunteers who serve as Editors for SPIE journals, including *Optical Engineering*, *Advanced Photonics*, *JEI*, *JNP*, *JPE*, or *JOM*. Come reconnect with colleagues over snacks and drinks.

LGBTQ+ Social

31 January 2023 • 6:30 PM–7:30 PM
Moscone Center, Level 2 West, Moscone West, Level 2 Community Lounge

Come join us and socialize and network with other LGBTQ+ attendees, students, scientists, and allies in the optics and photonics community.



See full details and updates at
spie.org/pw or on the **SPiE App**

SPIE Student Member Meetup

1 February 2023 • 4:30 PM–5:30 PM

Moscone Center, Community Lounge (Level 2 West)

Come meet your fellow Student Members from all over the world! Make new friends, meet MKS industry representatives, SPIE leadership, and expand your network.

Black in Photonics Meetup

1 February 2023 • 5:30 PM–6:30 PM

Moscone Center, Community Lounge (Level 2 West)

Network and celebrate the people of color in our community. Allies always welcome!

Career Lab Connection Reception

1 February 2023 • 7:00 PM–8:30 PM

Moscone Center, Community Lounge (Level 2 West)

Wind down after the BiOS Poster Session with a drink and relaxed conversation with colleagues and new friendships forged throughout the week.

Photonics West Networking Reception in the Exhibition

2 February 2023 • 2:30 PM–3:30 PM

Moscone Center, North-South (Exhibit Level)

Open to all attendees.

Come network and socialize with exhibitors!

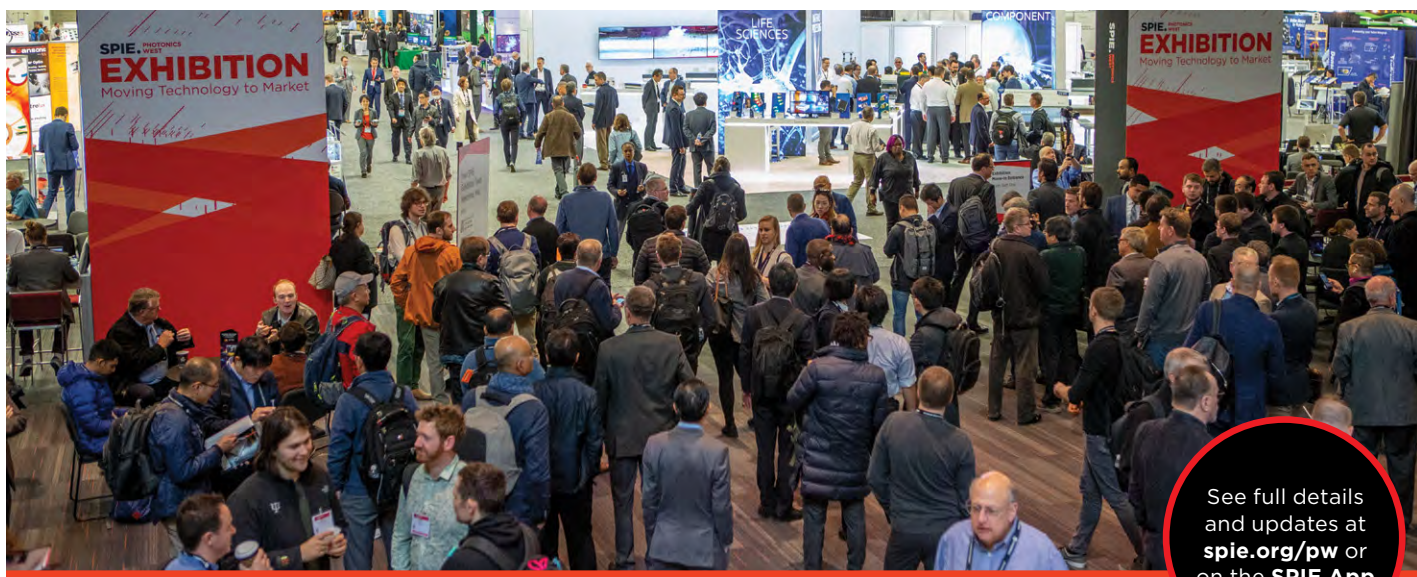


Moscone West Community Park

Meet colleagues throughout the week to reconnect and expand your network

Join us in the Moscone West Community Park—a place for everyone. You can attend networking and professional development events, learn how diversity drives success on global collaborations—or just relax and recharge between sessions.

EVENT	CATEGORY	LOCATION
Lunch and Learns	EDI/Professional Development	Community Lounge
SPIE Community Development Showcase	Membership/Professional Development	Community Lounge
Women in Optics Meetup	Community Networking	Community Lounge
LGBTQ+ Social	Community Networking	Community Lounge
SPIE Student Member Meetup	Community Networking	Community Lounge
Black in Photonics Meetup	Community Networking	Community Lounge
Career Lab Connection Reception	Community Networking	Community Lounge
First Timers' Reception	Community Networking	Community Lounge
Student and Early Career Networking Reception	Community Networking	Community Stage
The Great Career Showdown	Professional Development	Community Stage
Paws for a Break	Social and Networking	Community Park



Two World-Class Exhibitions

More companies exhibit at Photonics West than any other exhibition in North America. Meet top suppliers, make the right connections, and discover new possibilities.



BiOS Expo

28-29 January 2023

Location: Halls DE

BiOS Expo is the world's largest biomedical optics and biophotonics exhibition. Find the latest technologies from top companies supplying biomedical research and healthcare solutions.

EXHIBITION HOURS:

Saturday 28 January 10:00 AM–5:00 PM
 Sunday 29 January 10:00 AM–4:00 PM

FEATURED TECHNOLOGIES:

Biomedical optics components, products, instrumentation, and applications • Lasers • Molecular imaging • Health diagnostics and therapeutics • Nano/biophotonics detectors • Biosensors • Spectroscopic/microscopic imaging



Photonics West Exhibition

31 January–2 February 2023

Location: Halls ABCDEF

Companies offer an inside look into their portfolio of products and services—find top suppliers, explore product and company capabilities, and build partnerships that will advance your work.

EXHIBITION HOURS:

Tuesday 31 January 10:00 AM–5:00 PM
 Wednesday 1 February 10:00 AM–5:00 PM
 Thursday 2 February 10:00 AM–4:00 PM

FEATURED TECHNOLOGIES:

Lasers and peripherals • Beam conditioning and steering components • Beam profiling and measurement instrumentation • Cameras and CCD components • Fiber optic components, equipment, systems • Optical components and hardware • Optical communications • Optical detectors • High speed imaging and sensing • Optical materials and substrates • IR sources and detectors • Electronic imaging components • Optical coatings • Lenses and filters • Positioning systems and mounts • Metrology and testing equipment • Software for design and simulation

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The logo for VIALUX, featuring the word "VIALUX" in green capital letters. The letter "I" is stylized with a yellow dot above it and a red dot below it.The logo for Videology, featuring a green square with a white camera icon and the text "Videology" in white, with "Industrial-Grade Cameras" and "an INTEST Company" in smaller text below.The logo for viewworks, featuring the word "viewworks" in red lowercase letters.The logo for NIGO PHOTONICS, featuring the word "NIGO" in large white capital letters and "PHOTONICS" in smaller white capital letters below, all on a dark blue background.The logo for VON ARDENNE, featuring the text "VON ARDENNE" in black capital letters followed by a small red and white striped square icon.The logo for Wasatch Photonics, featuring the word "Wasatch" in white and "Photonics" in green, with a green curved line above "Photonics".The logo for ximea, featuring an orange circle followed by the word "ximea" in black lowercase letters.The logo for ZEISS, featuring the word "ZEISS" in white capital letters on a blue background with a white curved line at the bottom.

2023 PHOTONICS WEST PROMOTIONAL PARTNERS

International OptoIndex | optics.org | Photonics & Imaging Technology | Physics Today | The Optronics Co., Ltd.
Electro Optics Magazine | Photonics Online | Spectroscopy Magazine | Laser Focus World | Photonics Media | Photoniques

2023 BIOS PROMOTIONAL PARTNERS

optics.org | Laser Focus World | BioPhotonics, a Photonics Media publication | Electro Optics Magazine

BIOS DAILY CONFERENCE SCHEDULE

Check the conference schedule frequently for updates
Presentation times are subject to change

SATURDAY 28 January	SUNDAY 29 January	MONDAY 30 January	TUESDAY 31 January	WEDNESDAY 1 February	THURSDAY 2 February
Photonic Therapeutics and Diagnostics (Wong, Sevick)					
12352 Photonics in Dermatology and Plastic Surgery 2023 (Choi, Zeng) Room 159			12398 Reporters, Markers, Dyes, Nanoparticles, and Molecular Probes for Biomedical Applications XIV (Berezin, Raghavachari) Room 101		
12353 Advanced Photonics in Urology 2023 (Kang, Sroka, Zhang) Room 153					
12354 Imaging, Therapeutics, and Advanced Technology in Head and Neck Surgery and Otolaryngology 2023 (Wong, Ilgner) Room 160					
12355 Diagnostic and Therapeutic Applications of Light in Cardiology 2023 (Marcu, van Soest) Room 76					
12356 Endoscopic Microscopy XVIII (Tearney, Wang, Suter) Room 313					
12357 Visualizing and Quantifying Drug Distribution in Tissue VII (Chan, Evans) Room 306					
12358 Photonic Diagnosis, Monitoring, Prevention, and Treatment of Infections and Inflammatory Diseases 2023 (Dai, Popp, Wu) Room 158					
12359 Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic Therapy XXXI (Kessel, Hasan, Maytin) Room 307					
12360 Ophthalmic Technologies XXXIII (Hammer, Bizheva, Schuele) Room 301					
12361 Molecular-Guided Surgery: Molecules, Devices, and Applications IX (Gioux, Gibbs, Pogue) Room 151					
12362 Mechanisms of Photobiomodulation Therapy XVII (Liebert, Lyons, Carroll) Room 156					
12363 Multiscale Imaging and Spectroscopy IV (Campagnola, Maitland, Roblyer) Room 304					



See full details and updates at spie.org/pw or on the **SPiE App**

SATURDAY 28 January	SUNDAY 29 January	MONDAY 30 January	TUESDAY 31 January	WEDNESDAY 1 February	THURSDAY 2 February
Neurophotonics, Neurosurgery, and Optogenetics (Shoham, Devor)					
12364 Clinical and Translational Neurophotonics 2023 (Yang, Kainerstorfer) Room 102		12365 Neural Imaging and Sensing 2023 (Luo, Ding, Fu) Room 307			
12366 Optogenetics and Optical Manipulation 2023 (Mohanty, Roe, Shoham) Room 101					
Clinical Technologies and Systems (Mahadevan-Jansen, Vo-Dinh)					
12368 Advanced Biomedical and Clinical Diagnostic and Surgical Guidance Systems XXI (Boudoux, Tunnell) Room 308		12367 Optical Coherence Tomography and Coherence Domain Optical Methods in Biomedicine XXVII (Izatt, Fujimoto) Room 201			
12369 Optics and Biophotonics in Low-Resource Settings IX (Levitz, Ozcan) Room 314					
12370 Design and Quality for Biomedical Technologies XVI (Hwang, Vargas, Pfefer) Room 303					
12371 Multimodal Biomedical Imaging XVIII (Azar, Intes, Fang) Room 202					
12372 Optical Fibers and Sensors for Medical Diagnostics, Treatment and Environmental Applications XXIII (Gannot, Roodenko) Room 312			12373 Optical Biopsy XXI: Toward Real-Time Spectroscopic Imaging and Diagnosis (Alfano, Seddon, Shi) Room 302		
12375 Biophotonics in Exercise Science, Sports Medicine, Health Monitoring Technologies, and Wearables IV (Shadgan, Gandjbakhche) Room 154	12374 Microfluidics, BioMEMS, and Medical Microsystems XXI (Gray, Rapp, Dalton) Room 202				
		12376 Optical Tomography and Spectroscopy of Tissue XV (Fantini, Taroni) Room 154			

SPiE. DIGITAL LIBRARY

Presentations on the Digital Library

The Photonics West conference proceedings papers and presentations are published in the SPiE Digital Library. All paid conference registrations include 50 downloads for ongoing access.

BIOS DAILY CONFERENCE SCHEDULE

Check the conference schedule frequently for updates
Presentation times are subject to change

SATURDAY 28 January	SUNDAY 29 January	MONDAY 30 January	TUESDAY 31 January	WEDNESDAY 1 February	THURSDAY 2 February
Tissue Optics, Laser-Tissue Interaction, and Tissue Engineering (Jansen, Ramella-Roman)					
12377 Optical Interactions with Tissue and Cells XXXIV (Linz, Bixler, Post) Room 152					
	12378 Dynamics and Fluctuations in Biomedical Photonics XX (Tuchin, Leahy, Wang) Room 156				
	12379 Photons Plus Ultrasound: Imaging and Sensing 2023 (Oraevsky, Wang) Room 211				
12381 Optical Elastography and Tissue Biomechanics X (Larin, Scarcelli) Room 210		12380 Biophotonics and Immune Responses XVIII (Chen) Room 204			
12382 Polarized Light and Optical Angular Momentum for Biomedical Diagnostics 2023 (Ramella-Roman, Ma, Novikova, Elson, Vitkin) Room 204					
	12411 Frontiers in Ultrafast Optics: Biomedical, Scientific, and Industrial Applications XXIII (Herman, Osellame, Ben-Yakar) Room 158				
Biomedical Spectroscopy, Microscopy, and Imaging (Periasamy, Farkas,)					
		12383 Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues XXI (Tarnok, Houston, Su) Room 305			
	12384 Multiphoton Microscopy in the Biomedical Sciences XXIII (Periasamy, So, König) Room 303			12385 Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XXX (Brown, Wilson, Waller) Room 102	
12386 Single Molecule Spectroscopy and Superresolution Imaging XVI (Gregor, Koberling, Erdmann, Olofsson) Room 201		12387 Optical Diagnostics and Sensing XXIII: Toward Point-of-Care Diagnostics (Coté) Room 308			
	12388 Adaptive Optics and Wavefront Control for Biological Systems IX (Bifano, Ji, Tian) Room 54				
12389 Quantitative Phase Imaging IX (Liu, Squires, Park) Room 155					
12390 High-Speed Biomedical Imaging and Spectroscopy VIII (Tsia, Goda) Room 302					
12391 Label-free Biomedical Imaging and Sensing (LBIS) 2023 (Shaked, Hayden) Room 213					
12392 Advanced Chemical Microscopy for Life Science and Translational Medicine 2023 (Cheng, Min, Simpson) Room 157					
12393 Biomedical Applications of Light Scattering XIII (Wax, Backman) Room 205					



See full details and updates at
spie.org/pw or on the **SPIE App**

SATURDAY 28 January	SUNDAY 29 January	MONDAY 30 January	TUESDAY 31 January	WEDNESDAY 1 February	THURSDAY 2 February
Nano/Biophotonics (Prasad, Goldys)					
		12394 Nanoscale Imaging, Sensing, and Actuation for Biomedical Applications XX (Fixler, Goldys, Wachsmann-Hogiu) Room 101			
12395 Colloidal Nanoparticles for Biomedical Applications XVIII (Osiński, Kanaras) Room 305					
	12396 Plasmonics in Biology and Medicine XX (Vo-Dinh, Ho, Ray) Room 102				
	12397 Frontiers in Biological Detection: From Nanosensors to Systems XV (Danielli, Miller, Weiss) Room 50				

LASE

SPIE LASE is the most important laser technologies conference in the field. Topics include laser manufacturing, laser materials processing, micro-nano packaging, fiber, diode, and solid state lasers, laser resonators, ultrafast and semiconductor lasers and LEDs, and 3D fabrication technologies.

Speaker Check-In and Preview Station

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LASE Poster Session

31 January 2023 • 6:00 PM-8:00 PM

Moscone Center, Level 2 West

Poster Setup: Tuesday 10:00 AM-5:00 PM

Conference attendees are invited to attend the LASE poster session on Tuesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster authors: View poster presentation guidelines and set-up instructions at <https://spie.org/PW/poster-guidelines>

LASE SYMPOSIUM CHAIRS



Stefan Kaierle
Laser Zentrum
Hannover e.V.
(Germany)



John Ballato
Clemson Univ.
(United States)

LASE SYMPOSIUM CO-CHAIRS



Craig B. Arnold
Princeton Univ.
(United States)



Takunori Taira
RIKEN / IMS (Japan)

LASE PROGRAM TRACK CHAIRS

Laser Sources

Akihiko Kasukawa, Furukawa Electric Co. (Japan)

Stuart D. Jackson, Macquarie Univ. (Australia)

Nonlinear Optics and Beam Guiding

Vladimir Ilchenko, Jet Propulsion Lab. (United States)

Paul O. Leisher, Freedom Photonics, LLC (United States)

Micro/Nano Applications

Henry Helvajian, The Aerospace Corp. (United States)

Guido Hennig, Daetwyler Graphics AG (Switzerland)

Macro Applications

Bo Gu, Bos Photonics (United States)

Constantin L. Häfner, Fraunhofer-Institut für Lasertechnik ILT (Germany)

LASE DAILY CONFERENCE SCHEDULE

Check the conference schedule frequently for updates | Presentation times are subject to change

SATURDAY 28 January	SUNDAY 29 January	MONDAY 30 January	TUESDAY 31 January	WEDNESDAY 1 February	THURSDAY 2 February
Laser Sources (Kasukawa, Jackson)					
			12399 Solid State Lasers XXXII: Technology and Devices (Clarkson, Shori) Room 202		
		12400 Fiber Lasers XX: Technology and Systems (Supradeepa, Jollivet) Room 203			
		12402 Components and Packaging for Laser Systems IX (Glebov, Leisher) Room 205	12401 High Power Lasers for Fusion Research VII (Awwal, Haefner) Room 213		
	12403 High-Power Diode Laser Technology XXI (Zediker, Zucker) Room 205		12404 Vertical External Cavity Surface Emitting Lasers (VECSELs) XII (Bedford) Room 54		
Nonlinear Optics/Beam Guiding (Leisher, Ilchenko)					
		12405 Nonlinear Frequency Generation and Conversion: Materials and Devices XXII (Schunemann) Room 212			
				12406 Real-time Measurements, Rogue Phenomena, and Single-Shot Applications VIII (Solli, Herink, Bielawski) Room 205	
			12407 Laser Resonators, Microresonators, and Beam Control XXV (Ilchenko, Armani, Sheldakova, Kudryashov) Room 204		
Micro/Nano Applications (Helvajian, Hennig)					
12410 Nanoscale and Quantum Materials: From Synthesis and Laser Processing to Applications 2023 (Kabashin, Farsari, Mahjouri-Samani) Room 311		12408 Laser Applications in Microelectronic and Optoelectronic Manufacturing (LAMOM) XXVIII (Narazaki, Gemini, Kleinert) Room 210			
			12409 Laser-based Micro- and Nanoprocessing XVII (Kling, Watanabe, Pflöging) Room 208		
	12411 Frontiers in Ultrafast Optics: Biomedical, Scientific, and Industrial Applications XXIII (Herman, Osellame, Ben-Yakar) Room 158				
Macro Applications (Gu, Häfner)					
			12412 Laser 3D Manufacturing X (Gu, Chen, Helvajian) Room 215		
		12413 Free-Space Laser Communications XXXV (Hemmati, Robinson) Room 206			
				12414 High-Power Laser Materials Processing: Applications, Diagnostics, and Systems XII (Kaierle, Kleine) Room 211	

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- CPS-SNAP**...Cyber Physical Systems enabled by Sensing/Network/AI and Photonics Conference 2023
- HEDS**.....International Conference on High Energy Density Science 2023
- ICNN**.....International Conference on Nano-photonics and Nano-optoelectronics 2023
- LDC**.....Laser Display and Lighting Conference 2023
- LSC**.....Conference on Laser and Synchrotron Radiation Combination Experiment 2023
- LSSE**.....Laser Solutions for Space and the Earth 2023
- OMC**.....The 10th Optical Manipulation and Structured Materials Conference
- OPTM**.....Optical Technology and Measurement for Industrial Applications 2023
- OWPT**.....Optical Wireless and Fiber Power Transmission Conference 2023
- TILA-LIC**.....Tiny Integrated Laser and Laser Ignition Conference 2023
- XOPT**.....International Conference on X-ray Optics and Applications 2023

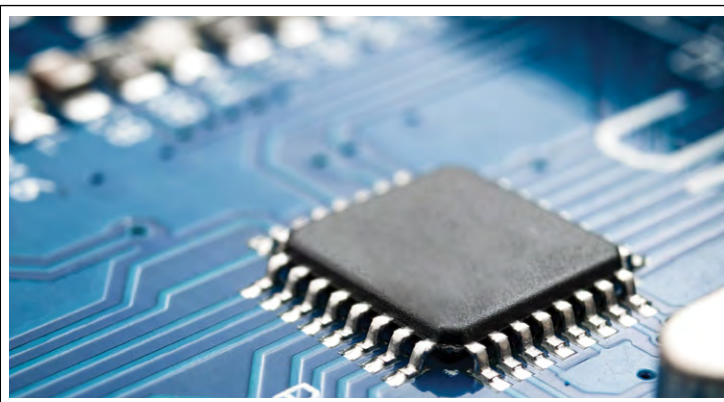
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PHOTONICS MEDIA



OPTO

SPIE OPTO is the most important optoelectronics conference in the field. Topics include silicon photonics, photonic crystals, optoelectronics, semiconductor lasers, and nanophotonics. This conference addresses the latest developments in a broad range of optoelectronic technologies and their integration for a variety of commercial applications.

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OPTO Poster Session

1 February 2023 • 6:00 PM-8:00 PM

Moscone Center, Level 2 West

Poster Setup: Wednesday 10:00 AM-5:00 PM

Conference attendees are invited to attend the OPTO poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster authors: View poster presentation guidelines and set-up instructions at <https://spie.org/PW/poster-guidelines>

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Sonia M. García-Blanco
Univ. Twente
(Netherlands)



Bernd Witzigmann
Friedrich-Alexander-Univ.
Erlangen-Nürnberg
(Germany)

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Ulrich T. Schwarz
Technische
Univ. Chemnitz
(Germany)



Karin Hinzer
Univ. of Ottawa
(Canada)

OPTO PROGRAM TRACK CHAIRS

Optoelectronic Materials and Devices

James G. Grote, Photonics Engineering Consultant
(United States)

Shibin Jiang, AdValue Photonics, Inc. (United States)

Photonic Integration

Yakov Sidorin, Quarles & Brady LLP (United States)

Jean-Emmanuel Broquin, Univ. Grenoble Alpes (France)

Nanotechnologies in Photonics

Ali Adibi, Georgia Institute of Technology (United States)

MOEMS-MEMS in Photonics

Holger Becker, microfluidic ChipShop GmbH (Germany)

Georg von Freymann, Technische Univ. Kaiserslautern
(Germany)

Advanced Quantum and Optoelectronic Applications

David L. Andrews, Univ. of East Anglia (United Kingdom)

Semiconductor Lasers, LEDs, and Applications

Klaus P. Streubel, OSRAM GmbH (United States)

Displays and Holography

Liang-Chy Chien, Kent State Univ. (United States)

OPTO DAILY CONFERENCE SCHEDULE

Check the conference schedule frequently for updates
Presentation times are subject to change

SATURDAY 28 January	SUNDAY 29 January	MONDAY 30 January	TUESDAY 31 January	WEDNESDAY 1 February	THURSDAY 2 February
Optoelectronic Materials and Devices (Grote, Jiang)					
			12415 Physics and Simulation of Optoelectronic Devices XXXI (Witzigmann, Osinski, Arakawa) Room 156		
		12416 Physics, Simulation, and Photonic Engineering of Photovoltaic Devices XII (Freundlich, Collin, Hinzer, Sellers) Room 159			
		12417 Optical Components and Materials XX (Jiang, Digonnet) Room 214		12418 Organic Photonic Materials and Devices XXV (Shensky, Rau, Sugihara) Room 214	
	12419 Ultrafast Phenomena and Nanophotonics XXVII (Betz, Elezzabi) Room 306				
		12420 Terahertz, RF, Millimeter, and Submillimeter-Wave Technology and Applications XVI (Sadwick, Yang) Room 160			
		12421 Gallium Nitride Materials and Devices XVIII (Fujioka, Morkoç, Schwarz) Room 152			
		12422 Oxide-based Materials and Devices XIV (Rogers, Teherani) Room 151			
			12423 2D Photonic Materials and Devices VI (Majumdar, Torres, Deng) Room 155		
Photonic Integration (Sidorin, Broquin)					
		12420 Terahertz, RF, Millimeter, and Submillimeter-Wave Technology and Applications XVI (Sadwick, Yang) Room 160			
		12424 Integrated Optics: Devices, Materials, and Technologies XXVII (García-Blanco, Cheben) Room 304			
			12425 Smart Photonic and Optoelectronic Integrated Circuits 2023 (He, Vivien) Room 312		
		12426 Silicon Photonics XVIII (Reed, Knights) Room 301			
				12427 Optical Interconnects XXIII (Chen, Schröder) Room 303	
		12428 Photonic Instrumentation Engineering X (Busse, Soskind) Room 311			
			12429 Next-Generation Optical Communication: Components, Sub-Systems, and Systems XII (Li, Nakajima, Srivastava) Room 216		
Nanotechnologies in Photonics (Adibi)					
	12430 Quantum Sensing and Nano Electronics and Photonics XIX (Razeghi, Khodaparast, Vitiello) Room 70				
		12431 Photonic and Phononic Properties of Engineered Nanostructures XIII (Adibi, Lin, Scherer) Room 50			
		12432 High Contrast Metastructures XII (Chang-Hasnain, Fan, Zhou) Room 76			
	12433 Advanced Fabrication Technologies for Micro/Nano Optics and Photonics XVI (von Freymann, Blasco, Chanda) Room 208				

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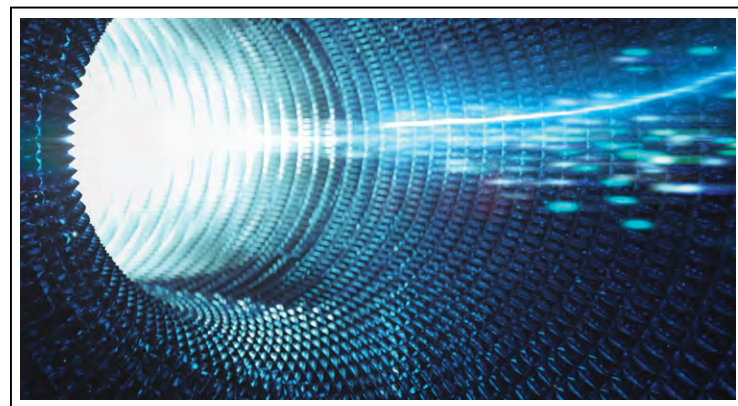
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SATURDAY 28 January	SUNDAY 29 January	MONDAY 30 January	TUESDAY 31 January	WEDNESDAY 1 February	THURSDAY 2 February
MOEMS-MEMS in Photonics (Becker, von Freymann)					
	12374 Microfluidics, BioMEMS, and Medical Microsystems XXI (Gray, Rapp, Dalton) Room 202				
	12388 Adaptive Optics and Wavefront Control for Biological Systems IX (Bifano, Ji, Tian) Room 54				
	12433 Advanced Fabrication Technologies for Micro/Nano Optics and Photonics XVI (von Freymann, Blasco, Chanda) Room 2018				
		12434 MOEMS and Miniaturized Systems XXII (Zappe, Piyawattanametha, Park) Room 2020			
		12435 Emerging Digital Micromirror Device Based Systems and Applications XV (Ehmke, Lee) Room 2018			
Advanced Quantum and Optoelectronic Applications (Andrews)					
		12436 Complex Light and Optical Forces XVII (Andrews, Galvez, Rubinsztein-Dunlop) Room 314			
				12437 Photonic Heat Engines: Science and Applications V (Seletskiy, Kuno, Pauzauskie) Room 54	
		12438 AI and Optical Data Sciences IV (Jalali, Kitayama) Room 313			
	12446 Quantum Computing, Communication, and Simulation III (Hemmer, Migdall) Room 105				
12447 Quantum Sensing, Imaging, and Precision Metrology (Scheuer, Shahriar) Room 103 & 104					
Semiconductor Lasers, LEDs, and Applications (Streubel)					
			12415 Physics and Simulation of Optoelectronic Devices XXXI (Witzigmann, Osirski, Arakawa) Room 156		
		12421 Gallium Nitride Materials and Devices XVIII (Fujioka, Morkoç, Schwarz) Room 152			
				12439 Vertical-Cavity Surface-Emitting Lasers XXVII (Lei, Graham) Room 158	
			12440 Novel In-Plane Semiconductor Lasers XXII (Belyanin, Smowton) Room 157		
		12441 Light-Emitting Devices, Materials, and Applications XXVII (Kim, Krames, Strassburg) Room 153			
Displays and Holography (Chien)					
		12443 Advances in Display Technologies XIII (Lee, Wang, Yoon) Room 2016		12442 Emerging Liquid Crystal Technologies XVIII (Chien, Mušević Tabiryan) Room 2016, 101	
				12444 Ultra-High-Definition Imaging Systems VI (Miyata, Yatagai, Koike) Room 104	
			12445 Practical Holography XXXVII: Displays, Materials, and Applications (Blanche, Lee) Room 2014		



QUANTUM WEST

Quantum West will showcase the exciting possibilities of “Quantum 2.0,” the future of applied quantum technologies to solve entirely new challenges and provide unique capabilities in large-scale systems. Join your colleagues at this forum to address the interests of researchers, engineers, tech companies, investors, and governments—all contributors that can bring about a quantum-enabled future.

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Enjoy an abundance of opportunities to learn, network, and connect

All events held at Quantum West Stage, Hall A Lobby

Opening Session: Welcome and Keynote Marco Pistoia (JPMorgan Chase) + Market Report	31 January	9:00 AM-10:30 AM
A Global View of Quantum in Industry Keynote Taro Shimada, Toshiba Corp. (Japan) + Panel	31 January	11:00 AM-12:30 PM
QED-C Quantum Marketplace™: Solutions for Deployed Quantum 2.0	31 January	2:30 PM-4:15 PM
Quantum West Networking Reception	31 January	4:15 PM-5:45 PM
Funding Commercial Advances in Quantum Technologies	1 February	9:00 AM-10:45 AM PT
Executive Insights Panel	1 February	11:15 AM-12:15 PM PT
Quantum Workforce Development	1 February	1:30 PM-3:15 PM PT
Quantum Demonstrators	1 February	3:45 PM-5:25 PM PT
Fireside Chat	1 February	5:25 PM-5:45 PM PT

Quantum West plenary and industry featured speakers



Michael J. Hayduk
Deputy Director,
Information Directorate,
Air Force Research Lab.
(United States)



Kaniah Konkoly-Thege,
Chief Legal Counsel,
Quantinuum Ltd.
(United States)



Miles J. Padgett
University of Glasgow
(United Kingdom)



Celia Merzbacher
Executive Director, SRI
International / QED-C
(United States)



Taro Shimada
President and CEO,
Toshiba Corp. (Japan)

QUANTUM WEST DAILY CONFERENCE SCHEDULE

Check the conference schedule frequently for updates | Presentation times are subject to change

SATURDAY 28 January	SUNDAY 29 January	MONDAY 30 January	TUESDAY 31 January	WEDNESDAY 1 February	THURSDAY 2 February
Conference 12446 • Room 105					
Quantum West Industry Program Don't miss sessions running 31 January and 1 February on the Quantum West Stage outside Hall A on the exhibit level of Moscone South.	12446 Quantum Computing, Communication, and Simulation III <i>(Hemmer, Migdall)</i>				
		8:00 AM–11:50 AM SESSION 4: Quantum Computing I	8:00 AM–11:50 AM SESSION 6: Quantum Simulation	8:00 AM–10:10 AM SESSION 10: Networking II	8:00 AM–10:20 AM SESSION 14: Quantum Sources II
		Coffee Break 10:15 AM–10:45 AM	Coffee Break 10:20 AM–10:50 AM	Coffee Break 10:10 AM–10:35 AM	Coffee Break 10:20 AM–10:50 AM
	10:30 AM–12:20 PM SESSION 1: Quantum Measurements I	10:45 AM SESSION 4: Quantum Computing I (continued)	10:50 AM SESSION 6: Quantum Simulation (continued) 11:50 AM–12:35 PM SESSION 7: Quantum Communications Keynote	10:35 AM–11:55 AM SESSION 11: Networking III	10:50 AM–12:10 PM SESSION 15: Quantum Sources III
	Lunch Break 12:20 PM–1:50 PM	Lunch Break 11:50 AM–1:00 PM	Lunch Break 12:35 PM–2:05 PM	Lunch Break 11:55 AM–1:25 PM	Lunch Break 12:10 PM–1:40 PM
	1:50 PM–3:40 PM SESSION 2: Quantum Measurements II	1:00 PM–3:05 PM Quantum West Plenary Session	2:05 PM–4:45 PM SESSION 8: Quantum Communications	1:25 PM–3:55 PM SESSION 12: Networking IV	1:40 PM–3:30 PM SESSION 16: Quantum Detector and Processing Tech I
	Coffee Break 3:40 PM–4:10 PM	Coffee Break 3:05 PM–3:30 PM	Coffee Break 3:25 PM–3:55 PM	Coffee Break 3:55 PM–4:20 PM	Coffee Break 3:30 PM–4:00 PM
	4:10 PM–6:10 PM SESSION 3: Memory	3:30 PM–6:00 PM SESSION 5: Quantum Computing II	3:55 PM SESSION 8: Quantum Communications (continued) 4:45 PM–6:05 PM SESSION 9: Networking I	4:20 PM–6:30 PM SESSION 13: Quantum Sources I 6:00 PM–8:00 PM Posters-Wednesday	4:00 PM–5:50 PM SESSION 17: Quantum Detector and Processing Tech II



Eric Mounier
Fellow Analyst, Yole Développement (France)



Marco Pistoia
Head of Applied Research and Engineering, JPMorgan Chase & Co. (United States)



Carmen Palacios-Berraquero
CEO and Co-Founder, Nu Quantum (United Kingdom)



Halina Rubinsztein-Dunlop
Quantum Science Laboratory, The University of Queensland (Australia)



Mark Tolbert
TOPTICA Photonics, Inc. (United States)

QUANTUM WEST DAILY CONFERENCE SCHEDULE

Check the conference schedule frequently for updates | Presentation times are subject to change

SATURDAY 28 January		SUNDAY 29 January		MONDAY 30 January	
12447 Quantum Sensing, Imaging, and Precision Metrology (Scheuer; Shahriar)					
Sessions 1-4 run concurrently with sessions 5-7		Sessions 8-11 run concurrently with sessions 12-15		Sessions 16-17 run concurrently with sessions 18-19	
8:30 AM-10:30 AM SESSION 1: Matter Wave Interferometry I	8:30 AM-10:15 AM SESSION 5: Classical Imaging, Quantum Imaging, and LIDAR I	8:05 AM-10:10 AM SESSION 8: Dark Matter Search	8:30 AM-10:25 AM SESSION 12: New Directions in Precision Metrology I	9:00 AM-11:30 AM SESSION 16: Networked and Computational Sensors	8:30 AM-11:20 AM SESSION 18: Chip-Scale Technologies for Sensing I
Coffee Break 10:30 AM-11:00 AM	Coffee Break 10:15 AM-10:45 AM	Coffee Break 10:10 AM-10:40 AM	Coffee Break 10:25 AM-10:55 AM	Coffee Break 10:05 AM- 10:35 AM	Coffee Break 10:00 AM-10:30 AM
11:00 AM-1:10 PM SESSION 2: Matter Wave Interferometry II	10:45 AM-12:25 PM SESSION 6: Classical Imaging, Quantum Imaging, and LIDAR II	10:40 AM-12:35 PM SESSION 9: Optical and Spin Squeezing I	10:55 AM-12:50 PM SESSION 13: Enabling Technologies for Precision Sensing I	10:35 AM-11:30 AM SESSION 16: Networked and Computational Sensors (continued)	10:30 AM-11:20 AM SESSION 18: Chip-Scale Technologies for Sensing I (continued)
Lunch Break 1:10 PM-2:40 PM	Lunch Break 12:25 PM-1:55 PM	Lunch Break 12:35 PM-2:05 PM	Lunch Break 12:50 PM-2:20 PM	Lunch Break 11:30 AM-1:00 PM	Lunch Break 11:20 AM-1:00 PM
2:40 PM-4:20 PM SESSION 3: Optical and Atomic Clocks I	1:55 PM-4:00 PM SESSION 7: NV Diamond-Based Sensing and Biosensing	2:05 PM-4:00 PM SESSION 10: Optical and Spin Squeezing II	2:20 PM-3:50 PM SESSION 14: Enabling Technologies for Precision Sensing II	1:00 PM-3:05 PM Quantum West Plenary Session	
Coffee Break 4:20 PM-4:50 PM		Coffee Break 4:00 PM-4:30 PM	Coffee Break 3:50 PM-4:20 PM	Coffee Break 3:05 PM-3:30 PM	Coffee Break 3:05 PM-3:30 PM
4:50 PM-6:10 PM SESSION 4: Optical and Atomic Clocks II		4:30 PM-6:40 PM SESSION 11: Magnetometry	4:20 PM-5:55 PM SESSION 15: Enabling Technologies for Precision Sensing III	3:30 PM-5:40 PM SESSION 17: Fundamental Physics	3:30 PM-5:25 PM SESSION 19: New Directions in Precision Metrology II

Quantum West Industry Program

Don't miss sessions running 31 January and 1 February on the Quantum West Stage outside Hall A on the exhibit level of Moscone South.

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TUESDAY 31 January		WEDNESDAY 1 February		THURSDAY 2 February
Room 103 and 104				
Sessions 20-23 run concurrently with sessions 24-26		Sessions 27-30 run concurrently with sessions 31-33		
8:00 AM-9:40 AM SESSION 20: Electrometry and Rydberg Atoms	8:30 AM-10:35 AM SESSION 24: PT-Symmetry and Exceptional Points	8:30 AM-9:45 AM SESSION 27: QM Information Science and Fundamental Research I	8:30 AM-10:25 AM SESSION 31: Chip-Scale Technologies for Sensing II	8:45 AM-10:05 AM SESSION 34: Plasmonics and Nonlinear Optics
Coffee Break 9:40 AM-10:10 AM	Coffee Break 10:35 AM-11:05 AM	Coffee Break 9:45 AM-10:15 AM	Coffee Break 10:25 AM-10:55 AM	Coffee Break 10:05 AM -10:35 AM
10:10 AM-12:05 PM SESSION 21: New Directions in Quantum Sensing I	11:05 AM-12:45 PM SESSION 25: Integrated Optics and Resonators I	10:15 AM-11:55 AM SESSION 28: QM Information Science and Fundamental Research II	10:55 AM-12:40 PM SESSION 32: Fiber Based Sensing	10:35 AM-12:30 PM SESSION 35: Rotation and Acceleration Sensing
Lunch Break 12:05 PM-1:35 PM	Lunch Break 12:45 PM-2:15 PM	Lunch Break 11:55 AM-1:25 PM	Lunch Break 12:40 PM-2:10 PM	Lunch Break 12:30 PM-2:00 PM
1:35 PM-3:15 PM SESSION 22: New Directions in Quantum Sensing II	2:15 PM-3:20 PM SESSION 26: Integrated Optics and Resonators II	1:25 PM-3:10 PM SESSION 29: New Directions in Quantum Sensing IV	2:10 PM-4:00 PM SESSION 33: Opto-mechanical Sensing	2:00 PM-2:55 PM SESSION 36: Bioimaging and Sensing
Coffee Break 3:15 PM-3:45 PM	Coffee Break 3:20 PM-3:50 PM	Coffee Break 3:10 PM-3:40 PM		Coffee Break 2:55 PM-3:25 PM
3:45 PM-5:40 PM SESSION 23: New Directions in Quantum Sensing III	3:50 PM-4:55 PM SESSION 26: Integrated Optics and Resonators II (continued)	3:40 PM-6:00 PM SESSION 30: New Directions in Quantum Sensing V		3:25 PM-4:45 PM SESSION 36: Bioimaging and Sensing (continued)

APPLICATION TRACKS

Applications tracks list presentations on a specific topic together within the program so that participants can easily locate presentations in their area of interest. Learn about key technologies creating market opportunities and connect with people creating the future. Each track will highlight applicable papers.

See conference app or website for a full listing of presentations in each of these tracks: spie.org/pwapplications



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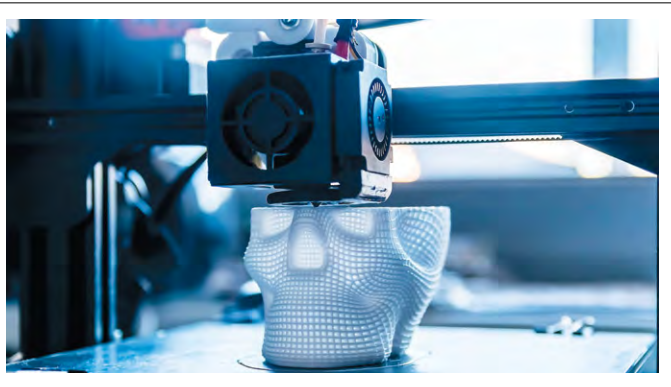
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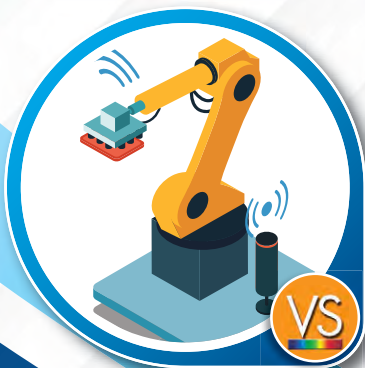
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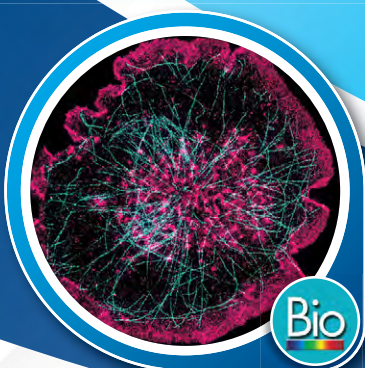
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Courses: 28–30 January, 2 February

Technical Conference: 30 January

Invited Talks: 31 January, 1 February

Exhibition: 31 January, 1 February

Keynote Speakers



Christine Thanner
EV Group



Michael Klug
Google



Michael Angiulo
Magic Leap



Paul Travers
Vuzix



INDUSTRY EVENTS

AR | VR | MR Headset Museum

31 January and 1 February 2023 • 8:00 AM–6:00 PM
Moscone Center, Level 3 West

Don't miss the extensive collection of 100+ headsets from the late 1980s up to today.

Job Fair

31 January 2023 • 10:00 AM–5:00 PM
Moscone Center, Level 3 West

Meet with companies who are interested in you in the AR|VR|MR space.

Optical Design Challenge Awards

31 January 2023 • 5:50 PM–6:00 PM
AR | VR | MR Main Stage (Level 3 West)

Winners of the Optical Design Challenge will be announced.

TECHNICAL CONFERENCE

Access conference content from the leading event for the advancement of augmented, virtual, and mixed reality technologies.

SPIE COURSES

Created by experts, SPIE courses are designed to expand professional knowledge and skills. Take what you learn in class and apply it directly to your work. Register now for AR/VR/MR/HMD courses on metrology, waveguides, head-mounted display requirements, and optical technologies and architectures.

AR|VR|MR EVENTS

Check the schedule and view descriptions online: www.spie.org/avr

Invited Stage

The invited stage features keynote presentations, invited speakers, and expert panels from a wide range of leaders in the XR industry.

TUESDAY EVENTS

Tuesday Morning Keynote

31 January 2023 • 8:00 AM–8:50 AM

AR | VR | MR Main Stage (Level 3 West)

Join us for our first keynote talk, from Paul Travers at Vuzix.

Invited Talks 1: Next Gen Display Architectures

31 January 2023 • 8:50 AM–11:10 AM

AR | VR | MR Main Stage (Level 3 West)

Join us for exciting invited talks from Metaversethics.org, Lenovo, Meta Reality Labs, Lynx Mixed Reality, LusoVU, NewSight Reality, and EverySight.

Panel: Prescription (Rx) for AR glasses and for MR/VR head mounted displays: challenges and opportunities

31 January 2023 • 11:10 AM–12:00 PM

AR | VR | MR Main Stage (Level 3 West)

The panel will address questions relative to technologies used today or in the future to integrate Rx in consumer or commercial XR glasses, goggles or HMDs.

Tuesday Afternoon Keynote

31 January 2023 • 1:00 PM–1:40 PM

AR | VR | MR Main Stage (Level 3 West)

Join us for a Keynote Talk from Michael Anguilo, Chief Growth Office at Magic Leap.

Invited Talks 2: Display Building Blocks

31 January 2023 • 1:40 PM–5:00 PM

AR | VR | MR Main Stage (Level 3 West)

Join us for exciting invited talks from tooz, Vuzix, Dispelix, Cellid, Applied Materials, Letin AR, Lumus, and imec.

Panel: Reflective versus diffractive waveguides: what should the industry target?

31 January 2023 • 5:00 PM–5:50 PM

AR | VR | MR Main Stage (Level 3 West)

This panel will welcome several industry players involved in waveguides for augmented reality applications, be they reflective or diffractive.

WEDNESDAY EVENTS

Wednesday Morning Keynote

1 February 2023 • 8:00 AM–8:50 AM

AR | VR | MR Main Stage (Level 3 West)

Join us for a keynote talk by Michael Klug from Google

Invited Talks 3: Light Engines

1 February 2023 • 8:50 AM–11:10 AM

AR | VR | MR Main Stage (Level 3 West)

Join us for exciting invited talks from Avegant, Trilite Technologies, OQmented, Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP, Porotech, STMicroelectronics, and Mojo Vision.

Panel: Human Perception Considerations for Developing AR/MR Display

1 February 2023 • 11:10 AM–12:00 PM

AR | VR | MR Main Stage (Level 3 West)

In this panel we will explore different approaches to human-centric displays, what are the challenges in building them and what would it take to productize such technologies.

Wednesday Afternoon Keynote

1 February 2023 • 1:00 PM–1:40 PM

AR | VR | MR Main Stage (Level 3 West)

Join us for a Keynote talk by Christine Thanner of the EV Group.

Invited Talks 4: Hardware Ecosystems

1 February 2023 • 1:40 PM–5:00 PM

AR | VR | MR Main Stage (Level 3 West)

Join us for exciting invited talks from Schott, Hoya Corporation, Inkron, TOK America, Morphotonics, Magic Leap, Metalenz, Goertek, and Sunny Optical Technology Group.

Panel: Best practices for assessing quality in near eye displays

1 February 2023 • 5:00 PM–5:50 PM

AR | VR | MR Main Stage (Level 3 West)

Join experts to hear their views on the challenge of appropriately assessing display quality in near eye display devices across the AR-VR-MR spectrum.

Attend the AR|VR|MR Exhibition

31 January 2023..... 10:00 AM–5:00 PM

1 February 2023..... 10:00 AM–5:00 PM

Moscone Center, Level 3 West

Meet with the biggest names in consumer electronics and up-and-coming XR companies. Whether you want to check out the latest in AR, VR, and MR hardware or connect with colleagues, the exhibition has something for everyone.

FEATURED TECHNOLOGIES:

- The latest AR VR headset technologies
- Optical design, micro-optics, optical engineering
- Sensing technologies
- Display technologies
- Materials engineering
- Diffractive holography
- Nano-photonics and more



PHOTONICS WEST COURSES

Advance your career by adding in-person training

Created and taught by experts, SPIE courses are designed to expand professional knowledge and skills. Topics include optomechanics, AR/VR/MR/HMD, quantum, optical coherence tomography, optical systems design and more. Take what you learn in class and apply it directly to your work.

SATURDAY 28 January	SUNDAY 29 January	MONDAY 30 January	TUESDAY 31 January	WEDNESDAY 1 February	THURSDAY 2 February
Advanced Quantum and Optoelectronic Applications					
	SC1319 Quantum Computing: A Concise Introduction (Venegas-Andraca) 8:30 AM–5:30 PM, \$780 / \$441 / \$915				SC1320 Quantum Cryptography Basics (Hasanovic) 8:30 AM–12:30 PM, \$510 / \$309 / \$585
AR VR MR HMD					
	SC1310 Optical Metrology for AR/VR/MR (Zhou) 8:30 AM–12:30 PM, \$470 / \$293 / \$545	SC1317 Waveguides for Mixed Reality: Principles and Applications (Georgiou) 8:30 AM–12:30 PM, \$470 / \$293 / \$545			SC1096 Head-Mounted Display Requirements and Designs for Augmented Reality Applications (Browne, Melzer) 8:30 AM–5:30 PM, \$790 / \$445 / \$925
	SC1218 Optical Technologies and Architectures for Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR) Head-Mounted Displays (HMDs) (Kress) 1:30–5:30 PM, \$470 / \$293 / \$545				
Clinical Technologies and Systems					
	SC312 Principles and Applications of Optical Coherence Tomography (Fujimoto) 1:30–5:30 PM, \$470 / \$293 / \$545	SC981 Biomedical and Biosensing Applications of Optical Fibers and Fiber Sensors (Mendez, Mendoza) 1:30–5:30 PM, \$540 / \$321 / \$615			

Price key: SPIE Member / Student Member / Non-Member

MONEY-BACK GUARANTEE

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Onsite courses

View course descriptions
and register online.

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DAILY COURSE SCHEDULE

Check the course schedule and view course descriptions online



See full details and updates at
spie.org/pw or on the **SPiE App**

SATURDAY 28 January	SUNDAY 29 January	MONDAY 30 January	TUESDAY 31 January	WEDNESDAY 1 February	THURSDAY 2 February
Imaging					
		SC1288 Problems in Autonomous Vehicle Imaging Systems (Grant) 1:30–5:30 PM, \$515 / \$311 / \$590	SC1323 CMOS Image Sensors: Technology, Applications and Camera Design Methodology (Crisp) 1:30–5:30 PM, \$555 / \$327 / \$630	SC1231 Designing and Specifying Digital Cameras (Baldwin) 8:30 AM–12:30 PM, \$470 / \$293 / \$545	
Laser Safety					
		SC1256 Basic Laser Safety (Barat) 1:30–5:30 PM, \$510 / \$309 / \$585			
Laser Sources					
	SC752 Solid State Laser Technology (Hodgson) 8:30 AM–5:30 PM, \$780 / \$441 / \$915	SC1318 Improving Laser Reliability: Examples and Techniques (Grossman) 1:30–5:30 PM, \$470 / \$293 / \$545		SC972 Basic Laser Technology: Fundamentals and Performance Specifications (Sukuta) 8:30 AM–12:30 PM, \$470 / \$293 / \$545	
Metrology and Standards					
SC212 Modern Optical Testing (Kim) 1:30–5:30 PM, \$505 / \$307 / \$580	SC1286 Modern Optical Measurements: An Introduction with Practical Applications (Reichel, Blankenbach) 8:30 AM–12:30 PM, \$470 / \$293 / \$545		SC863 Introduction to Modern Optical Drawings – the ISO 10110 Standard (Aikens) 1:30–5:30 PM, \$520 / \$313 / \$595	SC700 Understanding Scratch and Dig Specifications (Aikens) 8:30 AM–12:30 PM, \$570 / \$333 / \$645	
	SC1310 Optical Metrology for AR/VR/MR (Zhou) 8:30 AM–12:30 PM, \$470 / \$293 / \$545			SC1017 Optics Surface Inspection Workshop (Aikens) 1:30–5:30 PM, \$570 / \$333 / \$645	
	SC1287 Optical Measurements for (Automotive) Displays (Blankenbach, Reichel) 1:30–5:30 PM, \$470 / \$293 / \$545				
Micro/Nano Applications					
		SC1285 Industrial Ultrafast Lasers for Micro-Processing and Applications (Hodgson) 8:30 AM–12:30 PM, \$470 / \$293 / \$545			

Price key: SPIE Member / Student Member / Non-Member

DAILY COURSE SCHEDULE

Check the course schedule and view course descriptions online

SATURDAY 28 January	SUNDAY 29 January	MONDAY 30 January	TUESDAY 31 January	WEDNESDAY 1 February	THURSDAY 2 February
MOEMS-MEMS in Photonics					
SC1125 Design Techniques and Applications Fields for Digital Micro-optics (<i>Kress</i>) 1:30–5:30 PM, \$470 / \$293 / \$545			SC454 Fabrication Technologies for Micro- and Nano-Optics (<i>Suleski</i>) 8:30 AM–12:30 PM, \$470 / \$293 / \$545		
Nano/Biophotonics					
			SC1186 Fluorescence Sensing and Imaging: Towards Portable Healthcare (<i>Levi</i>) 1:30–5:30 PM, \$470 / \$293 / \$545		
Neurophotonics, Neurosurgery, and Optogenetics					
	SC1126 Neurophotonics (<i>Levi, Dufour</i>) 1:30–5:30 PM, \$470 / \$293 / \$545				
Nonlinear Optics / Beam Guiding					
	SC047 Introduction to Nonlinear Optics (<i>Fisher</i>) 8:30 AM–12:30 PM, \$470 / \$293 / \$545				
Optical Materials & Fabrication					
			SC1086 Optical Materials, Fabrication and Testing for the Optical Engineer (<i>DeGroote Nelson</i>) 1:30–5:30 PM, \$470 / \$293 / \$545		

Price key: SPIE Member / Student Member / Non-Member



See full details and updates at spie.org/pw or on the **SPIE App**

SATURDAY 28 January	SUNDAY 29 January	MONDAY 30 January	TUESDAY 31 January	WEDNESDAY 1 February	THURSDAY 2 February
Optical Systems & Design Optomechanics					
	SC156 Basic Optics for Engineers (<i>Poutous</i>) 8:30 AM–5:30 PM, \$820 / \$457 / \$955	SC015 Fastening Optical Elements with Adhesives (<i>Daly</i>) 8:30 AM–12:30 PM, \$470 / \$293 / \$545	SC010 Introduction to Optical Alignment Techniques (<i>Castle</i>) 8:30 AM–5:30 PM, \$780 / \$441 / \$915	SC1232 Introduction to LIDAR for Autonomous Vehicles (<i>Shaw</i>) 8:30 AM–12:30 PM, \$470 / \$293 / \$545	
	SC014 Introduction to Optomechanical Design (<i>Vukobratovich</i>) 8:30 AM–5:30 PM, \$1,460 / \$767 / \$1,730		SC935 Optical System Design: Aberrations, Optimization, and Optical Design Software (<i>Bentley</i>) 8:30 AM–5:30 PM, \$875 / \$479 / \$1,010	SC1311 Understanding Optical System Specifications: Identifying and Managing Hidden Conflicts (<i>Bentley</i>) 1:30–5:30 PM, \$470 / \$293 / \$545	
	SC011 Design of Efficient Illumination Systems (<i>Cassarly</i>) 1:30–5:30 PM, \$470 / \$293 / \$545	SC690 Optical System Design: Layout Principles and Practice (<i>Bentley</i>) 8:30 AM–5:30 PM, \$815 / \$455 / \$950	SC1199 Stray Light Analysis and Control (<i>Fest</i>) 8:30 AM–5:30 PM, \$825 / \$459 / \$960		SC003 Practical Optical System Design (<i>Olson</i>) 8:30 AM–5:30 PM, \$780 / \$441 / \$915
			SC720 Cost-Conscious Tolerancing of Optical Systems (<i>Michels</i>) 1:30–5:30 PM, \$470 / \$293 / \$545		
Optoelectronic Materials and Devices					
	SC1277 Photodetectors: Theory, Practice, and Applications (<i>Piatek</i>) 8:30 AM–12:30 PM, \$470 / \$293 / \$545				
	SC747 Semiconductor Photonic Device Fundamentals (<i>Linden</i>) 8:30 AM–5:30 PM, \$780 / \$441 / \$915				
Photonic Integration					
SC1071 Understanding Diffractive and Meta-Optics (<i>Soskind</i>) 8:30 AM–5:30 PM, \$815 / \$455 / \$950	SC1316 Heterogeneous Integration of Electrical IC and Photonic IC Packaging (<i>Lau</i>) 1:30–5:30 PM, \$470 / \$293 / \$545			SC817 Silicon Photonics (<i>Michel, Saini</i>) 1:30–5:30 PM, \$470 / \$293 / \$545	

DAILY COURSE SCHEDULE

Check the course schedule and view course descriptions online

SATURDAY 28 January	SUNDAY 29 January	MONDAY 30 January	TUESDAY 31 January	WEDNESDAY 1 February	THURSDAY 2 February
Photonic Therapeutics and Diagnostics					
				SC1221 Physiological Optics of the Eye for Engineers (Lakshminarayanan) 8:30 AM–5:30 PM, \$815 / \$455 / \$950	
Sales, Marketing, and Industry					
		SC1170 A Hands-On Introduction to Optics (Diehl) 10:30 AM–12:30 PM, \$300 / \$205 / \$325			
		SC1224 Fundamentals of Optical Engineering (Vogt) 1:30–5:30 PM, \$470 / \$293 / \$545			
Semiconductor Lasers, LEDs, and Applications					
			SC1259 Introduction to Vertical-Cavity Surface-Emitting Lasers (VCSELs) and Applications (Choquette) 8:30 AM–12:30 PM, \$470 / \$293 / \$545	SC1314 Colorimetry for LED Users (Muschaweck) 1:30–5:30 PM, \$470 / \$293 / \$545	
			SC1146 Laser Diode Beam Basics, Characteristics and Manipulation (Sun) 8:30 AM–12:30 PM, \$470 / \$293 / \$545		
Tissue Optics, Laser-Tissue Interaction, and Tissue Engineering					
	SC029 Tissue Optics (Jacques) 1:30–5:30 PM, \$470 / \$293 / \$545	SC1290 Medical Laser-Tissue Interactions (Verdaasdonk) 8:30 AM–12:30 PM, \$470 / \$293 / \$545			

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Conference 12352

28 - 29 January 2023 | Moscone Center, Room 159 (Upper Mezzanine South)

Photonics in Dermatology and Plastic Surgery 2023

Conference Chairs: **Bernard Choi**, Beckman Laser Institute and Medical Clinic (United States); **Haishan Zeng**, BC Cancer Research Institute (Canada)

Program Committee: **Anthony J. Durkin**, Beckman Laser Institute and Medical Clinic (United States); **Conor L. Evans**, Wellman Ctr. for Photomedicine (United States); **Yusuke Hara**, Shiseido Co., Ltd. (Japan); **Manu Jain**, Memorial Sloan-Kettering Cancer Ctr. (United States); **Hanna Jonasson**, Linköping Univ. (Sweden); **Kristen M. Kelly**, Univ. of California, Irvine School of Medicine (United States); **Boris Majaron**, Josef Stefan Institute (Slovenia); **Milind Rajadhyaksha**, Memorial Sloan-Kettering Cancer Ctr. (United States); **Jessica C. Ramella-Roman**, Florida International Univ. (United States); **Lise Lyngsnes Randeberg**, Norwegian Univ. of Science and Technology (Norway); **Rolf B. Saager**, Linköping Univ. (Sweden); **InSeok Seo**, Johnson & Johnson Consumer Products (United States); **Eric R Tkaczyk**, Vanderbilt Health One Hundred Oaks (United States); **Hegun Wang**, Johnson & Johnson Consumer Products (United States); **Ruikang K. Wang**, Univ. of Washington (United States); **Mihaela Balu**, Beckman Laser Institute and Medical Clinic (United States)

SATURDAY 28 JANUARY

SESSION 1: SKIN CANCER I

8:20 AM - 10:00 AM

Session chair: Kristen M. Kelly, Beckman Laser Institute and Medical Clinic (United States)

12352-1 • 8:20 AM - 8:40 AM

Exploration of photoacoustic remote sensing virtual histology in skin malignancies

Author(s): Benjamin R. Ecclestone, James Tweel, Krystal Li, Univ. of Waterloo (Canada); Hager Gaouda, illumiSonics Inc. (Canada); Kevan Bell, Univ. of Waterloo (Canada); Deepak Dinakaran, Muba Taher, John Mackey, Univ. of Alberta (Canada); Parsin Haji Reza, Univ. of Waterloo (Canada)

12352-2 • 8:40 AM - 9:00 AM

Effects of formalin fixation on ex vivo confocal microscopy imaging

Author(s): Julia Kahn, Memorial Sloan-Kettering Cancer Ctr. (United States), New York Medical College (United States); Ucalene Harris, Anna Vaeth, Anthony Rossi, Manu Jain, Memorial Sloan-Kettering Cancer Ctr. (United States)

12352-3 • 9:00 AM - 9:20 AM

Volumetric imaging of melanoma in situ biopsy using rapid tissue clearing with two-photon fluorescence microscopy

Author(s): Chi Z. R. Huang, Vincent D. Ching-Roa, Abdalrahman Almallahi, Univ. of Rochester (United States); Sherrif F. Ibrahim, Rochester Dermatologic Surgery (United States), Univ. of Rochester Medical Ctr. (United States); Bruce R. Smoller, Univ. of Rochester Medical Ctr. (United States); Michael G. Giacomelli, Univ. of Rochester (United States)

12352-4 • 9:20 AM - 9:40 AM

A spectroscopic sensor for noninvasive detection of singlet oxygen production in skin during UV irradiation

Author(s): Tiffany Yu, Physical Sciences Inc. (United States); Arthur Pétusseau, Petr Bruza, Brian W. Pogue, Thayer School of Engineering at Dartmouth (United States); Steven J. Davis, Youbo Zhao, Physical Sciences Inc. (United States)

12352-5 • 9:40 AM - 10:00 AM

A melanoma cancer screening framework based on depth-resolved light scattering

Author(s): Motasam Majedy, Nandan Das, Johannes Johansson, Rolf B. Saager, Linköping Univ. (Sweden)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: SKIN CANCER II

10:30 AM - 11:30 AM

Session chairs: Manu Jain, Memorial Sloan-Kettering Cancer Ctr. (United States), Mihaela Balu, Beckman Laser Institute and Medical Clinic (United States)

12352-6 • 10:30 AM - 10:50 AM

True digital hair removal with real value inpainting for improved dermoscopy based on image fusion

Author(s): Lennart Jütte, Leibniz Univ. Hannover (Germany); Steffen Emmert, Klinik und Poliklinik für Dermatologie und Venerologie, Universitätsmedizin Rostock (Germany); Bernhard Roth, Cluster of Excellence PhoenixD, Leibniz Univ. Hannover (Germany)

12352-7 • 10:50 AM - 11:10 AM

CANCELED: Skin cancer margin detection using nanosensitive optical coherence tomography and a comparative study with confocal microscopy

Author(s): Rajib Dey, National Univ. of Ireland, Galway (Ireland)

12352-61 • 11:10 AM - 11:30 AM PST

Comparative evaluation of conventional color imaging and hyperspectral imaging data as inputs to machine learning algorithms for classifying burn severity

Author(s): Samagra Pandey, Gordon T. Kennedy, Rebecca A. Rowland, Beckman Laser Institute and Medical Clinic (United States); Victor C. Joe, Theresa L. Chin, Univ. of California, Irvine (United States); Robert J. Christy, The Univ. of Texas Health Science Ctr. at San Antonio (United States); David M. Burmeister, Uniformed Services Univ. of the Health Sciences (United States); Robert H. Wilson, Univ. of California, Irvine (United States); Anthony J. Durkin, Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (United States)

SESSION 3: RAMAN SPECTROSCOPY

11:30 AM - 12:30 PM

Session chair: Haishan Zeng, BC Cancer Research Institute (Canada)

12352-9 • 11:30 AM - 11:50 AM

In vivo micro-Raman spectroscopy of arbitrary-shaped region of interest under simultaneous reflectance confocal imaging guidance

Author(s): Zhenguo Wu, Liwei Jiang, Jianhua Zhao, Haishan Zeng, BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada)

12352-10 • 11:50 AM - 12:10 PM

Investigation of absorption of Ceramide in skin barrier using customized confocal Raman spectroscopy

Author(s): Poongkulali Rajarahm, Renzhe Bi, Ruochong Zhang, Malini Olivo, Institute of Bioengineering and Bioimaging, A*STAR Agency for Science, Technology and Research (Singapore); Steven Tien Guan Thng, Skin Research Institute of Singapore, A*STAR Agency for Science, Technology and Research (Singapore)

12352-11 • 12:10 PM - 12:30 PM

Using spectroscopy to study skin conditions

Author(s): Sunil Kalia, The Univ. of British Columbia (Canada), BC Cancer Research Institute (Canada), BC Children's Hospital Research Institute (Canada); Haishan Zeng, BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada); Tashmeeta Ahad, The Univ. of British Columbia (Canada); Jianhua Zhao, BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada); Harvey Lui, The Univ. of British Columbia (Canada), BC Cancer Research Institute (Canada)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

SESSION 4: MACHINE LEARNING AND ALGORITHM DEVELOPMENT

2:00 PM - 3:20 PM

Session chair: Rolf B. Saager, Linköping Univ. (Sweden)

12352-12 • 2:00 PM - 2:20 PM

Comparative effectiveness of different machine learning algorithms for accurate classification of burn wounds using multispectral spatial frequency domain imaging data

Author(s): Robert H. Wilson, Rebecca Rowland, Gordon T. Kennedy, Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (United States); Victor C. Joe, Theresa L. Chin, Univ. of California, Irvine (United States); Robert J. Christy, U.S. Army Institute of Surgical Research (United States); David M. Burmeister, Uniformed Services Univ. of the Health Sciences (United States); Nicole P. Bernal, Univ. of California, Irvine (United States); Anthony J. Durkin, Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (United States)

12352-13 • 2:20 PM - 2:40 PM

Skin cancer detection by Raman spectroscopy and deep neural networks: preliminary results

Author(s): Jianhua Zhao, Haishan Zeng, BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada); Sunil Kalia, The Univ. of British Columbia (Canada), BC Cancer Research Institute (Canada), BC Children's Hospital Research Institute (Canada); Tim K. Lee, BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada); Harvey Lui, The Univ. of British Columbia (Canada), BC Cancer Research Institute (Canada)

12352-14 • 2:40 PM - 3:00 PM

Development of an automatic algorithm enabling layer segmentation and optical characteristic analysis in skin optical coherence tomography imaging

Author(s): Ting-Hao Chen, Yu-Hsuan Lee, Graduate Institute of Photonics and Optoelectronics, National Taiwan Univ. (Taiwan); Chau Yee Ng, Meng-Tsan Tsai, Chang Gung Memorial Hospital (Taiwan), Chang Gung Univ. (Taiwan); Cheng-Kuang Lee, NVIDIA Corp. (Taiwan); Hsiang-Chieh Lee, Graduate Institute of Photonics and Optoelectronics, National Taiwan Univ. (Taiwan)

12352-15 • 3:00 PM - 3:20 PM

Pre-processing dermatological image data to significantly improve the performance of cyclic GAN models

Author(s): Antje Schuschies, Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany), Westsächsische Hochschule Zwickau (Germany); Alexander Kabardiadi-Virkovski, Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany), Westsächsische Hochschule Zwickau (Germany); Peter Hartmann, Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany), Westsächsische Hochschule Zwickau (Germany), Forschungs- und Transferzentrum e.V. an der Westsächsischen Hochschule Zwickau (Germany)

Coffee Break 3:20 PM - 3:50 PM

SESSION 5: AGING AND PHOTODAMAGE

3:50 PM - 5:10 PM

Session chair: Ruikang K. Wang, Univ. of Washington (United States)

12352-16 • 3:50 PM - 4:10 PM

Assessment of intrinsic and extrinsic aging on dermal morphology using optical coherence tomography

Author(s): Vidyalakshmi Anilkumar, Cutaneous Biology Research Ctr., Massachusetts General Hospital (United States), International School of Photonics, Cochin Univ. of Science & Technology (India); Felix Hilge, Cutaneous Biology Research Ctr., Massachusetts General Hospital (United States), Institut für Biomedizinische Optik, Univ. zu Lübeck (Germany); Timo Kepp, Institut für Medizinische Informatik, Univ. zu Lübeck (Germany); Michael Wang-Evers, Cutaneous Biology Research Ctr., Massachusetts General Hospital (United States), Harvard Medical School (United States); Spencer Brush, Cutaneous Biology Research Ctr., Massachusetts General Hospital (United States); Hinnerk Schulz-Hildebrandt, Gereon Hüttmann, Institut für Biomedizinische Optik, Univ. zu Lübeck (Germany), Medizinisches Laserzentrum Lübeck GmbH (Germany), Airway Research Ctr. North, Deutsche Zentrum für Lungenforschung (Germany); Heinz Handels, Institut für Medizinische Informatik, Univ. zu Lübeck (Germany); Dieter Manstein, Cutaneous Biology Research Ctr., Massachusetts General Hospital (United States), Harvard Medical School (United States)

12352-17 • 4:10 PM - 4:30 PM

In vivo study of skin photodamage induced by a picosecond laser with a portable ultrahigh-resolution optical coherence tomography

Author(s): Yin-Shen Cheng, Tai-Ang Wang, Hsiang-Chieh Lee, National Taiwan Univ. (Taiwan); Chau Yee Ng, Chang Gung Memorial Hospital (Taiwan); Meng-Tsan Tsai, Chang Gung Univ. (Taiwan)

12352-18 • 4:30 PM - 4:50 PM

The potential application of PS-OCT in the safety assessment of non-steroidal topical creams for atopic dermatitis treatment

Author(s): Mengqiu Duan, Robert A. Byers, Simon G. Danby, Rosie N. Taylor, The Univ. of Sheffield (United Kingdom); Amy Cha, Pfizer Inc. (United States); Roni Adiri, Pfizer Pharmaceuticals Israel Ltd. (Israel); Chuanbo Zang, John Werth, Pfizer Inc. (United States); Michael J. Cork, Stephen J. Matcher, The Univ. of Sheffield (United Kingdom)

Conference 12352

12352-19 • 4:50 PM - 5:10 PM **In vivo multiphoton multiparametric 3D quantification of human skin aging on forearm and face**

Author(s): Ana-Maria Pena, Thérèse Baldeweck, L'Oréal Recherche et Innovation (France); Etienne Decenciére, Serge Koudoro, MINES ParisTech (France), Univ. PSL (France); Steeve Victorin, Edouard Raynaud, Blandine Ngo, Philippe Bastien, Sébastien Brizion, L'Oréal Recherche et Innovation (France); Emmanuelle Tancrede-Bohin, L'Oréal Recherche et Innovation (France), Hôpital Saint-Louis (France)

12352-20 • 5:10 PM - 5:30 PM

CANCELED: Advanced in vivo characterization of collagen and elastin fibers after radiofrequency microneedling via multiphoton tomography

Author(s): Lynhda Nguyen, Christian Mess, Max J. Schmerder, Stefan W. Schneider, Katharina Herberger, Volker Huck, Universitätsklinikum Hamburg-Eppendorf (Germany)

SUNDAY 29 JANUARY

SESSION 6: PHOTOTHERAPEUTICS

8:00 AM - 10:20 AM

Session chair: Bernard Choi, Beckman Laser Institute and Medical Clinic (United States)

12352-22 • 8:20 AM - 8:40 AM

Removing skin microvessels using photo-mediated ultrasound therapy: A study on chicken wattle model

Author(s): Mingyang Wang, Univ. of Michigan (United States); Rohit Singh, The Univ. of Kansas (United States); Yannis M. Paulus, Univ. of Michigan (United States); Xinmai Yang, The Univ. of Kansas (United States); Xueding Wang, Univ. of Michigan (United States)

12352-233 • 8:40 AM - 9:00 AM

Blood flow modulation for laser treatment in human cutaneous skin by pneumatic control

Author(s): Junsoo Lee, Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (United States); Nitesh Katta, Wangcun Jia, Scott Jenney, J. Stuart Nelson, Thomas E. Milner, Beckman Laser Institute and Medical Clinic (United States)

12352-24 • 9:00 AM - 9:20 AM

Large area fractional laser treatment of mouse skin enhances the metabolic rate

Author(s): Michael Wang-Evers, Nunciada Salma, Daniel Karasik, Armen Yerevanian, Heather Downs, Tuanlian Luo, Dieter Manstein, Massachusetts General Hospital (United States)

12352-25 • 9:20 AM - 9:40 AM

Controlled hyperthermia and monitored protocol for basal cell carcinoma: interim report

Author(s): Christopher B. Zachary, Rachel A. Elsanadi, Univ. of California, Irvine (United States); Indermeet Kohli, Henry Ford Health System (United States); Kristen M. Kelly, Beckman Laser Institute and Medical Clinic (United States); Rachana Soni, Sciton (United States); Craig Fortier, Jon Holmes, Michelson Diagnostics Ltd. (United Kingdom); Hacki Hecht, Alexander Makowski, Dan Negus, Sciton, Inc. (United States); Anna-Marie Hosking, Solomiya Grushchak, Univ. of California (United States); John Soliman, Univ. of California, Irvine (United States); John Wuenneberg, Henry Ford Health System (United States); Joseph Mehrabi, Univ. of California, Irvine (United States); David Ozog, Henry Ford Health System (United States)

12352-26 • 9:40 AM - 10:00 AM

In Vivo 1260-nm harmonic generation microscopy of laser-induced optical breakdown in human skin

Author(s): Connie Liu, Taipei City Hospital (Taiwan), Institute of Biophotonics, National Yang Ming Chiao Tung Univ. (Taiwan); Pei-Che Wu, Graduate Institute of Photonics and Optoelectronics, National Taiwan Univ. (Taiwan); Zi-Ping Chen, Institute of Biophotonics, National Yang Ming Chiao Tung Univ. (Taiwan); Chi-Kuang Sun, Graduate Institute of Photonics and Optoelectronics, National Taiwan Univ. (Taiwan); Yi-Hua Liao, National Taiwan Univ. Hospital (Taiwan), National Taiwan Univ. (Taiwan); Shih-Hsuan Chia, Institute of Biophotonics, National Yang Ming Chiao Tung Univ. (Taiwan)

12352-27 • 10:00 AM - 10:20 AM

Use of an indocyanine green nanoemulsion for the treatment of cutaneous melanoma by photothermal therapy

Author(s): Letícia Palombo Martinelli, Gabriel Jasinevicius, Lilian Moriyama, Instituto de Física de São Carlos, Univ. de São Paulo (Brazil); Hilde Buzzá, Instituto de Física, Pontificia Univ. Católica de Chile (Chile); Juan Chen, Gang Zheng, Univ. of Toronto (Canada); Cristina Kurachi, Instituto de Física de São Carlos, Univ. de São Paulo (Brazil)

Coffee Break 10:20 AM - 10:50 AM

SESSION 7: WOUND HEALING

10:50 AM - 12:10 PM PST

Session chair: Lise L. Randeberg, Norwegian Univ. of Science and Technology (Norway)

12352-28 • 10:50 AM - 11:10 AM

Post-operative monitoring of tissue perfusion in skin flaps in a murine model using enhanced thermal imaging

Author(s): Cobey L. McGinnis, Madeline R. Kern, Didier Dréau, Susan R. Trammell, The Univ. of North Carolina at Charlotte (United States)

12352-29 • 11:10 AM - 11:30 AM

Beneath the skin: multi-frequency SFDI to detect thin layers of skin using light scattering

Author(s): Luigi Belcastro, Hanna Jonasson, Tomas Strömberg, Ahmed Elserafy, Rolf B. Saager, Linköping Univ. (Sweden)

12352-30 • 11:30 AM - 11:50 AM

Development of a clinical prototype single input polarization-sensitive optical coherence tomography for imaging wound healing process

Author(s): Athira B. S., Peijun Tang, Nhan Le, Bazil Hyder, Ruikang Wang, Univ. of Washington (United States)

12352-62 • 11:50 AM - 12:10 PM

Quantifying age-related changes in skin metabolism and collagen organization using in vivo multiphoton microscopy

Author(s): Marcos Rodriguez, Univ. of Arkansas (United States); Kyle P. Quinn, Univ. of Arkansas (United States), Arkansas Integrative Metabolic Research Ctr. (United States); Alan E. Woessner, Arkansas Integrative Metabolic Research Ctr. (United States); Ragan Edison, Univ. of Arkansas (United States)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

SESSION 8: SKIN CHARACTERIZATION I

1:40 PM - 3:20 PM

Session chair: Hanna Jonasson, Linköping Univ. (Sweden)

12352-32 • 1:40 PM - 2:00 PM

Microcirculatory response to lower body negative pressure and the association to large vessel function

Author(s): Hanna Jonasson, Joakim Henrikson, Rolf B. Saager, Daniel Wilhelms, Linköping Univ. (Sweden)

12352-33 • 2:00 PM - 2:20 PM **Multispectral imaging realized by a unmodified smartphone**

Author(s): Qinghua He, Ruikang Wang, Univ. of Washington (United States)

12352-34 • 2:20 PM - 2:40 PM

Visible-light optical coherence tomography platform for the development of novel atopic dermatitis treatment

Author(s): Dmitry G. Revin, Robert A. Byers, Mengqiu Duan, Wei Li, Stephen J. Matcher, The Univ. of Sheffield (United Kingdom)

12352-35 • 2:40 PM - 3:00 PM

Model for skin response due to noxious heating using a spatial frequency domain imaging system with compact eye camera

Author(s): Nandan Das, Saad Nagi, Linköping Univ. (Sweden); Keiichiro Kagawa, Research Institute of Electronics, Shizuoka Univ. (Japan); Rolf B. Saager, Linköping Univ. (Sweden)

12352-36 • 3:00 PM - 3:20 PM

In vivo human skin dermal-epidermal junction zone delineation by volumetric multiphoton microscopy imaging

Author(s): Giselle Tian, Zhenguo Wu, Harvey Lui, Jianhua Zhao, Sunil Kalia, Haishan Zeng, The Univ. of British Columbia (Canada)

Coffee Break 3:20 PM - 3:50 PM

SESSION 9: SKIN CHARACTERIZATION II

3:50 PM - 5:10 PM

Session chair: Jessica C. Ramella-Roman, Florida International Univ. (United States)

12352-37 • 3:50 PM - 4:10 PM

Absorption and reduced scattering coefficients in epidermis and dermis from a Swedish cohort study

Author(s): Hanna Jonasson, Linköping Univ. (Sweden); Ingemar Fredriksson, Linköping Univ. (Sweden), Perimed AB (Sweden); Sara Bergstrand, Carl Johan Östgren, Marcus Larsson, Tomas Strömberg, Linköping Univ. (Sweden)

12352-38 • 4:10 PM - 4:30 PM

Spatiotemporal monitoring of skin hemodynamics using smartphone-enabled multispectral imaging photoplethysmography

Author(s): Qinghua He, Ruikang Wang, Univ. of Washington (United States)

12352-39 • 4:30 PM - 4:50 PM

Quantitative analysis of hair follicles using a serial optical coherence microscopy(OCM)

Author(s): Eun Ji Lee, Sangjin Lee, Myung-Ju Kim, Yujin Ahn, Woonggyu Jung, Ulsan National Institute of Science and Technology (Republic of Korea)

12352-40 • 4:50 PM - 5:10 PM

Characterizing skin properties non-invasively by polarization-sensitive optical coherence tomography

Author(s): Xin Zhou, Daniel C. Louie, Sina Maloufi, Yuheng Wang, Tim K. Lee, Shuo Tang, The Univ. of British Columbia (Canada)

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BIOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM – 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12352-41

Comparison of the effects of laser lancets and conventional lancets on in vivo skin using swept source optical coherence tomography

Author(s): Do Hyun Mun, You-rim Park, Yoo-kyoung Shin, Kanghae Kim, Joo Beom Eom, Dankook Univ. (Republic of Korea)

12352-43

Deep learning algorithms for predicting basement membrane involvement of acral lentiginous melanomas

Author(s): Byungho Oh, Severance Hospital (Republic of Korea); Yuseong Chu, Yonsei Univ. (Republic of Korea); Solam Lee, Yonsei Univ. Wonju College of Medicine (Republic of Korea); Sanggyun Lee, Gangnam Severance Hospital (Republic of Korea); Keeyang Chung, Cutaneous Biology Research Institute, Severance Hospital (Republic of Korea); Miryung Roh, Gangnam Severance Hospital (Republic of Korea); Kyungdeok Seo, Yonsei Univ. (Republic of Korea); Sejung Yang, Yonsei Univ. (Republic of Korea)

12352-44

Laser-induced thermal decomposition with diffractive lens array (DLA) in ex vivo and in vivo skin tissue

Author(s): Jiho Lee, Jongman Choi, Hyun Wook Kang, Pukyong National Univ. (Republic of Korea)

12352-45

Wound image segmentation using deep convolutional neural network

Author(s): Hyunyoung Kang, Kyungdeok Seo, Sena Lee, Yonsei Univ. (Republic of Korea); Byung Ho Oh, Sejung Yang, Yonsei Univ. College of Medicine (Republic of Korea)

12352-46

Improved block matching and 3D collaborative filtering algorithm for denoising skin OCT images

Author(s): Brandon Lukas, Julia May, Carolina Puyana, Maria Tsoukas, Kamran Avanaki, Univ. of Illinois at Chicago (United States)

Conference 12352

12352-47

emU-Net: a deep learning-based tool for enhancing the diagnostic capability of optical coherence tomography images of skin

Author(s): Jarjish Rahaman, National Chemical Lab., Council of Scientific & Industrial Research (India); Brandon Lukas, Julia May, Carolina Puyana, Maria Tsoukas, Kamran Avanaki, Univ. of Illinois at Chicago (United States)

12352-48

Quantitative analysis of optical coherence tomography skin images: Effect of light source bandwidth

Author(s): Sina Movahedi Aliabadi, Rayyan Manwar, Danilo Erricolo, Kamran Avanaki, Univ. of Illinois at Chicago (United States)

12352-49

Implementing the quantitative study of ultrasound imaging of skin

Author(s): Juliana B. Lara, Univ. of Illinois at Chicago (United States); Irem Demirkan, Bahçesehir Univ. (Turkey); Maria Tsoukas, Kamran Avanaki, Univ. of Illinois at Chicago (United States)

12352-60

Bone union enhancement by laser therapy

Author(s): Mohammad Nazrul Islam, National Institute of Traumatology and Orthopaedic Rehabilitation (Bangladesh)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12352-21

Photodynamic therapy effects on hydrogel viscoelastic properties

Author(s): Jace A. Willis, Alexandria Trevino, Calvin Nguyen, Chandler C. Benjamin, Vladislav V. Yakovlev, Texas A&M Univ. (United States)

12352-42

Noninvasive assessment of morphological and vascular features of the normal vulvar skin using multimodal OCT

Author(s): Arseniy L. Potapov, Privolzhsky Research Medical Univ. (Russian Federation); Anastasiya Bychkova, Ayna Saidova, National Medical Research Ctr. for Obstetrics, Gynecology and Perinatology named after Academician V.I. Kulakov (Russian Federation); Maria Loginova, Privolzhsky Research Medical Univ. (Russian Federation), Lobachevsky State University of Nizhny Novgorod (Russian Federation); Maria M. Karabut, Privolzhsky Research Medical Univ. (Russian Federation); Alexander Moiseev, Institute of Applied Physics (Russian Federation); Stefka G. Radenska-Lopovok, I.M. Sechenov First Moscow State Medical Univ. (Russian Federation); Inna Apolikhina, National Medical Research Ctr. for Obstetrics, Gynecology and Perinatology named after Academician V.I. Kulakov (Russian Federation); Natalia D. Gladkova, Marina A. Sirotkina, Privolzhsky Research Medical Univ. (Russian Federation)

Conference 12353

28 - 29 January 2023 | Moscone Center, Room 153 (Upper Mezzanine South)

Advanced Photonics in Urology 2023

Conference Chairs: **Hyun Wook Kang**, Pukyong National Univ. (Korea, Republic of); **Ronald Sroka**, Laser-Forschungslabor (Germany); **Jian J. Zhang**, Boston Scientific Corp. (United States)

Program Committee: **Ralf Brinkmann**, Medizinisches Laserzentrum Lübeck GmbH (Germany); **Kin F Chan**, Simpson Interventions (United States); **Nathaniel M. Fried**, The Univ. of North Carolina at Charlotte (United States); **Thomas Hasenberg**, Shockwave Medical Inc. (United States); **Joseph C. Liao**, Stanford Univ. (United States); **William W. Roberts M.D.**, Univ. of Michigan Health System (United States); **Babak Shadgan M.D.**, The Univ. of British Columbia (Canada); **Stefan B. Spaniol**, LifePhotonic GmbH (Germany); **Frank Strittmatter**, Laser-Forschungslabor (Germany); **Joel M. Teichman M.D.**, St. Paul's Hospital (Canada); **Hui Wang**, Miami Univ. (United States); **Kwangsung Park**, Chonnam National Univ. Medical School (Korea, Republic of); **Jae Gwan Kim**, Gwangju Institute of Science and Technology (Korea, Republic of); **Ben Turney**, Oxford Univ. Hospitals NHS Foundation Trust (United Kingdom)

SATURDAY 28 JANUARY

SESSION 1: LASER THERAPEUTICS I

8:50 AM - 10:10 AM

Moscone Center, Room 153 (Upper Mezzanine South)

Session chairs: Hyun Wook Kang, Pukyong National Univ. (Republic of Korea), Ronald Sroka, Laser- und Immunologie-Forschungseinrichtungen Zentrum (Germany)

12353-1 • 8:50 AM - 9:10 AM

Analysis of stone trajectory during laser lithotripsy: an in vitro study

Author(s): Bingyuan Yang, Univ. of Oxford (United Kingdom); Jian J. Zhang, Aditi Ray, Boston Scientific Corp. (United States); Ben Turney, Univ. of Oxford (United Kingdom)

12353-2 • 9:10 AM - 9:30 AM

Comparison of two surfactants for enhancing laser-induced vapor bubble dimensions

Author(s): Woheeb Saeed, Thomas C. Hutchens, Nathaniel M. Fried, The Univ. of North Carolina at Charlotte (United States)

12353-3 • 9:30 AM - 9:50 AM

Photothermal effects on urethral tissue for treatment of stress urinary incontinence

Author(s): Hwarang Shin, Yeachan Lee, Seonghee Lim, Hyun Wook Kang, Pukyong National Univ. (Republic of Korea)

12353-4 • 9:50 AM - 10:10 AM

A combination of photothermal and photodynamic therapies for treatment of prostate cancer

Author(s): Yeongeun Kim, Hyun Wook Kang, Pukyong National Univ. (Republic of Korea)

SESSION 2: OPTICAL IMAGING I

10:40 AM - 12:00 PM

Moscone Center, Room 153 (Upper Mezzanine South)

Session chairs: Hui Wang, Miami Univ. (United States), Kin F. Chan, Simpson Interventions (United States)

12353-5 • 10:40 AM - 11:00 AM

Using diffuse reflectance spectroscopy to improve prostate cancer surgery outcomes.

Author(s): Lotte M. de Roode, The Netherlands Cancer Institute (Netherlands); Joyce Sanders, The Netherlands Cancer Institute-Antoni van Leeuwenhoek Hospital (Netherlands); Marcos A. S. Guimaraes, Pim J. van Leeuwen, The Netherlands Cancer Institute (Netherlands); Henk G. van der Poel, The Netherlands Cancer Institute (Netherlands), Amsterdam UMC (Netherlands); Lisanne L. de Boer, The Netherlands Cancer Institute (Netherlands); Theo J. M. Ruers, The Netherlands Cancer Institute (Netherlands), Univ. Twente (Netherlands)

12353-6 • 11:00 AM - 11:20 AM

Optical coherence tomography for the detection of electrothermal injury in radiofrequency-induced ex-vivo porcine ureters

Author(s): Dilara J. Long, The Univ. of Arizona (United States); Photini Faith Rice, Department of Biomedical Engineering, University of Arizona (United States); David Mazi, Department of Electrical and Computer Engineering, University of Arizona (United States); Jennifer K. Barton, Wyant College of Optical Sciences, The Univ. of Arizona (United States); John M. Heusinkveld, The Univ. of Arizona (United States)

12353-7 • 11:20 AM - 11:40 AM

Detection of seminiferous tubules harboring spermatozoa by optical coherence tomography in a rat model of non-obstructive azoospermia

Author(s): Luyang Yu, Univ. of California, Riverside (United States); Yan He Lue, The Lundquist Institute (United States); Hang Yang, Junze Liu, Carlos Vega, Kevin Ho, Univ. of California, Riverside (United States); Christina Wang, Ron Swerdloff, The Lundquist Institute (United States); B. Hyle Park, Univ. of California, Riverside (United States)

12353-8 • 11:40 AM - 12:00 PM

Superior image interpretation by morpho-molecular signal correlation between optical coherence tomography and Raman spectroscopy: A road to clinical validation

Author(s): Fabian Placzek, Medizinische Univ. Wien (Austria); Iwan W. Schie, Leibniz-Institut für Photonische Technologien e.V. (Germany), Ernst-Abbe-Hochschule Jena (Germany); Florian Knorr, Eliana Cordero, Leibniz-Institut für Photonische Technologien e.V. (Germany); Lara M. Wurster, Medizinische Univ. Wien (Austria); Gregers G. Hermann, Karin Mogensen, Univ. of Copenhagen (Denmark); Thomas Hasselager, Herlev Hospital (Denmark); Wolfgang Drexler, Medizinische Univ. Wien (Austria); Jürgen Popp, Leibniz-Institut für Photonische Technologien e.V. (Germany), Institut für Physikalische Chemie (Germany); Rainer A. Leitgeb, Medizinische Univ. Wien (Austria)

Conference 12353

SESSION 3: LASER THERAPEUTICS II

1:20 PM - 3:00 PM

Moscone Center, Room 153 (Upper Mezzanine South)

Session chairs: Jian J. Zhang, Boston Scientific Corp. (United States), Hyun Wook Kang, Pukyong National Univ. (Republic of Korea)

12353-9 • 1:20 PM - 1:40 PM

Sodium copper chlorophyllin mediated interstitial photodynamic therapy (I-PDT) for locally advanced cervical cancer (LACC)

Author(s): Yeachan Lee, Pukyong National Univ. (Republic of Korea); Seong-Yeong Heo, Korea Institute of Ocean Science & Technology (Republic of Korea); Hwarang Shin, Seonghee Lim, Hyun Wook Kang, Pukyong National Univ. (Republic of Korea)

12353-10 • 1:40 PM - 2:00 PM

Transperineal laser ablation treatment for lower urinary tract symptoms in men: Outcomes of a pilot study

Author(s): Rob A. A. van Kollenburg, Luigi A. M. J. G. van Riel, Jorg R. Oddens, Theo M. de Reijke, Ton G. van Leeuwen, Harrie P. Beerlage, Daniel M. de Bruin, Amsterdam UMC (Netherlands)

12353-11 • 2:00 PM - 2:20 PM

Laser beam profile variation through Ho-YAG laser lithotripsy fibers

Author(s): Jian J. Zhang, Alex Lemieux, Steven Peng, Mike O'Brien, Boston Scientific Corp. (United States)

12353-12 • 2:20 PM - 2:40 PM

Balloon-assisted cylindrical laser ablation for urethral stenosis treatment

Author(s): Seonghee Lim, Pukyong National Univ (Republic of Korea); Jiho Lee, Hyun Wook Kang, Pukyong National Univ. (Republic of Korea)

12353-13 • 2:40 PM - 3:00 PM

Relaxation oscillation simulation of Ho-YAG lithotripsy laser

Author(s): Steven Peng, Boston Scientific Corp. (United States)

SESSION 4: OPTICAL IMAGING II

3:30 PM - 4:50 PM

Moscone Center, Room 153 (Upper Mezzanine South)

Session chairs: Ronald Sroka, Laser- und Immunologie-Forschungseinrichtungen Zentrum (Germany), Nathaniel M. Fried, The Univ. of North Carolina at Charlotte (United States)

12353-14 • 3:30 PM - 3:50 PM

A novel flexible ureteroscope design using a saline light guide channel for combined irrigation and illumination

Author(s): Aidan Restelli, Woheeb Saeed, Nathaniel M. Fried, The Univ. of North Carolina at Charlotte (United States)

12353-15 • 3:50 PM - 4:10 PM

Sequential modeling for cystoscopic image classification

Author(s): Mark Laurie, Okyaz Eminaga, Eugene Shkolyar, Xiao Jia, Tim K. Lee, Jin Long, Md Tauhidul Islam, Hubert Lau, Lei Xing, Joseph C. Liao, Stanford Univ. (United States)

12353-16 • 4:10 PM - 4:30 PM

Automatic frame classification and enhancement for CYSVIEW cystoscopy video

Author(s): Shuang Chang, Vanderbilt Univ. (United States); Sam S. Chang, Kristen Scarpato, Amy N. Luckenbaugh, Vanderbilt Univ. Medical Ctr. (United States); Soheil Kolouri, Audrey K. Bowden, Vanderbilt Univ. (United States)

12353-17 • 4:30 PM - 4:50 PM

Laser platform and light delivery optimization for bladder cancer treatment with a novel photosensitive drug

Author(s): Zoe Ylöniemi, Elias Kokko, Visa Kaivosoja, Modulight Corp. (Finland); Ana Colucci, Eerika Suokas, Jukka-Pekka Alanko, Modulight Corporation (Finland); Petteri Uusimaa, Modulight Corp. (Finland)

SUNDAY 29 JANUARY

SESSION 5: OPTICAL IMAGING III

9:20 AM - 11:00 AM

Moscone Center, Room 153 (Upper Mezzanine South)

Session chairs: Jae Gwan Kim, Gwangju Institute of Science and Technology (Republic of Korea), Jian J. Zhang, Boston Scientific Corp. (United States)

12353-18 • 9:20 AM - 9:40 AM

Urothelial response to water transport

Author(s): Hui Wang, Lan Dao, Miami Univ. (United States)

12353-19 • 9:40 AM - 10:00 AM

Percutaneous nephrostomy guidance by a polarization-sensitive optical coherence tomography probe

Author(s): Chen Wang, Yunlong Liu, Paul Calle, Feng Yan, The Univ. of Oklahoma (United States); Nathan A. Bradley, Kar-Ming Fung, Sanjay G. Patel, Zhongxin Yu, Chongle Pan, The Univ. of Oklahoma Health Sciences Ctr. (United States); Qinggong Tang, The Univ. of Oklahoma (United States)

12353-20 • 10:00 AM - 10:20 AM

A real-time classifier to predict the contribution of cystoscopy frames to 3D reconstructions

Author(s): Audrey K. Bowden, Mayaank Pillai, Rachel Eimen, Vanderbilt Univ. (United States); Kristen Scarpato, Vanderbilt Univ. Medical Ctr. (United States)

12353-21 • 10:20 AM - 10:40 AM

Correlation of MRI and contrast-enhanced ultrasound imaging and radical prostatectomy specimens following transperineal focal laser ablation for prostate cancer

Author(s): Mitra Almasian, Luigi A. van Riel, Rob A. A. van Kolleburg, Ton G. van Leeuwen, Theo M. de Reijke, Daniel M. de Bruin, Jorg R. Oddens, Jan-Erik Freund, Amsterdam UMC (Netherlands); Pim J. van Leeuwen, Henk van der Poel, Netherlands Cancer Institute (NKI) (Netherlands); Harrie P. Beerlage, Amsterdam UMC (Netherlands)

12353-22 • 10:40 AM - 11:00 AM

Flat lesion detection of white light cystoscopy with deep learning

Author(s): Xiao Jia, Eugene Shkolyar, Okyaz Eminaga, Mark Laurie, Zixia Zhou, Timothy K. Lee, Md Tauhidul Islam, Stanford Univ. (United States); Max Q.-H. Meng, The Chinese University of Hong Kong (Hong Kong, China); Joseph C. Liao, Lei Xing, Stanford Univ. (United States)

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM
Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BIOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM – 5:00 PM

View poster presentation guidelines and set-up instructions at:
<https://spie.org/PW/Poster-Guidelines>

12353-23

Caffeic acid-coated nanosilica for laser treatment of prostate cancer

Author(s): Sirajunnisa Abdul Razack, Hyun Wook Kang, Pukyong National Univ. (Republic of Korea)

12353-24

Alternative treatment for biofilm inhibition in urethral stent using 405 nm laser delivered by basket-integrated optical device

Author(s): Luluil Maknuna, Junghyun Hwang, Van Nam Tran, Hyun Wook Kang, Pukyong National Univ. (Republic of Korea)

12353-25

Design of zinc oxide-black phosphorus coatings over titanium surface for NIR assisted bacterial disinfection in urethral stents

Author(s): Sivakumar Bose, Hyun Wook Kang, Pukyong National Univ. (Republic of Korea)

12353-26

Enhanced coupling of high power laser light into single fiber for treatment of benign prostate hyperplasia

Author(s): Minh Duc Ta, Pukyong National Univ. (Republic of Korea); Van Gia Truong, TeCure, Inc. (Republic of Korea); Hyun Wook Kang, Pukyong National Univ. (Republic of Korea)

Conference 12354

28 January 2023 | Moscone Center, Room 160 (Upper Mezzanine South)

Imaging, Therapeutics, and Advanced Technology in Head and Neck Surgery and Otolaryngology 2023

Conference Chairs: **Brian J. F. Wong M.D.**, Beckman Laser Institute and Medical Clinic (United States); **Justus F. Ilgner M.D.**, Uniklinik RWTH Aachen (Germany)

Program Committee: **Milind Rajadhyaksha**, Memorial Sloan-Kettering Cancer Ctr. (United States); **Henricus J. C. M. Sterenberg**, Amsterdam UMC (Netherlands); **Javier A. Jo**, The Univ. of Oklahoma (United States); **Amy L. Oldenburg**, The Univ. of North Carolina at Chapel Hill (United States); **Ramesh K. Shori**, Naval Undersea Warfare Ctr. Keyport (United States)

SATURDAY 28 JANUARY

SESSION 1: ADVANCED IMAGING OF MIDDLE EAR PATHOLOGY: OCT, RAMAN SPECTROSCOPY AND BEYOND

9:00 AM - 10:20 AM

Moscone Center, Room 160 (Upper Mezzanine South)

Session chair: Justus F. Ilgner, Uniklinik RWTH Aachen (Germany)

12354-1 • 9:00 AM - 9:20 AM

Imaging and assessment of human ear wax with optical coherence tomography

Author(s): Alexander Ho, Guillermo L. Monroy, Edita Aksamitiene, Darold R. Spillman, Marina Marjanovic, Stephen A. Boppart, Beckman Institute, Univ. of Illinois (United States)

12354-2 • 9:20 AM - 9:40 AM

Speciation of otitis media causing bacterial biofilms using texture analysis features from OCT images

Author(s): Farzana R. Zaki, Kavaya Sudhir, Guillermo L. Monroy, Jindou Shi, Stephen A. Boppart, Univ. of Illinois (United States)

12354-3 • 9:40 AM - 10:00 AM

Integrated Raman spectroscopy and optical coherence tomography system for characterizing otitis media

Author(s): Guillermo L. Monroy, Beckman Institute, Univ. of Illinois (United States); Sean T. Fitzgerald, Andrea Locke, Vanderbilt Biophotonics Ctr., Vanderbilt Univ. (United States); Jungeun Won, Darold R. Spillman, Alexander Ho, Farzana R. Zaki, Honggu Choi, Eric J. Chaney, Beckman Institute, Univ. of Illinois (United States); Jay A. Werkhaven, Vanderbilt Univ. Medical Ctr. (United States); Kevin M. Mason, Abigail Wexner Research Institute, Nationwide Children's Hospital (United States); Anita Mahadevan-Jansen, Vanderbilt Biophotonics Ctr., Vanderbilt Univ. (United States), Vanderbilt Univ. Medical Ctr. (United States); Stephen A. Boppart, Beckman Institute, Univ. of Illinois (United States), Carle-Illinois College of Medicine, Univ. of Illinois (United States)

12354-4 • 10:00 AM - 10:20 AM

Data-informed imaging: how radiography and shape models support endoscopic OCT imaging of the middle ear

Author(s): Jonas Golde, TU Dresden (Germany); Joseph Morgenstern, Universitätsklinikum Carl Gustav Carus Dresden (Germany); Peng Liu, Nationales Centrum für Tumorerkrankungen Dresden (Germany); Steffen Ossmann, Universitätsklinikum Carl Gustav Carus Dresden (Germany); Lars Kirsten, Svea Steuer, TU Dresden (Germany); Stefanie Speidel, Nationales Centrum für Tumorerkrankungen Dresden (Germany); Edmund Koch, TU Dresden (Germany); Sebastian Bodenstedt, Nationales Centrum für Tumorerkrankungen Dresden (Germany); Marcus Neudert, Universitätsklinikum Carl Gustav Carus Dresden (Germany)

Coffee Break 10:20 AM - 10:50 AM

SESSION 2: ANATOMICAL AND FUNCTIONAL ANALYSIS OF UPPER AIRWAY TISSUE AND ADVANCES IN LASER MICROSURGERY

10:50 AM - 11:50 AM

Moscone Center, Room 160 (Upper Mezzanine South)

Session chair: Brian J. F. Wong, Beckman Laser Institute and Medical Clinic (United States)

12354-5 • 10:50 AM - 11:10 AM

Comparison of mechanical models for tracheal elastography derived from endoscopic OCT and intraluminal pressure measurements

Author(s): Yinghan Xu, The Univ. of North Carolina at Chapel Hill (United States); Ruofei Bu, Becton, Dickinson and Company (United States); Carlton J. Zdanski, Sorin Mitran, Amy L. Oldenburg, The Univ. of North Carolina at Chapel Hill (United States)

12354-6 • 11:10 AM - 11:30 AM

High-speed imaging of cilia beat frequency using phase-resolved spectrally encoded interferometric microscopy

Author(s): Do A Kim, Zhikai Zhu, Danny Chou, Katelyn Dilley, Theodore V. Nguyen, Zhongping Chen, Brian Wong, Edward Kuan, Univ. of California, Irvine (United States)

12354-7 • 11:30 AM - 11:50 AM

Ultrafast laser surgery probe for sub-surface ablation: In vivo sub-epithelial ablation and biomaterial injection in canine vocal folds

Author(s): Liam P. Andrus, Berk Camli, The Univ. of Texas at Austin (United States); Ted Mau, The Univ. of Texas Southwestern Medical Ctr. (United States); Adela Ben-Yakar, The Univ. of Texas at Austin

Lunch/Exhibition Break 11:50 AM - 1:50 PM

SESSION 3: ASSESSMENT OF ORAL TISSUE CHANGES USING OCT AND FLIM IN ENDOSCOPY

1:50 PM - 2:50 PM

Moscone Center, Room 160 (Upper Mezzanine South)

Session chair: Justus F. Ilgner, Uniklinik RWTH Aachen (Germany)

12354-8 • 1:50 PM - 2:10 PM

Dual-excitation multispectral autofluorescence lifetime endoscopy for clinical label-free metabolic imaging of oral lesions

Author(s): Rodrigo Cuenca Martinez, Michael J. Serafino, Gabriel P. Tortorelli, The Univ. of Oklahoma (United States); Ronald C. Faram, Kathleen E. Higgins, Sharukh S. Khajotia, College of Dentistry, The Univ. of Oklahoma Health Sciences Ctr. (United States); Yi-Shing L. Cheng, Jacqueline M. Plemons, Victoria Woo, Texas A&M Univ. College of Dentistry (United States); Carlos Busso Recabarren, Kayla R. Caughlin, The Univ. of Texas at Dallas (United States); Javier A. Jo, The Univ. of Oklahoma (United States)

12354-9 • 2:10 PM - 2:30 PM

Noninvasive optical biopsy of human oral lichen planus in vivo by optical coherence tomography

Author(s): Yuliia Gruda, TU Dresden (Germany); Jonas Golde, Faculty of Medicine, TU Dresden (Germany); Jiawen Li, The Univ. of Adelaide (Australia); Marius Albrecht, Christian Schnabel, Dominik Haim, Guenter Lauer, Korinna Joehrens, Michaela Buckova, Faculty of Medicine, TU Dresden (Germany); Robert A. McLaughlin, Institute for Photonics and Advanced Sensing, The Univ. of Adelaide (Australia); Julia Walther, Faculty of Medicine, TU Dresden (Germany)

12354-10 • 2:30 PM - 2:50 PM

Human palatine tonsil imaging with cross-polarized optical coherence tomography

Author(s): Asha Parmar, Gargi Sharma, Kanwarpal Singh, Max-Planck-Institut für die Physik des Lichts (Germany)

Coffee Break 2:50 PM - 3:20 PM

SESSION 4: EMERGING TECHNOLOGY FOR SURGICAL GUIDANCE AND LASER TREATMENT FROM BENCH TO OPERATING ROOM

3:20 PM - 5:20 PM

Moscone Center, Room 160 (Upper Mezzanine South)

Session chair: Javier A. Jo, The Univ. of Oklahoma (United States)

12354-11 • 3:20 PM - 3:40 PM

Epithelial segmentation of oral OCT with deep learning to quantify thickness and degree of stratification

Author(s): Chloe Hill, BC Cancer Research Institute (Canada), Simon Fraser Univ. (Canada); Catherine Poh, Calum MacAulay, BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada); Pierre Lane, BC Cancer Research Institute (Canada), Simon Fraser Univ. (Canada), The Univ. of British Columbia (Canada)

12354-12 • 3:40 PM - 4:00 PM

Anatomy-specific classification models using FLIm for head & neck cancer surgical guidance

Author(s): Mohamed Hassan, Univ. of California, Davis (United States)

12354-13 • 4:00 PM - 4:20 PM

Fluorescence lifetime-enhanced tumor margin assessment in head and neck cancers using receptor targeted probes

Author(s): Rahul Pal, Thinzar M. Lwin, Massachusetts General Hospital (United States); Marisa E. Hom, Vanderbilt Univ. (United States); Mark A. Varvares, Massachusetts Eye and Ear (United States); Eben L. Rosenthal, Vanderbilt Univ. (United States); Anand T. N. Kumar, Massachusetts General Hospital (United States)

12354-14 • 4:20 PM - 4:40 PM

Tissue perfusion analysis of parathyroid glands using ICG with probe-based fluorescence detection during neck surgeries

Author(s): Parker A. Willmon, Giju Thomas, Vanderbilt Univ. (United States); Colleen Kiernan, Naira Baregamian, Carmen Solórzano, Vanderbilt Univ. Medical Ctr. (United States); Anita Mahadevan-Jansen, Vanderbilt Univ. (United States)

12354-19 • 4:40 PM - 5:00 PM

Handheld laser speckle contrast imaging for intraoperative detection of parathyroid gland perfusion

Author(s): Han Dong, Parker A. Willmon, Pratheepa Rasiiah, Graham A. Throckmorton, Emmanuel A. Mannoh, Giju Thomas, Anita Mahadevan-Jansen, Vanderbilt Univ. (United States)

12354-15 • 5:00 PM - 5:20 PM

Application of low-level laser therapy in trigeminal neuralgia: A clinical case

Author(s): Laís Tatiane Ferreira, Viviane Brocca Souza, Simone Aparecida Ferreira, Gabrieli Simão, Institute of Physics of São Carlo, Univ. de São Paulo (Brazil), Central Paulista Univ. Ctr., UNICEP São Carlos (Brazil); Antonio Eduardo Aquino, Institute of Physics of São Carlo, Univ. de São Paulo (Brazil), Development and Training Ctr. for Post-Covid-19 Patient Rehabilitation Technologies and Procedures (Brazil); Marcelo Saito Nogueira, Tyndall National Institute (Ireland), Univ. College Cork (Ireland); Vanderlei Salvador Bagnato, Institute of Physics of São Carlo, Univ. de São Paulo (Brazil); Vitor Hugo Panhóca, Institute of Physics of São Carlo, Univ. de São Paulo (Brazil), Development and Training Ctr. for Post-Covid-19 Patient Rehabilitation Technologies and Procedures (Brazil)

SUNDAY 29 JANUARY

SESSION 5: SUNDAY SESSION

8:30 AM - 9:10 AM

Moscone Center, Room 160 (Upper Mezzanine South)

Session chair: Brian J. F. Wong, Beckman Laser Institute and Medical Clinic (United States)

12354-17 • 8:30 AM - 8:50 AM

Applications of AI to Biophotonics in Otolaryngology

Author(s): Theodore V. Nguyen, Univ. of California, Irvine School of Medicine (United States), Beckman Laser Institute and Medical Clinic (United States); Katelyn K. Dilley, Beckman Laser Institute and Medical Clinic (United States); Jonathan C. Pang, Sina J. Torabi, Univ. of California, Irvine School of Medicine (United States); Donggyoon Hong, Beckman Laser Institute and Medical Clinic (United States); Brian J. F. Wong, Beckman Laser Institute and Medical Clinic (United States), Univ. of California, Irvine School of Medicine (United States)

12354-18 • 8:50 AM - 9:10 AM

Determining the optimal VCSEL OCT probe focal length for intubated neonatal upper airway imaging

Author(s): Donggyoon Hong, Beckman Laser Institute and Medical Clinic (United States), Children's Health of Orange County (United States); Li-Dek Chou, Katelyn K. Dilley, Beckman Laser Institute and Medical Clinic (United States); Gurpreet S. Ahuja, Children's Health Orange County (United States), Univ. of California, Irvine (United States); Zhongping Chen, Univ. of California, Irvine (United States); Brian J. F. Wong, Beckman Laser Institute and Medical Clinic (United States), Univ. of California, Irvine (United States)

Conference 12354

12354-213 • 9:10 AM - 9:30 AM

Deep learning-based assessment of acute respiratory distress syndrome (ARDS) using optical coherence tomography (OCT)

Author(s): Raksha Sreeramachandra Murthy, Yusi Miao, Univ. of California, Irvine (United States); Li-Dek Chou, Beckman Laser Institute and Medical Clinic (United States); Andriy I. Batchinsky, The Geneva Foundation (United States); Zhongping Chen, Beckman Laser Institute and Medical Clinic (United States)

12354-22 • 9:30 AM - 9:50 AM

The effects of epinephrine on ciliary beat frequency in human sinonasal mucosa

Author(s): Katelyn K. Dilley, Theodore V. Nguyen, Do A. Kim, Zhikai Zhu, Lidek Chou, Donggyoon Hong, Zhongping Chen, Beckman Laser Institute and Medical Clinic (United States); Edward C. Kuan, Univ. of California, Irvine (United States); Brian J. F. Wong, Beckman Laser Institute and Medical Clinic (United States)

12354-20 • 9:50 AM - 10:10 AM

Deep learning accelerated quantitative assessment for optical coherence tomography images of acute chlorine gas inhalation injury in a rabbit model

Author(s): Zhikai Zhu, Hongqiu Lei, Raksha Sreeramachandra Murthy, Theodore V. Nguyen, Katelyn K. Dilley, Donggyoon Hong, Beckman Laser Institute and Medical Clinic (United States); Xiao Gao, Univ. of California, Riverside (United States); Matthew Brenner, Zhongping Chen, Beckman Laser Institute and Medical Clinic (United States)

Conference 12355

28 - 29 January 2023 | Moscone Center, Room 76 (Lower Mezzanine South)

Diagnostic and Therapeutic Applications of Light in Cardiology 2023

Conference Chairs: **Laura Marcu**, Univ. of California, Davis (United States); **Gijs van Soest**, Erasmus MC (Netherlands)

Program Committee: **Christos Bourantas**, St. Bartholomew's Hospital (United Kingdom); **Kenton W. Gregory M.D.**, Oregon Medical Laser Ctr. (United States); **Christine P. Hendon**, Columbia Univ. (United States); **Stanislav Y. Emelianov**, Georgia Institute of Technology (United States); **Guillermo J. Tearney M.D.**, Massachusetts General Hospital (United States)

SATURDAY 28 JANUARY

SESSION 1: INTRAVASCULAR INNOVATIONS: INVITED SESSION

8:30 AM - 10:30 AM

Moscone Center, Room 76 (Lower Mezzanine South)

Session chair: Gijs van Soest, Erasmus MC (Netherlands)

12355-1 • 8:30 AM - 9:00 AM

Emerging multimodality intravascular imaging technologies and their potential value in risk stratification and treatment planning (*Invited Paper*)

Author(s): Christos Bourantas, St. Bartholomew's Hospital (United Kingdom)

12355-2 • 9:00 AM - 9:30 AM

Ultrathin 3D-printed intravascular imaging catheters (*Invited Paper*)

Author(s): Jiawen Li, The Univ. of Adelaide (Australia); Simon Thiele, Pavel Puchka, Andrea Toulouse, Univ. Stuttgart (Germany); Rodney Kirk, Bryden Quirk, The Univ. of Adelaide (Australia); Ayla Hoogendoorn, South Australian Health and Medical Research Institute (SAHMRI) (Australia); Yung Chin Chen, Karlheinz Peter, Baker Heart and Diabetes Institute (Australia); Emma Akers, South Australian Health and Medical Research Institute (SAHMRI) (Australia); Stephen Nicholls, Monash Univ. (Australia); Johan Verjans, Peter Psaltis, Christina Bursill, South Australian Health and Medical Research Institute (SAHMRI) (Australia); Alois Herkommer, Harald Giessen, Univ. Stuttgart (Germany); Robert McLaughlin, The Univ. of Adelaide (Australia)

12355-3 • 9:30 AM - 10:00 AM

Intravascular optical coherence polarimetry (*Invited Paper*)

Author(s): Martin Villiger, Wellman Ctr. for Photomedicine (United States)

12355-4 • 10:00 AM - 10:30 AM

Demonstration of a combined multispectral FLIM/polarization-sensitive OCT catheter system for biochemical/structural evaluation of atherosclerosis lesions. (*Invited Paper*)

Author(s): Julien Bec, Xiangnan Zhou, Univ. of California, Davis (United States); Pelham Keahey, Martin Villiger, Brett E. Bouma, Massachusetts General Hospital (United States); Laura Marcu, Univ. of California, Davis (United States)

Coffee Break 10:30 AM - 11:00 AM

SESSION 2: THERAPY AND INTERVENTION MONITORING

11:00 AM - 12:40 PM

Moscone Center, Room 76 (Lower Mezzanine South)

Session chair: Christine P. Hendon, Columbia Univ. (United States)

12355-5 • 11:00 AM - 11:20 AM

Changes in tissue fluorescence during infrared laser sealing of blood vessels

Author(s): Woheeb Saeed, Nathaniel M. Fried, The Univ. of North Carolina at Charlotte (United States)

12355-6 • 11:20 AM - 11:40 AM

Intravascular photodynamic therapy guided by optical coherence tomography-near infrared fluorescence imaging for precise diagnosis and treatment of atherosclerosis

Author(s): Yeon Hoon Kim, KAIST (Republic of Korea); Jin Hyuk Kim, Korea Univ. Guro Hospital (Republic of Korea); Jeonggeun Song, KAIST (Republic of Korea); Ryeong Hyun Kim, Korea Univ. Guro Hospital (Republic of Korea); Hyeong Soo Nam, KAIST (Republic of Korea); Joon Woo Song, Hyun Jung Kim, Korea Univ. Guro Hospital (Republic of Korea); Jae Won Ahn, Kyeongsoon Park, Chung-Ang Univ. (Republic of Korea); Jin Won Kim, Korea Univ. Guro Hospital (Republic of Korea); Hongki Yoo, KAIST (Republic of Korea)

12355-7 • 11:40 AM - 12:00 PM

Multi-modal imaging system with optically integrated probe for left atrial anatomical mapping

Author(s): Haiqiu Yang, Columbia Univ. (United States); Michael Douglass, Case Western Reserve Univ. (United States); Deepak Saluja, Columbia Univ. Medical Ctr. (United States); Kenneth R. Laurita, Andrew M. Rollins, Case Western Reserve Univ. (United States); Christine P. Hendon, Columbia Univ. (United States)

12355-8 • 12:00 PM - 12:20 PM

Polarization-sensitive optical coherence tomography (PSOCT) for identifying and analyzing gaps in lesion lines during ex vivo simulated radiofrequency ablation procedure

Author(s): Michael Douglass, Juan Perez, Case Western Reserve Univ. (United States); Lydia Akino, Case Western Reserve Univ. (United States), Heart and Vascular Research Ctr., Metro Health Medical Ctr. (United States); Haiqiu Yang, Columbia Univ. (United States); Walter J. Hoyt, Ochsner Health System (United States); Ohad Ziv, Kenneth R. Laurita, Case Western Reserve Univ. (United States), Heart and Vascular Research Ctr., Metro Health Medical Ctr. (United States); Christine Hendon, Columbia Univ. (United States); Andrew M. Rollins, Case Western Reserve Univ. (United States)

Conference 12355

12355-9 • 12:20 PM - 12:40 PM

Multifunctional coagulation profiling for cardiac surgical interventions at the point-of-care

Author(s): Ziqian Zeng, Wellman Ctr. for Photomedicine, Massachusetts General Hospital (United States), Harvard Medical School (United States); Pablo Gonzalez Polanco, Wellman Ctr. for Photomedicine (United States); Zeinab Hajjarian Kashany, Diane M. Tshikudi, Seemantini K. Nadkarni, Wellman Ctr. for Photomedicine (United States), Harvard Medical School (United States)

Lunch/Exhibition Break 12:40 PM - 2:10 PM

SESSION 3: DEVICES FOR DIAGNOSIS AND SENSING

2:10 PM - 4:10 PM

Moscone Center, Room 76 (Lower Mezzanine South)

Session chair: Christos Bourantas, St. Bartholomew's Hospital (United Kingdom)

12355-10 • 2:10 PM - 2:30 PM

A transparent quartz laparoscopic jaw design for infrared laser sealing of vascular tissues using a reciprocating, side-firing fiber

Author(s): Patrick O'Brien, Woheeb Saeed, Nathaniel M. Fried, The Univ. of North Carolina at Charlotte (United States)

12355-11 • 2:30 PM - 2:50 PM

Wearable optical sensor arrays for cardiovascular health monitoring and biomarker mapping

Author(s): Ahmad Katoun, Razvan Petre, Albert van Breemen, Bart Peeters, Hylke Akkerman, Holst Ctr. (Netherlands)

12355-12 • 2:50 PM - 3:10 PM

Non-contact cardiac activity monitoring using optical speckle-tolerant pulsed laser vibrometer

Author(s): ChenChia Wang, Sudhir Trivedi, Feng Jin, Brimrose Corp. of America (United States); Gary P. Zientara, U.S. Army Research Institute of Environmental Medicine (United States); Fow-Sen Choa, Univ. of Maryland, Baltimore County (United States); Jacob B. Khurgin, Johns Hopkins Univ. (United States)

12355-13 • 3:10 PM - 3:30 PM

Laser Doppler vibrometry sensors implemented in a silicon photonic integrated circuit for measuring cardiovascular signals on bare skin

Author(s): Yanlu Li, Univ. Gent (Belgium), imec (Belgium); Soren Aasmul, Medtronic Netherlands (Netherlands); Andrei Bakoz, Chirag Murendranath Patil, Padraic E. Morrissey, Tyndall National Institute (Ireland); Tracy Wotherspoon, Owen Pullin, Felix Campano Casado, Microchip Technology Inc. (United Kingdom); Petr Záruba, Argotech a.s. (Czech Republic); Roel Baets, Univ. Gent (Belgium), imec (Belgium); Emiel Dieussaert, Univ. Gent (Belgium)

12355-124 • 3:30 PM - 3:50 PM

Intravascular imaging of coronary atherosclerosis using a dual-transducer ultrasound and photoacoustic catheter

Author(s): Antonio López-Marín, Erasmus MC (Netherlands); Vergy Daeichin, Kaminari Medical B.V. (Netherlands); Geert Springeling, Robert Beurskens, Antonius F. W. van der Steen, Gijs van Soest, Erasmus MC (Netherlands)

12355-25 • 3:50 PM - 4:10 PM

Histology-trained deep learning model for automated coronary plaque composition assessment in combined intravascular ultrasound-optical coherence tomography images

Author(s): Xingru Huang, Retesh Bajaj, Queen Mary Univ. of London (United Kingdom); Natasha Alves-Kotzev, Jill Weyers, Sunnybrook Research Institute (Canada); Molly Levine, Mohil Garg, MedStar Washington Hospital Ctr. (United States); Soe Maung, Queen Mary Univ. of London (United Kingdom); Hector Garcia Garcia, MedStar Washington Hospital Ctr. (United States); Kit M. Bransby, Queen Mary Univ. of London (United Kingdom); Ryo Torii, Univ. College London (United Kingdom); Rob Krams, Anthony Mathur, Andreas Baumbach, Qianni Zhang, Queen Mary Univ. of London (United Kingdom); Brian Courtney, Sunnybrook Research Institute (Canada); Christos Bourantas, Queen Mary Univ. of London (United Kingdom)

Coffee Break 4:10 PM - 4:20 PM

PANEL DISCUSSION: OPPORTUNITIES FOR OPTICS IN CARDIOVASCULAR MEDICINE

4:20 PM - 5:45 PM

Moscone Center, Room 76 (Lower Mezzanine South)

Session chairs: Gijs van Soest, Erasmus MC (Netherlands), Jiawen Li, The Univ. of Adelaide (Australia)

INTRODUCTION

Kenton Gregory, Oregon Medical Laser Ctr. (United States)

PANEL MODERATORS

Gijs van Soest, Erasmus MC (Netherlands)

Jiawen Li, The Univ. of Adelaide (Australia)

PANELISTS

Kenton Gregory, Oregon Medical Laser Ctr. (United States)

Laura Marcu, Univ. of California, Davis (United States)

Ye Chen-Izu, Univ. of California, Davis (United States)

Christos Bourantas, St. Bartholomew's Hospital (United Kingdom)

Martin Villiger Wellman Ctr. for Photomedicine (United States)

This panel discussion will address pitfalls in the translation of new technologies for diagnosis and therapy from bench to bedside. We will also look ahead to emerging concepts and needs in cardiovascular medicine that currently remain unaddressed.

12355-201 • 4:20 PM - 4:45 PM

How to transform an academic medical inventor into an entrepreneur in six painful steps

Author(s): Kenton W. Gregory, Oregon Medical Laser Ctr. (United States)

SUNDAY 29 JANUARY

SESSION 4: CARIOGENESIS AND REMODELING

8:00 AM - 10:20 AM

Moscone Center, Room 76 (Lower Mezzanine South)

Session chair: Laura Marcu, Univ. of California, Davis (United States)

12355-14 • 8:00 AM - 8:30 AM

Microlaser contractility sensing: A new approach for biomechanical sensing deep inside the beating heart
(Invited Paper)

Author(s): Marcel Schubert, Soraya Caixeiro, Vera Titze, Univ. zu Köln (Germany); Amy Dorward, Samantha Pitt, Univ. of St. Andrews (United Kingdom); Malte Gather, Univ. zu Köln (Germany)

12355-15 • 8:30 AM - 8:50 AM

Longitudinal, high-resolution, 4D imaging of the mouse embryonic heart development with optical coherence tomography

Author(s): Andre C. Faubert, Stevens Institute of Technology (United States); Irina V. Larina, Baylor College of Medicine (United States); Shang Wang, Stevens Institute of Technology (United States)

12355-16 • 8:50 AM - 9:10 AM

Multimodal microscopy imaging of cardiac collagen network: are we looking at the same structures?

Author(s): Zhao Zhang, Clemson Univ. (United States); Lily Neff, Amy Bradshaw, Medical Univ. of South Carolina (United States); Adam T. Baker, Hongming Fan, Clemson Univ. (United States); Emily Ye, Medical Univ. of South Carolina (United States); William Richardson, Bruce Gao, Tong Ye, Clemson Univ. (United States)

12355-17 • 9:10 AM - 9:30 AM

Highly multiplexed 3D FISH imaging in the embryonic quail heart

Author(s): Junwoo Suh, Yehe Liu, Andrew M. Rollins, Michiko Watanabe, Michael Jenkins, Case Western Reserve Univ. (United States)

12355-183 • 9:30 AM - 9:50 AM

Contrast-free segmentation of blood vessels using deep learning

Author(s): Maryse Lapierre-Landry, Yehe Liu, Mahdi Bayat, David L. Wilson, Michael W. Jenkins, Case Western Reserve Univ. (United States)

12355-19 • 9:50 AM - 10:20 AM

Shining light into cellular and molecular mechanisms of cardiac function and heart diseases (Invited Paper)

Author(s): Ye Chen-Izu, Leighton T. Izu, Univ. of California, Davis (United States)

Coffee Break 10:20 AM - 10:50 AM

SESSION 5: CHARACTERIZATION OF ATHEROSCLEROSIS

10:50 AM - 12:30 PM

Moscone Center, Room 76 (Lower Mezzanine South)

Session chair: Martin Villiger, Wellman Ctr. for Photomedicine (United States)

12355-20 • 10:50 AM - 11:10 AM

Intravascular polarimetry with existing clinical instruments

Author(s): Georgia Thomas, Massachusetts General Hospital (United States); Massachusetts Institute of Technology (United States); Kenichiro Otsuka, Graduate School of Medicine, Osaka City Univ. (Japan); Joost Daemen, Erasmus MC (Netherlands); Brett E. Bouma, Massachusetts Institute of Technology (United States), Massachusetts General Hospital (United States); Martin Villiger, Massachusetts General Hospital (United States)

12355-21 • 11:10 AM - 11:30 AM

Label-free characterization of human coronary atherosclerosis using optical coherence tomography-fluorescence lifetime imaging (OCT-FLIm) catheter

Author(s): Hyeong Soo Nam, KAIST (Republic of Korea); Sunwon Kim, Korea Univ. Ansan Hospital (Republic of Korea); Dong Oh Kang, Korea Univ. Guro Hospital (Republic of Korea); Jeong Moo Han, KAIST (Republic of Korea); Eun Jin Park, Jin Won Kim, Korea Univ. Guro Hospital (Republic of Korea); Hongki Yoo, KAIST (Republic of Korea)

12355-22 • 11:30 AM - 11:50 AM

Multispectral optoacoustic tomography of lipids in carotid artery atherosclerosis

Author(s): Jonas Riksen, Sowmiya Chandramoorthi, Antonius F. W. van der Steen, Gijs van Soest, Erasmus MC (Netherlands)

12355-23 • 11:50 AM - 12:10 PM

Improving intravascular optical coherence tomography with deep learning

Author(s): Woojin Lee, Hyeong Soo Nam, Wang-Yuhl Oh, KAIST (Republic of Korea); Jin Won Kim, Korea Univ. Guro Hospital (Republic of Korea); Hongki Yoo, KAIST (Republic of Korea)

12355-24 • 12:10 PM - 12:30 PM

Machine learning assisted characterization of atherosclerotic plaque components via multispectral fluorescence lifetime imaging microscopy

Author(s): Jeongmoo Han, KAIST (Republic of Korea); Sunwon Kim, Korea Univ. Ansan Hospital (Republic of Korea); Hyun Jung Kim, Korea Univ. Guro Hospital (Republic of Korea); Hyeong Soo Nam, KAIST (Republic of Korea); Jin Won Kim, Korea Univ. Guro Hospital (Republic of Korea); Hongki Yoo, KAIST (Republic of Korea)

Conference 12355

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM
Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BIOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM – 5:00 PM

View poster presentation guidelines and set-up instructions at:
<https://spie.org/PW/Poster-Guidelines>

12355-103

Deep learning approach to transformer-based arrhythmia classification using scalogram of single-lead ECG

Author(s): Ji Seung Ryu, Yonsei Univ. (Republic of Korea); Solam Lee, Wonju College of Medicine, Yonsei Univ. (Republic of Korea); Youngjun Park, Yonsei University Wonju College of Medicine (Republic of Korea); Yu Seong Chu, Sena Lee, Seunghyun Jang, Seungyoung Kang, Hyunyoung Kang, Sejung Yang, Yonsei Univ. (Republic of Korea)

Conference 12356

28 - 29 January 2023 | Moscone Center, Room 313 (Level 3 South)

Endoscopic Microscopy XVIII

Conference Chairs: **Guillermo J. Tearney M.D.**, Massachusetts General Hospital (United States); **Thomas D. Wang**, Univ. of Michigan (United States); **Melissa J. Suter**, Massachusetts General Hospital (United States)

Program Committee: **Kathy Beaudette**, Castor Optics, Inc. (Canada); **Matthew Brenner M.D.**, Beckman Laser Institute and Medical Clinic (United States); **Johannes F. de Boer**, Vrije Univ. Amsterdam (Netherlands); **Arthur F. Gmitro**, The Univ. of Arizona (United States); **Michalina J. Gora**, Univ. de Strasbourg (France); **Lida P. Hariri M.D.**, Massachusetts General Hospital (United States); **Stephen Lam M.D.**, BC Cancer Research Institute (Canada); **Amy L. Oldenburg**, The Univ. of North Carolina at Chapel Hill (United States); **Wibool Piyawattanametha**, King Mongkut's Institute of Technology Ladkrabang (Thailand); **DongKyun Kang**, Wyant College of Optical Sciences (United States); **David D. Sampson**, Univ. of Surrey (United Kingdom); **Eric J. Seibel**, Univ. of Washington (United States)

SATURDAY 28 JANUARY

SESSION 1: CLINICAL ENDOSCOPIC IMAGING

1:30 PM - 3:30 PM

Moscone Center, Room 313 (Level 3 South)

Session chair: Guillermo J. Tearney, Massachusetts General Hospital (United States)

12356-1 • 1:30 PM - 1:50 PM

Smartphone-compatible confocal endomicroscope for imaging cervix in vivo

Author(s): Nachiket Kulkarni, Andrew Masciola, Abhinav Nishant, Kyung-Jo Kim, Arthur Gmitro, The Univ. of Arizona (United States); Esther Freeman, Massachusetts General Hospital (United States); Philippa Makanga, Aggrey Semeere, Miriam Nakelembe, Infectious Diseases Institute (Uganda); DongKyun Kang, The Univ. of Arizona (United States)

12356-2 • 1:50 PM - 2:10 PM

Interdental detection of proximal caries in vivo by polarization-sensitive optical coherence tomography

Author(s): Jonas Golde, TU Dresden (Germany); Michael Hackmann, Qingyun Li, The Univ. of Western Australia (Australia); Onur Cetinkaya, Institute of Physical Chemistry (Poland); Tobias Rosenauer, Florian Tetschke, Christian Schnabel, TU Dresden (Germany); Karol Karnowski, Institute of Physical Chemistry (Poland); David D. Sampson, Advanced Technology Institute, Univ. of Surrey (United Kingdom); Edmund Koch, Christian Hannig, Julia Walther, TU Dresden (Germany)

12356-3 • 2:10 PM - 2:30 PM

Endoscopic polarization-sensitive optical coherence tomography for fibrosis quantification in interstitial lung disease patients

Author(s): Margherita Vaselli, Vrije Univ. Amsterdam (Netherlands); Kirsten Kalverda, Peter Bonta, Jouke Annema, Johannes F. de Boer, Amsterdam UMC (Netherlands); Tatiana Soldati, Vrije Univ. Amsterdam (Netherlands)

12356-4 • 2:30 PM - 2:50 PM

A portable and minimally invasive human nasal potential difference (NPD) measurement system

Author(s): David O. Otuya, Massachusetts General Hospital (United States), Harvard Medical School (United States); Kadambari Vijaykumar, Gregory Fleming James Cystic Fibrosis Research Ctr., The Univ. of Alabama at Birmingham School of Medicine (United States), The Univ. of Alabama at Birmingham (United States); Sophia N. Zoghbi, Nicolas M. Dechene, Emily Ryan, Sarah L. Silva, Massachusetts General Hospital (United States); Heather Y. Harthorne, Gregory Fleming James Cystic Fibrosis Research Ctr., The Univ. of Alabama at Birmingham School of Medicine (United States); Catriona N. Grant, Massachusetts General Hospital (United States); Steven M. Rowe, Gregory Fleming James Cystic Fibrosis Research Ctr., The Univ. of Alabama at Birmingham School of Medicine (United States), The Univ. of Alabama at Birmingham (United States); Marty M. Solomon, Gregory Fleming James Cystic Fibrosis Research Ctr., The Univ. of Alabama at Birmingham School of Medicine (United States), The Univ. of Alabama at Birmingham (United States); Guillermo J. Tearney, Massachusetts General Hospital (United States), Harvard Medical School (United States)

12356-5 • 2:50 PM - 3:10 PM

Airway smooth muscle assessments with PS-OCT: Structure and function

Author(s): David C. Adams, Melissa J. Suter, Massachusetts General Hospital (United States)

12356-6 • 3:10 PM - 3:30 PM

Unsedated transnasal optical coherence tomography imaging in healthy pregnant women

Author(s): Evangelia Gavgiotakis, David O. Otuya, Rachel E. Shore, Alissa A. Cirio, Tyler Rihm, Alexander A. Krall, Peter Choy, Sarah L. Giddings, Anita Chung, Catriona N. Grant, Paola A. Leon Alarcon, Ara L. Bablouzian, Matthew Beatty, Guillermo J. Tearney, Massachusetts General Hospital (United States)

Coffee Break 3:30 PM - 4:00 PM

SESSION 2: NOVEL ENDOSCOPY DESIGN

4:00 PM - 6:20 PM

Moscone Center, Room 313 (Level 3 South)

Session chair: Melissa J. Suter, Massachusetts General Hospital (United States)

12356-7 • 4:00 PM - 4:20 PM

Iterative prototyping based on lessons learned from the falloposcope in vivo pilot study experience

Author(s): Andrew D. Rocha, William K. Drake, Photini F. Rice, Dilara J. Long, Hasina Shir, Ryan H. Walton, Mary N. Reed, Dominique Galvez, Colin Potter, Taliah Gorman, John M. Huesinkveld, Jennifer K. Barton, The Univ. of Arizona (United States)

Conference 12356

12356-8 • 4:20 PM - 4:40 PM

Handheld dual-axis confocal microscopy for neurosurgical guidance: Developing a 2nd-generation prototype

Author(s): Kevin W. Bishop, Bingwen Hu, Adam K. Glaser, Univ. of Washington (United States); Nader Sanai, Barrow Neurological Institute (United States); Jonathan T. C. Liu, Univ. of Washington (United States)

12356-9 • 4:40 PM - 5:00 PM

Piezoelectric bender actuator scanning endomicroscope

Author(s): Rachel Tan, Rachel Chan, Whitney Loh, Kaicheng Liang, A*STAR Agency for Science, Technology and Research (Singapore)

12356-10 • 5:00 PM - 5:20 PM

Dual-resolution, catheter-based probe for visualization of angular-diverse scattering contrast of esophagus in vivo with optical coherence tomography

Author(s): Taylor M. Cannon, Wellman Ctr. for Photomedicine (United States), Institute for Medical Engineering & Science, Massachusetts Institute of Technology (United States); Milen S. Shishkov, Wellman Ctr. for Photomedicine (United States); Ginger J. Schmidt, Wellman Ctr. for Photomedicine (United States), Institute for Medical Engineering & Science, Massachusetts Institute of Technology (United States); Martin Villiger, Wellman Ctr. for Photomedicine (United States); Brett E. Bouma, Wellman Ctr. for Photomedicine (United States), Institute for Medical Engineering & Science, Massachusetts Institute of Technology (United States); Néstor Uribe-Patarroyo, Wellman Ctr. for Photomedicine (United States)

12356-11 • 5:20 PM - 5:40 PM

Cell-acquiring fallopian endoscope for detection of ovarian cancer via reflectance imaging, fluorescence imaging, and cell collection

Author(s): Dominique Galvez, Wyant College of Optical Sciences, The Univ. of Arizona (United States); Ricky Cordova, The Univ. of Arizona (United States); Kelli Kiekens, Andrew D. Rocha, William Drake, Wyant College of Optical Sciences (United States); Photini Rice, The Univ. of Arizona (United States); John M. Heusinkveld, University of Arizona, Department of Obstetrics and Gynecology (United States); Jennifer K. Barton, The Univ. of Arizona (United States)

12356-12 • 5:40 PM - 6:00 PM

A 32-channel MEMs-based laparoscopic 2D forward-viewing OCT probe

Author(s): Hyun-Sang Park, Wellman Ctr. for Photomedicine (United States), Massachusetts General Hospital (United States), Harvard Medical School (United States); Yongjoo Kim, Danielle J. Harper, Taeshik Kim, Yong-Chul Yoon, Milen S. Shishkov, Benjamin J. Vakoc, Wellman Ctr. for Photomedicine (United States)

12356-13 • 6:00 PM - 6:20 PM

High-resolution OCT probe as the stylet of cochlea implant for intraoperative imaging during the cochlear implant surgery

Author(s): Fang Hou, Alejandro E. Ortega, Massachusetts General Hospital (United States); Radhika K. Poduval, Massachusetts General Hospital (United States), Harvard Medical School (United States); Shoumik Lodh, Lillian Wang, Massachusetts General Hospital (United States); Varun Sagi, Konstantina M. Stankovic, Stanford Univ. School of Medicine (United States); Guillermo J. Tearney, Massachusetts General Hospital (United States), Harvard Medical School (United States)

SUNDAY 29 JANUARY

SESSION 3: NOVEL LENS DEVELOPMENT FOR ENDOSCOPY

8:00 AM - 10:00 AM

Moscone Center, Room 313 (Level 3 South)

Session chair: David C. Adams, Massachusetts General Hospital (United States)

12356-14 • 8:00 AM - 8:20 AM

Design and evaluation of miniaturized high numerical aperture and large field-of-view microscope objectives with reduced field curvature

Author(s): Sophia Laura Schulz, Grintech GmbH (Germany); Herbert Gross, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Christian Eggeling, Institut für Angewandte Optik und Biophysik, Friedrich-Schiller-Univ. Jena (Germany), Leibniz-Institut für Photonische Technologien e.V. (Germany); Bernhard Messerschmidt, Grintech GmbH (Germany)

12356-15 • 8:20 AM - 8:40 AM

Low-cost high-precision polymer optics for single-use endoscopic applications

Author(s): Jacques Duparré, Frank C. Wippermann, Nico Hagen, mcd - modern camera designs GmbH (Germany)

12356-16 • 8:40 AM - 9:00 AM

Diffractional metasurface light-shaping from fiber endoscope probes for increased depth of field

Author(s): Fei He, Univ. of Nottingham (United Kingdom); Rafael Fuentes-Dominguez, Richard Cousins, Christopher J. Mellor, The Univ. of Nottingham (United Kingdom); Jennifer K. Barton, Wyant College of Optical Sciences, The Univ. of Arizona (United States), Biomedical Engineering Interdisciplinary Program, The Univ. of Arizona (United States); George S. D. Gordon, Optics and Photonics Group, The Univ. of Nottingham (United Kingdom)

12356-17 • 9:00 AM - 9:20 AM

Phase imaging Endoscopy using metalens chromatic aberration.

Author(s): Aamod Shanker, Arka Majumdar, Johannes Froech, Univ. of Washington (United States)

12356-18 • 9:20 AM - 9:40 AM

3D printed freeform micro-optics for OCT coronary tissue imaging

Author(s): Radhika K. Poduval, Fang Hou, Alejandro E. Ortega, Shoumik Lodh, Aditya Kumar, Ashwin Panikkar, Hinnerk Schulz-Hildebrandt, Lillian Wang, Joseph A. Gardecki, Farouc A. Jaffer, Guillermo J. Tearney, Massachusetts General Hospital (United States)

12356-19 • 9:40 AM - 10:00 AM

Metasurfaces in Endoscopic Optical Coherence Tomography

Author(s): David C. Adams, Hamid Pahlevaninezhad, Masoud Pahlevaninezhad, Melissa J. Suter, Massachusetts General Hospital (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 4: TETHERED ENDOSCOPY FOR UPPER GI

29 January • 10:30 AM - 12:10 PM

Moscone Center, Room 313 (Level 3 South)

Session chair: DongKyun Kang, Wyant College of Optical Sciences (United States)

12356-20 • 10:30 AM - 10:50 A

CANCELED: Tethered capsule endoscopy-endomicroscopy (TEEM)

Author(s): Oscar Caravaca Mora, Chukwuemeka Okoro, Brandon S. McCorduck, Rachel Smith, John J. McDaniel, Nitasha Bhat, Sydney R. Kutowy, Hinnerk Schulz-Hildebrandt, Guillermo J. Tearney, Wellman Ctr. for Photomedicine (United States)

12356-45 • 10:30 AM - 10:50 AM

Replacing 12356-20: Miniaturized MEMS-based side-view dual-axis confocal microscopy system for in-vivo early cancer diagnosis

Author(s): Ahmad Shirazi, Tayebah Sahraeibeverdi, Miki Lee, HaiJun Li, Univ. of Michigan (United States); Sangeeta Jaiswal, ; Joonyoung Yu, Kenn R. Oldham, Thomas D. Wang, Univ. of Michigan (United States)

12356-21 • 10:50 AM - 11:10 AM

All-reflective tethered capsule endoscope for multimodal esophageal imaging

Author(s): Xavier Attendu, Amsterdam UMC (Netherlands), Polytechnique Montréal (Canada); Paul R. Bloemen, Niels H. Kind, Dirk J. Faber, Daniel M. de Bruin, Amsterdam UMC (Netherlands); Caroline Boudoux, Polytechnique Montréal (Canada), Castor Optics, Inc. (Canada); Ton G. van Leeuwen, Amsterdam UMC (Netherlands)

12356-22 • 11:10 AM - 11:30 AM

A minimally invasive tethered capsule endomicroscopy and biopsy platform

Author(s): Andrew D. Thrapp, Wellman Ctr. for Photomedicine (United States), Massachusetts General Hospital (United States), Harvard Medical School (United States); Rachel E. Shore, Tyler Rhim, David O. Otuya, Wellman Ctr. for Photomedicine (United States); Tara Lignelli, Matthew Beatty, Rachel Smith, Wellman Ctr. for Photomedicine (United States), Massachusetts General Hospital (United States); Guillermo J. Tearney, Wellman Ctr. for Photomedicine (United States), Massachusetts General Hospital (United States), Harvard Medical School (United States)

12356-23 • 11:30 AM - 11:50 AM

Tethered capsule endomicroscopy-guided tissue sampling of the GI tract by in vivo laser capture microdissection

Author(s): Fang Hou, Massachusetts General Hospital (United States), Harvard Medical School (United States); Rachel Smith, Tara Lignelli, Ara L. Babloutzian, Shwaathi Deenadayalan, Massachusetts General Hospital (United States); Tianxia Li, Adam Bass, Columbia Univ. Irving Medical Ctr. (United States); Guillermo J. Tearney, Massachusetts General Hospital (United States), Harvard Medical School (United States)

12356-24 • 11:50 AM - 12:10 PM

1060-nm compact SECM system with tethered endoscopic capsule for esophageal imaging in vivo.

Author(s): Junyoung Kim, Edward C. Farewell, Sung-Bin J. Yun, Abhishek Srinivas, Paola A. Leon Alarcon, Sydney R. Kutowy, Abigail L. Gregg, Guillermo J. Tearney, Massachusetts General Hospital (United States)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

SESSION 5: 2P AND MULTIPHOTON ENDOSCOPY

29 January • 1:40 PM - 3:20 PM

Moscone Center, Room 313 (Level 3 South)

Session chair: Thomas D. Wang, Univ. of Michigan (United States)

12356-25 • 1:40 PM - 2:00 PM

Optical design and simulation of two photon fluorescence imaging microendoscope with aberration correction

Author(s): Susan Thomas, Shanti Bhattacharya, Indian Institute of Technology Madras (India)

12356-26 • 2:00 PM - 2:20 PM

Design of multiphoton microendoscope system for minimally invasive detection of cancer

Author(s): Zuzana Adams, Wyant College of Optical Sciences, The Univ. of Arizona (United States); Taliah Gorman, The Univ. of Arizona (United States); Kelli C. Kiekens, Dominique Galvez, Wyant College of Optical Sciences (United States); Jennifer K. Barton, Wyant College of Optical Sciences, The Univ. of Arizona (United States), The Univ. of Arizona (United States)

12356-27 • 2:20 PM - 2:40 PM

Rigid endomicroscopic system for multiphoton imaging and tissue ablation in the head and neck region

Author(s): Chenting Lai, Bernhard Messerschmidt, Karl Reichwald, Sven Flämig, Grintech GmbH (Germany); Tino Eidam, Fabian Stutzki, Active Fiber Systems GmbH (Germany); Matteo Calvarese, Leibniz-Institut für Photonische Technologien e.V. (Germany); Hyeonsoo Bae, Leibniz-Institut für Photonische Technologien e.V. (Germany), Institut für Physikalische Chemie, Friedrich-Schiller-Univ. Jena (Germany); Tobias Meyer, Leibniz-Institut für Photonische Technologien e.V. (Germany); Michael Schmitt, Institut für Physikalische Chemie, Friedrich-Schiller-Univ. Jena (Germany); Herbert Gross, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Franziska Hoffmann, Orlando Guntinas-Lichius, Universitätsklinikum Jena (Germany); Jürgen Popp, Leibniz-Institut für Photonische Technologien e.V. (Germany), Institut für Physikalische Chemie, Friedrich-Schiller-Univ. Jena (Germany)

12356-28 • 2:40 PM - 3:00 PM

2P autofluorescence imaging endoscope for clinical observation of metabolic changes in cervical tissue

Author(s): Berk Camli, Liam P. Andrus, Aditya Roy, Biswajit Mishra, The Univ. of Texas at Austin (United States); Chris Xu, Cornell Univ. (United States); Irene Georgakoudi, Tufts Univ. (United States); Tomasz Tkaczyk, Rice Univ. (United States); Adela Ben-Yakar, The Univ. of Texas at Austin (United States)

Conference 12356

12356-29 • 3:00 PM - 3:20 PM

Large band multiphoton microendoscope with single-core standard graded-index multimode fiber based on spatial beam self-cleaning

Author(s): Tigran Mansuryan, Nour Tabcheh, Marc Fabert, Univ. de Limoges (France); Katarzyna Krupa, Polish Academy of Sciences (Poland); Raphael Jauberteau, Sapienza Univ. di Roma (Italy); Alessandro Tonello, Claire Lefort, Univ. de Limoges (France); Mario Ferraro, Sapienza Univ. di Roma (Italy); Fabio Mangini, Sapienza Univ. di Roma (Italy); Mario Zitelli, Sapienza Univ. di Roma (Italy); Massimiliano Papi, Ivo Boskoski, Univ. Cattolica del Sacro Cuore (Italy); Stefan Wabnitz, Sapienza Univ. di Roma (Italy); Vincent Couderc, Univ. de Limoges (France)

Coffee Break 3:20 PM - 3:50 PM

SESSION 6: NOVEL ENDOSCOPE ADVANCES AND DESIGNS

3:50 PM - 4:50 PM

Moscone Center, Room 313 (Level 3 South)

Session chair: Johannes F. de Boer, Vrije Univ. Amsterdam (Netherlands)

12356-30 • 3:50 PM - 4:10 PM

Three-dimensional imaging of the enteric nervous system for the design of a multimodal optogenetic endomicroscope

Author(s): Arielle Planchette, Jules Scholler, Yoseline Rosales Cabara, Ivana Gantar, Michalina Gora, Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

12356-32 • 4:10 PM - 4:30 PM

Clear optically matched panoramic access channel technique (COMPACT) for endoscopic deep brain functional imaging

Author(s): Meng Cui, Chenmao Wang, Zongyue Cheng, Purdue Univ. (United States)

12356-33 • 4:30 PM - 4:50 PM

Quantification and improvement of signal-to-background ratio of endogenous fluorescence imaging using double-clad fiber endoscopes

Author(s): Eric Brace, Pierre Lane, Simon Fraser Univ. (Canada), BC Cancer Research Institute (Canada)

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BIOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM - 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12356-43

The most compact single pixel dual-axis confocal imaging system for early cancer diagnostics capable of real-time in-vivo imaging

Author(s): Ahmad Shirazi, Tayebah Sahraeibeverdi, Miki Lee, HaiJun Li, Sangeeta Jaiswal, Joonyoung Yu, Kenn Oldham, Thomas Wang, Univ. of Michigan (United States)

12356-44

World's smallest single-shot two-wavelength holographic endoscope for 3D surface measurement

Author(s): Alexander Gröger, Univ. Stuttgart (Germany)

12356-31

Image artifacts due to trigger signal timing mismatch in dynamic SSOT endoscopy: cause and remedies

Author(s): Srikamal Jaganraj Soundararajan, Univ. of North Carolina at Chapel Hill (United States); Yinghan Xu, Amy Lynn Oldenburg, The Univ. of North Carolina at Chapel Hill (United States)

Conference 12357

28 January 2023 | Moscone Center, Room 306 (Level 3 South)

Visualizing and Quantifying Drug Distribution in Tissue VII

Conference Chairs: **Kin Foong Chan**, Simpson Interventions, Inc. (United States); **Conor L. Evans**, Wellman Ctr. for Photomedicine (United States)

Program Committee: **Zane A. Arp**, U.S. Food and Drug Administration (United States); **Eric G. Solon**, Madrigal Pharmaceuticals, Inc. (United States); **Alex J. Walsh**, Texas A&M Univ. (United States); **Crist**

SATURDAY 28 JANUARY

SESSION 1: PHARMACOKINETIC AND PHARMACODYNAMIC TOMOGRAPHY IN TRANSLATIONAL RESEARCH

8:00 AM - 10:00 AM

Moscone Center, Room 306 (Level 3 South)

Session chairs: **Conor L. Evans**, Wellman Ctr. for Photomedicine (United States); **Kin F. Chan**, Simpson Interventions (United States)

12357-1 • 8:00 AM - 8:15 AM

Visualizing and quantifying drugs in tissue

Author(s): **Conor L. Evans**, Wellman Ctr. for Photomedicine (United States)

12357-2 • 8:15 AM - 8:50 AM

Role of visualizing and quantifying drugs in dermal drug development (*Invited Paper*)

Author(s): **Priyanka Ghosh**, **Sam G. Raney**, **Markham C. Luke**, U.S. Food and Drug Administration (United States)

12357-3 • 8:50 AM - 9:25 AM

Quantitative analysis of in vivo skin penetration by confocal Raman spectroscopy (*Invited Paper*)

Author(s): **Gerwin J. Puppels**, RiverD International B.V. (Netherlands)

Coffee Break 10:00 AM - 10:25 AM

SESSION 2: PHARMACOKINETIC AND PHARMACODYNAMIC TOMOGRAPHY IN PRECLINICAL RESEARCH

10:25 AM - 12:35 PM

Moscone Center, Room 306 (Level 3 South)

Session chairs: **Alex J. Walsh**, Texas A&M Univ. (United States); **Zane A. Arp**, U.S. Food and Drug Administration (United States)

12357-4 • 10:25 AM - 10:50 AM

Visualizing and quantifying cisplatin-induced nephrotoxicity using nonlinear optical imaging (*Invited Paper*)

Author(s): **Aneesh Alex**, GlaxoSmithKline (United States); **Eric J. Chaney**, Univ. of Illinois (United States); **Crysthiane Ishiy**, **Ciarán Fisher**, GlaxoSmithKline (United Kingdom); **Darold Spillman**, **Marina Marjanovic**, Univ. of Illinois (United States); **Jan Roger**, GlaxoSmithKline (United Kingdom); **Reid Groseclose**, GlaxoSmithKline (United States); **Steve Hood**, GlaxoSmithKline (United Kingdom); **Stephen A. Boppart**, Univ. of Illinois (United States)

12357-5 • 10:50 AM - 11:15 AM

Stimulated Raman scattering (SRS) microscopy and deep learning: A novel pharmacokinetic approach for evaluation of topical bioequivalence (*Invited Paper*)

Author(s): **Fotis Iliopoulos**, **Isaac J. Pence**, Harvard Medical School (United States); **Massachusetts General Hospital** (United States); **Priyanka Ghosh**, **Sam G. Raney**, **Markham C. Luke**, U.S. Food and Drug Administration (United States); **Conor L. Evans**, Harvard Medical School (United States); **Massachusetts General Hospital** (United States)

12357-6 • 11:15 AM - 11:35 AM

FRET in small animal optical imaging: Intensity versus lifetime-based approaches

Author(s): **Jason T. Smith**, Rensselaer Polytechnic Institute (United States); **Nattawut Sinsuebphon**, National Science and Technology Development Agency (Thailand); **Xavier Michalet**, Univ. of California, Los Angeles (United States); **Xavier Intes**, Rensselaer Polytechnic Institute (United States); **Margarida Barroso**, Albany Medical College (United States)

12357-7 • 11:35 AM - 11:55 AM

Quantitative molecular absorption of cosmetic active molecules in human skin using coherent Raman imaging (CARS and SRS)

Author(s): **Barbara Sarri**, Institut Fresnel (France); **Lightcore Technologies** (France); **Xueqin Chen**, L'Oreal, Recherche et Development (France); **Anne Potter**, L'Oreal Recherche et Development (France); **Sebastien Gregoire**, **Thomas Bornschlöggl**, L'Oreal, Recherche et Development (France); **Hervé Rigneault**, Institut Fresnel (France)

12357-8 • 11:55 AM - 12:15 PM

Development of near-infrared paired-agent imaging for in vivo quantification of drug receptor occupancy in tumor

Author(s): **Yichen Feng**, Dartmouth-Hitchcock Medical Ctr. (United States); **Geisel School of Medicine** (United States); **Kenneth M. Tichauer**, Illinois Institute of Technology (United States); **Kimberley S. Samkoe**, Thayer School of Engineering at Dartmouth (United States)

12357-9 • 12:15 PM - 12:35 PM

Evaluating cutaneous pharmacokinetics of tazarotene by coherent Raman imaging

Author(s): **Maria Alice Maciel Tabosa**, **Conor L. Evans**, **Saara Luna**, Wellman Ctr. for Photomedicine, Massachusetts General Hospital (United States); **Harvard Medical School** (United States)

Lunch/Exhibition Break 12:35 PM - 1:55 PM

Conference 12357

SESSION 3: NOVEL MODEL AND SCREENING TOOLS FOR DRUG DEVELOPMENT

1:55 PM - 2:35 PM

Moscone Center, Room 306 (Level 3 South)

Session chair: Cristina L. Zavaleta, The Univ. of Southern California (United States)

12357-10 • 1:55 PM - 2:15 PM

Higher density of ECM composition in pancreatic cancer correlates with reduced drug delivery

Author(s): Cody C. Rounds, Sanzida Haque, Chengyue Li, Devin Nissen, Illinois Institute of Technology (United States); Dhruv Ranjan, Georgia Institute of Technology (United States); Marcella Vaicik, Rama S. Madhurapantula, Thomas C. Irving, Kenneth M. Tichauer, Illinois Institute of Technology (United States)

12357-12 • 2:15 PM - 2:35 PM

Measuring skin penetration under in-use conditions

Author(s): Yousuf Mohammed, The Univ. of Queensland (Australia); Krishna Telaprolu, The Univ. of Queensland (Australia), Certara, L.P. (United Kingdom); Jonathan Wei, Technische Univ. Delft (Netherlands); David Liu, Michael Roberts, The Univ. of Queensland (Australia)

PANEL DISCUSSION ON VISUALIZING AND QUANTIFYING DRUG DISTRIBUTION IN TISSUE

2:35 PM - 3:35 PM PST | Moscone Center, Room 306 (Level 3 South)

MODERATORS:

Conor Evans, Wellman Ctr. for Photomedicine (United States)

Kin F. Chan, Simpson Interventions (United States)

PANELISTS

Zane Arp, U.S. Food and Drug Administration (USA)

Priyanka Ghosh, U.S. Food and Drug Administration (USA)

Gerwin J. Puppels, RiverD International B.V. (Netherlands)

Aneesh Alex, GlaxoSmithKline (USA)

Stephen A. Boppart, MD, University of Illinois at Urbana-Champaign (USA)

Cristina Zavaleta, University of Southern California (USA)

In this Session, we shall discuss past and present experiences of academic and industry professionals in using non-optical and optical visualization tools for pharmacokinetic and pharmacodynamic research and development programs. We shall also gain insight into the US FDA expectation in evaluating datasets from currently available techniques and potential novel techniques for the purpose of regulatory submission and clinical translation.

Coffee Break 3:35 PM - 4:00 PM

SESSION 4: ADVANCED METHODS IN DRUG DETECTION AND IMAGING

4:00 PM - 6:00 PM

Moscone Center, Room 306 (Level 3 South)

Session chairs: Conor L. Evans, Wellman Ctr. for Photomedicine (United States), Kin F. Chan, Simpson Interventions (United States)

12357-14 • 4:00 PM - 4:20 PM

Impact of tumor microenvironment in antibody-HER2 binding using macroscopy fluorescence lifetime FRET in vivo imaging

Author(s): Amit Verma, Albany Medical College (United States); Vikas Pandey, Jason T. Smith, Xavier Intes, Rensselaer Polytechnic Institute (United States); Margarida Barroso, Albany Medical College (United States)

12357-15 • 4:20 PM - 4:40 PM

Temporal optical filtering: Finding a needle in the Raman haystack

Author(s): Terumasa Ito, Fumiaki Matsuoka, Kazuhiko Misawa, Tokyo Univ. of Agriculture and Technology (Japan)

12357-16 • 4:40 PM - 5:00 PM

Ex vivo mesoscopic assessment of drug delivery and target engagement via lifetime FRET

Author(s): Shan Gao, Rensselaer Polytechnic Institute (United States); Amit Verma, Margarida Barroso, Albany Medical College (United States); Xavier Intes, Rensselaer Polytechnic Institute (United States)

12357-17 • 5:00 PM - 5:20 PM

Application of stimulated raman scattering (SRS) microscopy for evaluation of olaparib biodistribution in an ovarian cancer cell line

Author(s): Craig F. Steven, EaStChem School of Chemistry, The Univ. of Edinburgh (United Kingdom), Institute of Genetics and Cancer, The Univ. of Edinburgh (United Kingdom); Manasa Punaha-Ravindra, EaStChem School of Chemistry, The Univ. of Edinburgh (United Kingdom); Martin Lee, Institute of Genetics and Cancer, Edinburgh Cancer Research UK Ctr. (United Kingdom); William Brownlee, Institute of Genetics and Cancer (United Kingdom); Paul Davey, Elisabetta Chiarparin, AstraZeneca PLC (United Kingdom); Valerie G. Brunton, MRC Institute of Genetics & Molecular Medicine (United Kingdom); Alison N. Hulme, EaStChem School of Chemistry, The Univ. of Edinburgh (United Kingdom)

12357-18 • 5:20 PM - 5:40 PM

Multispectral imaging quantifies available immune-inhibitory receptor concentrations for therapeutic binding of anti-PD-1 checkpoint inhibitors

Author(s): Divya Ravi, Abdibaset A. Bare, Dartmouth-Hitchcock Medical Ctr. (United States); Emma M. Cammack, Veronica C. Torres, Kimberley S. Samkoe, Thayer School of Engineering at Dartmouth (United States)

12357-21 • 5:40 PM - 6:00 PM

Tracking the Distribution of Mesoporous Silica Nanoparticles and Their Drug Release in Larval Zebrafish Tissue

Author(s): Jinyoung B. Jeong, California Nanosystems Institute (United States); Roxanne Castillo, Jeffrey I. Zink, Univ. of California, Los Angeles (United States); Laurent A. Bentolila, California NanoSystems Institute (United States)

Conference 12358

28 January 2023 | Moscone Center, Room 158 (Upper Mezzanine South)

Photonic Diagnosis, Monitoring, Prevention, and Treatment of Infections and Inflammatory Diseases 2023

Conference Chairs: **Tianhong Dai**, Wellman Ctr. for Photomedicine (United States), Massachusetts General Hospital (United States), Harvard Medical School (United States); **Jürgen Popp**, Leibniz-Institut für Photonische Technologien e.V. (Germany); **Mei X. Wu M.D.**, Harvard Medical School (United States)

Program Committee: **Alba Alfonso García**, Univ. of California, Davis (United States); **Timothy M. Baran**, Univ. of Rochester Medical Ctr. (United States); **Alessandro M. Deana**, UNINOVE (Brazil); **Alessandra Nara de Souza Rastelli D.D.S.**, Univ. Estadual Paulista “Júlio de Mesquita Filho” (Brazil); **Pu-Ting Dong**, The Forsyth Institute (United States), Harvard School of Dental Medicine (United States); **Yanfang Feng**, Wellman Ctr. for Photomedicine (United States); **Walfre Franco**, Univ. of Massachusetts Lowell (United States); **Leon G. Leanse**, Massachusetts General Hospital (United States); **Kristen C. Maitland**, Chan Zuckerberg Initiative (United States); **Ute Neugebauer**, Universitätsklinikum Jena (Germany); **Ying Wang M.D.**, Chinese PLA General Hospital (China)

SATURDAY 28 JANUARY

KEYNOTE

8:40 AM - 9:40 AM

Moscone Center, Room 158 (Upper Mezzanine South)

Session chair: Tianhong Dai, Harvard Medical School (United States)

12358-1 • 8:40 AM - 9:40 AM

Translational clinical molecular spectroscopy (*Keynote Presentation*)

Author(s): Jürgen Popp, Friedrich-Schiller-Univ. Jena (Germany)

SESSION 1: PHOTONIC DIAGNOSIS I

9:40 AM - 11:00 AM

Moscone Center, Room 158 (Upper Mezzanine South)

Session chair: Jürgen Popp, Friedrich-Schiller-Univ. Jena (Germany)

12358-2 • 9:40 AM - 10:10 AM

Rapid and low-cost detection of human corona virus using MEMS ATR-FTIR spectroscopy (*Invited Paper*)

Author(s): Yasser M. Sabry, Ain Shams Univ. (Egypt), Si-Ware Systems (Egypt); Amr O. Ghoname, Mohamed Kilany, Moustafa Mohamed, Ain Shams Univ. (Egypt); Ahmed Mostafa, Amgad Khalifa, Nawah Scientific (Egypt); Sherif Okda, Mazen Erfan, Si-Ware Systems (Egypt); Omar Sakr, Nawah Scientific (Egypt); Ahmed M. Othman, ESIEE Paris (France); Bassam Saadany, Si-Ware Systems (Egypt); Daa Khalil, Ain Shams Univ. (Egypt)

12358-3 • 10:10 AM - 10:30 AM

Fast label-free multiphoton fluorescence lifetime imaging microscopy for metabolic characterization of the skin microbiome

Author(s): Janet E. Sorrells, Rishyashring R. Iyer, Lingxiao Yang, Farzana R. Zaki, Eric J. Chaney, Marina Marjanovic, Stephen A. Boppart, Univ. of Illinois (United States)

12358-4 • 10:30 AM - 11:00

Accurate identification of bacteria in a minimally prepared environment using Raman spectroscopy assisted by machine learning (*Invited Paper*)

Author(s): Benjamin Thomsen, Jesper Christensen, Olga Rodenko, DFM A/S (Denmark); Iskander Usenov, Institute of Optics and Atomic Physics, Technische Universität Berlin (Germany); Rasmus B. Grønnemose, Research Unit of Clinical Microbiology, University of Southern Denmark and Odense University Hospital (Denmark); Mikael Ø. Lassen, DFM A/S (Denmark)

Coffee Break 11:00 AM - 11:25 AM

SESSION 2: PHOTONIC DIAGNOSIS II

11:25 AM - 12:45 PM

Moscone Center, Room 158 (Upper Mezzanine South)

Session chair: Timothy M. Baran, Univ. of Rochester Medical Ctr. (United States)

12358-5 • 11:25 AM - 11:55 AM

Photonic Platforms for On-site Analysis of Infectious Diseases (*Invited Paper*)

Author(s): Anja Silge, Karina Weber, Jürgen Popp, Leibniz-Institut für Photonische Technologien e.V. (Germany), Friedrich-Schiller Univ. Jena (Germany), InfectoGnostics Research Campus Jena (Germany)

12358-8 • 11:55 AM - 12:15 PM

Assessment of heat diffusion in tissue to investigate potential biomedical applications of thermography

Author(s): Pantea Tavakolian, Daniel Magley, Sudiksha Singhal, Harvard Medical School (United States), Massachusetts General Hospital (United States); Alissa Ann Cirio, Massachusetts General Hospital (United States); Guillermo J. Tearney, Harvard Medical School (United States), Massachusetts General Hospital (United States)

12358-7 • 12:15 PM - 12:45 PM

To distinguish bacterial and viral infections with a microneedle array-immunosensor (*Invited Paper*)

Author(s): Mei X. Wu, Zuan-Tao Lin, Harvard Medical School (United States)

Lunch/Exhibition Break 12:45 PM - 1:55 PM

SESSION 3: ANTIMICROBIAL PHOTOTHERAPY I

1:55 PM - 3:25 PM

Moscone Center, Room 158 (Upper Mezzanine South)

Session chair: Tianhong Dai, Harvard Medical School (United States)

12358-9 • 1:55 PM - 2:25 PM **Photothermal therapy of bacterial infections using phage-nanoparticle conjugates** (*Invited Paper*)

Author(s): Irene Chen, Univ. of California, Los Angeles (United States)

Conference 12358

12358-10 • 2:25 PM - 2:45 PM

Methylene blue photodynamic therapy of bacterial species found in human abscesses: planktonic, biofilm, and 3D silicone models

Author(s): Helen Chan, Martin S. Pavelka, Timothy M. Baran, Univ. of Rochester (United States)

12358-11 • 2:45 PM - 3:05 PM

CANCELED: Home treatment for onychomycosis by photodynamic therapy with curcumin and *Melaleuca alternifolia* (tea tree)

Author(s): Ana Paula da Silva, Ievgeniia Iermak, Fabiana R. Ferreira, Vanderlei S. Bagnato, Natalia M. Inada, Instituto de Física de São Carlos (Brazil)

12358-12 • 3:05 PM - 3:25 PM

Antimicrobial PDT effectively destroys *E.coli* and *E.faecalis* orthopaedic biofilms compared to low efficacy of Tobramycin-Vancomycin mixture: an in vitro study using optical coherence tomography

Author(s): Valentin V. Demidov, Dartmouth Health (United States); Matthew C. Bond, Dartmouth College (United States); Ida L. Gitajn, Dartmouth Health (United States); Carey D. Nadell, Dartmouth College (United States); Jonathan T. Elliott, Dartmouth Health (United States), Geisel School of Medicine (United States), Dartmouth College (United States)

Coffee Break 3:25 PM - 3:50 PM

SESSION 4: ANTIMICROBIAL PHOTOTHERAPY II

3:50 PM - 5:30 PM

Moscone Center, Room 158 (Upper Mezzanine South)

Session chair: Mei X. Wu, Harvard Medical School (United States)

12358-13 • 3:50 PM - 4:20 PM

Dual near-infrared II laser modulates the cellular redox state of T cells and augments the efficacy of cancer immunotherapy *(Invited Paper)*

Author(s): Shinya Yokomizo, Wataru Katagiri, Massachusetts General Hospital (United States); Takanobu Ishizuka, Keiko Yamashita, Terumo Corp. (Japan); Satoshi Kashiwagi, Massachusetts General Hospital (United States)

12358-14 • 4:20 PM - 4:40 PM

Microplasma exposure as a novel therapeutic treatment for otitis media demonstrated in a pre-clinical chinchilla model

Author(s): Guillermo L. Monroy, Beckman Institute for Advanced Science and Technology, Univ. of Illinois (United States); Jinhong Kim, Alexander Ho, Andrey Mironov, Univ. of Illinois (United States); Farzana R. Zaki, Darold R. Spillman, Beckman Institute for Advanced Science and Technology, Univ. of Illinois (United States); Gabrielle Choo-Kang, Univ. of Illinois (United States); Jungeun Won, Beckman Institute for Advanced Science and Technology, Univ. of Illinois (United States); Peter P. Sun, Univ. of Illinois (United States); Edit Aksamitiene, Marina Marjanovic, Eric J. Chaney, Beckman Institute for Advanced Science and Technology, Univ. of Illinois (United States); Thanh Huong Nguyen, J. Gary Eden, Univ. of Illinois (United States); Stephen A. Boppart, Beckman Institute for Advanced Science and Technology, Univ. of Illinois (United States)

12358-15 • 4:40 PM - 5:10 PM

Blue light enhances antibiotic activity in multidrug-resistant bacteria *(Invited Paper)*

Author(s): Leon G. Leanse, Carolina dos Anjos, Rox R. Anderson, David C. Hooper, Tianhong Dai, Massachusetts General Hospital (United States)

12358-16 • 5:10 PM - 5:30 PM

Antimicrobial blue light promotes an important role in enzymatic activity and degradation of β -lactamases.

Author(s): Carolina dos Anjos, Rox R. Anderson, Tianhong Dai, Leon G. Leanse, Wellman Ctr. for Photomedicine (United States)

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM - 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12358-17

Natural versus synthetic curcuminoids as photosensitizers: Photobleaching and antimicrobial photodynamic therapy evaluation

Author(s): Nicolas Melo, Johan Tovar, Instituto de Física de São Carlos (Brazil); Livia Dovigo, Univ. Estadual Paulista "Julio de Mesquita Filho" (Brazil); Lucas Dias, Instituto de Física de São Carlos (Brazil); Vanderlei Bagnato, Instituto de Física de São Carlos (Brazil), Hagler Institute for Advanced Studies, Texas A&M Univ. (United States); Natália Mayumi Inada, Instituto de Física de São Carlos (Brazil)

Conference 12359

28 - 29 January 2023 | Moscone Center, Room 307 (Level 3 South)

Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic Therapy XXXI

Conference Chairs: **David H. Kessel**, Wayne State Univ. (United States); **Tayyaba Hasan**, Wellman Ctr. for Photomedicine (United States), Division of Health Sciences and Technology, Harvard-MIT (United States), Harvard Medical School and Massachusetts General Hospital (United States)

Conference Co-Chair: **Edward V. Maytin M.D.**, Lerner Research Institute - Cleveland Clinic (United States)

Program Committee: **Theresa M. Busch**, Univ. of Pennsylvania (United States); **Huang-Chiao Huang**, Univ. of Maryland, College Park (United States); **Girgis Obaid**, Univ. of Texas at Dallas Chapter (United States); **Fabienne Dumoulin**, Acibadem Univ. (Turkey); **Merrill A. Biel M.D.**, Univ. of Minnesota, Twin Cities (United States); **Kenneth K. Wang M.D.**, Mayo Clinic (United States)

SATURDAY 28 JANUARY

SESSION 1: PHOTODYNAMIC THERAPY I

9:00 AM - 10:00 AM

Moscone Center, Room 307 (Level 3 South)

Session chair: Edward V. Maytin, Lerner Research Institute - Cleveland Clinic (United States)

12359-1 • 9:00 AM - 9:20 AM

Photodynamic approaches to alleviate desmoplasia: Improving surgical and survival outcomes

Author(s): Girgis Obaid, Chanda Bhandari, The Univ. of Texas at Dallas (United States); Shazia Bano, Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States); Kimberley Samkoe, Thayer School of Engineering at Dartmouth (United States); Kenneth Hoyt, The Univ. of Texas at Dallas (United States); Tayyaba Hasan, Wellman Ctr. for Photomedicine (United States)

12359-2 • 9:20 AM - 9:40 AM

Development of photodynamic and RNA medicine combination therapies for pancreatic ductal adenocarcinoma

Author(s): Vida Karimnia, Univ. of Massachusetts Boston (United States); Frank Slack, Beth Israel Deaconess Medical Ctr. (United States); Jonathan P. Celli, Univ. of Massachusetts Boston (United States)

12359-3 • 9:40 AM - 10:00 AM

Drug resistant cancer cells exhibit increased protoporphyrin IX accumulation and improved PDT response following 5-aminolevulinic acid photosensitization

Author(s): Yiran Liu, Michael Anderson, Sally K. Mensah, Sergio Farias, Maryam Labaf, Kourosh Zarringhalam, Univ. of Massachusetts Boston (United States); Shakir Khan, Tayyaba Hasan, Massachusetts General Hospital (United States); Jonathan Celli, Univ. of Massachusetts Boston (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: PHOTODYNAMIC THERAPY II

10:30 AM - 11:50 AM

Moscone Center, Room 307 (Level 3 South)

Session chair: Sanjay Anand, Cleveland Clinic (United States)

12359-25 • 10:30 AM - 10:50 AM

Continuous-wave spectroscopic singlet oxygen sensor for photodynamic therapy dosimetry in a murine model of actinic keratosis

Author(s): Sanjay Anand, Cleveland Clinic (United States); Tiffany Yu, Physical Sciences Inc. (United States); Cheng-En Cheng, Cleveland Clinic (United States); Steven J. Davis, Youbo Zhao, Physical Sciences Inc. (United States); Edward V. Maytin, Cleveland Clinic (United States)

12359-5 • 10:50 AM - 11:10 AM

Excipient-free pure drug photosensitizer nanoparticles for PDT, imaging, and chemotherapy of cancer

Author(s): John A. Quinlan, Collin T. Inglut, Idrisa Rahman, Huang Chiao Huang, Univ. of Maryland, College Park (United States)

12359-6 • 11:10 AM - 11:30 AM

Suppression of cancer cells proliferation and glioma (in vivo) growth by near-infrared laser: Mechanisms and irradiation patterns

Author(s): Sergei G. Sokolovski, Aston Univ. (United Kingdom); Oxana Semyachkina-Glushkovskaya, Saratov State Univ. (Russian Federation); Edik Rafailov, Aston Univ. (United Kingdom)

12359-7 • 11:30 AM - 11:50 AM

A Monte Carlo simulation for moving light source in intracavity PDT

Author(s): Karl Beeson, Evgueni Parilov, Mary J. Potasek, Simphotek Inc. (United States); Timothy C. Zhu, Hongjing Sun, Perelman School of Medicine, Univ. of Pennsylvania (United States); Dennis Sourvanos, Univ. of Pennsylvania (United States)

Lunch/Exhibition Break 12:00 PM - 1:15 PM

SESSION 3: PHOTODYNAMIC THERAPY III

1:15 PM - 2:55 PM

Moscone Center, Room 307 (Level 3 South)

Session chair: Timothy C. Zhu, Perelman Ctr. for Advanced Medicine (United States)

12359-8 • 1:15 PM - 1:35 PM

Optimization of light delivery for non-muscle invasive bladder cancer PDT

Author(s): Elias Kokko, Zoe Ylöniemi, Visa Kaivosoja, Jukka-Pekka Alanko, Petteri Uusimaa, Modulight Corp. (Finland)

Conference 12359

12359-9 • 1:35 PM - 1:55 PM

Novel ophthalmic PDT laser platform to target oncology and various other retinal indications

Author(s): Laura Vesala, Eero Koivumäki, Jukka-Pekka Alanko, Timo Tanila, Ivan Baldin, Zoe Ylöniemi, Petteri Uusimaa, Modulight Corp. (Finland)

12359-10 • 1:55 PM - 2:15 PM

Evaluation of fractionated photofrin-mediated photodynamic therapy using different light fluences with reactive oxygen species explicit dosimetry (ROSED)

Author(s): Hongjing Sun, Vivek Rastogi, Timothy C. Zhu, Penn Medicine (United States)

12359-11

Evaluation of the cumulative Cherenkov converted dose on TSET patient with multiple Cherenkov cameras

Author(s): Yifeng Zhu, Daniel Alexander, Perelman Ctr. for Advanced Medicine (United States); Tianshun Miao, Yale School of Medicine (United States); Brian W. Pogue, Univ. of Wisconsin-Madison (United States); Timothy C. Zhu, Perelman Ctr. for Advanced Medicine (United States)

28 January 2023 • 2:15 PM - 2:35 PM PST | Moscone Center, Room 307 (Level 3 South)

Show Abstract +

12359-12

Multispectral singlet oxygen luminescent dosimetry (MSOLD) for Photofrin-mediated Photodynamic Therapy

Author(s): Dvij Sharma, Vivek Rastogi, Hongjing Sun, Timothy C. Zhu, Perelman Ctr. for Advanced Medicine (United States)

28 January 2023 • 2:35 PM - 2:55 PM PST | Moscone Center, Room 307 (Level 3 South)

**Show Abstract +
Break**

Coffee Break 2:55 PM - 3:30 PM

SESSION 4: PHOTODYNAMIC THERAPY IV

3:30 PM - 4:50 PM

Moscone Center, Room 307 (Level 3 South)

Session chair: Huang-Chiao Huang, Univ. of Maryland, College Park (United States)

12359-31 • 3:30 PM - 3:50 PM

Integrating optical diagnostics and PDT: Image guided treatment of oral lesions using a handheld multichannel fluorescence probe

Author(s): Jonathan P. Celli, Shakir Khan, Univ. of Massachusetts Boston (United States); Rongguang Liang, Wyant College of Optical Sciences (United States); Tayyaba Hasan, Wellman Ctr. for Photomedicine (United States); Bilal Hussain, CNIT - Photonic Networks & Technologies National Lab. (Italy); Shahid Ali Siddiqui, Syed A. Hasan, Aligarh Muslim University, Jawaharlal Nehru Medical College, Department of Radiotherapy (India)

12359-14 • 3:50 PM - 4:10 PM

Immune-modulatory effects of combination regimens with painless photodynamic therapy and pro-differentiating agents in a murine model of actinic keratosis

Author(s): Sanjay Anand, Cheng-En Cheng, Lauren Heusinkveld, Edward V. Maytin, Cleveland Clinic (United States)

12359-15 • 4:10 PM - 4:30 PM

PDT light fluence phantom modeling of the human pleural cavity: a proof-of-concept pre-clinical study

Author(s): Dennis Sourvanos, Ctr. for Innovation and Precision Dentistry, Univ. of Pennsylvania (United States), Institute for Translational Medicine and Therapeutics, Perelman School of Medicine, Univ. of Pennsylvania (United States); Hongjing Sun, Keith A. Cengel, Perelman Ctr. for Advanced Medicine, Univ. of Pennsylvania (United States); Joseph P. Fiorellini, Ctr. for Innovation and Precision Dentistry, Univ. of Pennsylvania (United States); Timothy C. Zhu, Perelman Ctr. for Advanced Medicine, Univ. of Pennsylvania (United States), Ctr. for Innovation and Precision Dentistry, Univ. of Pennsylvania (United States)

12359-16 • 4:30 PM - 4:50 PM

Test method for evaluating the photocytotoxic potential of fluorescence imaging products

Author(s): Shruti Vig, Brandon Gaitan, Lucas Frankle, Miriam Adwan, Univ. of Maryland, College Park (United States); Yu Chen, Univ. of Massachusetts Amherst (United States); Rosalie Elespuru, Joshua Pfefer, Ctr. for Devices and Radiological Health, U.S. Food and Drug Administration (United States); Huang-Chiao Huang, Univ. of Maryland, College Park (United States)

12359-30 • 4:50 PM - 5:10 PM

Skin PDT dose-depth estimation for radiometric comparison of lamp and daylight sources

Author(s): Alberto J. Ruiz, Thayer School of Engineering at Dartmouth (United States), QUEL Imaging, LLC (United States); Ethan P. M. LaRochelle, Quel Imaging, LLC (United States); M. Shane Chapman, Dartmouth-Hitchcock Medical Ctr. (United States); Kimberley S. Samkoe, Thayer School of Engineering at Dartmouth (United States); Brian W. Pogue, Univ. of Wisconsin-Madison (United States)

PANEL ON PATHWAY TO IMPACT: A DISCUSSION OF LIMITED TOPICS AND WAY FORWARD

29 January 2023 • 8:30 AM - 10:30 AM

Moscone Center, Room 307 (Level 3 South)

PANEL MODERATORS:

Tayyaba Hasan, Wellman Center for Photomedicine (United States)
Huang-Chiao Huang, University of Maryland (United States)
Girgis Obaid, University of Texas at Dallas (United States)

PANELISTS

Brian Pogue, Univ. of Wisconsin - Madison (United States)
Edward Maytin, Lerner Research Institute - Cleveland Clinic (United States)
Ethan Rochelle, Quel Imaging LLC (United States)
Alberto Ruiz, Dartmouth Engineering (United States)

This series of discussions started at the 2022 conference explores the areas and strategies for a pathway to Photodynamic Therapy (PDT) and associated processes' impact. PDT has been approved by regulatory authorities for specific indications worldwide since 1995 and has proven to be a minimally invasive and effective modality, sometimes when all else has failed. Yet it has not had the impact that it deserves, and adoption has been slow. With advances in optical technologies in general and the development of less expensive light sources, and detection systems along with an emphasis on and incorporation of mobile devices, it lends itself to adoption in Low Resource settings. It is also an enhancer of existing and emerging technologies both in image-guided surgery and therapy settings possibly incorporating potential for precision medicine. We plan on a largely open microphone discussion and audience participation will be key.

Coffee Break 10:30 AM - 11:00 AM

SUNDAY 29 JANUARY

SESSION 5: PHOTODYNAMIC THERAPY V

11:00 AM - 11:40 AM

Moscone Center, Room 307 (Level 3 South)

Session chair: Girgis Obaid, Univ. of Texas at Dallas Chapter (United States)

12359-17 • 11:00 AM - 11:20 AM

Fluorescence-guided, targeted photochemotherapy of peritoneal carcinomatosis

Author(s): Barry J. Liang, Univ. of Maryland, College Park (United States); Robert Perttälä, Modulight Corp. (Finland); Sumiao Pang, Chen-Hua Ma, Payal Srivastava, Brandon Gaitan, Aaron J. Sorrin, Univ. of Maryland, College Park (United States); Zoe Ylöniemi, Modulight Corp. (Finland); Dana Roque, Marlene and Stewart Greenebaum Cancer Ctr. (United States); Tayyaba Hasan, Wellman Ctr. for Photomedicine (United States), Massachusetts General Hospital (United States), Harvard Medical School (United States); Petteri Uusimaa, Modulight Corp. (Finland); Huang-Chiao Huang, Univ. of Maryland, College Park (United States), Marlene and Stewart Greenebaum Cancer Ctr. (United States)

12359-18 • 11:20 AM - 11:40 AM

Photodynamic therapy for basal cell carcinoma is enhanced by pretreatment with oral vitamin D: Interim results of a clinical trial

Author(s): Edward V. Maytin, Lauren Heusinkveld, Jeffrey Negrey, Abigail Updyke, Sanjay Anand, Christine B. Warren, Lerner Research Institute - Cleveland Clinic (United States); Nathalie Zeitouni, The Univ. of Arizona (United States); Tayyaba Hasan, Massachusetts General Hospital (United States)

POSTERS-SUNDAY

5:30 PM - 7:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM - 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12359-19

Potential effects of nanostructured protoporphyrin IX-mediated photodynamic therapy in different tumor cells lines

Author(s): Ilaiáli S. Leite, Instituto de Física de São Carlos, Univ. de São Paulo (Brazil); Juan L. Vivero-Escoto, Zachary Lyles, The Univ. of North Carolina at Charlotte (United States); Vanderlei S. Bagnato, Juliana C. Bernardi, Natalia M. Inada, Instituto de Física de São Carlos, Univ. de São Paulo (Brazil)

12359-20

Localization of a molecularly targeted probe for imaging and photodynamic therapy of breast cancer in a murine model

Author(s): Zihao Li, Joseph B. Majeski, Regine Choe, Univ. of Rochester (United States); Hans F. Schmitthenner, Rochester Institute of Technology (United States); Timothy M. Baran, Univ. of Rochester (United States)

12359-21

Preliminary measurements of optical properties in human abscess cavities prior to methylene blue photodynamic therapy

Author(s): Md. Nafiz Hannan, Ashwani K. Sharma, Timothy M. Baran, Univ. of Rochester (United States)

12359-22

A study of multi-beam PDT treatment in cervical cancer caused by various HPV genotype infections

Author(s): Chaemin Kim, Univ. of Toronto (Canada), AMOS PHARM Co., Ltd. (Republic of Korea); Goeun Lee, Univ. of Toronto (Canada), Princess Margaret Cancer Ctr., Univ. Health Network (Canada); Sung-Ho Lee, Princess Margaret Cancer Ctr., Univ. Health Network (Canada), AMOS PHARM Co., Ltd. (Republic of Korea); Stephen Im, St. Michael's Hospital (Canada), Women's College Hospital (Canada), Univ. of Toronto (Canada); Seung Hee Han, Princess Margaret Cancer Ctr., Univ. Health Network (Canada)

12359-23

Determining the apoptotic timeline during ALA-mediated PDT of breast cancer cells in vitro via digital fourier holographic microscopy and optical scatter imaging

Author(s): Lauren E. Moore, Bijaya Basnet, Vincent M. Rossi, Washburn Univ. (United States)

12359-27

Photodeactivation of pathogens using methylene blue with nanoparticles for prosthetic joint infection

Author(s): Justice ben Yosef, Zikrulloh Khuzhakulov, Simran Banga, Ali Oguz Er, Western Kentucky Univ. (United States)

12359-26

A real-time IR navigation system for pleural photodynamic therapy with a 3D surface acquisition system

Author(s): Hongjing Sun, Penn Medicine (United States); Dennis Sourvanos, Univ. of Pennsylvania (United States); Mary J. Potasek, Gene Parilov, Karl Beeson, Simphotek Inc. (United States); Timothy C. Zhu, Penn Medicine (United States)

Conference 12360

28 - 29 January 2023 | Moscone Center, Room 301 (Level 3 South)

Ophthalmic Technologies XXXIII

Conference Chairs: **Daniel X. Hammer**, U.S. Food and Drug Administration (United States); **Kostadinka Bizheva**, Univ. of Waterloo (Canada); **Georg Schuele**, Tesseract Health (United States)

Program Committee: **Rafat R. Ansari**, NASA Glenn Research Ctr. (United States); **Ralf Brinkmann**, Medizinisches Laserzentrum Lübeck GmbH (Germany); **Wolfgang Drexler**, Medizinische Univ. Wien (Austria); **Sina Farsiu**, Duke Univ. (United States); **Katharine F. Grieve**, Institut de la Vision (France); **Arthur Ho**, Brien Holden Vision Institute (Australia); **Karen M. Joos**, Vanderbilt Univ. Medical Ctr. (United States); **Anthony N. Kuo M.D.**, Duke Univ. School of Medicine (United States); **Kirill V. Larin**, Univ. of Houston (United States); **Zhuolin Liu**, U.S. Food and Drug Administration (United States); **Fabrice Manns**, Univ. of Miami (United States); **Ezra Maguen M.D.**, American Eye Institute (United States); **Donald T. Miller**, Indiana Univ. (United States); **Derek Nankivil**, Johnson & Johnson Vision Care, Inc. (United States); **Jean-Marie Parel**, Bascom Palmer Eye Institute (United States); **Daniel V. Palanker**, Stanford Univ. (United States); **Ygal Rotenstreich**, The Chaim Sheba Medical Ctr., Tel Hashomer (Israel); **Luigi Rovati**, Univ. degli Studi di Modena e Reggio Emilia (Italy); **Marco Ruggeri**, Bascom Palmer Eye Institute (United States); **Jerry Sebag**, VMR Institute (United States); **Per G. Söderberg**, Uppsala Univ. (Sweden); **Yuankai K. Tao**, Vanderbilt Univ. (United States); **Robert J. Zawadzki**, Univ. of California, Davis (United States)

SATURDAY 28 JANUARY

SESSION 1: ANGIOGRAPHY AND OXIMETRY

8:15 AM - 9:45 AM

Moscone Center, Room 301 (Level 3 South)

Session chairs: Karen M. Joos, Vanderbilt Univ. Medical Ctr. (United States), Marco Ruggeri, Bascom Palmer Eye Institute (United States)

12360-1 • 8:15 AM - 8:30 AM

Retinal parafoveal oximetry using visible light optical coherence tomography in health subjects

Author(s): Jingyu Wang, Johns Hopkins Univ. (United States); Weiye Song, Natalie Sadlak, Marissa G. Fiorello, Manishi Desai, Boston Medical Ctr. (United States); Ji Yi, Johns Hopkins Univ. (United States)

12360-2 • 8:30 AM - 8:45 AM

Diffuse illumination in laser Doppler Holography for ophthalmology

Author(s): Zofia Bratasz, Michael Atlan, Institut Langevin (France)

12360-3 • 8:45 AM - 9:00 AM

High dynamic range blood flow evaluation in the retina with spectrally extended line field OCTA

Author(s): Si Chen, Nanyang Technological Univ. (Singapore); Chen Hsin Sun, National Univ. Hospital (Singapore); Xin Ge, Sun Yat-Sen Univ. (China); Xi Chen, Shiliang Lou, Kan Lin, Yukun Wang, Linbo Liu, Nanyang Technological Univ. (Singapore)

12360-4 • 9:00 AM - 9:15 AM

Quantitative retinal blood flow measurement in humans using adaptive optics scanning laser ophthalmoscopy and erythrocyte mediated angiography

Author(s): Achyut Raghavendra, Victoria Chen, Univ. of Maryland School of Medicine (United States); Zhuolin Liu, Daniel X. Hammer, Ctr. for Devices and Radiological Health, U.S. Food and Drug Administration (United States); Osamah J. Saeedi, Univ. of Maryland School of Medicine (United States)

12360-5 • 9:15 AM - 9:30 AM

Lissajous OCT angiography for large field-of-view, high-dense spatial sampling, and long-duration microvasculature imaging

Author(s): Shuichi Makita, Univ. of Tsukuba (Japan); Masahiro Miura, Tokyo Medical Univ. (Japan); Shinnosuke Azuma, Toshihiro Mino, Tatsuo Yamaguchi, Topcon Technohouse Corp. (Japan); Yoshiaki Yasuno, Univ. of Tsukuba (Japan)

12360-6 • 9:30 AM - 9:45 AM

Visible light optical coherence tomography reveals age-related photoreceptor changes in the mouse

Author(s): Pooja Chauhan, NYU Langone Health (United States); Aaron M. Kho, Glenn Yiu, Brian Quang Dang, Univ. of California, Davis (United States); Vivek J. Srinivasan, Univ. of California, Davis (United States), NYU Langone Health (United States)

Coffee Break 9:45 AM - 10:15 AM

SESSION 2: MACHINE LEARNING

10:15 AM - 11:30 AM

Moscone Center, Room 301 (Level 3 South)

Session chairs: Yuankai Kenny K. Tao, Vanderbilt Univ. (United States), Georg Schuele, Tesseract Health, Inc. (United States)

12360-7 • 10:15 AM - 10:30 AM

Retinal vascular connectivity network for deep learning OCTA construction from single OCT volume scan

Author(s): David Le, Univ. of Illinois at Chicago (United States); Taeyoon Son, Univ. of Illinois at Chicago (United States); Tae-Hoon Kim, Mansour Abtahi, Tobiloba Adejumo, Xincheng Yao, Univ. of Illinois at Chicago (United States)

12360-8 • 10:30 AM - 10:45 AM

Learning-based denoising and fringe removal in time-domain full-field OCT in vivo images

Author(s): Ahmed Ben Aissa, Institut Langevin (France); Kate Grieve, Ctr. Hospitalier National d'Ophtalmologie des Quinze-Vingts (France); Claude Boccara, Viacheslav Mazlin, Institut Langevin (France)

12360-9 • 10:30 AM - 10:45 AM

Projection-resolved optical coherence tomographic angiography using artificial intelligence

Author(s): Jie Wang, Tristan T. Hormel, Thomas S. Hwang, Steven T. Bailey, Yali Jia, Oregon Health & Science Univ. (United States)

12360-10 • 11:00 AM - 11:15 AM

Deep learning enables visualization of individual RPE cells from a single AO-OCT volume

Author(s): Vineeta Das, Furu Zhang, Andrew J. Bower, National Institutes of Health (United States); Bruno Alvisio, BioTeam, Inc. (United States); Zhuolin Liu, Ctr. for Devices and Radiological Health, U.S. Food and Drug Administration (United States); Daniel X. Hammer, Ctr. for Devices and Radiological Health, U.S. Food and Drug Administration (United States); Johnny . Tam, National Institutes of Health (United States)

12360-11 • 11:15 AM - 11:30 AM

S-cone identification using AO-OCT cone structural measurements and support vector machine classifier

Author(s): Qiuzhi Ji, Marcel T. Bernucci, Yan Liu, James A. Crowell, Indiana Univ. (United States); Davin J. Miller, Purdue Univ. (United States); Donald T. Miller, Indiana Univ. (United States)

PASCAL ROL INTRODUCTION AND ADDRESS

11:30 AM - 12:30 PM

Moscone Center, Room 301 (Level 3 South)

Session chairs: Daniel X. Hammer, U.S. Food and Drug Administration (United States), Per G. Söderberg, Uppsala Univ. (Sweden)

The Pascal Rol keynote presentation was established to promote the exchange of ideas between clinicians with a technological need and engineers interested in solving problems in ophthalmology. The invited lecture is sponsored by the Pascal Rol Foundation

11:30 AM - 11:45 AM: Introduction

12360-121 • 11:30 AM - 12:30 PM

Artificial intelligence and data science in ophthalmology: Perspectives from the National Eye Institute (Keynote Presentation)

Author(s): Michael F. Chiang, National Eye Institute (United States)

Lunch/Exhibition Break 12:30 PM - 1:30 PM

SESSION 3: FUNCTIONAL METHODS AND OPTORETINOGRAPHY

1:30 PM - 3:15 PM

Moscone Center, Room 301 (Level 3 South)

Session chairs: Robert J. Zawadzki, Univ. of California, Davis (United States), Kostadinka Bizheva, Univ. of Waterloo (Canada)

12360-12 • 1:30 PM - 1:45 PM

Frequency characterization of human photoreceptors' response to light with the use of chirped flicker stimulus optoretinography

Author(s): Slawomir Tomczewski, Institute of Physical Chemistry (Poland), International Ctr. for Translational Eye Research (Poland); Piotr F. Wegrzyn, International Ctr. for Translational Eye Research (Poland), Institute of Physical Chemistry (Poland), Univ. of Warsaw (Poland); Dawid Borycki, Maciej Wielgo, Andrea Curatolo, Maciej Wojtkowski, International Ctr. for Translational Eye Research (Poland), Institute of Physical Chemistry (Poland)

12360-13 • 1:45 PM - 2:00 PM

In-vivo optophysiology in rodent eyes using phase-sensitive optical coherence tomography

Author(s): Bingyao Tan, Huakun Li, Nanyang Technological Univ. (Singapore); Veluchamy A. Barathi, Leopold Schmetterer, Singapore Eye Research Institute (Singapore); Tong Ling, Nanyang Technological Univ. (Singapore)

12360-14 • 2:00 PM - 2:15 PM

Two-photon perimetry gives a more reproducible outcome than conventional perimetry

Author(s): Marcin J. Marzejon, International Ctr. for Translational Eye Research (Poland), Institute of Physical Chemistry (Poland), Gdansk Univ. of Technology (Poland); Juliusz Solarz-Niesłuchowski, Univ. of Warsaw (Poland); Maciej Wojtkowski, International Ctr. for Translational Eye Research (Poland), Institute of Physical Chemistry (Poland); Katarzyna Komar, International Ctr. for Translational Eye Research (Poland), Nicolaus Copernicus Univ. (Poland)

12360-15 • 2:15 PM - 2:30 PM

Clinical optoretinography using OCT phase velocity

Author(s): Reddikumar Maddipatla, Kari V. Vienola, Robert J. Zawadzki, Ravi S. Jonnal, Univ. of California, Davis (United States)

12360-16 • 2:30 PM - 2:45 PM

Phase-restoring subpixel image registration and automated signal extraction for optoretinography using phase-sensitive OCTs

Author(s): Tong Ling, Huakun Li, Bingyao Tan, Nanyang Technological Univ. (Singapore); Vimal P. Pandiyan, Univ. of Washington (United States); Veluchamy A. Barathi, Singapore Eye Research Institute (Singapore); Ramkumar Sabesan, Univ. of Washington (United States); Leopold Schmetterer, Singapore Eye Research Institute (Singapore)

12360-17 • 2:45 PM - 3:00 PM

Coarse-scale optoretinography (CoORG) with a line-scan OCT for extended field-of-view

Author(s): Teng Liu, Xiaoyun Jiang, Vimal Prabhu Pandiyan, Emily Slezak, Ramkumar Sabesan, Univ. of Washington (United States)

12360-18 • 3:00 PM - 3:15 PM

Photopigment density variation of individual cone photoreceptors revealed by phase-sensitive AO-OCT

Author(s): Marcel T. Bernucci, Yan Liu, James A. Crowell, Indiana Univ. (United States); Kazuhiro Kurokawa, Indiana Univ. (United States), Legacy Health (United States); Qiuzhi Ji, Donald T. Miller, Indiana Univ. (United States)

Coffee Break 3:15 PM - 3:30 PM

SESSION 4: CELLULAR IMAGING, ADAPTIVE OPTICS, AND WAVEFRONT MANIPULATION

3:30 PM - 5:00 PM

Moscone Center, Room 301 (Level 3 South)

Session chairs: Donald T. Miller, Indiana Univ. (United States), Daniel X. Hammer, U.S. Food and Drug Administration (United States)

12360-19 • 3:30 PM - 3:45 PM

Validation of the TSA-OCT -based longitudinal in vivo studies of murine inner retinal cellular morphology using mice lines with fluorescently labeled ganglion cells

Author(s): Jessica Cho, Univ. of California, Davis (United States); Pengfei Zhang, Dalian Univ. of Technology (China); Sarah J. Karlen, Ratheesh K. Meleppat, Nicholas Marsh-Armstrong, Univ. of California, Davis (United States); Anna La Torre Vila, Univ. of California Davis (United States); Robert J. Zawadzki, Univ. of California, Davis (United States)

12360-20 • 3:45 PM - 4:00 PM

High-speed adaptive optics partially confocal ophthalmoscope based on digital micromirror device (DMD)

Author(s): Soohyun Lee, The Ohio State Univ. (United States); Ratheesh K. Meleppat, Robert J. Zawadzki, Univ. of California, Davis (United States); Stacey S. Choi, Nathan P. Doble, The Ohio State Univ. (United States)

Conference 12360

12360-21 • 4:00 PM - 4:15 PM

Improved SNR FFOCT retinal imaging by wavefront sensorless deformable mirror-based aberration correction

Author(s): Yao Cai, Olivier Thouvenin, Viacheslav Mazlin, Claude Boccara, Institut Langevin (France); Kate F. Grieve, Institut de la Vision (France); Pedro Mecê, Institut Langevin (France)

12360-22 • 4:15 PM - 4:30 PM

Quantitative phase and volumetric retinal imaging using angle-resolved AOSLO imaging

Author(s): Guanping Feng, Univ. of Rochester Medical Ctr. (United States); Univ. of Rochester (United States); Karteek Kunala, Univ. of Rochester (United States); Qiang Yang, Univ. of Rochester Medical Ctr. (United States); Jesse Schallek, Univ. of Rochester Medical Ctr. (United States); Univ. of Rochester (United States)

12360-23 • 4:30 PM - 4:45 PM

Low-latency, photon-efficient wavefront sensing for ultrafast adaptive optics imaging of the human retina

Author(s): Yan Liu, James A. Crowell, Kazuhiro Kurokawa, Marcel T. Bernucci, Qiuzhi Ji, Ayoub Lassoued, Hae Won Jung, Donald T. Miller, Indiana Univ. (United States)

12360-24 • 4:45 PM - 5:00 PM

Structural metrics of the photoreceptor-pigment epithelium-choriocapillaris complex measured with 3.4 MHz adaptive optics-optical coherence tomography

Author(s): Daniel X. Hammer, Oliver Wolcott, Achyut Raghavendra, Zhuolin Liu, U.S. Food and Drug Administration (United States)

SESSION 5: INTRAOPERATIVE AND MICROSCOPE INTEGRATED SYSTEMS

5:00 PM - 6:15 PM

Moscone Center, Room 301 (Level 3 South)

Session chairs: Anthony N. Kuo, Duke Univ. School of Medicine (United States); Jerry Sebag, VMRI Institute (United States)

12360-25 • 5:00 PM - 5:15 PM

Real-time feature-guided image fusion of posterior-segment intrasurgical optical coherence tomography and digital surgical microscopy

Author(s): Robert M. Trout, Christian Viehland, Jianwei D. Li, Duke Univ. (United States); William Raynor, Duke Univ. Medical Ctr. (United States); Al-Hafeez Z. Dhalla, Duke Univ. (United States); Anthony N. Kuo, Lejla M. Vajzovic, Duke Univ. Medical Ctr. (United States); Cynthia A. Toth, Joseph A. Izatt, Duke Univ. (United States), Duke Univ. Medical Ctr. (United States)

12360-26 • 5:15 PM - 5:30 PM

Multi-instrument-tracking for video-rate 4D ex vivo imaging of ophthalmic surgical maneuvers

Author(s): Eric M. Tang, Mohamed T. El-Haddad, Vanderbilt Univ. (United States); Shriji N. Patel, Vanderbilt Univ. Medical Ctr. (United States); Yuankai K. Tao, Vanderbilt Univ. (United States)

12360-27 • 5:30 PM - 5:45 PM

Robotically-aligned optical coherence tomography angiography with multiple illumination angles for enhanced vessel visualization

Author(s): Amit Narawane, Mark Draelos, Pablo Ortiz, Duke Univ. (United States); Ryan P. McNabb, Anthony N. Kuo, Duke Univ. Medical Ctr. (United States); Joseph A. Izatt, Duke Univ. (United States)

12360-28 • 5:45 PM - 6:00 PM

OCT with integrated video optotype for dynamic choroidal thickness maps in response to defocused stimuli

Author(s): Anthony N. Kuo, Duke Univ. School of Medicine (United States); Alex D. Nixon, Derek Nankivil, Johnson & Johnson Vision Care, Inc. (United States); Ryan P. McNabb, Duke Univ. School of Medicine (United States)

12360-29 • 6:00 PM - 6:15 PM

Interchangeable imaging platform for ophthalmic robotically aligned optical coherence tomography

Author(s): Ryan P. McNabb, Duke Univ. School of Medicine (United States); Yuan Tian, Al-Hafeez Z. Dhalla, Pablo Ortiz, Mark Draelos, Joseph A. Izatt, Duke Univ. (United States); Anthony N. Kuo, Duke Univ. School of Medicine (United States)

SUNDAY 29 JANUARY

SESSION 6: OCULAR BIOMECHANICAL PROPERTIES

Joint Session with Conferences 12381 and 12360

29 January 2023 • 8:15 AM - 10:00 AM

Moscone Center, Room 210 (Level 2 South)

Session chairs: Kirill V. Larin, Univ. of Houston (United States); Giuliano Scarcelli, Univ. of Maryland, College Park (United States)

12360-30 • 8:15 AM - 8:30 AM

Cross-meridian air-puff deformation OCT for improved detection of early stage keratoconus

Author(s): Judith S. Birkenfeld, Instituto de Optica "Daza de Valdes" (Spain); Andrea Curatolo, International Ctr. for Translational Eye Research (Poland); Ashkan Eliasy, Univ. of Liverpool (United Kingdom); Alejandra Varea, Eduardo Martínez Enriquez, Instituto de Optica "Daza de Valdes" (Spain); Bernardo Lopes Teixeira, Ahmed Abass, Univ. of Liverpool (United Kingdom); Nicolas Alexandre-Alba, Hospital Univ. Fundación Jiménez Díaz (Spain); Jesus Merayo-Llodes, Fernández-Vega Ophthalmological Institute (Spain), Univ. de Valladolid (Spain); Ahmed Elsheikh, Univ. of Liverpool (United Kingdom); Susana Marcos, The Institute of Optics, Univ. of Rochester (United States)

12381-22 • 8:30 AM - 8:45 AM

Biomechanical interactions of the perilimbal sclera and aqueous veins with intraocular pressure regulation

Author(s): Guan Xu, Univ. of Michigan Kellogg Eye Ctr. (United States); Linyu Ni, Univ. of Michigan (United States); Wonsuk Kim, Alexus Warchock, Erik Krawczyk, John Riesterer, Univ. of Michigan-Dearborn (United States); Sayoko Moroi, The Ohio State Univ. Wexner Medical Ctr. (United States); Alan Argento, Univ. of Michigan-Dearborn (United States)

12360-31 • 8:45 AM - 9:00 AM

Combining OCE and Brillouin microscopy to evaluate in vivo lens biomechanics in 3D

Author(s): Justin Schumacher, Univ. of Maryland, College Park (United States); Alexander W. Schill, Manmohan Singh, Univ. of Houston (United States); Fabrice Manns, Univ. of Miami (United States); Kirill V. Larin, Univ. of Houston (United States); Giuliano Scarcelli, Univ. of Maryland, College Park (United States)

12381-23 • 9:00 AM - 9:15 AM

Characterizing regional biomechanical properties of the porcine iris using optical coherence elastography

Author(s): Taye Mekonnen, Christian Zevallos Delgado, Univ. of Houston (United States); Babak N. Safa, Georgia Institute of Technology/Emory University (United States); Manmohan Singh, Salavat R. Aglyamov, Univ. of Houston (United States); C. Ross Ethier, Georgia Institute of Technology/Emory University (United States); Kirill V. Larin, Univ. of Houston (United States)

12360-32 • 9:15 AM - 9:30 AM

Detecting subclinical keratoconus by mapping corneal biomechanics using wave-based optical coherence elastography

Author(s): Fernando Zvietcovich, Alejandra Varea, Consejo Superior de Investigaciones Científicas (Spain); Nicolas Alejandro-Alba, Hospital Univ. Fundación Jiménez Díaz (Spain); Jesus Merayo-Llodes, Univ. de Oviedo (Spain); Judith S. Birkenfeld, Consejo Superior de Investigaciones Científicas (Spain); Susana Marcos, Univ. of Rochester (United States)

12381-24 • 9:30 AM - 10:00 AM

Ocular biomechanics (*Invited Paper*)

Author(s): Massimo Fazio, Legacy Devers Eye Institute (United States), The Univ. of Alabama at Birmingham (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 7: ANTERIOR SEGMENT IMAGING AND THERAPIES

10:30 AM - 11:30 AM

Moscone Center, Room 301 (Level 3 South)

Session chairs: Fabrice Manns, Univ. of Miami (United States), Luigi Rovati, Univ. degli Studi di Modena e Reggio Emilia (Italy)

12360-90 • On demand | Presented live 29 January 2023

Corneal filler injection for enhancement after myopic small-incision lenticule extraction (SMILE)

Author(s): Lara Buhl, Wellman Ctr. for Photomedicine (United States); Maron Dolling, Wellman Ctr. for Photomedicine (United States), Institute of Biomedical Optics, University Luebeck (Germany); Stefan Kassumeh, Siegfried Priglinger, Department of Ophthalmology, University Hospital, LMU Munich (Germany); Richard R. Anderson, Wellman Ctr. for Photomedicine (United States); Mark Bischoff, Corporate Research and Technology, Carl Zeiss AG (Germany); Reginald Birngruber, Wellman Ctr. for Photomedicine (United States), Institute for Biomedical Optics, University Luebeck (Germany)

12360-34 • 10:45 AM - 11:00 AM

Moxifloxacin-based extended depth-of-field (EDOF) wide-field microscopy with surface tracking for non-invasive examination of conjunctival goblet cells in awake human subjects

Author(s): Ki Hean Kim, Jungbin Lee, Seonghan Kim, Suil Jeon, Jieun Yun, Noseung Park, Kyungbin Bae, Pohang Univ. of Science and Technology (Republic of Korea); Chang Ho Yoon, Seoul National Univ. Hospital (Republic of Korea)

12360-35 • 11:00 AM - 11:15 AM

Wavefront shaping and optical memory effect of excised crystalline lenses: a comprehensive scattering characterization

Author(s): Alba M. Paniagua-Díaz, Univ. de Murcia (Spain); Ines Yago, Jose M. Marin, Hospital Clínico Univ. Virgen de la Arrixaca (Spain); Pablo Artal Soriano, Univ. de Murcia (Spain)

12360-36 • 11:15 AM - 11:30 AM

SS-OCT images of the human crystalline lens reveal local changes in the morphology and transparency with ageing

Author(s): Ashish Gupta, Daniel Ruminski, Alfonso Jiménez Villar, Nicolaus Copernicus Univ. (Poland); Raul Duarte Toledo, Univ. de Murcia (Spain); Grzegorz Gondek, Spozmai Panezai, Nicolaus Copernicus Univ. (Poland); Pablo Artal, Univ. de Murcia (Spain); Ireneusz P. Grulkowski, Nicolaus Copernicus Univ. (Poland)

Lunch/Exhibition Break 11:30 AM - 1:00 PM

SESSION 8: NOVEL DEVICES, THERAPIES, AND METHODOLOGY

1:00 PM - 3:30 PM

Moscone Center, Room 301 (Level 3 South)

Session chairs: Daniel V. Palanker, Stanford Univ. (United States), Georg Schuele, Tesseract Health, Inc. (United States)

12360-37 • 1:00 PM - 1:15 PM

Enhanced visualization of the lamina cribrosa by spectral bandwidth alteration in OCT

Author(s): Danielle J. Harper, Yong-Chul Yoon, Benjamin J. Vakoc, Wellman Ctr. for Photomedicine (United States)

12360-38 • 1:15 PM - 1:30 PM

Optoacoustic temperature measurement with a single microsecond laser pulse

Author(s): Eric Seifert, Medizinisches Laserzentrum Lübeck GmbH (Germany); Hossameldin S. Abbas, Univ. zu Lübeck (Germany); Ralf Brinkmann, Medizinisches Laserzentrum Lübeck GmbH (Germany), Univ. zu Lübeck (Germany)

High-speed, in vivo, volumetric imaging of mouse retinal tissue with spatio-temporal optical coherence tomography (STOC-T)

Author(s): Piotr F. Wegrzyn, International Ctr. for Translational Eye Imaging (Poland), Institute of Physical Chemistry (Poland); Slawomir Tomczewski, International Ctr. for Translational Eye Research (Poland), Institute of Physical Chemistry (Poland); Dawid Borycki, International Ctr. for Translational Eye Research (Poland), Institute of Physical Chemistry (Poland); Wiktor Kulesza, International Ctr. for Translational Eye Research (Poland), Insitute of Physical Chemistry (Poland); Maciej Wielgo, Katarzyna Kordecka, Anna Galińska, Onur Cetinkaya, International Ctr. for Translational Eye Research (Poland), Institute of Physical Chemistry (Poland); Piotr Ciacka, International Ctr. for Translational Eye Research (Poland), Institute of Physical Chemistry (Poland); Egidijus Aukorius, Ctr. for Physical Sciences and Technology (Lithuania); Andrzej Folk, International Ctr. for Translational Eye Research (Poland), Insitute of Physical Chemistry (Poland); Robert J. Zawadzki, Univ. of California, Davis (United States); Maciej Wojtkowski, Andrea Curatolo, International Ctr. for Translational Eye Research (Poland), Institute of Physical Chemistry (Poland)

Conference 12360

12360-40 • 1:45 PM - 2:00 PM

Double-MEMS retinal eye tracker with adjustable temporal and spatial sampling

Author(s): Maciej M. Bartuzel, Patrycjusz Stremplewski, Michal Meina, Szymon Tamborski, Krystian Wróbel, Maciej Szkulmowski, Nicolaus Copernicus Univ. (Poland)

12360-41 • 2:00 PM - 2:15 PM

Phase imaging of retinal microstructures with multi-channel AOSLO

Author(s): Mircea Mujat, Ankit Patel, Nicusor V. Iftimia, Physical Sciences Inc. (United States)

12360-42 • 2:15 PM - 2:30 PM

Spiral scanning for improved fixation in confocal scanning laser ophthalmoscopy

Author(s): Franklin Wei, Kristen Hagan, Claire Li, Duke Univ. (United States); Anthony N. Kuo, Duke Univ. School of Medicine (United States); Joseph A. Izatt, Al-Hafeez Z. Dhalla, Duke Univ. (United States)

12360-43 • 2:30 PM - 2:45 PM

Localizing and quantifying macular pigments in humans with visible light optical coherence tomography (OCT)

Author(s): Alok Gupta, Ruoyu Meng, New York Univ. (United States); Vivek Srinivasan, NYU Grossman School of Medicine (United States)

12360-44 • 2:45 PM - 3:00 PM

Binocular varichroma and accommodation measurement system: The visual impact of LCA or TCA correction

Author(s): Derek Nankivil, Johnson & Johnson Vision Care, Inc. (United States); Swati Bhargava, Nadav H. Ivzan, Steven A. Cholewiak, Francesco LaRocca, Austin Roorda, Martin S. Banks, Univ. of California, Berkeley (United States)

12360-45 • 3:00 PM - 3:15 PM

Clinic-ready wide-field 500 kHz swept-source OCT angiography

Author(s): Guangru Ben B. Liang, Oregon Health & Science Univ. (United States); Xiang Wei, Topcon (United States); Yukun Guo, Tristan T. Hormel, Yali Jia, Oregon Health & Science Univ. (United States)

12360-46 • 3:15 PM - 3:30 PM

Interferometric thermometry of ocular tissues for retinal laser therapy

Author(s): Yueming Zhuo, David Veyssset, Junya Hattori, Mohajeet Bhuckory, Daniel V. Palanker, Stanford Univ. (United States)

Coffee Break 3:30 PM - 3:45 PM

SESSION 9: POLARIZATION TECHNIQUES

3:45 PM - 4:45 PM PST | Moscone Center, Room 301 (Level 3 South)

Session chairs: Ralf Brinkmann, Medizinisches Laserzentrum Lübeck GmbH (Germany), Kostadinka Bizheva, Univ. of Waterloo (Canada)

12360-47 • 3:45 PM - 4:00 PM

Retinal characteristics of APPSL and 5xFAD mouse models of Alzheimer's disease

Author(s): Conrad W. Merkle, Antonia Lichtenegger, Medizinische Univ. Wien (Austria); Jörg Neddens, Estibaliz Etxeberria, Stefanie Flunkert, Manuela Prokesch, QPS Austria GmbH (Austria); Gerhard Garhöfer, Bernhard Baumann, Medizinische Univ. Wien (Austria)

12360-48 • 4:00 PM - 4:15 PM

Synthesizing retinal degree of polarization uniformity from OCT with OCT-angiography by deep learning

Author(s): Yusong Liu, Shuichi Makita, Univ. of Tsukuba (Japan); Masahiro Miura, Takuya Iwasaki, Tokyo Medical Univ. (Japan); Shinnosuke Azuma, Toshihiro Mino, Tatsuo Yamaguchi, Topcon Technohouse Corp. (Japan); Yoshiaki Yasuno, Univ. of Tsukuba (Japan)

12360-49 • 4:15 PM - 4:30 PM

Wide-field 400-kHz polarization diversity optical coherence tomography imaging of retinal pigment epithelium melanin loss in retinitis pigmentosa

Author(s): Yusi Miao, Khaldon Abbas, The Univ. of British Columbia (Canada); Destiny Hsu, Simon Fraser Univ. (Canada); Jun Song, Hoyoung Jung, Eduardo V. Navajas, Myeong Jin Jin, The Univ. of British Columbia (Canada)

12360-50 • 4:30 PM - 4:45 PM

Pathological changes in fiber structures in the eye detected with polarization-sensitive optical coherence tomography

Author(s): Joy Willemse, Vincent S. Zoutenbier, Patrick González, Vrije Univ. Amsterdam (Netherlands); Lucas J. Maillette de Buy Wenniger, Amsterdam UMC (Netherlands); Johannes F. de Boer, Vrije Univ. Amsterdam (Netherlands)

SESSION 10: HAND-HELD DEVICES

4:45 PM - 6:00 PM

Moscone Center, Room 301 (Level 3 South)

Session chairs: Wolfgang Drexler, Medizinische Univ. Wien (Austria), Derek Nankivil, Johnson & Johnson Vision Care, Inc. (United States)

12360-55 • 4:45 PM - 5:00 PM

Dual modality handheld adaptive optics optical coherence tomography probe for in vivo 3-D photoreceptor imaging

Author(s): Kristen Hagan, Jongwan Park, Theodore B. DuBose, Somayyeh Soltanian-Zadeh, Al-Hafeez Z. Dhalla, Duke Univ. (United States); Anthony N. Kuo, Ryan P. McNabb, Duke Univ. School of Medicine (United States); Joseph A. Izatt, Sina Farsiu, Duke Univ. (United States)

12360-51 • 5:00 PM - 5:15 PM

A handheld adaptive optics device for personalized visual evaluation

Author(s): Shoaib R. Soomro, Voptica S.L. (Spain); Pablo Artal, Univ. de Murcia (Spain)

12360-53 • 5:15 PM - 5:30 PM **Optimization of handheld spectrally encoded coherence tomography and reflectometry for point-of-care ophthalmic diagnostics**

Author(s): Jacob J. Watson, Rachel Hecht, Eric M. Tang, Yuankai K. Tao, Vanderbilt Univ. (United States)

12360-54 • 5:30 PM - 5:45 PM

140° field of view contact handheld swept-source OCT for pediatric peripheral imaging

Author(s): Shuibin Ni, Thanh-Tin P. Nguyen, Oregon Health & Science Univ. (United States); Ringo Ng, Simon Fraser Univ. (Canada); Susan Ostmo, Yali Jia, Oregon Health & Science Univ. (United States); Michael F. Chiang, National Institutes of Health (United States); David Huang, Alisan H. Skalet, J. Peter Campbell, Yifan Jian, Oregon Health & Science Univ. (United States)

12360-80 • 6:00 PM - 6:30 PM

Wearable multi-color RAPD screening device

Author(s): Arda Gulersey, Ahmet Berk Tuzcu, Doga Gunduzalp, Koray Kavakli, Abdullah Kucukoduk, Umit Yasar Guleser, Ugur Aygun, Murat Hasanreisoglu, Afsun Sahin, Hakan Urey, Koç Univ. (Turkey)

PASCAL ROL AWARD PRESENTATION

29 January 2023

Moscone Center, Room 301 (Level 3 South)

Session chair: Daniel X. Hammer, U.S. Food and Drug Administration (United States)

Outstanding extended abstracts submitted to the Ophthalmic Technologies conference will be nominated for the Pascal Rol Award for Best Paper in Ophthalmic Technologies. The award and prize will be presented after the last scientific Session of the conference to recognize the best paper and presentation.

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM PST | Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BIOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM - 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12360-57 • On demand | Presented live 29 January 2023

Retinal microvascular and neuronal pathologies probed in vivo by adaptive optical two-photon fluorescence microscopy

Author(s): Qinrong Zhang, Yuhang Yang, Kevin J. Cao, Wei Chen, Santosh Paidi, Chun-Hong Xia, Richard H. Kramer, Xiaohua Gong, Na Ji, Univ. of California, Berkeley (United States)

12360-59 • On demand | Presented live 29 January 2023

Segmentation of eye floaters from OCT data for fast and safe treatment of vitreous opacities

Author(s): Jaryi Lippek, Piet Dyroey, Laser Zentrum Hannover e.V. (Germany); Miroslav Zabic, Laser Zentrum Hannover e.V. (Germany); Leibniz Univ. Hannover (Germany); Hannoversches Zentrum für Optische Technologien (Germany); Sonja Johannsmeier, Tammo Ripken, Laser Zentrum Hannover e.V. (Germany)

12360-60

Economic and compact modulation unit for visual simulation: the advantages of vertical aligned liquid crystal devices

Author(s): Juan Mompeán, Alba M. Paniagua-Díaz, Univ. de Murcia (Spain); Shoaib R. Soomro, Voptica S.L. (Spain); Pablo Artal, Univ. de Murcia (Spain)

12360-61 • On demand | Presented live 29 January 2023

Depth-gated Fourier transform to accelerate spectra recovery in visible-light optical coherence tomography retinal oximetry

Author(s): Stephanie L. Nolen, Jingyu Wang, Ji Yi, Johns Hopkins Univ. (United States)

12360-62 • On demand | Presented live 29 January 2023

Iridotomy and capsulotomy on porcine eyes with ultrashort laser pulses in the picosecond regime

Author(s): Michael Körber, Technische Hochschule Nürnberg Georg Simon Ohm (Germany), Paracelsus Medizinische Privatuniversität (Germany); Milan Fritzsche, Andreas Giese, Technische Hochschule Nürnberg Georg Simon Ohm (Germany); Konstantina Kostourou, NANEOPrecision IBS Coatings GmbH (Germany); Daniel Kopf, MONTFORT Laser GmbH (Austria); Manfred Kottcke, Technische Hochschule Nürnberg Georg Simon Ohm (Germany); Francesco Luciani, Klinikum Nürnberg (Germany); Jonathan Wenk, Bernd Braun, Technische Hochschule Nürnberg Georg Simon Ohm (Germany); Josef M. Schmidbauer, Klinikum Nürnberg (Germany), Paracelsus Medizinische Privatuniversität (Germany)

12360-63

Photo-mediated ultrasound therapy for treatment of choroidal neovascularization in a rabbit model

Author(s): Mingyang Wang, Van Phuc Nguyen, Univ. of Michigan (United States); Rohit Singh, The Univ. of Kansas (United States); Basheer Mossallam, Univ. of Michigan (United States); Xinmai Yang, The Univ. of Kansas (United States); Xueding Wang, Yannis M. Paulus, Univ. of Michigan (United States)

12360-64 • On demand | Presented live 29 January 2023

On the use of a liquid lens for improving iris images quality in a hyperspectral system

Author(s): Ettore Masetti, Luigi Rovati, Univ. degli Studi di Modena e Reggio Emilia (Italy)

12360-65 • On demand | Presented live 29 January 2023

Novel ophthalmic laser system paired with focal electroretinography for subthreshold laser therapy of DME

Author(s): Jukka-Pekka Alanko, Eero Koivumäki, Laura Vesala, Johannes Kivelä, Zoe Ylöniemi, Petteri Uusimaa, Modulight Corp. (Finland); Ossi Kaikkonen, Teemu Turunen, Jaakko Nieminen, Jani Tirronen, Maculaser Oy (Finland)

12360-66 • On demand | Presented live 29 January 2023

Fluorescein videoangiography data analysis protocol for mapping retinal vascular permeability in humans

Author(s): Sarah R. Vavrek, Elif K. Nalbant, Illinois Institute of Technology (United States); Nicholas J. Konopek, Ghazi Bou Ghanem, Amani A. Fawzi, Northwestern Univ. (United States); William F. Mieler, Univ. of Illinois at Chicago (United States); Jennifer J. Kang-Mieler, Stevens Institute of Technology (United States); Kenneth M. Tichauer, Illinois Institute of Technology (United States)

Conference 12360

12360-67 • On demand | Presented live 29 January 2023

Mitigating inadvertent retinal “bites” in vitrectomy with a smart vitrector equipped by a fiber-based OCT sensor

Author(s): Christos Boutopoulos, Alexandre Abid, Flavio Rezende, Renaud Duval, Univ. de Montréal (Canada)

12360-68

Wide field of view non-mydratiac biomarker detection portable fundus camera

Author(s): Diego R. Palacios, Bowen Zhai, Carlos Mendoza-Santiesteban, Michael R. Wang, Univ. of Miami (United States)

12360-69 • On demand | Presented live 29 January 2023

Early detection of retinoblastoma: using Monte Carlo models to differentiate leukocoria from pseudo-leukocoria

Author(s): Jane Walter, The Hospital for Sick Children (SickKids) (Canada); Ana Janic, Univ. of Toronto (Canada); Stephanie Rizza, Rishabh Johri, Rahma Osman, Aditya Damani, Thomas Looi, The Hospital for Sick Children (SickKids) (Canada); Lothar D. Lilge, Univ. Health Network (Canada); Ashwin Mallipatna, The Hospital for Sick Children (SickKids) (Canada)

12360-71

Universally applicable cross-modal eye tracking for improved high-resolution retinal imaging

Author(s): Ankit Patel, Mircea Mujat, Nicusor V. Iftimia, Physical Sciences Inc. (United States)

12360-72

Progress on development of FF-SS-OCT system for functional retinal imaging in mice

Author(s): Ratheesh K. Meleppat, Denise Valente, Sarah J. Karlen, Univ. of California, Davis (United States); Pengfei Zhang, Dalian Univ. of Technology (China); Soohyun Lee, The Ohio State Univ. (United States); Ravi S. Jonnal, Univ. of California, Davis (United States); Nathan P. Doble, The Ohio State Univ. (United States); Robert J. Zawadzki, Univ. of California, Davis (United States)

12360-73

In vivo optoretinography realized by raster-scan SS-OCT: A feasibility study

Author(s): Duo Zhang, Yaping Shi, Ruikang K. Wang, Univ. of Washington (United States)

12360-74 • On demand | Presented live 29 January 2023

Electrochemical clearing of rabbit cornea post-acidic and alkaline injury

Author(s): Katelyn Dilley, Theodore V. Nguyen, Clara Chao, Naya Sterritt, Ila Youssefi, Zhongping Chen, Beckman Laser Institute and Medical Clinic (United States); Michael Hill, Occidental College (United States); Brian J. F. Wong, Beckman Laser Institute and Medical Clinic (United States)

12360-76

Calibration of laser Doppler flowmetry

Author(s): Mircea Mujat, Ankit Patel, Gopi N. Maguluri, Nicusor V. Iftimia, Physical Sciences Inc. (United States)

12360-77 • On demand | Presented live 29 January 2023

Measurement of sub-foveal choroidal thickness from optical low coherence reflectometry biometry: a new method

Author(s): Sivvani Muthusamy, National Institute of Technology, Tiruchirappalli (India); Janarthanam Jothi Balaji, Sankara Nethralaya (India); Anusha Patiala, Dept. of Optometry, Medical Research Foundation (India); Vasudevan Lakshminarayanan, Univ. of Waterloo (Canada)

12360-78

Quantitative elastography of the optic nerve head using shaker based optical coherence tomography

Author(s): Fengyi Zhang, Univ. of California, Irvine (United States); Runze Li, The Univ. of Southern California (United States); Yan Li, Univ. of California, Irvine (United States); Zhikai Zhu, Univ. of California (United States); Qifa Zhou, The Univ. of Southern California (United States); Zhongping Chen, Univ. of California, Irvine (United States)

12360-79 • On demand | Presented live 29 January 2023

Dynamic accommodation measurement using Purkinje reflections and ML algorithms

Author(s): Faik Ozan Ozhan, Arda Gulersoy, Ugur Aygun, Afsun Sahin, Hakan Urey, Koç Univ. (Turkey)

12360-81 • On demand | Presented live 29 January 2023

Optical characterisation of spectacle lenses for myopia control

Author(s): Augusto Arias Gallego, Universitätsklinikum Tübingen (Germany); Arne Ohlendorf, Carl Zeiss Vision GmbH (Germany); Pablo Artal, Univ. de Murcia (Spain); Siegfried Wahl, Universitätsklinikum Tübingen (Germany); Carl Zeiss Vision International GmbH (Germany)

12360-82 • On demand | Presented live 29 January 2023

Multi-fusion strategies for deep learning artery and vein segmentation in OCT angiography

Author(s): Mansour Abtahi, David Le, Jennifer I. Lim, Xincheng Yao, Univ. of Illinois at Chicago (United States)

12360-83 • On demand | Presented live 29 January 2023

Silent stimulation of cones: a comparison between the ERG and PLR responses

Author(s): Giovanni Gibertoni, Univ. degli Studi di Modena e Reggio Emilia (Italy); Ashwin Badrinath Pothiadia Irungovel, Suresh Viswanathan, SUNY State College of Optometry (United States); Luigi Rovati, Univ. degli Studi di Modena e Reggio Emilia (Italy)

12360-85 • On demand | Presented live 29 January 2023

Miniaturized indirect illumination with light polarization and power controls for high dynamic range fundus photography

Author(s): Alfa Rossi, Taeyoon Son, Mojtaba Rahimi, Xincheng Yao, Univ. of Illinois at Chicago (United States)

12360-86 • On demand | Presented live 29 January 2023

An eye-tracking algorithm for nystagmus detection in videonystagmography based on convolutional neural networks

Author(s): Yerin Lee, Sena Lee, Junghun Han, Hyeon Jun Wang, Young Joon Seo, Sejung Yang, Yonsei Univ. (Republic of Korea)

12360-87 • On demand | Presented live 29 January 2023

Early detection of Alzheimer's disease in the human retina: insights of 7 years research

Author(s): Benjamin Lochocki, Vrije Univ. Amsterdam (Netherlands); Jurre den Haan, Frederique J. de Ruyter, Maurice A.G. M. Kroon, E. Marleen Kemper, Charlotte E. Teunissen, Bert van Berckel, Aleid van de Kreeke, Philip Scheltens, Jeroen J. M. Hoozemans, Frank D. Verbraak, Femke H. Bouwman, Amsterdam UMC (Netherlands); Johannes F. de Boer, Vrije Univ. Amsterdam (Netherlands)

12360-88 • On demand | Presented live 29 January 2023

Tunable sphero-cylindrical lens for automated refractors

Author(s): Luca Ciaffoni, Matteo Rodighiero, Dynamic Optics S.r.l. (Italy); Antonio Vanzo, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Tommaso Furieri, Univ. degli Studi di Padova (Italy); Jacopo Mocci, Dynamic Optics S.r.l. (Italy); Stefano Bonora, CNR-Istituto di Fotonica e Nanotecnologie (Italy)

12360-89

Miniature chain-like gold nanosphere clusters enhance renal excretion for multimodal molecular imaging

Author(s): Van Phuc Nguyen, Univ. of Michigan Kellogg Eye Ctr. (United States); Wei Qian, Bing Liu, IMRA America, Inc. (United States); Josh Zhe, Jessica Henry, Mingyang Wang, Wei Zhang, Xueding Wang, Yannis M. Paulus, Univ. of Michigan Kellogg Eye Ctr. (United States)

12360-91

Optical coherence tomography imaging visualization of USH2A progression in living rabbit

Author(s): Van Phuc Nguyen, Jun Song, Yanxiu Li, Univ. of Michigan Kellogg Eye Ctr. (United States); Jifeng Zhang, Univ. of Michigan (United States); Josh Zhe, Univ. of Michigan Kellogg Eye Ctr. (United States); Y. Eugene Chen, Dongshan Yang, Univ. of Michigan (United States); Yannis M. Paulus, Jie Xu, Univ. of Michigan Kellogg Eye Ctr. (United States)

12360-92

Photoacoustic microscopy and optical coherence tomography molecular imaging evaluation of age response to bevacizumab therapy in choroidal neovascularization

Author(s): Van Phuc Nguyen, Univ. of Michigan Kellogg Eye Ctr. (United States); Yingbin Fu, Baylor College of Medicine (United States); Xueding Wang, Yannis M. Paulus, Univ. of Michigan Kellogg Eye Ctr. (United States)

12360-93 • On demand | Presented live 29 January 2023

Artificial eye model and holographic display based IOL simulator

Author(s): Deniz Akyazi, Koray Kavakli, Ugur Aygun, Afsun Sahin, Hakan Urey, Koç Univ. (Turkey)

12360-94 • On demand | Presented live 29 January 2023

Targeted spectral acquisition in the eye fundus

Author(s): Nicolas Lapointe, Cleoplace Akitegetse, Jasmine Poirier, Maxime Picard, Zilia (Canada); Dominic Sauvageau, Zilia (Canada), Univ. of Alberta (Canada)

12360-95 • On demand | Presented live 29 January 2023

Design of glistening-free hydrophobic polymers

Author(s): Nima Heidary, Frank Noll, Norbert A. Hampp, Philipps-Univ. Marburg (Germany)

12360-96

Spatially selective photothermolysis guided by reflectance confocal microscopy for precise treatment of corneal neovascularization

Author(s): Liwei Jiang, Zhenguo Wu, Jianhua Zhao, BC Cancer Research Ctr. (Canada); Jing Cui, Jeanne Xi, Harvey Lui, Sonia N. Yeung, Joanne Matsubara, The Univ. of British Columbia (Canada); Haishan Zeng, BC Cancer Research Ctr. (Canada)

12360-33

Changes in the human conjunctiva and sclera associated with the shape of the contact lens edge

Author(s): Ehsan Imani, Weixiang Song, Jiil Woods, Lyndon Jones, Kostadinka Bizheva, Univ. of Waterloo (Canada)

DIGITAL POSTERS

28 January 2023 • 8:00 AM

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12360-84 • On demand | Presented live 28 January 2023

Can fluorescein angiography be predicted from color fundus? The effect of a larger training set

Author(s): Chang Liu, Jianlong Yang, Shanghai Jiao Tong Univ. (China); Hongfei Ye, Shanghai Jiao Tong Univ. School of Medicine (China); Haoran Zhang, Shanghai Jiao Tong Univ. (China); Ce Zheng, Shanghai Jiao Tong Univ. School of Medicine (China); Aili Zhang, Shanghai Jiao Tong Univ. (China)

Conference 12361

28 - 29 January 2023 | Moscone Center, Room 151 (Upper Mezzanine South)

Molecular-Guided Surgery: Molecules, Devices, and Applications IX

Conference Chairs: **Sylvain Gioux**, Intuitive Surgical, Sàrl (Switzerland); **Summer L. Gibbs**, Oregon Health & Science Univ. (United States)

Conference Co-Chair: **Brian W. Pogue**, Univ. of Wisconsin System (United States)

Program Committee: **Michael Bouvet**, Univ. of California, San Diego (United States); **David J. Cuccia**, Modulated Imaging, Inc. (United States); **Michele Diana**, ICube (France); **Hisataka Kobayashi**, National Cancer Institute (United States); **Frédéric Leblond**, Polytechnique Montréal (Canada); **Jonathan T.C. Liu**, Univ. of Washington (United States); **Vasilis Ntziachristos**, Helmholtz Zentrum München GmbH (Germany), Technical Univ. of Munich (Germany); **Keith D. Paulsen**, Thayer School of Engineering at Dartmouth (United States); **Eben L. Rosenthal M.D.**, Stanford Univ. School of Medicine (United States); **Jonathan M. Sorger**, Intuitive Surgical, Inc. (United States); **Kenneth M. Tichauer**, Illinois Institute of Technology (United States); **Alex Vahrmeijer**, Leiden Univ. Medical Ctr. (Netherlands); **Thomas D. Wang M.D.**, Univ. of Michigan (United States); **Brian C. Wilson**, Ontario Cancer Institute (Canada)

SATURDAY 28 JANUARY

SESSION 1: ENDOGENOUS AND LABEL-FREE IMAGING

8:30 AM - 10:00 AM

Moscone Center, Room 151 (Upper Mezzanine South)

Session chairs: Sylvain Gioux, Intuitive Surgical, Sàrl (Switzerland), Kenneth M. Tichauer, Illinois Institute of Technology (United States)

12361-1 • 8:30 AM - 9:00 AM

Clinical translation of a novel, dye-free perfusion imaging technique in minimally invasive surgery (Invited Paper)

Author(s): Wido Heeman, Univ. of Groningen (Netherlands); Gooitzen van Dam, Univ. Medical Ctr. Groningen (Netherlands); E. Christiaan Boerma, Medisch Ctr. Leeuwarden (Netherlands)

12361-2 • 9:00 AM - 9:15 AM

Speckle-illumination stereo endoscopy for depth and optical property mapping

Author(s): Anthony A. Song, Mason T. Chen, Nicholas J. Durr, Johns Hopkins Univ. (United States)

12361-3 • 9:15 AM - 9:30 AM

How to assess the realism of synthetic spectral images

Author(s): Marco Hübner, Deutsches Krebsforschungszentrum (Germany); Leonardo Ayala, Maike Rees, Tim J. Adler, Kris Dreher, Deutsches Krebsforschungszentrum (Germany), Ruprecht-Karls-Univ. Heidelberg (Germany); Silvia Seidlitz, Jan Sellner, Deutsches Krebsforschungszentrum (Germany), Ruprecht-Karls-Univ. Heidelberg (Germany), Helmholtz Information & Data Science School for Health (Germany); Ahmad Bin Qasim, Deutsches Krebsforschungszentrum (Germany), Ruprecht-Karls-Univ. Heidelberg (Germany); Alexander Seitel, Deutsches Krebsforschungszentrum (Germany); Alexander Studier-Fischer, UniversitätsKlinikum Heidelberg (Germany); Alexey Aksenov, Christina Engels, Dogu Teber, Städtisches Klinikum Karlsruhe GmbH (Germany); Beat Müller-Stich, UniversitätsKlinikum Heidelberg (Germany); Felix Nickel, UniversitätsKlinikum Heidelberg (Germany), Helmholtz Information & Data Science School for Health (Germany); Lena Maier-Hein, Deutsches Krebsforschungszentrum (Germany), Ruprecht-Karls-Univ. Heidelberg (Germany)

12361-4 • 9:30 AM - 9:45 AM

Multispectral filter arrays for early cancer detection in endoscopy

Author(s): Katie-Lou White, Calum Williams, Lina Hacker, Sarah E. Bohndiek, Univ. of Cambridge (United Kingdom)

12361-5 • 9:45 AM - 10:00 AM

A topographic Raman imaging approach for surgical margin assessment

Author(s): Alexander Czaja, Alice Jiang, Olga Eremina, Cristina Zavaleta, The Univ. of Southern California (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: IMAGING SYSTEMS AND ADVANCED IMAGING METHODS I

10:30 AM - 12:00 PM

Moscone Center, Room 151 (Upper Mezzanine South)

Session chairs: Scott C. Davis, Dartmouth-Hitchcock Medical Ctr. (United States), Cristina L. Zavaleta, The Univ. of Southern California (United States)

12361-6 • 10:30 AM - 11:00 AM

Enhancing intra-operative tumour delineation with multispectral SWIR fluorescence imaging and machine learning (Invited Paper)

Author(s): Dale J. Waterhouse, EPSRC Ctr. for Interventional and Surgical Sciences, Univ. College London (United Kingdom); Laura Privitera, UCL Great Ormond Street Institute of Child Health (United Kingdom), EPSRC Ctr. for Interventional and Surgical Sciences, Univ. College London (United Kingdom); Danail Stoyanov, EPSRC Ctr. for Interventional and Surgical Sciences, Univ. College London (United Kingdom); Stefano Giuliani, Great Ormond Street Hospital for Children NHS Foundation Trust (United Kingdom)

12361-7 • 11:00 AM - 11:15 AM

Protoporphyrin IX delayed fluorescence imaging: a modality for wide range surgical guidance

Author(s): Arthur F. Pétusseau, Petr Bruza, Dartmouth College (United States); Brian W. Pogue, Univ. of Wisconsin-Madison (United States)

12361-8 • 11:15 AM - 11:30 AM

Fluorescence spectroscopy based estimation of biochemical concentrations and scattering properties for colorectal cancer detection

Author(s): Marcelo Saito Nogueira, Tyndall National Institute, Univ. College Cork (Ireland), Univ. College Cork (Ireland); Robert Matthews, Tyndall National Institute, Univ. College Cork (Ireland); Shane Killeen, Micheal O'Riordain, Mercy Univ. Hospital (Ireland); Stefan Andersson-Engels, Tyndall National Institute, Univ. College Cork (Ireland), Univ. College Cork (Ireland)

12361-9 • 11:30 AM - 11:45 AM

Fast reconstruction algorithms and instrumentation for spatial frequency domain fluorescence diffuse optical imaging

Author(s): Sang Hoon Chong, Vadim A. Markel, Univ. of Pennsylvania (United States); Ashwin B. Parthasarathy, Univ. of South Florida (United States); Yi Hong Ong, Kenneth Abramson, Univ. of Pennsylvania (United States); Frank A. Moscatelli, New York Univ. (United States); Arjun G. Yodh, Univ. of Pennsylvania (United States)

12361-10 • 11:45 AM - 12:00 PM

Deep learning-enabled fluorescence tomography in the spatial frequency domain: Pre-clinical oral cancer surgery studies

Author(s): Michael J. Daly, Scott Holtshousen, Stefanie Markevich, Arjun Jagota, Mandolin L. Bartling, Brian C. Wilson, Jonathan C. Irish, Univ. Health Network (Canada)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 3: IMAGING SYSTEMS AND ADVANCED IMAGING METHODS II

1:30 PM - 3:00 PM

Moscone Center, Room 151 (Upper Mezzanine South)

Session chairs: Hak Soo Choi, Massachusetts General Hospital (United States), Brian W. Pogue, Univ. of Wisconsin-Madison (United States)

12361-11 • 1:30 PM - 2:00 PM

Pixelated spectral imaging devices for image guided cancer surgery (*Invited Paper*)

Author(s): Viktor Gruev, Univ. of Illinois (United States)

12361-12 • 2:00 PM - 2:15 PM

SPAD imagers in fluorescence-guided surgical navigation

Author(s): Petr Bruza, Thayer School of Engineering at Dartmouth (United States); Brian W. Pogue, Univ. of Wisconsin-Madison (United States); Edoardo Charbon, Claudio Bruschini, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Arthur F. Pétusseau, Thayer School of Engineering at Dartmouth (United States)

12361-13 • 2:15 PM - 2:30 PM

An ambient light compatible, fluorescence-guided surgery imaging platform for real-time clinical assessment of vascular perfusion and flap viability in breast reconstruction

Author(s): Trevor Seets, OnLume (United States); Ellen C. Shaffrey, Univ. of Wisconsin-Madison (United States); Tisha Kawahara, Sakshi Singh, OnLume, Inc. (United States); Allison J. Seitz, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); Samuel O. Poore, Univ. of Wisconsin-Madison (United States); Adam J. Uselmann, Christie Lin, OnLume, Inc. (United States)

12361-15 • 2:30 PM - 2:45 PM

Automated motion artifact correction for dynamic contrast-enhanced fluorescence imaging during open orthopedic surgery

Author(s): Yue Tang, Dartmouth College (United States); I. Leah Gitajn, Dartmouth-Hitchcock Medical Ctr. (United States); Xu Cao, Xinyue Han, Dartmouth College (United States); Jonathan T. Elliott, Dartmouth-Hitchcock Medical Ctr. (United States); Xiaohan Yu, Dartmouth College (United States); Logan M. Bateman, Jessica M. Sin, Eric R. Henderson, Dartmouth-Hitchcock Medical Ctr. (United States); Brian W. Pogue, Shudong Jiang, Dartmouth College (United States)

12361-14 • 2:45 PM - 3:00 PM

Rapid, variable aperture approach to quantify depth of fluorescence in a heterogenous medium

Author(s): Cody Rounds, Medical Imaging Research Ctr., Illinois Institute of Technology (United States); Jaron de Wit, Jasper Vonk, Floris J. Voskuil, Univ. Medical Ctr. Groningen (Netherlands); Jennifer Vorjohan, Sophia Nelson, Brooke Villinski, Allyson Trang, Illinois Institute of Technology (United States); Max J. H. Witjes, Univ. Medical Ctr. Groningen (Netherlands); Kenneth M. Tichauer, Medical Imaging Research Ctr., Illinois Institute of Technology (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 4: CONTRAST AGENTS

3:30 PM - 5:00 PM

Moscone Center, Room 151 (Upper Mezzanine South)

Session chairs: Lei G. Wang, Oregon Health & Science Univ. (United States), Kimberley S. Samkoe, Thayer School of Engineering at Dartmouth (United States)

12361-16 • 3:30 PM - 4:00 PM

Harnessing cyanine reactivity to prepare novel fluorophores for in vivo imaging applications (*Invited Paper*)

Author(s): Martin Schnermann, National Cancer Institute (United States)

12361-17 • 4:00 PM - 4:30 PM

Structure-inherent targeting for biophotonic imaging and targeted therapy (*Invited Paper*)

Author(s): Hak Soo Choi, Atsushi Yamashita, Seung Hun Park, Homan Kang, Kai Bao, Satoshi Kashiwagi, Massachusetts General Hospital (United States)

12361-18 • 4:30 PM - 4:45 PM

In vivo optical imaging using a novel fluorescently-labeled single-domain antibody targeting a universal tumor marker

Author(s): Lukasz Mateusiak, Sam Floru, Janne Wouters, Timo De Groof, Noemi Declerck, Vrije Univ. Brussel (Belgium); Simone Janssen, Vrije Univ. Brussel (Belgium), Univ. Gent (Belgium); Pieterjan Debie, Katty Zeven, Janik Puttemans, Karine Breckpot, Nick Devoogdt, Sophie Hernot, Vrije Univ. Brussel (Belgium)

12361-19 • 4:45 PM - 5:00 PM

A new non-specific candidate agent for fluorescence guided neurosurgery produces high, persistent tumor contrast shortly after administration

Author(s): Augustino Scorzo, Brook Byrd, Rendall Strawbridge, Scott Davis, Dartmouth College (United States)

SUNDAY 29 JANUARY

SESSION 5: PRECLINICAL & CLINICAL TRANSLATION I

9:00 AM - 10:15 AM

Moscone Center, Room 151 (Upper Mezzanine South)

Session chairs: Samuel S. Streeter, Thayer School of Engineering at Dartmouth (United States); Summer L. Gibbs, Oregon Health & Science Univ. (United States)

12361-20 • 9:00 AM - 9:30 AM

Paired-agent imaging for the rapid and accurate detection of involved margins in Mohs micrographic surgery *(Invited Paper)*

Author(s): Veronica C. Torres, Dartmouth College (United States); Rachael Chacko, Geisel School of Medicine (United States); Sassan Hodge, Dartmouth College (United States); Joshua Levy, Geisel School of Medicine, Dartmouth College (United States); Louis Vaickus, Geisel School of Medicine, Dartmouth College (United States); Eunice Chen, Matthew LeBoeuf, Geisel School of Medicine, Dartmouth College (United States); Kimberley S. Samkoe, Dartmouth College (United States)

12361-21 • 9:30 AM - 9:45 AM

First clinical results of fluorescence lifetime enhanced tumor imaging using exogenous agents

Author(s): Rahul Pal, Thinzar M. Lwin, Murali Krishnamoorthy, Stefan A. Carp, Massachusetts General Hospital (United States); Corey D. Chan, Newcastle Univ. (United Kingdom); Maclean Nasrallah, John Y. K. Lee, Univ. of Pennsylvania (United States); Yin Hung, Massachusetts General Hospital (United States); Allen Feng, Massachusetts Eye and Ear (United States); Kenneth M. Tanabe, Massachusetts General Hospital (United States); Eben L. Rosenthal, Vanderbilt Univ. (United States); Brian V. Nahed, Massachusetts General Hospital (United States); Kevin Emerick, Massachusetts Eye and Ear (United States); Kenneth Rankin, Newcastle Univ. (United Kingdom); Santiago Lozano-Calderon, Massachusetts General Hospital (United States); Mark A. Varvares, Massachusetts Eye and Ear (United States); Anand T. N. Kumar, Massachusetts General Hospital (United States)

12361-22 • 9:45 AM - 10:00 AM

Fluorescence conjugated anti-mucin antibodies to target and brightly label colorectal and pancreatic cancer

Author(s): Kristin E. Cox, Michael A. Turner, Siamak Amirfakhri, Univ. of California, San Diego (United States); VA San Diego Healthcare System (United States); Thinzar M. Lwin, Dana Farber Cancer Ctr. (United States); Shanglei Liu, Univ. of California, San Diego (United States); Robert M. Hoffman, Univ. of California, San Diego (United States); VA San Diego Healthcare System (United States); AntiCancer, Inc. (United States); Surinder K. Batra, Univ. of Nebraska Medical Ctr. (United States); Michael Bouvet, Univ. of California, San Diego (United States); VA San Diego Healthcare System (United States)

12361-23 • 10:00 AM - 10:15 AM

Deriving clinical parameters for paired agent imaging in head and neck squamous cell carcinomas

Author(s): Sanjana Pannem, Dartmouth College (United States); Cheng Wang, Thayer School of Engineering at Dartmouth (United States); Divya Ravi, Dartmouth College (United States); Sassan Hodge, Thayer School of Engineering at Dartmouth (United States); Eunice Chen, Jonathan T. Elliott, Dartmouth College (United States); Kenneth M. Tichauer, Illinois Institute of Technology (United States); Keith D. Paulsen, Kimberley S. Samkoe, Thayer School of Engineering at Dartmouth (United States)

Coffee Break 10:15 AM - 10:45 AM

SESSION 6: PRECLINICAL & CLINICAL TRANSLATION II

10:45 AM - 12:00 PM

Moscone Center, Room 151 (Upper Mezzanine South)

Session chairs: Connor W. Barth, Oregon Health & Science Univ. (United States); Brian W. Pogue, Univ. of Wisconsin-Madison (United States)

12361-24 • 10:45 AM - 11:15 AM

Fluorescence-guided and molecularly-guided debreidement: identifying devitalized and infected tissue in orthopaedic trauma *(Invited Paper)*

Author(s): Jonathan T. Elliott, Eric Henderson, Samuel S. Streeter, Valentin Demidov, Dartmouth-Hitchcock Medical Ctr. (United States); Xinyue Han, Yue Tang, Thayer School of Engineering at Dartmouth (United States); J Scott Sottosanti, Dartmouth-Hitchcock Medical Ctr. (United States); Logan Bateman, Petr Brůža, Shudong Jiang, Thayer School of Engineering at Dartmouth (United States); I Leah Gitajn, Dartmouth-Hitchcock Medical Ctr. (United States)

12361-25

Use of freshly amputated human limbs for pre-clinical evaluation of molecular-targeted fluorescent probes

Author(s): Logan M. Bateman, Dartmouth Health (United States); Thayer School of Engineering at Dartmouth (United States); Kendra A. Hebert, Thayer School of Engineering at Dartmouth, Dartmouth College (United States); Samuel S. Streeter, Thayer School of Engineering at Dartmouth (United States); Jenna A. Nunziata, Heart & Vascular Ctr., Dartmouth-Hitchcock Medical Ctr. (United States); Connor W. Barth, Lei G. Wang, Summer L. Gibbs, Oregon Health & Science Univ. (United States); Eric R. Henderson, Dartmouth Health (United States); Geisel School of Medicine, Dartmouth College (United States); Thayer School of Engineering at Dartmouth (United States)

12361-26 • 11:30 AM - 11:45 AM

Risk prediction on orthopaedic trauma patients for fracture-associated infection using dynamic contrast enhanced-fluorescence imaging

Author(s): Xinyue Han, Dartmouth College (United States); Logan M. Bateman, Paul M. Werth, Dartmouth-Hitchcock Medical Ctr. (United States); Shudong Jiang, Dartmouth College (United States); Ida L. Gitajn, Dartmouth-Hitchcock Medical Ctr. (United States); Jonathan T. Elliott, Dartmouth College (United States)

12361-27 • 11:45 AM - 12:00 PM

Early identification of life-threatening soft-tissue infection using dynamic fluorescence imaging: First-in-kind clinical study of first-pass kinetics

Author(s): Samuel S. Streeter, Thayer School of Engineering at Dartmouth (United States); Gabrielle S. Ray, Dartmouth-Hitchcock Medical Ctr. (United States), Geisel School of Medicine (United States); Logan M. Bateman, Kendra A. Hebert, Thayer School of Engineering at Dartmouth (United States); Fallon E. Bushee, Geisel School of Medicine (United States); I. Leah Gitajn, Dartmouth Health (United States), Geisel School of Medicine (United States); Jaimo Ahn, Michigan Medicine (United States); Sunil Singhal, Neils D. Martin, Perelman School of Medicine (United States); Nicholas M. Bernthal, Christopher Lee, David Geffen School of Medicine, Univ. of California, Los Angeles (United States); William T. Obrebsky, Jonathan G. Shoenecker, Vanderbilt Univ. School of Medicine (United States); Jonathan T. Elliott, Dartmouth Health (United States), Thayer School of Engineering at Dartmouth (United States), Geisel School of Medicine at Dartmouth (United States); Eric R. Henderson, Dartmouth Health (United States), Geisel School of Medicine at Dartmouth (United States), Thayer School of Engineering at Dartmouth (United States)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 7: PRECLINICAL & CLINICAL TRANSLATION III

1:30 PM - 3:00 PM

Moscone Center, Room 151 (Upper Mezzanine South)

Session chairs: Jonathan T. Elliott, Dartmouth-Hitchcock Medical Ctr. (United States), Sylvain Gioux, Intuitive Surgical, Sàrl (Switzerland)

12361-28 • 1:30 PM - 2:00 PM

Fluorescence mesoscopic imaging of whole lymph nodes for intraoperative sentinel lymph node biopsy procedures *(Invited Paper)*

Author(s): Kenneth M. Tichauer, Cody Rounds, Illinois Institute of Technology (United States); Veronica C. Torres, Dartmouth College (United States); Chengyue Li, Hang Nguyen, Illinois Institute of Technology (United States); Thom S. Nijboer, Floris J. Voskuil, Univ. Medical Ctr. Groningen (Netherlands); Jovan G. Brankov, Illinois Institute of Technology (United States); Max J. H. Witjes, Univ. Medical Ctr. Groningen (Netherlands)

12361-29 • 2:00 PM - 2:15 PM

Clinical translation of near infrared nerve-specific fluorescence contrast agents for enhanced nerve identification during surgery

Author(s): Connor W. Barth, Lei Wang, Antonio R. Montañó, Anas Masillati, Oregon Health & Science Univ. (United States); Syed Rizvi, Adam Alani, Oregon State Univ. (United States); Alexander Antaris, Jonathan Sorger, Intuitive Surgical, Inc. (United States); Summer L. Gibbs, Oregon Health & Science Univ. (United States)

12361-30 • 2:15 PM - 2:30 PM

First demonstration of a novel nerve-targeting fluorophore in ex vivo human tissue

Author(s): Kendra A. Hebert, Thayer School of Engineering at Dartmouth (United States); Logan M. Bateman, Thayer School of Engineering at Dartmouth (United States), Dartmouth Health (United States); Dylan J. Parker, Jenna A. Nunziata, Dartmouth-Hitchcock Medical Ctr. (United States); Joseph A. Paydarfar, Jennifer Hong, Dartmouth Health (United States), Geisel School of Medicine, Dartmouth College (United States); Darcy A. Kerr, George J. Zanzizzi, Dartmouth-Hitchcock Medical Ctr. (United States), Geisel School of Medicine, Dartmouth College (United States); Connor W. Barth, Summer L. Gibbs, Oregon Health & Science Univ. (United States); Eric R. Henderson, Thayer School of Engineering, Dartmouth College (United States), Dartmouth Health (United States), Geisel School of Medicine, Dartmouth College (United States); Lei Wang, Oregon Health & Science Univ. (United States)

12361-31 • 2:30 PM - 2:45 PM

Two-color imaging of vital nerve structures with applications in fluorescence-guided surgery using near-infrared fluorophores with improved physicochemical properties

Author(s): Antonio R. Montañó, Anas M. Masillati, Lei . Wang, Dani Szafran-Reeder, Connor W. Barth, Nourhan A. Shams, Summer L. Gibbs, Oregon Health & Science Univ. (United States)

12361-32 • 2:45 PM - 3:00 PM

Utilization of near infrared cranial nerve-specific fluorophores intraoperatively for visualization enhancement

Author(s): Anas M. Masillati, Antonio R. Montañó, Lei Wang, Connor W. Barth, Dani Szafran-Reeder, Summer L. Gibbs, Oregon Health & Science Univ. (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 8: CLINICAL APPLICATIONS

3:30 PM - 5:30 PM

Moscone Center, Room 151 (Upper Mezzanine South)

Session chairs: Eric R. Henderson, Dartmouth-Hitchcock Medical Ctr. (United States), Summer L. Gibbs, Oregon Health & Science Univ. (United States)

12361-33 • 3:30 PM - 4:00 PM

Translation of optics into clinical surgery practice *(Invited Paper)*

Author(s): Theo J.M. Ruers, The Netherlands Cancer Institute (Netherlands)

12361-34 • 4:00 PM - 4:30 PM

Tumor-targeted precision surgery *(Invited Paper)*

Author(s): Daan G.J. Linders, Martijn A. van Dam, Leiden University Medical Center (Netherlands); Lisanne K.A. Neijenhuis, Leiden University Medical Center (Netherlands), Centre for Human Drug Research (Netherlands); Jacobus Burggraaf, Centre for Human Drug Research (Netherlands), Leiden University Medical Center (Netherlands), Leiden Academic Centre of Drug Research (Netherlands); Alexander L. Vahrmeijer, Leiden University Medical Center (Netherlands)

Conference 12361

12361-35 • 4:30 PM - 5:00 PM

Fluorescence-guided robotic liver surgery (Invited Paper)

Author(s): Rutger-Jan Swijnenburg, Amsterdam UMC (Netherlands)

29 January 2023 PST | Moscone Center, Room 151 (Upper Mezzanine South)

12361-37 • 5:00 PM - 5:15 PM

Proceduralist criteria for evaluating interface utility of novel imaging modalities in early phase clinical trials

Author(s): Eric R. Henderson, Jonathan T. Elliott, Dartmouth-Hitchcock Medical Ctr. (United States); Shudong Jiang, Thayer School of Engineering at Dartmouth (United States); Ida L. Gitajn, Dartmouth-Hitchcock Medical Ctr. (United States); John Y. K. Lee, Univ. of Pennsylvania (United States); Summer L. Gibbs, Oregon Health & Science Univ. (United States); Michael Bouvet, Univ. of California, San Diego (United States); Anita Mahadevan-Jansen, Vanderbilt Univ. (United States); Samuel S. Streeter, Keith D. Paulsen, Thayer School of Engineering at Dartmouth (United States); Brian W. Pogue, Univ. of Wisconsin-Madison (United States); Kimberley S. Samkoe, Thayer School of Engineering at Dartmouth (United States); Sunil Singhal, Univ. of Pennsylvania (United States)

12361-36 • 5:15 PM - 5:30 PM

Fluorescence optomics for cancer detection

Author(s): Yao Chen, Samuel S. Streeter, Brady Hunt, Hira S. Sardar, Jason R. Gunn, Dartmouth College (United States); Laura J. Tafe, Joseph A. Paydarfar, Dartmouth-Hitchcock Medical Ctr. (United States); Brian W. Pogue, Keith D. Paulsen, Kimberley S. Samkoe, Dartmouth College (United States), Dartmouth-Hitchcock Medical Ctr. (United States)

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM – 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12361-38

Towards virtual whole-slide histology of freshly resected tissue specimens using integrated ultraviolet confocal reflectance and photoacoustic remote sensing microscopy

Author(s): Nathaniel J. M. Haven, Matthew T. Martell, Brendyn D. Cikaluk, Brendon S. Restall, Jean Deschenes, Lashan Peiris, Nadia Giannakopoulos, Roger J. Zemp, Univ. of Alberta (Canada)

12361-40

Two-color fluorescence guided surgery (FGS) for improved head and neck cancer resections

Author(s): Dani Szafran-Reeder, Antonio R. Montano, Anas M. Masillati, Connor W. Barth, Lei G. Wang, Summer L. Gibbs, Oregon Health & Science Univ. (United States)

12361-41

Optimization of nerve-specific fluorophores for utility in Fluorescence Guided Surgery

Author(s): William Greer, Dani Szafran-Reeder, Antonio R. Montano, Anas M. Masillati, Connor W. Barth, Lei G. Wang, Summer L. Gibbs, Oregon Health & Science Univ. (United States)

12361-42

Flexible cyclic immunofluorescence (cyCIF) using oligonucleotide barcoded antibodies

Author(s): Jocelyn Jones, Oregon Health & Science Univ. (United States)

12361-43 • On demand | Presented live 29 January 2023

Raman macroscopic imaging system for intraoperative brain cancer detection

Author(s): Patrick Orsini, Joannie Desroches, OPTECH Montreal (Canada); François Daoust, Hugo Tavera, Frédéric Dallaire, Polytechnique Montréal (Canada), CRCHUM (Canada); Kevin Savard, Jacques Bismuth, Philippe Mckoy, OPTECH Montreal (Canada); Israel Veilleux, Polytechnique Montréal (Canada), CRCHUM (Canada); Kevin Petrecca, Montreal Neurological Institute and Hospital (Canada); Frédéric Leblond, Polytechnique Montréal (Canada), CRCHUM (Canada)

12361-44

Advancing clinical reproducibility of intraoperative fluorescence imaging: analysis, metrics and multi-center equivalence

Author(s): Ethan P. M. LaRochelle, Alberto J. Ruiz, Quel Imaging, LLC (United States); Samuel S. Streeter, Thayer School of Engineering at Dartmouth (United States), Quel Imaging, LLC (United States); Kimberley S. Samkoe, Shudong Jiang, Thayer School of Engineering at Dartmouth (United States)

12361-45

PPIX delayed fluorescence imaging as a tool for in vivo assessment of hypoxia

Author(s): Marien Ochoa, Matthew S. Reed, Brian W. Pogue, Univ. of Wisconsin-Madison (United States)

Conference 12362

28 January 2023 | Moscone Center, Room 156 (Upper Mezzanine South)

Mechanisms of Photobiomodulation Therapy XVII

Conference Chairs: Ann Liebert, The Univ. of Sydney (Australia); Jeri-Anne Lyons, Univ. of Northern Colorado (United States); James D. Carroll, THOR Photomedicine Ltd. (United Kingdom)

Program Committee: Praveen Arany, Univ. at Buffalo (United States); Michael L. Denton, Air Force Research Lab. (United States); Tomas Hode, Immunophotonics, Inc. (United States); Clark E. Tedford, Lumithera, Inc. (United States); Mei X. Wu M.D., Harvard Medical School (United States), Wellman Ctr. for Photomedicine (United States)

SATURDAY 28 JANUARY

SESSION 1: CLINICAL APPLICATIONS OF PHOTOBIO-MODULATION I

8:00 AM - 10:10 AM

Moscone Center, Room 156 (Upper Mezzanine South)

Session chair: Jeri-Anne Lyons, Univ. of Northern Colorado (United States)

12362-1 • 8:00 AM - 8:30 AM

Photobiomodulation: The roadmap to mainstream acceptance *(Invited Paper)*

Author(s): James D. Carroll, THOR Photomedicine Ltd. (United Kingdom)

12362-2 • 8:30 AM - 8:50 AM

Systemic photobiomodulation: Clinical evidence from a double-blind, placebo-controlled study with near-infrared light

Author(s): Anne Berends, Seaborough Research B.V. (Netherlands); Marina Giménez, Michelle Luxwolda, Eila van Stipriaan, Pauline Bollen, Rieks Hoekman, Marthe Koopmans, Chrono@Work B.V. (Netherlands); Praveen Arany, Univ. at Buffalo (United States); Roelof Hut, Univ. of Groningen (Netherlands); Marijke Gordijn, Chrono@Work B.V. (Netherlands); Michael Krames, Seaborough Research B.V. (Netherlands)

12362-3 • 8:50 AM - 9:10 AM

Translational studies of photobiomodulation for the treatment of multiple sclerosis

Author(s): Miguel Tolentino, Univ. of Wisconsin-Milwaukee (United States); Mitra Rouhani, Marquette Univ. (United States); Chi C. Cho, Univ. of Wisconsin-Milwaukee (United States); Alexander Ng, Marquette Univ. (United States); Jeri-Anne Lyons, Univ. of Northern Colorado (United States)

12362-4 • 9:10 AM - 9:30 AM

Photobiomodulation on hard to heal ulcers, influence of diabetes mellitus on treatment time to healing, in frail elderly patients

Author(s): Marianne Degerman, Skellefteå Municipality (Sweden); Micael Öhman, Lulea Univ. of Technology (Sweden)

12362-5 • 9:30 AM - 9:50 AM

Photobiomodulation alleviates chronic kidney disease via suppression of oxidative stress: A pre-clinical study

Author(s): Ji Bian, Chunling Huang, Royal North Shore Hospital, The Univ. of Sydney (Australia); Ann Liebert, The Univ. of Sydney (Australia); Brian Bicknell, College of Health and Medicine, The Australian National Univ. (Australia); Xin-Ming Chen, Carol A. Pollock, Royal North Shore Hospital, The Univ. of Sydney (Australia)

12362-6 • 9:50 AM - 10:10 AM

Alteration of corneal epithelial-stromal interactions by NIR-femtosecond laser irradiation for therapeutic modulation of wound healing processes

Author(s): Mikhail Fomovsky, Jiashuai Fan, Sinisa Vukelic, Columbia Univ. (United States)

Coffee Break 10:10 AM - 10:30 AM

SESSION 2: CLINICAL APPLICATIONS OF PHOTOBIO-MODULATION II

10:30 AM - 12:10 PM

Moscone Center, Room 156 (Upper Mezzanine South)

Session chair: Ann Liebert, The Univ. of Sydney (Australia)

12362-7 • 10:30 AM - 11:00 AM Microbiome change as a mechanism of photobiomodulation *(Invited Paper)*

Author(s): Brian Bicknell, NICM Health Research Institute, Univ. of Western Sydney (Australia); Ann Liebert, NICM Research Institute (Australia)

12362-8 • 11:00 AM - 11:20 AM

Whole-body photobiomodulation treatment of fibromyalgia: A triple-blinded randomized clinical trial

Author(s): James D. Carroll, THOR Photomedicine Ltd. (United Kingdom)

12362-9 • 11:20 AM - 11:50 AM

Photobiomodulation enhances the endurance of anaerobic exercise *(Invited Paper)*

Author(s): Mei X. Wu, Prabhat Upadhyay, Harvard Medical School (United States); Min Yan, Shanghai Jiao Tong Univ. (United States)

12362-10 • 11:50 AM - 12:10 PM

Effects of long-term photobiomodulation on 5xFAD murine model of Alzheimer disease in a sham-controlled blind experiment study

Author(s): Aleksander Sobolewski, Gaël Barthet, Wyss Ctr. for Bio and Neuro Engineering (Switzerland); Hubert van den Bergh, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Corinne Brana, Filipa Ferreira, Michalina Góra, George Kouvas, Wyss Ctr. for Bio and Neuro Engineering (Switzerland); Salvatore Novello, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Jules Scholler, Mélanie Sipion, Wyss Ctr. for Bio and Neuro Engineering (Switzerland); Hilal Lashuel, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Lunch/Exhibition Break 12:10 PM - 2:00 PM

Conference 12362

SESSION 3: BASIC MECHANISMS OF PHOTOBIOMODULATION

2:00 PM - 3:30 PM

Moscone Center, Room 156 (Upper Mezzanine South)

Session chair: James D. Carroll, THOR Photomedicine Ltd. (United Kingdom)

12362-11 • 2:00 PM - 2:30 PM

Assessment of NIR and THz photostimulation at the cellular and subcellular levels *(Invited Paper)*

Author(s): Michael L. Denton, Air Force Research Lab. (United States); Gary D. Noojin, Nathaniel J. Pope, SAIC (United States)

12362-12 • 2:30 PM - 2:50 PM

Validating homogeneity for a novel 3-dimensional tissue phantom modelling system of the human maxilla

Author(s): Dennis Sourvanos, Ctr. for Innovation and Precision Dentistry, Univ. of Pennsylvania (United States), Institute for Translational Medicine and Therapeutics, Perelman School of Medicine, Univ. of Pennsylvania (United States); Ryan D. Hall Morales, Perelman Ctr. for Advanced Medicine (United States); Andreea Dimofte, Perelman Ctr. for Advanced Medicine, Univ. of Pennsylvania (United States); Joseph P. Fiorellini, Ctr. for Innovation and Precision Dentistry, Univ. of Pennsylvania (United States); Timothy C. Zhu, Perelman Ctr. for Advanced Medicine, Univ. of Pennsylvania (United States), Ctr. for Innovation and Precision Dentistry, Univ. of Pennsylvania (United States)

12362-13 • 2:50 PM - 3:10 PM

Elucidating photobiomodulation dosing via model-based estimates and direct light application at the nerve

Author(s): Andrew Buzza, Kalista Tapas, Junqi Zhuo, Stephen Lewis, Case Western Reserve Univ. (United States); Juanita Anders, Uniformed Services Univ. of the Health Sciences (United States); Michael Jenkins, Michael Moffitt, Case Western Reserve Univ. (United States)

12362-14 • 3:10 PM - 3:30 PM

Long-term photobiomodulation on mitochondrial activities of IMR-32 cells at 810nm

Author(s): Huai-Ching Hsieh, Yi-Ju Lee, Kung-Bin Sung, An-Chi Wei, National Taiwan Univ. (Taiwan)

Coffee Break 3:30 PM - 4:00 PM

SESSION 4: EMERGING CONCEPTS AND CLINICAL APPLICATIONS

4:00 PM - 5:50 PM PST | Moscone Center, Room 156 (Upper Mezzanine South)

Session chair: Jeri-Anne Lyons, Univ. of Northern Colorado (United States)

12362-16 • 4:00 PM - 4:30 PM

Photobiomodulation in wakefulness and sleep: A role for biophotons *(Invited Paper)*

Author(s): Ann Liebert, Sydney Adventist Hospital (Australia); Cecile Moro, John Mitrofanis, Univ. Grenoble Alpes (France)

12362-17 • 4:30 PM - 4:50 PM

Translaryngeal photobiomodulation therapy using basket-integrated diffusing applicator for tracheostomy-associated fenestrated wound management

Author(s): Yeachan Lee, Pukyong National Univ. (Republic of Korea); Hyounghun Lee, Kosin Univ. (Republic of Korea); Seonghee Lim, Hwarang Shin, Pukyong National Univ. (Republic of Korea); Sunju Oh, Kosin Univ. (Republic of Korea); Hyun Wook Kang, Pukyong National Univ. (Republic of Korea)

12362-24 • 4:50 PM - 5:10 PM

The germicidal effect of a prototype multicolor lighting panel on Human Coronavirus

Author(s): John C. Castel, CareWear Corp (United States); Violet V. Bumah, University of Tennessee Martin (United States); Gene Mahlet, San Diego State University (United States), George Washington University School of Medicine (United States); Chukuka S. Enwemeka, San Diego State University (United States)

12362-19 • 5:10 PM - 5:30 PM

Influence of long-term transcranial infrared light stimulation on the hemodynamic response of the prefrontal cortex during cognitive activities

Author(s): Chien-Jung Chiu, Yu-Wun Wu, National Taiwan Univ. (Taiwan); Li-Da Huang, The Univ. of Texas at Austin (United States), CytonSys Inc. (United States); Francisco Gonzalez-Lima, The Univ. of Texas at Austin (United States); Andy Ying-Chi Liao, Chi-Hsiang Chuang, Kung-Bin Sung, National Taiwan Univ. (Taiwan)

12362-20 • 5:30 PM - 5:50 PM

Effectiveness on cognition in Alzheimer's patients by personal red and near infrared LED photobiomodulation therapy device treatment: a case study (protocol)

Author(s): Sungkyoo Lim, Eal-Whan Park, Dankook Univ. (Republic of Korea)

12362-26 • 5:50 PM - 6:10 PM

Inactivation of Salmonella enterica with a novel pulsed blue light panel

Author(s): John C. Castel, CareWear Corp (United States); Qune Mahlet, San Diego State University (United States); Violet V. Bumah, University of Tennessee (United States); Chukuka S. Enwemeka, San Diego State University (United States)

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BIOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM - 5:00 PM

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12362-21 • On demand | Presented live 29 January 2023

Understanding the mechanisms of photobiostimulation on mitochondrial bioenergetics: the challenges of respirometry with real-time irradiation at 635 nm

Author(s): Natasha F. Mezzacappo, Univ. de São Paulo (Brazil); Natalia M. Inada, Instituto de Física de São Carlos (Brazil); Aline S. Perez, Univ. de São Paulo (Brazil); Edilene de S. Siqueira-Santos, Roger F. Castilho, Aníbal E. Vercesi, Univ. of Campinas (Brazil); Vanderlei S. Bagnato, Univ. de São Paulo (Brazil)

12362-22 • On demand | Presented live 29 January 2023

Duodenal multi-wavelength photobiomodulation with light emitting diode improves glycemic control and hepatic parameters in type 2 diabetes animal model

Author(s): Jinhee Kwon, So Hee Kim, Do Hyun Park, Asan Medical Ctr. (Republic of Korea)

12362-25 • On demand | Presented live 29 January 2023

Near-infrared photobiomodulation therapy for rehabilitation of patients with long COVID

Author(s): Jesus Jimenez Garcia, Verlight (Mexico); Silvana Lomán Morales, Carlos J. Lomán Villegas, Private physician (Mexico)

Conference 12363

28 - 29 January 2023 | Moscone Center, Room 304 (Level 3 South)

Multiscale Imaging and Spectroscopy IV

Conference Chairs: **Paul J. Campagnola**, Univ. of Wisconsin-Madison (United States); **Kristen C. Maitland**, Chan Zuckerberg Initiative (United States); **Darren M. Roblyer**, Boston Univ. (United States)

Program Committee: **Jonathon Quincy Brown**, Tulane Univ. (United States); **Ji-Xin Cheng**, Boston Univ. (United States); **Mini Das**, Univ. of Houston (United States); **Kevin W. Elliceiri**, Univ. of Wisconsin-Madison (United States); **Irene Georgakoudi**, Tufts Univ. (United States); **Yevgenia Kozorovitskiy**, Northwestern Univ. (United States); **Muyinatu A. Lediju Bell**, Johns Hopkins Univ. (United States); **Narasimhan Rajaram**, Univ. of Arkansas (United States); **Andrew M. Rollins**, Case Western Reserve Univ. (United States); **Melissa C. Skala**, Morgridge Institute for Research (United States); **Alex J. Walsh**, Texas A&M Univ. (United States)

SATURDAY 28 JANUARY

SESSION 1: MULTISCALE IMAGING IN ONCOLOGY

8:30 AM - 10:00 AM

Moscone Center, Room 304 (Level 3 South)

Session chair: Narasimhan Rajaram, Univ. of Arkansas (United States)

12363-1 • 8:30 AM - 9:00 AM

Multiscale imaging for early cancer detection (Invited Paper)

Author(s): Jennifer K. Barton, Andrew Rocha, Travis Sawyer, The Univ. of Arizona (United States); Sarah Bohndiek, Univ. of Cambridge (United Kingdom)

12363-2 • 9:00 AM - 9:20 AM

Two-photon imaging of endogenous biomolecules in freshly excised human cervical tissue biopsies captures pre-cancer induced changes in tissue metabolism and morphology

Author(s): Christopher M. Polleys, Tufts Univ. (United States); Hong-Thao N. Thieu, Elizabeth M. Genega, Narges Jahanseir, Tufts Medical Ctr. (United States); Irene Georgakoudi, Tufts Univ. (United States)

12363-3 • 9:20 AM - 9:40 AM

Enhanced detection of neoplasia in esophageal biopsies via non-destructive 3D pathology with deep-learning triage

Author(s): Lindsey A. Barner, Gan Gao, Deepti M. Reddi, Lydia Lan, Wynn Burke, Univ. of Washington (United States); William M. Grady, Univ. of Washington (United States); Fred Hutchinson Cancer Research Ctr. (United States); Jonathan T. C. Liu, Univ. of Washington (United States)

12363-4 • 9:40 AM - 10:00 AM

Multimodal coherent Raman and multiphoton nonlinear microscopy reveals early therapy-induced senescence in human cancer cells to prevent tumor recurrence

Author(s): Arianna Bresci, Francesco Manetti, Politecnico di Milano (Italy); Silvia Ghislanzoni, Fondazione IRCCS Istituto Nazionale dei Tumori (Italy); Federico Vernuccio, Salvatore Sorrentino, Chiara Ceconello, Politecnico di Milano (Italy); Renzo Vanna, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Italia Bongarzone, Fondazione IRCCS Istituto Nazionale dei Tumori (Italy); Giulio Cerullo, Dario Polli, Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: LIGHT AND DATA I

10:30 AM - 12:00 PM

Moscone Center, Room 304 (Level 3 South)

Session chair: Jonathon Quincy Brown, Tulane Univ. (United States)

12363-5 • 10:30 AM - 11:00 AM

Ultrafast light field tomography and microscopy (Invited Paper)

Author(s): Liang Gao, UCLA Samueli School of Engineering (United States)

12363-6 • 11:00 AM - 11:20 AM

Unsupervised deep image restoration for gigapixel microscopy

Author(s): Shiqi Xu, Xi Yang, Kanghyun Kim, Clare Cook, Amey Chaware, Kevin Zhou, Lucas Kreiss, Roarke Horstmeyer, Duke Univ. (United States)

12363-43 • 11:20 AM - 11:40 AM

Developing a molecular understanding for using Raman spectroscopy to measure tissue hydration

Author(s): Trevor Voss, Anita Mahadevan-Jansen, Vanderbilt Univ. (United States)

12363-8 • 11:40 AM - 12:00 PM

Investigation on baseline fitting for Raman spectroscopy of living cells and its impact on principal component analysis

Author(s): Kaustav Das, Terumasa Ito, Kazuhiko Misawa, Tokyo Univ. of Agriculture and Technology (Japan)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 3: LIGHT AND DATA II

1:30 PM - 3:20 PM

Moscone Center, Room 304 (Level 3 South)

Session chair: Paul J. Campagnola, Univ. of Wisconsin-Madison (United States)

12363-9 • 1:30 PM - 2:00 PM

PathCAM: Pathology Computer Assisted Microscope for Multiscale Expert-in-the-Loop Digital Pathology (Invited Paper)

Author(s): J. Quincy Brown, Kimberly L. Ashman, Max Cooper, Huimin Zhuge, Tulane Univ. (United States); Sharon E. Fox, VA Southeast Louisiana Healthcare System (United States); Jonathan I. Epstein, Johns Hopkins Univ. (United States); Carola Wenk, Brian Summa, Tulane Univ. (United States)

12363-10 • 2:00 PM - 2:20 PM

Artificial image tuning using a generative adversarial network on collagen images from second harmonic generation microscopy

Author(s): Melissa Champer, Vikas Singh, Paul Campagnola, Univ. of Wisconsin-Madison (United States)

12363-11 • 2:20 PM - 2:40 PM

Meet the Clusters: A Deep Learning Approach for Label-Free Detection of Circulating Tumor Cell Clusters Using Flow Cytometry

Author(s): Nilay Vora, Tufts Univ. (United States); Prashant Shekhar, Embry-Riddle Aeronautical Univ. (United States); Jasmine Kwan, Michael Esmail, Abani Patra, Irene Georgakoudi, Tufts Univ. (United States)

12363-12 • 2:40 PM - 3:00 PM

Deep learning decomposition of overlapping channels in multicolor fluorescence virtual pathology

Author(s): Ivan Bozic, J. Quincy Brown, Tulane Univ. (United States)

12363-13 • 3:00 PM - 3:20 PM

Comparison of pre-processing techniques to reduce non-tissue related variations in hyperspectral reflectance imaging

Author(s): Mark Witteveen, The Netherlands Cancer Institute-Antoni van Leeuwenhoek Hospital (Netherlands); Ton A.G.J. M. Leeuwen, Maurice Aalders, Henricus Sterenborg, Amsterdam UMC (Netherlands); Theo Ruers, Anouk L. Post, The Netherlands Cancer Institute-Antoni van Leeuwenhoek Hospital (Netherlands)

Coffee Break 3:20 PM - 3:40 PM

SESSION 4: IMAGING AND SPECTROSCOPY THROUGH TIME AND SPACE

3:40 PM - 5:30 PM

Moscone Center, Room 304 (Level 3 South)

Session chair: Francisco E. Robles, Georgia Institute of Technology (United States)

12363-14 • 3:40 PM - 4:10 PM

Spectral photoacoustic and ultrasound imaging of vascular function *(Invited Paper)*

Author(s): Kristie Huda, Vinoin Vincely, Carolyn L. Bayer, Tulane Univ. (United States)

12363-15 • 4:10 PM - 4:30 PM

Miniaturized head-mounted wide-field microscope to monitor bilateral cortical activity in mice engaged in social interaction

Author(s): Jessica Lucchesi, Alessandro Scaglione, Anna Letizia Allegra Mascaro, Francesco Saverio Pavone, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy)

12363-16 • 4:30 PM - 4:50 PM

Deep-UV microscopy as a tool to capture multiscale intracellular dynamics

Author(s): Viswanath Gorti, Francisco E. Robles, Georgia Institute of Technology (United States), Emory Univ. (United States)

12363-17 • 4:50 PM - 5:10 PM

Comprehensive histology of fresh tumor-resection margins with rapid open-top light-sheet (OTLS) microscopy

Author(s): Gan Gao, Dominie Miyasato, Lindsey A. Barner, Lawrence D. True, Jeffrey Houlton, Jonathan T. C. Liu, Univ. of Washington (United States)

12363-18 • 5:10 PM - 5:30 PM

Complete Characterization of RNA Biomarker Fingerprints Using a Multi-Modal Spectroscopy Approach for Early Breast Cancer Diagnosis

Author(s): Shuyan Zhang, Institute of Bioengineering and Bioimaging (Singapore); Qing Yang S. Wu, A*STAR Institute of Materials Research and Engineering (Singapore); Fann Ting C. Ang, Institute of Bioengineering and Bioimaging (Singapore); Melissa Hum, National Cancer Ctr. of Singapore (Singapore); Jayakumar Perumal, Institute of Bioengineering and Bioimaging (Singapore); Ann S. G. Lee, National Cancer Ctr. of Singapore (Singapore); Jinghua Teng, A*STAR Institute of Materials Research and Engineering (Singapore); Dinish U.S., Malini Olivo, Institute of Bioengineering and Bioimaging (Singapore)

SUNDAY 29 JANUARY

SESSION 5: MULTISCALE METABOLIC IMAGING

8:30 AM - 10:00 AM

Moscone Center, Room 304 (Level 3 South)

Session chair: Alex J. Walsh, Texas A&M Univ. (United States)

12363-19 • 8:30 AM - 9:00 AM

Label free multi-photon metabolic imaging: From mitochondria to humans *(Invited Paper)*

Author(s): Irene Georgakoudi, Christopher Polleys, Yang Zhang, Volha Liaudanskaya, Adriana Sanchez, Einstein Gnanatheepam, Maria Savvidou, David Kaplan, Tufts Univ. (United States); Hong-Thao Thieu, Elizabeth M. Genega, Thomas Schenldorfer, Tufts Univ. School of Medicine (United States); Jessica Shiu, Anand Ganesan, Mihaela Balu, Univ. of California, Irvine (United States)

12363-20 • 9:00 AM - 9:20 AM

Label-free clinical metabolic imaging of epithelial tissue with multi-wavelength excitation and multispectral emission autofluorescence lifetime endoscopy

Author(s): Javier A. Jo, The Univ. of Oklahoma (United States)

12363-21 • 9:20 AM - 9:40 AM

Optical metabolic imaging reveals differences in radiation resistant and susceptible tumor xenografts

Author(s): Jesse D. Ivers, Sina Dadgar, Joel Rodriguez Troncoso, Narasimhan Rajaram, Univ. of Arkansas (United States)

12363-22 • 9:40 AM - 10:00 AM

A combined frequency domain diffuse optical spectroscopy and diffuse correlation spectroscopy system towards inspiratory muscle metabolism monitoring of mechanically ventilated patients

Author(s): Carlos A. Gómez, David Boas, Boston Univ. (United States); W. Darlene Reid, Univ. of Toronto (Canada); Darren Roblyer, Boston Univ. (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 6: EMERGING SOURCES OF MULTISCALE CONTRAST I

10:30 AM - 11:50 AM

Moscone Center, Room 304 (Level 3 South)

Session chair: Javier A. Jo, The Univ. of Oklahoma (United States)

Conference 12363

12363-23 • 10:30 AM - 10:50 AM

Understanding the molecular mechanism of light regulation in a minor antenna of plants: CP29 and mutants in membrane nanodiscs

Author(s): Samim Sardar, Istituto Italiano di Tecnologia (Italy); Roberto Caferri, Univ. degli Studi di Verona (Italy); Franco V. A. Camargo, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Javier Pamos Serrano, Alberto Ghezzi, Politecnico di Milano (Italy); Stefano Capaldi, Luca Dall'Osto, Roberto Bassi, Univ. degli Studi di Verona (Italy); Cosimo D'Andrea, Giulio Cerullo, Politecnico di Milano (Italy)

12363-24 • 10:50 AM - 11:10 AM

Monitoring phytoplankton diversity using NIR Raman spectroscopy, EEM and multivariate data analysis

Author(s): Nina I. Novikova, Hannah Matthews, Isabelle Williams, Mary A. Sewell, Michel K. Nieuwoudt, M. C. Simpson, Neil G. R. Broderick, Thomas Haase, The Univ. of Auckland (New Zealand)

12363-25 • 11:10 AM - 11:30 AM

Preliminary investigation of non-invasive blood pressure estimation using speckle contrast optical spectroscopy

Author(s): Ariane Garrett, Kenny Kim, Jacob Chin, Boston Univ. (United States); Edbert Sie, Francesco Marsili, Meta (United States); David Boas, Darren Roblyer, Boston Univ. (United States)

12363-26 • 11:30 AM - 11:50 AM

Variable oxygenation blood flow phantoms for calibration of spectral imaging techniques

Author(s): Michaela Taylor-Williams, Graham Spicer, Sarah E. Bohndiek, Univ. of Cambridge (United Kingdom)

Lunch/Exhibition Break 11:50 AM - 1:20 PM

SESSION 7: EMERGING SOURCES OF MULTISCALE CONTRAST II

1:20 PM - 3:10 PM

Moscone Center, Room 304 (Level 3 South)

Session chair: Muyinatu A. Lediju Bell, Johns Hopkins Univ. (United States)

12363-27 • 1:20 PM - 1:50 PM

Dual-modality ultrasound and photoacoustic imaging for accurate ovarian and adnexal lesion diagnosis and risk assessment (*Invited Paper*)

Author(s): Quing Zhu, Hongbo Luo, Washington Univ. in St. Louis (United States)

12363-28 • 1:50 PM - 2:10 PM

Dynamic full-field optical coherence microscopy of early mammalian oocytes

Author(s): Seweryn Morawiec, Patrycjusz Stremplewski, Nicolaus Copernicus Univ. (Poland); Anna Ajduk, Univ. of Warsaw (Poland); Brendan F. Kennedy, The Univ. of Western Australia (Australia); Maciej Szkulmowski, Nicolaus Copernicus Univ. (Poland)

12363-29 • 2:10 PM - 2:30 PM

A model for the reflectance in spatial frequency domain imaging from the diffuse to the subdiffuse regime

Author(s): Anouk L. Post, The Netherlands Cancer Institute (Netherlands); Amsterdam UMC (Netherlands); Dirk J. Faber, Ton G. van Leeuwen, Amsterdam UMC (Netherlands)

12363-30 • 2:30 PM - 2:50 PM

Polarization sensitive Monte Carlo based empirical relation to extract the scattering power of peritoneal metastasis

Author(s): Einstein Gnanatheepam, Robert Trout, Ahmed Gado, Artem Dinh, Martin Hunter, Tufts Univ. (United States); Thomas Schnelltdorfer, Tufts Medical Ctr. (United States); Irene Georgakoudi, Tufts Univ. (United States)

12363-31 • 2:50 PM - 3:10 PM

Sensitivity of functional near-infrared spectroscopy to optical properties in brain imaging

Author(s): Anthony Donaldson, Diego Andrare, Mini Das, Univ. of Houston (United States)

Coffee Break 3:10 PM - 3:40 PM

SESSION 8: NEW MULTISCALE TECHNOLOGIES

3:40 PM - 5:50 PM

Moscone Center, Room 304 (Level 3 South)

Session chair: Irene Georgakoudi, Tufts Univ. (United States)

12363-32 • 3:40 PM - 4:10 PM

Tackling women's health problems with optical imaging and spectroscopy (*Invited Paper*)

Author(s): Christine M. O'Brien, Francesca Bonetta-Misetli, Kevin W. Bishop, Leonid Shmuylovich, Washington Univ. in St. Louis (United States); Laura E. Masson, J.M. Newton, Jeff Reese, Anita Mahadevan-Jansen, Vanderbilt Univ. (United States); Samuel Achilefu, Washington Univ. in St. Louis (United States)

12363-33 • 4:10 PM - 4:30 PM

Improved fabrication and calibration for computational hyperspectral snapshot imaging

Author(s): Yashovardhan Raniwala, Neerja Aggarwal, Laura Waller, Univ. of California, Berkeley (United States)

12363-34 • 4:30 PM - 4:50 PM

Fibre optic illuminated fluorescence microscopy with ultraviolet surface excitation

Author(s): Alexander Yong, Zesheng Zheng, Chiyo Tan, Joel Ang, Jessica Kng, Ko Hui Tan, Cyrus Tan, Rachael Soh, Rachel Tan, Kaicheng Liang, Institute of Bioengineering and Bioimaging, Agency for Science, Technology and Research (A*STAR) (Singapore)

12363-35 • 4:50 PM - 5:10 PM

DMD-based optical inspection system using UV laser structured illumination for wide-range and high-resolution imaging

Author(s): Taerim Yoon, Pusan National Univ. (Republic of Korea); Pil Un Kim, LG Electronics Inc. (Republic of Korea); Heesang Ahn, Kyujung Kim, Tae Joong Eom, Pusan National Univ. (Republic of Korea)

12363-36 • 5:10 PM - 5:30 PM

A structured light generator device for super-resolution microscopy

Author(s): Matteo Calvarese, Leibniz-Institut für Photonische Technologien e.V. (Germany); Petra Paiè, Alessia Candeo, Gianmaria Calisesi, Politecnico di Milano (Italy); Francesco Ceccarelli, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Gianluca Valentini, Politecnico di Milano (Italy); Roberto Osellame, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Hai Gong, Mark Neil, Imperial College London (United Kingdom); Francesca Bragheri, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Andrea Bassi, Politecnico di Milano (Italy)

12363-37 • 5:30 PM - 5:50 PM

Towards deep imaging with EPI second harmonic generation holography

Author(s): Gabe Murray, Jeff Field, Yusef Farah, Lang Wang, Maxine Xiu, Olivier Pinaud, Randy Bartels, Colorado State Univ. (United States)

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM – 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12363-38 • On demand | Presented live 29 January 2023

Optical switch combined Raman spectroscopy for rapid SERS measurements

Author(s): Seung-jin Lee, Jae-Sang Lee, Young-Wan Choi, Woo June Choi, Chung-Ang Univ. (Republic of Korea)

12363-39 • On demand | Presented live 29 January 2023

Chaotic waveforms for medical imaging

Author(s): Bailey DeCocco, Rebecca L. LaVenture, Chandra Pappu, Union College (United States); Fan-Yi Lin, National Tsing Hua University (Taiwan)

12363-40

Inner surface roughness assessment of 3d printed dental crowns using optical coherence tomography

Author(s): Sm Abu Saleah, Jaeyul Lee, Kyungpook National Univ. (Republic of Korea); Ruchire Eranga Wijesinghe, Univ. of Sri Jayewardenepura (Sri Lanka); Mansik Jeon, Jeehyun Kim, Kyungpook National Univ. (Republic of Korea)

12363-41 • On demand | Presented live 29 January 2023

Pathological analysis of degenerative changes in humeral osteoarthritis using Raman spectroscopy

Author(s): Ryuji Asaoka, Univ. of Toyama (Japan); Hiroshi Kiyomatsu, Akihiro Jono, Masaki Takao, Ehime Univ. (Japan); Takashi Katagiri, Yusuke Oshima, Univ. of Toyama (Japan)

12363-42

Efficient Raman spectroscopy in tissue with a wavelength-swept strategy

Author(s): Elahe Parham, Antoine Rousseau, Mireille Quémener, Daniel C. Côté, Univ. Laval (Canada), Brain Research Ctr., Ctr. de Recherche CERVO (Canada), Ctr. d'optique Photonique et laser, Univ. Laval (Canada)

12363-46 • On demand | Presented live 29 January 2023

Shortwave-infrared spatial frequency domain imaging for quantifying water and lipid concentrations in tissue

Author(s): Thomas Livecchi, Rutgers, The State Univ. of New Jersey (United States); Anahita Pilvar, Boston Univ. (United States); Ben E. Urban, Hresh M. Subhash, Colgate-Palmolive Co. (United States); Steven L. Jacques, Univ. of Washington (United States); Darren Roblyer, Boston Univ. (United States); Mark C. Pierce, Rutgers, The State Univ. of New Jersey (United States)

12363-47 • On demand | Presented live 29 January 2023

Using modern intraoral scanners for deep learning-assisted diagnostic solutions in dentistry

Author(s): Abmael Oliveira, Rutgers, The State Univ. of New Jersey (United States), Colgate-Palmolive Co. (United States); Ananya Jana, Rutgers, The State Univ. of New Jersey (United States); Hresh M. Subhash, Colgate-Palmolive Co. (United States); Steven L. Jacques, Univ. of Washington (United States); Mark C. Pierce, Rutgers, The State Univ. of New Jersey (United States)

12363-7

Label-free, two-photon image resolution enhancement using a deep-learning autoencoder algorithm

Author(s): Tien Long Dinh, Christopher M. Polleys, Nilay Vora, Tufts Univ. (United States); Hong-Thao N. Thieu, Elizabeth M. Genega, Tufts Medical Ctr. (United States); Irene Georgakoudi, Tufts Univ. (United States), Cell, Developmental, and Molecular Biology Program, Tufts Univ. (United States)

Conference 12364

28 January 2023 | Moscone Center, Room 102 (Level 1 South Lobby)

Clinical and Translational Neurophotonics 2023

Conference Chairs: **Victor X. D. Yang**, Univ. of Toronto (Canada), Ryerson Univ. (Canada); **Jana M. Kainerstorfer**, Carnegie Mellon Univ. (United States)

Program Committee: **Steen J. Madsen**, Univ. of Nevada, Las Vegas (United States); **Nitish V. Thakor**, National Univ. of Singapore (Singapore); **David Abookasis**, Ariel Univ. of Samaria (Israel); **Frederic Leblond**, Polytechnique Montréal (Canada); **Herbert Stepp**, Ludwig-Maximilians-Univ. München (Germany); **Cuiru Sun**, Tianjin Univ. (China)

SATURDAY 28 JANUARY

SESSION 1: NOVEL METHODS

8:00 AM - 10:00 AM

Moscone Center, Room 102 (Level 1 South Lobby)

Session chair: Jana M. Kainerstorfer, Carnegie Mellon Univ. (United States)

12364-2 • 8:00 AM - 8:20 AM

Label-free identification of Alzheimer's disease plaques using multiple co-registered nonlinear optical biomarkers

Author(s): Kayvan F. Tehrani, Jaena Park, Carlos Renteria, Stephen A. Boppart, Univ. of Illinois (United States)

12364-3 • 8:20 AM - 8:40 AM

Brain white matter fiber tracts identification using wide-field imaging Mueller polarimetry: Ex vivo studies in a surgery-like environment

Author(s): Leonard Felger, Inselspital (Switzerland), Univ. Bern (Switzerland); Romain Gros, Theoni Maragkou, Univ. Bern (Switzerland); Richard McKinley, Stefano Moriconi, Michael Murek, Inselspital (Switzerland), Univ. Bern (Switzerland); Tatiana Novikova, Angelo Pierangelo, Lab. de Physique des Interfaces et des Couches Minces, CNRS (France); Omar Rodriguez-Núñez, Irena Zubak, Philippe Schucht, Inselspital (Switzerland), Univ. Bern (Switzerland)

12364-4 • 8:40 AM - 9:00 AM

Diffuse reflectance spectroscopy for optical guidance in neurosurgery and design of a multimodal optic probe

Author(s): Alexandre Bédard, Pegah Eslami, Ctr. de Recherche CERVO (Canada); Damon Depaoli, Harvard Medical School (United States); Mireille Quémener, Physics, Physics Engineering and Optics department/Laval University (Canada), Ctr. de Recherche CERVO (Canada); Martin Parent, Département of Psychiatry and Neuroscience/Laval University (Canada); Daniel Côté, Ctr. de Recherche CERVO (Canada), Physics, Engineering Physics and Optics department/Laval University (Canada)

12364-5 • 9:00 AM - 9:20 AM

A comparison of brain perfusion sensitivity achievable by diffuse correlation spectroscopy versus speckle contrast optical spectroscopy

Author(s): Stefan A. Carp, Athinoula A. Martinos Ctr. for Biomedical Imaging (United States); Mitchell B. Robinson, Massachusetts Institute of Technology (United States); Xiaojun Cheng, David A. Boas, Boston Univ. (United States); Maria A. Franceschini, Athinoula A. Martinos Ctr. for Biomedical Imaging (United States)

12364-22 • 9:20 AM - 9:40 AM

Simultaneous multimodal fNIRS-EEG recordings reveal new insights in neural activity during motor execution, observation, and imagery

Author(s): Wan-Chun Su, Hadis Dashtestani, Amir Gandjbakhche, National Institutes of Health (United States)

12364-25 • 9:40 AM - 10:00 AM

Preliminary Study of Diffuse Correlation Spectroscopy for Longitudinal Monitoring of Aneurysmal Subarachnoid Hemorrhage in the Neuro Intensive Care Unit

Author(s): Minhee Kim, Gwangju Institute of Science and Technology (Republic of Korea), Massachusetts General Hospital (United States); Bryce Carr, Massachusetts General Hospital (United States); David Y. Chung, Joanna Yang, Boston Medical Center (United States), Massachusetts General Hospital (United States); John Sunwoo, Massachusetts General Hospital (United States); Jae Gwan Kim, Gwangju Institute of Science and Technology (Republic of Korea); Maria A. Franceschini, Stefan A. Carp, Massachusetts General Hospital (United States), Harvard Medical School (United States)

Coffee Break 10:00 AM - 10:20 AM

SESSION 2: DIFFUSE OPTICAL TOMOGRAPHY

10:20 AM - 11:50 AM

Moscone Center, Room 102 (Level 1 South Lobby)

Session chair: Jason Yang, Carnegie Mellon Univ. (United States)

12364-6 • 10:20 AM - 10:50 AM

Mapping cortical activity with high-density diffuse optical tomography (HD-DOT) during motor imitation (Invited Paper)

Author(s): Tessa G. George, Washington Univ. in St. Louis (United States); Rebecca Rochowiak, Kennedy Krieger Institute (United States); Kelsey T. King, Washington Univ. in St. Louis (United States); Daniel Lidstone, Kennedy Krieger Institute (United States); Carolina Pacheco, Johns Hopkins Univ. (United States); Sung Min Park, Dalin Yang, Washington Univ. in St. Louis (United States); Mary Beth Nebel, Kennedy Krieger Institute (United States); Bahar Tunçgenç, The Univ. of Nottingham (United Kingdom); Rene Vidal, Johns Hopkins Univ. (United States); Natasha Marrus, Washington Univ. in St. Louis (United States); Stewart H. Mostofsky, Kennedy Krieger Institute (United States); Adam T. Eggebrecht, Washington Univ. in St. Louis (United States)

12364-7 • 10:50 AM - 11:10 AM

Generating whole brain diffuse optical tomography data sets for machine learning data augmentation

Author(s): Zephaniah Phillips, Seung-Hyun Lee, Eunjeong Choi, Dong Cheon Kim, Ah Song Jang, Hee Kyong Kim, Beop-Min Kim, Korea Univ. (Republic of Korea)

12364-8 • 11:10 AM - 11:30 AM

Subject specific head modeling based on computed tomography for high-density diffuse optical tomography

Author(s): Monalisa Munsu, Arefeh Sherafati, Adam T. Eggebrecht, Abraham Z. Snyder, Broc Burke, Zachary E. Markow, Washington Univ. School of Medicine in St. Louis (United States); Tracy M. Burns-Yocum, Indiana Univ. (United States); Heather M. Lugar, Washington Univ. School of Medicine in St. Louis (United States); Anagha Narayanan, Tulane Univ. School of Medicine (United States); Tasha Doty, Sarah A. Eisenstein, Alexandra M. Svoboda, Mariel L. Schroeder, Mwiza Ushe, Tamara Hershey, Joseph P. Culver, Washington Univ. School of Medicine in St. Louis (United States)

12364-9 • 11:30 AM - 11:50 AM

Open access fNIRS dataset of surgical skill execution in the fundamental of laparoscopic program

Author(s): Anil Kamat, Condell Eastmond, Erim Yanik, Suvaran De, Xavier Intes, Rensselaer Polytechnic Institute (United States)

Lunch/Exhibition Break 11:50 AM - 1:10 PM

SESSION 3: CLINICAL AND TRANSLATIONAL NEUROPHOTONICS I

1:10 PM - 3:20 PM

Moscone Center, Room 102 (Level 1 South Lobby)

Session chair: Adam T. Eggebrecht, Washington Univ. School of Medicine in St. Louis (United States)

12364-24 • 1:10 PM - 1:30 PM

Non-invasive monitoring of cerebral hemodynamics using near-infrared spectroscopy and diffuse correlation spectroscopy during transcatheter aortic valve replacement surgery

Author(s): Ailis Muldoon, Bryce Carr, Behzad Khajavi, Alyssa Martin, Mitchell Robinson, Athinoula A. Martinos Ctr for Biomedical Imaging (United States); Julia Bertsch, Alexis Novak, Liza Parab, Ariel Mueller, Marissa Albanese, MGH Anesthesia Research Center (United States); Jason Qu, Mass General Anesthesia and Pain Medicine (United States); Maria Angela Franceschini, Stefan A. Carp, Athinoula A. Martinos Ctr for Biomedical Imaging (United States)

12364-10 • 1:30 PM - 2:00 PM

Non-invasive diffuse optical monitoring of cerebral oxygen metabolism, cerebral blood volume and cerebral water content in a swine-model of contusional traumatic brain injury (Invited Paper)

Author(s): Rodrigo Menezes Forti, Lucas J. Hobson, Tiffany S. Ko, The Children's Hospital of Philadelphia (United States); Emilie Benson, The Children's Hospital of Philadelphia (United States), Univ. of Pennsylvania (United States); Nicolina R. Ranieri, Gerard Laurent, Madison Bowe, M. Katie Weeks, Nicholas J. Widmann, The Children's Hospital of Philadelphia (United States); Samuel Shin, Univ. of Pennsylvania (United States); Sarah Morton, Anthony M. Davis, Takayuki Sueishi, Yuxi Lin, Nicholas Fagan, The Children's Hospital of Philadelphia (United States); Brian R. White, Univ. of Pennsylvania (United States); Daniel J. Licht, Todd J. Kilbaugh, The Children's Hospital of Philadelphia (United States); Arjun G. Yodh, Univ. of Pennsylvania (United States); Wesley B. Baker, The Children's Hospital of Philadelphia (United States)

12364-11 • 2:00 PM - 2:20 PM

Effects of blood pressure on brain metabolism during cardiopulmonary bypass

Author(s): Marianne Suwalski, Daniel Milej, Western Univ. (Canada), Lawson Health Research Institute (Canada); Ajay Rajaram, Harvard University, Boston Children's Hospital Children's Hospital (United States); Mamadou Diop, Western Univ. (Canada), Lawson Health Research Institute (Canada); John Murkin, Western Univ. (Canada), London Health Sciences Ctr. (Canada); Jason Chui, London Health Sciences Ctr. (Canada), Western Univ. (Canada); Keith St. Lawrence, Western Univ. (Canada), Lawson Health Research Institute (Canada)

12364-12 • 2:20 PM - 2:40 PM

Optical sensor for non-invasive intracranial pressure monitoring in traumatic brain injury

Author(s): Maria Roldan, Panicos A. Kyriacou, City, Univ. of London (United Kingdom)

12364-13 • 2:40 PM - 3:00 PM

Non-invasive estimation of intracranial pressure using near-infrared spectroscopy

Author(s): William B. Scammon, Filip Relander, Syeda Tabassum, Deepshikha Acharya, Carnegie Mellon Univ. (United States); Alexander Ruesch, Neuroscience Institute, Carnegie Mellon Univ. (United States); Jason Yang, Carnegie Mellon Univ. (United States); Michael Wolf, Jaskaran Rakkar, Robert S. B. Clark, Michael M. McDowell, Univ. of Pittsburgh Medical Ctr. (United States), Children's Hospital of Pittsburgh (United States); Jana M. Kainerstorfer, Neuroscience Institute, Carnegie Mellon Univ. (United States)

12364-14 • 3:00 PM - 3:20 PM

Diffuse correlation spectroscopy measured cerebral blood flow is associated with outcome after subarachnoid hemorrhage

Author(s): Eashani Sathialingam, Kyle Cowdrick, Tara Urner, Shasha Bai, Feras Akbik, Owen Samuels, Prem Kandiah, Ofer Sadan, Erin Buckley, Rowan O. Brothers, Emory Univ. (United States)

Coffee Break 3:20 PM - 3:50 PM

SESSION 4: CLINICAL AND TRANSLATIONAL NEUROPHOTONICS II

3:50 PM - 5:20 PM

Moscone Center, Room 102 (Level 1 South Lobby)

Session chair: Rodrigo M. Menezes Forti, The Children's Hospital of Philadelphia (United States)

12364-15 • 3:50 PM - 4:20 PM

Diffuse optical spectroscopies for detecting hemometabolic stress in pediatric sickle cell disease (Invited Paper)

Author(s): Rowan O. Brothers, Katherine Turrentine, Mariam Akbar, Sydney Triplett, Emory Univ. (United States); Robert C. Brown, Children's Healthcare of Atlanta Inc. (United States); Erin Buckley, Emory Univ. (United States)

Conference 12364

12364-16 • 4:20 PM - 4:40 PM

Comparing methodologies for assessing autoregulation in a pediatric swine model using non-invasive optical measurements

Author(s): Bryce Carr, Athinoula A. Martinos Ctr. for Biomedical Imaging (United States); Kichang Lee, Ekaterina Creed, Massachusetts General Hospital (United States); Dibbyan Mazumder, Behzad Khajavi, Athinoula A. Martinos Ctr. for Biomedical Imaging (United States); Kitae Jung, Michael G. Silverman, Massachusetts General Hospital (United States); Stefan A. Carp, Athinoula A. Martinos Ctr. for Biomedical Imaging (United States)

12364-17 • 4:40 PM - 5:00 PM

Monitoring cerebral autoregulation at the respiration rate using near-infrared spectroscopy

Author(s): Nikita Kedia, Carnegie Mellon Univ. (United States), Univ. of Pittsburgh (United States); Mohini Banerjee, Deepshikha Acharya, Carnegie Mellon Univ. (United States); Alexander Ruesch, Neuroscience Institute, Carnegie Mellon Univ. (United States); Jason Yang, Carnegie Mellon Univ. (United States); Samantha Schmitt, Matthew Smith, Neuroscience Institute, Carnegie Mellon Univ. (United States); Jana M. Kainerstorfer, Carnegie Mellon Univ. (United States)

12364-19 • 5:00 PM - 5:20 PM

Evolution of ischemic stroke assessed with resting-state hemodynamics in mice

Author(s): Brian R. White, The Children's Hospital of Philadelphia (United States), Perelman School of Medicine (United States); Claudia Chan, Sabrina Da Silva, The Children's Hospital of Philadelphia (United States); Evelyn K. Shih, The Children's Hospital of Philadelphia (United States), Perelman School of Medicine (United States)

Conference 12365

30 - 31 January 2023 | Moscone Center, Room 307 (Level 3 South)

Neural Imaging and Sensing 2023

Conference Chairs: **Qingming Luo**, Hainan Univ. (China); **Jun Ding**, Stanford Univ. School of Medicine (United States); **Ling Fu**, Huazhong Univ. of Science and Technology (China)

Program Committee: **David A. Boas**, Boston Univ. (United States); **Shih-Chi Chen**, The Chinese Univ. of Hong Kong (Hong Kong, China); **Yu Chen**, Univ. of Maryland, College Park (United States); **Bernard Choi**, Beckman Laser Institute and Medical Clinic (United States); **Javier DeFelipe**, Univ. Polit cnica de Madrid (Spain); **Hongwei Dong**, Univ. of California, Los Angeles (United States); **Congwu Du**, Stony Brook Univ. (United States); **Sergio Fantini**, Tufts Univ. (United States); **Na Ji**, Univ. of California, Berkeley (United States); **Beop-Min Kim**, Korea Univ. (Korea, Republic of); **Pengcheng Li**, HUST-Suzhou Institute for Brainmatics (China); **Francesco Saverio Pavone**, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); **Leilei Peng**, Wyant College of Optical Sciences (United States); **Darcy S. Peterka**, Columbia Univ. (United States); **Claus-Peter Richter**, Northwestern Univ. (United States); **Anna W. Roe**, Zhejiang Univ. (China); **Oxana V. Semyachkina-Glushkovskaya**, Saratov State Univ. (Russian Federation); **Shy Shoham**, NYU Langone Health (United States); **Shaoqun Zeng**, Britton Chance Ctr. for Biomedical Photonics (China)

MONDAY 30 JANUARY

SESSION 1: DIFFUSE OPTICAL IMAGING I

8:30 AM - 10:10 AM

Moscone Center, Room 307 (Level 3 South)

Session chair: Shih-Chi Chen, The Chinese Univ. of Hong Kong (Hong Kong, China)

12365-1 • 8:30 AM - 8:50 AM

Dual-slope diffuse optical imaging with a modular source-detector array

Author(s): Giles Blaney, Cristianne Fernandez, Angelo Sassaroli, Tapan Das, Sergio Fantini, Tufts Univ. (United States)

12365-2 • 8:50 AM - 9:10 AM

A whole-head ultra-high density diffuse optical tomography system for functional human brain mapping

Author(s): Morgan Fogarty, Sean M. Rafferty, Washington Univ. in St. Louis (United States); Anthony C. O'Sullivan, Calamity F. Svoboda, Washington Univ. School of Medicine in St. Louis (United States); Zachary E. Markow, Edward J. Richter, Washington Univ. in St. Louis (United States); Tessa G. George, Kelsey T. King, Dana Wilhelm, Kalyan Tripathy, Washington Univ. School of Medicine in St. Louis (United States); Jason W. Trobaugh, Washington Univ. in St. Louis (United States); Adam T. Eggebrecht, Washington Univ. School of Medicine in St. Louis (United States); Joseph P. Culver, Washington Univ. in St. Louis (United States)

12365-3 • 9:10 AM - 9:30 AM

Absolute measurement of blood flow using a wide-field cerebral metabolic imaging (CMI) system

Author(s): Thinh Phan, UCI Health, Beckman Laser Institute and Medical Clinic (United States), Univ. of California, Irvine (United States); Christian Crouzet, Gordon T. Kennedy, UCI Health, Beckman Laser Institute and Medical Clinic (United States); Anthony J. Durkin, UCI Health, Beckman Laser Institute and Medical Clinic (United States), Univ. of California, Irvine (United States); Bernard Choi, UCI Health, Beckman Laser Institute and Medical Clinic (United States)

12365-4 • 9:30 AM - 9:50 AM

Template- and model-based decoding of movie identities with high-density diffuse optical tomography of neural hemodynamics

Author(s): Zachary E. Markow, Kalyan Tripathy, Jason W. Trobaugh, Washington Univ. in St. Louis (United States); Alexa M. Svoboda, Univ. of Cincinnati (United States); Mariel L. Schroeder, Purdue Univ. (United States); Sean M. Rafferty, Edward J. Richter, Adam T. Eggebrecht, Washington Univ. in St. Louis (United States); Mark A. Anastasio, Univ. of Illinois (United States); Joseph P. Culver, Washington Univ. in St. Louis (United States)

12365-5 • 9:50 AM - 10:10 AM

Crucial considerations in designing a fiber-based speckle contrast optical tomography for neuroimaging in humans

Author(s): Chen-Hao P. Lin, Washington Univ. in St. Louis (United States), Washington Univ. School of Medicine in St. Louis (United States); Inema E. Orukari, Washington Univ. School of Medicine in St. Louis (United States); Lisa Kobayashi Frisk, ICFO-Institut de Ci ncies Fot niques, The Barcelona Institute of Science and Technology - BIST (Spain); Manish Verma, Sumana Chetia, ICFO-Institut de Ci ncies Fot niques, The Barcelona Institute of Science and Technology - BIST (Spain); Adam T. Eggebrecht, Washington Univ. School of Medicine in St. Louis (United States); Turgut Durduran, ICFO-Institut de Ci ncies Fot niques, The Barcelona Institute of Science and Technology - BIST (Spain); ICREA - Instituci  Catalana de Recerca i Estudis Avan ats (Spain); Joseph P. Culver, Washington Univ. in St. Louis (United States), Washington Univ. School of Medicine in St. Louis (United States); Jason W. Trobaugh, Washington Univ. in St. Louis (United States)

Coffee Break 10:10 AM - 10:40 AM

SESSION 2: BRAIN ACTIVITIES

10:40 AM - 12:00 PM

Moscone Center, Room 307 (Level 3 South)

Session chair: Sergio Fantini, Tufts Univ. (United States)

12365-6 • 10:40 AM - 11:00 AM

5-HT_{2A} receptor agonism modifies neurovascular coupling and neuronal network activity in mice

Author(s): Jonah A. Padawer-Curry, Joshua S. Siegel, Anmol Jarang, Ginger E. Nicol, Jordan G. McCall, Adam Q. Bauer, Washington Univ. School of Medicine in St. Louis (United States)

12365-7 • 11:00 AM - 11:20 AM

Quantification of cerebral microhemorrhages with three-dimensional histology

Author(s): Danny F. Xie, Christian Crouzet, Chuo Fang, Jihua Liu, Han Liu, Wei Ling Lau, David H. Cribbs, Mark J. Fisher, Bernard Choi, Univ. of California, Irvine (United States)

12365-8 • 11:20 AM - 11:40 AM

Neurovascular coupling changes as a result of head-fixed body tilt in awake mice

Author(s): Juan Cortes, Harsha Sridhar, Deepshikha Acharya, Jana M. Kainerstorfer, Carnegie Mellon Univ. (United States); Alberto L. Vazquez, Univ. of Pittsburgh (United States)

Conference 12365

12365-30 • 11:40 AM - 12:00 PM

Optical noninvasive resting-state identification of Δ^9 -tetrahydrocannabinol (THC)

Author(s): Nisan Ozana, Michael Pascale, Kevin Potter, Brian Kendzior, Gladys Pachas, Eden Evins, Jodi Gilman, Massachusetts General Hospital (United States), Harvard Medical School (United States)

Lunch Break 12:00 PM - 1:30 PM

SESSION 3: MICROSCOPY I

1:30 PM - 3:20 PM

Moscone Center, Room 307 (Level 3 South)

Session chair: Jun Ding, Stanford Univ. School of Medicine (United States)

12365-9 • 1:30 PM - 2:00 PM

High-resolution human brain 3D reconstruction with light-sheet fluorescence microscopy (Invited Paper)

Author(s): Irene Costantini, Marina Scardigli, Josephine Ramazzotti, Niamh Brady, Franco Cheli, Giacomo Mazzamuto, Filippo Castelli, Curzio Checcucci, Ludovico Silvestri, Paolo Frascioni, Francesco S. Pavone, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy)

12365-10 • 2:00 PM - 2:20 PM

Optical gearbox enabled high-speed two-photon functional imaging

Author(s): Meng Cui, Jianian Lin, Zongyue Cheng, Purdue Univ. (United States)

12365-11 • 2:20 PM - 2:40 PM

Direct imaging of lipid metabolism in cells and brain organoids by optical photothermal infrared microscopy

Author(s): Yeran Bai, Univ. of California, Santa Barbara (United States), Photothermal Spectroscopy Corp. (United States); Stella Glasauer, Carolina M. Camargo, Xinran Tian, Andrew Longhini, Kenneth Kosik, Univ. of California, Santa Barbara (United States); Craig B. Prater, Photothermal Spectroscopy Corp. (United States)

12365-12 • 2:40 PM - 3:00 PM

Functional imaging of non-human primate visual cortex using a miniaturized lensless microscope

Author(s): Jimin Wu, Rice Univ. (United States); Yuzhi Chen, The Univ. of Texas at Austin (United States); Ashok Veeraraghavan, Rice Univ. (United States); Eyal Seidemann, The Univ. of Texas at Austin (United States); Jacob T. Robinson, Rice Univ. (United States)

12365-13 • 3:00 PM - 3:20 PM

Two-photon voltage imaging denoising by self-supervised learning

Author(s): Chang Liu, Boston Univ. (United States); Jelena Platisa, Yale Univ. (United States); Xin Ye, Allison M. Ahrens, Ichun A. Chen, Ian G. Davison, Boston Univ. (United States); Vincent A. Pieribone, Yale Univ. (United States); Jerry L. Chen, Lei Tian, Boston Univ. (United States)

Coffee Break 3:20 PM - 3:50 PM

SESSION 4: DIFFUSE OPTICAL IMAGING II

3:50 PM - 5:10 PM

Moscone Center, Room 307 (Level 3 South)

Session chair: Francesco Saverio S. Pavone, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy)

12365-14 • 3:50 PM - 4:10 PM

New dual-comb functional near infrared spectroscopy (fNIRS) technique: study of optical properties and perturbation localization

Author(s): Roberto Barreiro Marcos, Frank Sanabria Macías, Arquimea Research Ctr. (Spain); Pedro Martín Mateos, Univ. Carlos III de Madrid (Spain); José Luis González-Mora, Univ. de La Laguna (Spain); Julio E. Posada-Román, Arquimea Research Ctr. (Spain); Cristina de Dios Fernandez, Arquimea Research Ctr. (Spain), Univ. Carlos III de Madrid (Spain)

12365-15 • 4:10 PM - 4:30 PM

Fractional amplitude of physiological fluctuations of resting state fNIRS in Alzheimer's disease patient and healthy control

Author(s): Hany Ferdinando, Univ. of Oulu (Finland), Univ. Kristen Petra (Indonesia); Sadegh Moradi, Univ. of Oulu (Finland); Vesa Korhonen, Vesa Kiviniemi, Univ. of Oulu (Finland), Oulu Univ. Hospital (Finland); Teemu S. Myllylä, Univ. of Oulu (Finland)

12365-16 • 4:30 PM - 4:50 PM

Wearable diffuse optical tomography with discrete scalable spring-loaded modules

Author(s): Alvin S. Agato, Hannah E. Devore, Michelle J. Hedlund, William T. Hamic, Anthony C. O'Sullivan, Calamity F. Svoboda, Adam T. Eggebrecht, Edward J. Richter, Joseph P. Culver, Washington Univ. in St. Louis (United States)

12365-17 • 4:50 PM - 5:10 PM

Evaluation of multivariate approaches to functional connectivity mapping with fNIRS

Author(s): Wiete Fehner, Washington Univ. in St. Louis (United States); Morgan Fogarty, Washington Univ. in St. Louis (United States); Mark A. Anastasio, Univ. of Illinois (United States); Joseph P. Culver, Washington Univ. in St. Louis (United States)

TUESDAY 31 JANUARY

SESSION 5: MICROSCOPY II

8:30 AM - 10:00 AM

Moscone Center, Room 307 (Level 3 South)

Session chair: Xingde Li, Johns Hopkins Univ. (United States)

12365-18 • 8:30 AM - 9:00 AM

Large-volume deep-brain function imaging via clear optically matched panoramic access channel technique (COMPACT) (Invited Paper)

Author(s): Meng Cui, Chenmao Wang, Zongyue Cheng, Purdue Univ. (United States)

12365-19 • 9:00 AM - 9:20 AM

Dual-channel two-photon fluorescence brain imaging using fiber-delivered supercontinuum source

Author(s): Youbo Zhao, Physical Sciences Inc. (United States); Smrithi Padmakumar, Northeastern Univ. (United States); Mark T. Scimone, Gopi N. Maguluri, Physical Sciences Inc. (United States); Mansoor M. Amiji, Northeastern Univ. (United States); Nicusor V. Iftimia, Physical Sciences Inc. (United States)

12365-20 • 9:20 AM - 9:40 AM

All-optical neurophysiology using superfast polarization-sensitive off-axis full-field optical coherence microscopy (SPoOF OCM) at kilohertz frame rates

Author(s): Rishyashring R. Iyer, Univ. of Illinois (United States); Carlos A. Renteria, Univ. of Illinois (United States); Jiho Kahng, Univ. of Illinois (United States); Stephen A. Boppart, Univ. of Illinois (United States)

12365-21 • 9:40 AM - 10:00 AM

Tracing peripheral nerve regeneration with polarization-sensitive optical coherence tomography using optic axis uniformity

Author(s): Thamidul Islam Tonmoy, Youyi Tai, Junze Liu, Natasha Brinkley, Jin Nam, B. Hyle Park, Univ. of California, Riverside (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 6: NOVEL TECHNIQUES

10:30 AM - 11:50 AM PST | Moscone Center, Room 307 (Level 3 South)

Session chair: Meng Cui, Purdue Univ. (United States)

12365-22 • 10:30 AM - 10:50 AM

Migration correction technique using spatial information of neuronal images in fiber-inserted mouse under free-running behavior

Author(s): Kairi Mine, The Univ. of Tokyo (Japan); Chika Nishimura, Kyoto Univ. (Japan); Tomohiko Hayakawa, The Univ. of Tokyo (Japan); Satoshi Yawata, Dai Watanabe, Kyoto Univ. (Japan); Masatoshi Ishikawa, The Univ. of Tokyo (Japan), Tokyo Univ. of Science (Japan)

12365-23 • 10:50 AM - 11:10 AM

In vivo characterization of the near-infrared genetically encoded calcium indicator NIR-GECO2G

Author(s): Sarah Shaykevich, Justin P. Little, NYU Grossman School of Medicine (United States); Robert E. Campbell, The Univ. of Tokyo (Japan); Shy Shoham, NYU Grossman School of Medicine (United States)

12365-24 • 11:10 AM - 11:30 AM

Multi-functionalities of nanodiamond as a neuritogenic promoter and dSTORM super-resolution imaging probe

Author(s): Jaeheung Kim, Moon Sung Kang, Dong-Wook Han, Chang-Seok Kim, Pusan National Univ. (Republic of Korea)

12365-25 • 11:30 AM - 11:50 AM

Exploring the Allen mouse connectivity experiments with new neuroinformatic tools for neurophotonics, diffusion MRI and tractography applications

Author(s): Mahdi Abou Hamdan, Ecole Polytechnique (France), Univ. de Lorraine (France); Elise Cosenza, Univ. de Bordeaux (France); Sylvain Miraux, CRMSB, UMR5536 CNRS, Université de Bordeaux (France); Laurent Petit, Univ. de Bordeaux (France); Joël Lefebvre, Univ. du Québec à Montréal (Canada)

POSTERS-MONDAY

30 January 2023 • 5:30 PM - 7:00 PM PST | Moscone Center, Level 2 West

Conference attendees are invited to attend the Monday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM - 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12365-26 • On demand | Presented live 30 January 2023

Attention-based CNN-BiLSTM for sleep state classification of spatiotemporal wide-field calcium imaging data

Author(s): Xiaohui Zhang, Univ. of Illinois (United States); Eric C. Landsness, Joseph P. Culver, Jin-Moo Lee, Washington Univ. School of Medicine in St. Louis (United States); Mark A. Anastasio, Univ. of Illinois (United States)

12365-27 • On demand | Presented live 30 January 2023

Wearable fNIRS device of higher spatial resolution realized by triangular arrangement of dual-purpose optodes

Author(s): Toru Yamada, Hiroshi Kawaguchi, National Institute of Advanced Industrial Science and Technology (Japan); Jun Watabe, Mitsuo Ohashi, Spectratech Inc. (Japan)

12365-28 • On demand | Presented live 30 January 2023

Custom cannula for in vivo subcortical two-photon microscopy in mouse models of Alzheimer's disease

Author(s): Zhengyi Lu, Gregory Cross, Yu-Chieh Yuan, Alfredo Cardenas-Rivera, Chang Liu, Abbas Yaseen, Northeastern Univ. (United States)

12365-29

Resting cerebral blood flow and its response to physiological stimulation measured in awake mice using diffuse correlation spectroscopy

Author(s): Paul Shin, Zack Starkweather, Marco Renna, Behzad Khajavi, Buyin Fu, Stefan A. Carp, Maria A. Franceschini, Sava Sakadžić, Massachusetts General Hospital (United States)

Conference 12366

28 - 29 January 2023 | Moscone Center, Room 101 (Level 1 South Lobby)

Optogenetics and Optical Manipulation 2023

Conference Chairs: **Samarendra K. Mohanty**, Nanoscope Technologies, LLC (United States); **Anna W. Roe**, Zhejiang Univ. (China); **Shy Shoham**, NYU Langone Health (United States)

Program Committee: **Antoine Adamantidis**, Univ. Bern (Switzerland); **George J. Augustine**, The Lee Kong Chian School of Medicine (Singapore); **Klaus B. Gerwert**, Ruhr-Univ. Bochum (Germany); **Xue Han**, Boston Univ. (United States); **Elizabeth M. Hillman**, Columbia Univ. (United States); **E. Duco Jansen**, Vanderbilt Univ. (United States); **Richard Kramer**, Univ. of California, Berkeley (United States); **Alfred L. Nuttall**, Oregon Health & Science Univ. (United States); **Darcy S. Peterka**, Columbia Univ. (United States); **Michelle Y. Sander**, Boston Univ. (United States); **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany); **Cuiru Sun**, Tianjin Univ. (China); **John P. Welsh**, Univ. of Washington (United States)

SATURDAY 28 JANUARY

SESSION 1: CIRCUITS

3:30 PM - 5:50 PM

Moscone Center, Room 101 (Level 1 South Lobby)

Session chair: Anna Wang Roe, Zhejiang Univ. (China)

12366-15 • 3:30 PM - 4:00 PM

Whole-brain fMRI combined with cortex-wide optogenetics (*Invited Paper*)

Author(s): Seong-Gi Kim, Sungkyunkwan Univ. (Republic of Korea); Seonghoon Kim, Seoul National Univ. (Republic of Korea); Hyun Seok Moon, Sungkyunkwan Univ. (Republic of Korea); Myunghwan Choi, Seoul National Univ. (Republic of Korea)

12366-16 • 4:00 PM - 4:30 PM

Optogenetic control of cortical circuits (*Invited Paper*)

Author(s): Valentin Dragoi, McGovern Medical School, The Univ. of Texas Health Science Ctr. at Houston (United States)

12366-17 • 4:30 PM - 4:50 PM

Light-based motor mapping of multiple limbs using deep learning reveals behaviorally relevant cortical motor representations

Author(s): Nischal Khanal, Jonah A. Padawer-Curry, Kevin Schulte, Trevor Voss, Byungchan Kim, Annie R. Bice, Adam Q. Bauer, Washington Univ. School of Medicine in St. Louis (United States)

12366-18 • 4:50 PM - 5:10 PM

Mapping local and global interactions between parvalbumin inhibitory neurons and excitatory neurons over the cortex in awake mice

Author(s): Xiaodan Wang, Annie R. Bice, Adam Q. Bauer, Washington Univ. School of Medicine in St. Louis (United States)

12366-32 • 5:10 PM - 5:30 PM

Simultaneous monitoring of the effects of optogenetic stimulation of monkey S2 cortex using functional MRI and MRI thermometry

Author(s): Li Min Chen, Pai-Feng Yang, Zhangyan Yang, Huiwen Luo, Jamie Reed, Vanderbilt Univ. Medical Ctr. (United States); Feng Wang, Vanderbilt Univ. Institute of Imaging Science (United States); William A. Grissom, John C. Gore, Vanderbilt Univ. Medical Ctr. (United States)

12366-33 • 5:30 PM - 5:50 PM

Spatiotemporal optogenetic control of cardiomyocyte excitability using a microLED array

Author(s): Sebastian Junge, Masa Al Masri, Leibniz Univ. Hannover (Germany), NIFE - Lower Saxony Ctr. for Biomedical Engineering, Implant Research and Development (Germany); Ricci Signorini, Monika Szepes, Medizinische Hochschule Hannover (Germany); Jan Guelink, Heiko Brüning, Qubedot GmbH (Germany); Ina Gruh, Medizinische Hochschule Hannover (Germany); Maria Leilani Torres-Mapa, Alexander Heisterkamp, Leibniz Univ. Hannover (Germany), NIFE - Lower Saxony Ctr. for Biomedical Engineering, Implant Research and Development (Germany)

SUNDAY 29 JANUARY

SESSION 2: TOOL DEVELOPMENT I

8:00 AM - 10:10 AM

Moscone Center, Room 101 (Level 1 South Lobby)

Session chair: Claus-Peter Richter, Northwestern Univ. (United States)

12366-1 • 8:00 AM - 8:30 AM

Nanoparticle-enhanced infrared neural stimulation and inhibition of ganglion cells in the rat retina (*Invited Paper*)

Author(s): James M. Begeng, Swinburne Univ. of Technology (Australia); Wei Tong, National Vision Research Institute (Australia), The Univ. of Melbourne (Australia); Blanca del Rosal, RMIT Univ. (Australia); Michael R. Ibbotson, National Vision Research Institute (Australia), The Univ. of Melbourne (Australia); Tatiana Kameneva, Swinburne Univ. of Technology (Australia), The Univ. of Melbourne (Australia); Paul R. Stoddart, Swinburne Univ. of Technology (Australia)

12366-2 • 8:30 AM - 8:50 AM

Two-photon imaging of GABAergic and non-GABAergic neuronal activity induced by infrared neural stimulation in awake mouse cortex

Author(s): Peng Fu, Yin Liu, Liang Zhu, Mengqi Wang, Weijie Zhang, Hequn Zhang, Anna Wang Roe, Wang Xi, Zhejiang Univ. (China)

12366-3 • 8:50 AM - 9:10 AM

Dual-color optogenetic tool enables heart pacing and restorable heart arrest in *D.melanogaster*

Author(s): Elena Gracheva, Fei Wang, Yuxuan Wang, Jiantao Zhu, Matthew Fishman, Abigail Matt, Hongwu Liang, Chao Zhou, Washington Univ. in St. Louis (United States)

12366-4 • 9:10 AM - 9:30 AM

Drug delivery and optical neuromodulation using a structured polymer optical fiber with ultra-high NA

Author(s): Kunyang Sui, Marcello Meneghetti, Technical Univ. of Denmark (Denmark); Jaspreet Kaur, R.J.F. Sørensen, Rune W. Berg, Univ. of Copenhagen (Denmark); Christos Markos, Technical Univ. of Denmark (Denmark)

12366-5 • 9:30 AM - 9:50 AM

Advances in non-genetic photoacoustic neuromodulation: Mechanism and close-looped capability

Author(s): Chen Yang, Boston Univ. (United States)

12366-6 • 9:50 AM - 10:10 AM

Infrared neural stimulation and electrophysiology in a soft fiber-based neural interface

Author(s): Marcello Meneghetti, Kunyang Sui, Technical Univ. of Denmark (Denmark), Univ. of Copenhagen (Denmark); Jaspreet Kaur, Jakob F. Sørensen, Rune W. Berg, Univ. of Copenhagen (Denmark); Christos Markos, Technical Univ. of Denmark (Denmark), Norblis ApS (Denmark)

Coffee Break 10:10 AM - 10:30 AM

SESSION 3: CLINICAL APPLICATIONS

10:30 AM - 12:00 PM

Moscone Center, Room 101 (Level 1 South Lobby)

Session chair: Paul R. Stoddart, Swinburne Univ. of Technology (Australia)

12366-7 • 10:30 AM - 11:00 AM Towards an optical cochlear implant (Invited Paper)

Author(s): Joaquin Cury, Xiaodong Tan, Claus-Peter Richter, Northwestern Univ. (United States)

12366-8 • 11:00 AM - 11:20 AM

Infrared neural stimulation in human cerebral cortex

Author(s): Li Pan, An Ping, Anna Wang Roe, Kedi Xu, Zhejiang Univ. (China); Junming Zhu, Zhejiang Univ. School of Medicine (China); Kenneth E. Schriver, Zhejiang Univ. (United States)

12366-9 • 11:20 AM - 11:40 AM

Combined optogenetic and electrical stimulation of mouse retinal ganglion cells improves stimulation efficacy

Author(s): James M. Begeng, Swinburne Univ. of Technology (Australia), National Vision Research Institute (Australia); William Kwan, Monash Univ. (Australia), National Vision Research Institute (Australia); Emma Brunton, National Vision Research Institute (Australia); Tatiana Kameneva, Paul R. Stoddart, Swinburne Univ. of Technology (Australia); Michael R. Ibbotson, Wei Tong, National Vision Research Institute (Australia), The Univ. of Melbourne (Australia); Rachael T. Richardson, Bionics Institute (Australia), The Univ. of Melbourne (Australia)

12366-10 • 11:40 AM - 12:00 PM

Functionalizing inner retina with multi-characteristic opsin arrested further degeneration and functional deterioration

Author(s): Samarendra K. Mohanty, Nanoscope Technologies, LLC (United States), Nanoscope Instruments, Inc. (United States), Nanoscope Therapeutics, Inc. (United States); Subrata Batabyal, Adnan Dibbas, Houssam Al-Saad, Nanoscope Technologies, LLC (United States); Sanghoon K. Kim, Nanoscope Instruments, Inc. (United States)

Lunch/Exhibition Break 12:00 PM - 1:20 PM

SESSION 4: TOOL DEVELOPMENT II

1:20 PM - 3:00 PM

Moscone Center, Room 101 (Level 1 South Lobby)

Session chair: Shy Shoham, NYU Langone Health (United States)

12366-11 • 1:20 PM - 1:50 PM

Wireless programmable optical tools for behavioral neuroscience (Invited Paper)

Author(s): Mingzheng Wu, Yiyuan Yang, Yixin Wu, John A. Rogers, Yevgenia Kozorovitskiy, Northwestern Univ. (United States)

12366-34 • 1:50 PM - 2:20 PM

High-speed spatial light modulators for high throughput optical neural interfaces (Invited Paper)

Author(s): Rikky Muller, Univ. of California, Berkeley (United States)

12366-12 • 2:20 PM - 2:40 PM

An optogenetic implant with 1024 micro-OLEDs on a shank-shaped CMOS chip

Author(s): Sabina G. H. Hillebrandt, Humboldt Ctr. for Nano- and Biophotonics, Univ. zu Köln (Germany), Univ. of St. Andrews (United Kingdom); Chang-Ki Moon, Humboldt Ctr. for Nano- and Biophotonics, Univ. zu Köln (Germany), Univ. of St. Andrews (United Kingdom); Adriaan J. Taal, Ken L. Shepard, Columbia Univ. (United States); Malte C. Gather, Humboldt Centre for Nano- and Biophotonics, Univ. zu Köln (Germany), Univ. of St. Andrews (United Kingdom); Ilke Uguz, Columbia Univ. (United States)

12366-14 • 2:40 PM - 3:00 PM

In vivo optogenetic stimulation using Parylene photonic waveguides for light delivery

Author(s): Jay W. Reddy, Vishal Jain, Nacef Guessaymi, Mohammad H. Malekoshoraie, Maysamreza Chamanzar, Carnegie Mellon Univ. (United States)

12366-13 • 3:00 PM - 3:20 PM

CANCELED: Precise optical neuron stimulation with a multimode fiber assisted by wavefront shaping

Author(s): Tianting Zhong, The Hong Kong Polytechnic Univ. (Hong Kong, China)

Conference 12366

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM
Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM – 5:00 PM

View poster presentation guidelines and set-up instructions at:
<https://spie.org/PW/Poster-Guidelines>

12366-20 • On demand | Presented live 29 January 2023

Linear and nonlinear photoconversion of monomeric and dimeric DrBphP bacterial phytochrome variants

Author(s): Diana I. Galiakhmetova, Aleksandr S. Koviarov, Viktor V. Dremine, Aston Univ. (United Kingdom); Andrei A. Gorodetsky, Univ. of Birmingham (United Kingdom); Marios Maimaris, Imperial College London (United Kingdom); Dmitrii A. Stoliarov, Aston Univ. (United Kingdom); Mikhail Balaban, Vladislav V. Verkhusha, Albert Einstein College of Medicine (United States); Sergei G. Sokolovski, Edik U. Rafailov, Aston Univ. (United Kingdom)

12366-22

Optimization of optogenetic control of Drosophila cardiac function using ChRmine opsin

Author(s): Fei Wang, Elena Gracheva, Abigail Matt, Hongwu Liang, Matthew Fishman, Chao Zhou, Washington Univ. in St. Louis (United States)

12366-23 • On demand | Presented live 29 January 2023

An integrated setup for in-vitro optogenetic experiments using AI to localize stimulation

Author(s): Ilya Auslender, Yasaman Heydari, Clara Zaccaria, Asiye Malkoç, Beatrice Vignoli, Lorenzo Pavesi, Univ. degli Studi di Trento (Italy)

12366-24

OCT-guided variable spot electrophysiology platform for correlated structural and functional assessment of optogenetic intervention

Author(s): Sanghoon K. Kim, Michael Carlson, Michael Aldape, Nanoscope Instruments, Inc. (United States); Subrata Batabyal, Nanoscope Technologies, LLC (United States); Samarendra K. Mohanty, Nanoscope Technologies, LLC (United States), Nanoscope Instruments, Inc. (United States), Nanoscope Therapeutics, Inc. (United States)

Conference 12367

30 January - 1 February 2023 | Moscone Center, Room 201 (Level 2 South)

Optical Coherence Tomography and Coherence Domain Optical Methods in Biomedicine XXVII

Conference Chairs: **Joseph A. Izatt**, Duke Univ. (United States); **James G. Fujimoto**, Massachusetts Institute of Technology (United States)

Program Committee: **Peter E. Andersen**, Technical Univ. of Denmark (Denmark); **Kostadinka Bizheva**, Univ. of Waterloo (Canada); **Stephen A. Boppart M.D.**, Univ. of Illinois at Urbana-Champaign (United States); **Zhongping Chen**, Beckman Laser Institute and Medical Clinic (United States); **Johannes de Boer**, Vrije Univ. Amsterdam (Netherlands); **Wolfgang Drexler**, Medizinische Univ. Wien (Austria); **Grigory V. Gelikonov**, Institute of Applied Physics (Russian Federation); **Christoph K. Hitzenberger**, Medizinische Univ. Wien (Austria); **Robert A. Huber**, Univ. zu Lübeck (Germany); **Rainer A. Leitgeb**, Medizinische Univ. Wien (Austria); **Xingde Li**, Johns Hopkins Univ. (United States); **Yingtian Pan**, Stony Brook Univ. (United States); **Adrian G. H. Podoleanu**, Univ. of Kent (United Kingdom); **Andrew M. Rollins**, Case Western Reserve Univ. (United States); **Marinko V. Sarunic**, Simon Fraser Univ. (Canada); **Guillermo J. Tearney M.D.**, Wellman Ctr. for Photomedicine (United States); **Valery V. Tuchin**, Saratov State Univ. (Russian Federation); **Tomsk State Univ.** (Russian Federation); **Institute of Precision Mechanics and Control of the RAS** (Russian Federation); **Ruikang K. Wang**, Univ. of Washington (United States); **Maciej Wojtkowski**, Nicolaus Copernicus Univ. (Poland); **Yoshiaki Yasuno**, Univ. of Tsukuba (Japan)

MONDAY 30 JANUARY

SESSION 1: OCT ENDOSCOPY

8:00 AM - 9:30 AM

Moscone Center, Room 201 (Level 2 South)

Session chair: Joseph A. Izatt, Duke Univ. (United States)

12367-1 • 8:00 AM - 8:15 AM

Self-propelled retrograde tethered capsule endomicroscopy (R-TCE) in the colon

Author(s): Du-Ri Song, Tara C. Lignelli, Mikayla Tinus, Evan Sevieri, Patricia Grahmann, John J. McDaniel, Alissa A. Cirio, Paola A. Leon Alarcon, Seamus S. Winters, Hamed Khalili, Abigail L. Gregg, David O. Otuya, Jing Dong, Adam Mauskapf, Joseph A. Gardecki, Andrew D. Thrapp, Guillermo J. Tearney, Massachusetts General Hospital (United States)

12367-2 • 8:15 AM - 8:30 AM

3D micro-printing of miniaturized fiber-optic probes capable of multi-modal imaging and beam tailoring

Author(s): Jiawen Li, The Univ. of Adelaide (Australia); Simon Thiele, Paul Ruchka, Andrea Toulouse, Univ. Stuttgart (Germany); Rodney W. Kirk, Bryden C. Quirk, The Univ. of Adelaide (Australia); Ayla Hoogendoorn, South Australian Health & Medical Research Institute (Australia); Yungchin Chen, Karlheinz Peter, Baker Institute (Australia); Stephen J. Nicholls, Monash Heart (Australia); Johan Verjans, Peter J. Psaltis, Christina Bursill, South Australian Health & Medical Research Institute (Australia); Alois M. Herkommer, Harald Giessen, Univ. Stuttgart (Germany); Robert A. McLaughlin, The Univ. of Adelaide (Australia)

12367-3 • 8:30 AM - 8:45 AM

Development of a hand-held OCT laryngoscope for reconstruction of 4-D vocal fold dynamics

Author(s): Anna M. Wisniowiecki, The Univ. of Southern California (United States); Wihan Kim, Alfred E. Mann Institute for Biomedical Engineering, The Univ. of Southern California (United States); Frank D. Macias-Escriba, Diego E. Razura, Michael M. Johns, Brian E. Applegate, The Univ. of Southern California (United States)

12367-4 • 8:45 AM - 9:00 AM

OCT/OCT angiography endoscope in monitoring vaginal health

Author(s): Saijun Qiu, Beckman Laser Institute and Medical Clinic (United States)

12367-5 • 9:00 AM - 9:15 AM

Monitoring microscopic disease progression in pulmonary fibrosis using endobronchial optical coherence tomography

Author(s): Sreyankar Nandy, Sarita R. Berigei, Bess Flashner, Massachusetts General Hospital (United States); Rebecca A. Raphaely, Massachusetts General Hospital (United States); Amita Sharma, Amalia Decoursey, Satomi Yamamoto-Mcguire, Caroline Fromson, Mamary Kone, Stephanie Halks, Kevin Reyes, Kimberley Schreefer, Colleen M. Keyes, Lida P. Hariri, Massachusetts General Hospital (United States)

12367-6 • 9:15 AM - 9:30 AM

Synchronous high-speed OCT imaging with sensor less brushless DC motor and FDML laser in a phase-locked loop

Author(s): Awanish Pratap Singh, Madita Göb, Martin Ahrens, Tim Eixmann, Univ. zu Lübeck (Germany); Hinnerk Schulz-Hildebrandt, Wellman Ctr. for Photomedicine, Harvard Medical School (United States); Gereon M. Hüttmann, Robert A. Huber, Maik Rahlves, Univ. zu Lübeck (Germany)

Coffee Break 9:30 AM - 10:00 AM

SESSION 2: NEW LIGHT SOURCES

10:00 AM - 11:30 AM

Moscone Center, Room 201 (Level 2 South)

Session chair: James G. Fujimoto, Massachusetts Institute of Technology (United States)

12367-7 • 10:00 AM - 10:15 AM

1.0- μ m broadband dispersion-compensated stretched-pulse mode locking wavelength-swept source for in-vivo retinal OCT imaging

Author(s): Gyeong Hun Kim, Seong Jin Bak, Tae Joong Eom, Chang-Seok Kim, Pusan National Univ. (Republic of Korea)

Conference 12367

12367-8 • 10:15 AM - 10:30 AM

Novel 1.6 MHz swept source for real-time volumetric in-vivo OCT imaging of the human retina

Author(s): Esteban Andres Proano Grijalva, Technical Univ. of Denmark (Denmark); Alejandro Martínez Jiménez, Adrian Bradu, Adrian Fernandez Uceda, Univ. of Kent (United Kingdom); Bjorn Meyer, Ane Jensen, OCTLIGHT ApS (Denmark); Elizaveta Semenova, Technical Univ. of Denmark (Denmark); Thor Ersted Ansbaek, OCTLIGHT ApS (Denmark); Kresten Yvind, Technical Univ. of Denmark (Denmark), OCTLIGHT ApS (Denmark); Adrian G. H. Podoleanu, Univ. of Kent (United Kingdom)

12367-9 • 10:30 AM - 10:45 AM

850 nm FDML: performance and challenges

Author(s): Marie Kluft, Simon Lotz, Muhammad Asim Bashir, Univ. zu Lübeck (Germany); Tom Pfeiffer, Alexander Mlynec, Wolfgang Wieser, Optores GmbH (Germany); Alexander Chamorovski, Vladimir R. Shidlovski, Superlum Diodes Ltd. (Ireland); Robert A. Huber, Univ. zu Lübeck (Germany)

12367-10 • 10:45 AM - 11:00 AM

MHz time stretch swept source using a commercial erbium-doped fiber amplifier

Author(s): Alejandro Martínez Jiménez, Univ. of Kent (United Kingdom); Matej Spacek, Brno Univ. of Technology (Czech Republic); Melanie Wacker, Robert A. Huber, Univ. zu Lübeck (Germany); Adrian Bradu, Adrian G. H. Podoleanu, Univ. of Kent (United Kingdom)

12367-11 • 11:00 AM - 11:15 AM

1190 nm Fourier domain mode locked (FDML) laser for optical coherence tomography (OCT)

Author(s): Muhammad Asim Bashir, Simon Lotz, Marie Kluft, Institut Für Biomedizinische Optik, Univ. zu Lübeck (Germany); Igor Krestnikov, Innolume GmbH (Germany); Christian Jirauschek, Technische Univ. München (Germany); Robert A. Huber, Institut Für Biomedizinische Optik, Univ. zu Lübeck (Germany)

12367-12 • 11:15 AM - 11:30 AM

A dual resonance sweeping regime in dispersion tuned akinetic swept source at 1550 nm

Author(s): Rene Riha, Adrian Bradu, Adrian G. H. Podoleanu, Univ. of Kent (United Kingdom)

Lunch Break 11:30 AM - 1:00 PM

SESSION 3: OPHTHALMIC NEW TECHNOLOGY

1:00 PM - 3:00 PM

Moscone Center, Room 201 (Level 2 South)

Session chair: Ruikang K. Wang, Univ. of Washington (United States)

12367-13 • 1:00 PM - 1:15 PM

Theoretical and practical considerations in translational optoretinography

Author(s): Ravi S. Jonnal, Reddikumar Maddipatla, Kari V. Vienola, Denise Valente, Robert J. Zawadzki, Univ. of California, Davis (United States)

12367-14 • 1:15 PM - 1:30 PM

Repeatable retinal imaging independent of posture and head pose with robotically-aligned optical coherence tomography

Author(s): Mark Draelos, Pablo Ortiz, Amit Narawane, Ryan P. McNabb, Anthony N. Kuo, Joseph A. Izatt, Duke Univ. (United States)

12367-15 • 1:30 PM - 1:45 PM

Influence of eye movements on functional signals in optoretinography

Author(s): Clara Pfäffle, Svea Höhl, Hendrik Spahr, Léo Puyó, Univ. zu Lübeck (Germany); Jonas Franke, Medizinisches Laserzentrum Lübeck GmbH (Germany); Gereon M. Hüttmann, Univ. zu Lübeck (Germany), Medizinisches Laserzentrum Lübeck GmbH (Germany), Airway Research Ctr. North (ARCN), Deutsches Zentrum für Lungenforschung (Germany); Dierck Hillmann, Vrije Univ. Amsterdam (Netherlands)

12367-16 • 1:45 PM - 2:00 PM

Visible light optical coherence tomography (OCT) of the human retina with superluminescent diodes (SLDs)

Author(s): Ruoyu Meng, NYU Langone Health (United States), NYU Tandon School of Engineering (United States); Alok Gupta, NYU Langone Health (United States); Vivek J. Srinivasan, NYU Langone Health (United States), Univ. of California, Davis (United States)

12367-17 • 2:00 PM - 2:15 PM

Potential and limitations of a commercial OCT device for high-resolution and functional retinal imaging

Author(s): Jonas Franke, Hendrik Spahr, Univ. zu Lübeck (Germany), Medizinisches Laserzentrum Lübeck GmbH (Germany); Lisa Kutzner, Heidelberg Engineering GmbH (Germany); Clara Pfäffle, Gerrit Meußler, Univ. zu Lübeck (Germany); Silke Aumann, Roland Rocholz, Heidelberg Engineering GmbH (Germany); Léo Puyó, Univ. zu Lübeck (Germany); Gereon M. Hüttmann, Univ. zu Lübeck (Germany), Medizinisches Laserzentrum Lübeck GmbH (Germany), Airway Research Ctr. North (ARCN), Deutsches Zentrum für Lungenforschung (Germany); Dierck Hillmann, Vrije Univ. Amsterdam (Netherlands)

12367-18 • 2:15 PM - 2:30 PM

Optimization of intraoperative spectrally encoded coherence tomography and reflectometry for ophthalmic surgery

Author(s): Rachel Hecht, Jacob J. Watson, Eric M. Tang, Yuankai K. Tao, Vanderbilt Univ. (United States)

12367-19 • 2:30 PM - 2:45 PM

A dynamic full field optical coherence tomography module for in vitro retinal and corneal imaging

Author(s): Salvatore Azzollini, Institut de la Vision (France); Tual Monfort, Institut de la Vision (France), Ctr. Hospitalier National d'Ophthalmologie des Quinze-Vingts (France); Olivier Thouvenin, Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (France), Institut Langevin (France); Kate F. Grieve, Institut de la Vision (France), Ctr. Hospitalier National d'Ophthalmologie des Quinze-Vingts (France)

12367-20 • 2:45 PM - 3:00 PM

Sensor-driven digital motion correction of robotically-aligned optical coherence tomography retinal volumes

Author(s): Pablo Ortiz, Amit Narawane, Duke Univ. (United States); Ryan P. McNabb, Anthony N. Kuo, Duke Univ. Medical Ctr. (United States); Joseph A. Izatt, Mark Draelos, Duke Univ. (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 4: BLOOD FLOW

3:30 PM - 5:30 PM

Moscone Center, Room 201 (Level 2 South)

Session chair: Zhongping Chen, Beckman Laser Institute and Medical Clinic (United States)

12367-21 • 3:30 PM - 3:45 PM

600 kHz A-scan rate enables OCTA-based retinal blood flow speeds quantification at capillary segment level using variable interscan time analysis (VISTA)

Author(s): Yunchan Hwang, Jungeun Won, Siyu Chen, Massachusetts Institute of Technology (United States); Antonio Yaghy, Jessica M. Girgis, Kenneth Lam, Nadia K. Waheed, New England Eye Ctr. (United States); James G. Fujimoto, Massachusetts Institute of Technology (United States)

12367-22 • 3:45 PM - 4:00 PM

Visually evoked blood flow change in the trilaminar retinal vasculature using OCT capillary velocimetry

Author(s): Bingyao Tan, Nanyang Technological Univ. (Singapore); Ouyang Qingling, Veluchamy A. Barathi, Leopold Schmetterer, Singapore Eye Research Institute (Singapore)

12367-23 • 4:00 PM - 4:15 PM

Exact measurement of transverse flow velocity using few-mode optical coherence tomography

Author(s): Raphaël Maltais-Tariant, Polytechnique Montréal (Canada); Mathieu Dehaes, Radio-oncology and Nuclear Medicine, Univ. de Montréal (Canada), CHU Sainte-Justine (Canada); Caroline Boudoux, Polytechnique Montréal (Canada), Castor Optic, Inc. (Canada), CHU Sainte-Justine (Canada)

12367-24 • 4:15 PM - 4:30 PM

Sub-diffusion flow velocimetry with number fluctuation optical coherence tomography

Author(s): Konstantine Cheishvili, Jeroen Kalkman, Technische Univ. Delft (Netherlands)

12367-25 • 4:30 PM - 4:45 PM

OCT velocimetry of in vivo vitreous dynamics induced by ocular saccades

Author(s): Evangeline Priyadharshini Devaraj, Daniel Ruminski, Bartłomiej Kaluzny, Nicolaus Copernicus Univ. (Poland); Jerry Sebag, VMR Institute (United States), Doheny Eye Institute (United States); Ireneusz P. Grulkowski, Nicolaus Copernicus Univ. (Poland)

12367-26 • 4:45 PM - 5:00 PM

Scanning dynamic light scattering optical coherence tomography for measurement of high omnidirectional flow velocities

Author(s): Konstantine Cheishvili, Jeroen Kalkman, Technische Univ. Delft (Netherlands)

12367-27 • 5:00 PM - 5:15 PM

Integrating pressure sensor with OCT handheld probe to facilitate imaging of blood perfusion in Skin

Author(s): Yaping Shi, Jie Lu, Nhan Le, Ruikang K. Wang, Univ. of Washington (United States)

12367-28 • 5:15 PM - 5:30 PM

1.7-micron optical coherence tomography angiography (OCTA) for characterization of hereditary hemorrhagic telangiectasia (HHT) lesions

Author(s): Raksha Sreeramachandra Murthy, Univ. of California, Irvine (United States), Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (United States); Rachel Elsanadi, Beckman Laser Institute and Medical Clinic (United States); Yan Li, John Soliman, Univ. of California, Irvine (United States), Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (United States); Li-Dek Chou, Beckman Laser Institute and Medical Clinic (United States); Dennis Sprecher, Cure HHT (United States); Christopher C. W. Hughes, Univ. of California, Irvine (United States); Kristen M. Kelly, Univ. of California, Irvine (United States), Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (United States); Zhongping Chen, Dept. of Biomedical Engg, Univ. of California, Irvine (United States), Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (United States)

POSTERS-MONDAY

30 January 2023 • 5:30 PM - 7:00 PM PST

Moscone Center, Level 2 West

Conference attendees are invited to attend the Monday BIOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM - 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12367-84 • On demand | Presented live 30 January 2023

Common-path optical coherence tomography using Bessel beam axicon probe for malignancy identification

Author(s): Pooja Gupta, Kaushal Vairagi, CSIR - Central Scientific Instruments Organisation (India), Academy of Scientific and Innovative Research (AcSIR) (India); Vishal Sharma, Kaushal Kishor Prasad, Postgraduate Institute of Medical Education and Research (India); Samir K. Mondal, CSIR - Central Scientific Instruments Organisation (India), Academy of Scientific and Innovative Research (AcSIR) (India)

12367-86 • On demand | Presented live 30 January 2023

Design and fabrication of a long-term stable model eye for OCT retinal imaging

Author(s): Takuro Okubo, Topcon Corp. (Japan); Toshihiro Mino, Topcon Advanced Biomedical Imaging Lab. (United States)

12367-87 • On demand | Presented live 30 January 2023

Integrated 840nm high-power dual-polarization SLED source

Author(s): Stefan Gloor, José Rios, Nikolay Primerov, Nicolai Matuschek, Marcus Duellk, EXALOS AG (Switzerland)

12367-88

Fourier domain OCT interferometric ranging

Author(s): Bart C. Johnson, Joey M. Jabbour, Ivo Nikolov, Nate J. Kemp, Peter Whitney, Excelitas Technologies Corp. (United States)

Conference 12367

12367-90

Precision dermatomy under OCT control: data on skin anatomy and clinical application possibilities

Author(s): Artem A. Karpenko, Ksenia S. Petrova, Galina A. Petrova, Svetlana V. Nemirova, Privolzhsky Research Medical Univ. (Russian Federation); Ekaterina P. Proidakova, Lobachevsky State Univ. of Nizhny Novgorod (Russian Federation); Elena N. Derpalyuk, Privolzhsky Research Medical Univ. (Russian Federation)

12367-91 • On demand | Presented live 30 January 2023

Label-free ex-vivo animal tissue metabolism investigation using dynamic optical coherence tomography

Author(s): Pradipta Mukherjee, Shinichi Fukuda, Donny Lukmanto, Toshiharu Yamashita, Kosuke Okada, Shuichi Makita, Univ. of Tsukuba (Japan); Ibrahim G. Abd El-Sadek, Univ. of Tsukuba (Japan), Damietta Univ. (Egypt); Arata Miyazawa, Sky Technology Inc. (Japan); Yoshiaki Yasuno, Univ. of Tsukuba (Japan)

12367-92

Pulsatility index estimation in ocular vessels using Doppler optical coherence tomography

Author(s): Ewelina Pijewska, Jakub Kluczewski, Michal Chlebiej, Krystian Wrobel, Nicolaus Copernicus Univ. (Poland); Mikolaj Pawlak, Poznan Univ. of Medical Sciences (Poland); Maciej Szkulmowski, Nicolaus Copernicus Univ. (Poland)

12367-93

Imaging prostate tumor spheroids with dynamic contrast UHR-OCT

Author(s): Stephanie Swanson, Univ. of Waterloo (Canada), Grand River Regional Cancer Ctr., Grand River Hospital (Canada); Keyu Chen, Ehsan Imani, Univ. of Waterloo (Canada); Ernest Osei, Grand River Regional Cancer Ctr., Grand River Hospital (Canada), Univ. of Waterloo (Canada), Ontario Veterinary College, Univ. of Guelph (Canada); Kostadinka Bizheva, Univ. of Waterloo (Canada)

12367-94 • On demand | Presented live 30 January 2023

Evaluating vessel mechanics with optical coherence tomography based digital image correlation

Author(s): Reece W. Fratus, Thomas Fair, Adam T. Baker, Lucas Schmidt, Tong Ye, Bruce Z. Gao, Clemson Univ. (United States); Qi Wang, Taixing Cui, Univ. of South Carolina (United States); Thomas K. Borg, Arman Kilic, Medical Univ. of South Carolina (United States)

12367-95

Low noise operation of phase-code mode-locked (PCML) laser for circular-ranging OCT

Author(s): Tae Shik Kim, Benjamin J. Vakoc, Massachusetts General Hospital (United States)

12367-96 • On demand | Presented live 30 January 2023

Universal image formation theory for linear/nonlinear optical microscopy and optical coherence tomography

Author(s): Naoki Fukutake, Nikon Corp. (Japan); Shuichi Makita, Yoshiaki Yasuno, Univ. of Tsukuba (Japan)

12367-97 • On demand | Presented live 30 January 2023

Label-free dynamic OCT (D-OCT) based evaluation of tumor spheroids

Author(s): Ibrahim G. Abd El-Sadek, Univ. of Tsukuba (Japan), Damietta Univ. (Egypt); Rion Morishita, Tomoko Mori, Shuichi Makita, Pradipta Mukherjee, Satoshi Matsusaka, Yoshiaki Yasuno, Univ. of Tsukuba (Japan)

12367-98

High-resolution chromatic optical coherence tomography with extended imaging range

Author(s): Seung Eon Lee, Hongki Yoo, KAIST (Republic of Korea)

12367-99 • On demand | Presented live 30 January 2023

Disperse scatterer model of OCT and its application to design volumetric differential contrast imaging

Author(s): Kiriko Tomita, Shuichi Makita, Univ. of Tsukuba (Japan); Naoki Fukutake, Nikon Corp. (Japan); Rion Morishita, Univ. of Tsukuba (Japan); Ibrahim G. Abd El-Sadek, Univ. of Tsukuba (Japan), Damietta Univ. (Egypt); Pradipta Mukherjee, Univ. of Tsukuba (Japan); Antonia Lichtenegger, Univ. of Tsukuba (Japan), Zentrum für Medizinische Physik und Biomedizinische Technik, Medizinische Univ. Wien (Austria); Junya Tamaoki, Zentrum für Medizinische Physik und Biomedizinische Technik, Medizinische Univ. Wien (Japan); Lixuan Bian, Makoto Kobayashi, Univ. of Tsukuba (Japan); Tmoko Mori, Satoshi Matsusaka, Clinical Research and Regional Innovation, Univ. of Tsukuba (Japan); Yoshiaki Yasuno, Univ. of Tsukuba (Japan)

12367-100 • On demand | Presented live 30 January 2023

B-scan-wise multi-focus averaging method to suppress multiple scattering signal

Author(s): Yiqiang Zhu, Lida Zhu, Shuichi Makita, Yiheng Lim, Yoshiaki Yasuno, Univ. of Tsukuba (Japan)

12367-101

OCTSharp: an open-source C# software for OCT

Author(s): Weihao Chen, Hui Wang, Miami Univ. (United States)

12367-102 • On demand | Presented live 30 January 2023

Critique on optical coherence tomography in epistemological metrology

Author(s): Yoshiaki Yasuno, Univ. of Tsukuba (Japan)

12367-103 • On demand | Presented live 30 January 2023

Uncertainty measurement and confidence calibration for calcium detection in optical coherence images

Author(s): Hongshan Liu, Stevens Institute of Technology (United States); Abdul L. D. Bamba, Columbia Univ. (United States); Yu Gan, Stevens Institute of Technology (United States)

12367-104 • On demand | Presented live 30 January 2023

Long-range frequency-domain optical delay line based on a spinning tilted mirror for low-cost ocular biometry

Author(s): Maria Pilar Urizar, Instituto de Óptica "Daza de Valdés", Superior Council of Scientific Research (Spain), 2EyesVision S.L. (Spain); Alberto de Castro, Instituto de Óptica "Daza de Valdés", Consejo Superior de Investigaciones Científicas (Spain); Enrique Gamba, 2EYES VISION (Spain); Álvaro de la Peña, Institute of Optics "Daza de Valdés", Consejo Superior de Investigaciones Científicas (Spain); Onur Cetinkaya, International Ctr. for Translational Eye Research (Poland), Institute of Physical Chemistry (Poland); Susana Marcos, Instituto de Óptica "Daza de Valdés", Consejo Superior de Investigaciones Científicas (Spain), Ctr. for Visual Sciences, The Institute of Optics, Univ. of Rochester (United States), Flaum Eye Institute, Univ. of Rochester (United States); Andrea Curatolo, International Ctr. for Translational Eye Research (Poland), Institute of Physical Chemistry (Poland)

12367-105 • On demand | Presented live 30 January 2023

Spatio-temporal optical coherence tomography (STOC-T) focal plane adjustment in the mouse retina aided by a fundus camera

Author(s): Wiktor Kulesza, Kamil Łuczkiwicz, Piotr F. Węgrzyn, Sławomir Tomczewski, Dawid Borycki, Piotr Ciągła, Onur Cetinkaya, Maciej Wielgo, Katarzyna Kordecka, Anna Galińska, International Ctr. for Translational Eye Research (Poland); Egidijus Aukorius, Ctr. for Physical Sciences and Technology (Lithuania); Andrzej Foik, International Ctr. for Translational Eye Research (Poland); Robert J. Zawadzki, Univ. of California, Davis (United States); Maciej Wojtkowski, Andrea Curatolo, International Ctr. for Translational Eye Research (Poland)

12367-106 • On demand | Presented live 30 January 2023

Characterization of SiN/SiO₂ based MEMS-VCSEL at 1550 nm for optical coherence tomography

Author(s): Irene Rodriguez Lamoso, Technische Univ. Darmstadt (Germany); Alejandro Martínez Jiménez, Univ. of Kent (United Kingdom); Julijan Cesar, Sascha Preu, Technische Univ. Darmstadt (Germany); Adrian G. H. Podoleanu, Univ. of Kent (United Kingdom)

12367-107

3D motion tracking using optical coherence tomography based on circular scan patterns

Author(s): Senyue Hao, Washington Univ. in St. Louis (United States); Marcello M. Amaral, Washington Univ. in St. Louis (United States); Chao Zhou, Washington Univ. in St. Louis (United States)

12367-108

Doped-fiber amplification for watt-level OCT imaging at 1.0 μm and 1.56 μm

Author(s): Yong-Chul Yoon, Yongjoo Kim, Tae Shik Kim, Benjamin J. Vakoc, Joshua Greene, Wellman Ctr. for Photomedicine (United States)

TUESDAY 31 JANUARY

SESSION 5: NOVEL IMAGE SCANNING APPROACHES

8:00 AM - 9:30 AM

Moscone Center, Room 201 (Level 2 South)

Session chair: Robert A. Huber, Univ. zu Lübeck (Germany)

12367-29 • 8:00 AM - 8:15 AM

Large area robotically assisted optical coherence tomography (LARA-OCT) for skin imaging with MHz-OCT surface tracking

Author(s): Madita Göb, Simon Lotz, Institut für Biomedizinische Optik, Univ. zu Lübeck (Germany); Linh Ha-Wissel, Klinik für Dermatologie, Universitätsklinikum Schleswig-Holstein (Germany), Lübecker Institut für Experimentelle Dermatologie, Univ. zu Lübeck (Germany); Sazgar Burhan, Institut für Biomedizinische Optik, Univ. zu Lübeck (Germany); Sven Böttger, Floris Ernst, Institut für Robotik und Kognitive Systeme, Univ. zu Lübeck (Germany); Jennifer Hundt, Lübecker Institut für Experimentelle Dermatologie, Univ. zu Lübeck (Germany); Robert A. Huber, Institut für Biomedizinische Optik, Univ. zu Lübeck (Germany), Medizinisches Laserzentrum Lübeck GmbH (Germany)

12367-30 • 8:15 AM - 8:30 AM

A 32-beam, circular-ranging OCT system for video-rate, volumetric, laparoscopic imaging

Author(s): Yongjoo Kim, Wellman Ctr. for Photomedicine (United States), Harvard Medical School (United States); Yong-Chul Yoon, Wellman Ctr. for Photomedicine (United States), Harvard-MIT Health Sciences and Technology (United States); Hyun-Sang Park, Tae Shik Kim, Ahhyun S. Nam, Danielle J. Harper, Wellman Ctr. for Photomedicine (United States), Harvard Medical School (United States); Norman Lippok, Rafael A. Lomeli-Navarro, Wellman Ctr. for Photomedicine (United States); Benjamin J. Vakoc, Wellman Ctr. for Photomedicine (United States), Harvard Medical School (United States), Harvard-MIT Health Sciences and Technology (United States)

12367-31 • 8:30 AM - 8:45 AM

Efficient 3D cell tracking using adaptive scanning OCT

Author(s): Yuan Tian, Mark Draelos, Duke Univ. (United States); Ryan P. McNabb, Duke Univ. Medical Ctr. (United States); Al-Hafeez Z. Dhalla, Duke Univ. (United States); Anthony N. Kuo, Duke Univ. Medical Ctr. (United States); Joseph A. Izatt, Duke Univ. (United States)

12367-32 • 8:45 AM - 9:00 AM

Motion-immune digital refocusing of point-scanning optical coherence tomography using Lissajous scan for in vivo imaging

Author(s): Shuichi Makita, Lida Zhu, Pradipta Mukherjee, Yiheng Lim, Rion Morishita, Univ. of Tsukuba (Japan); Ibrahim G. Abd El-Sadek, Univ. of Tsukuba (Japan), Damiatta Univ. (Egypt); Yoshiaki Yasuno, Univ. of Tsukuba (Japan)

12367-33 • 9:00 AM - 9:15 AM

High-speed automatically aligning tabletop optical beam scanning device for OCT

Author(s): J. Kenji Clark, Shigeru Nakamura, NEC Corp. (Japan)

12367-34 • 9:15 AM - 9:30 AM

Multiple scattering suppression by multi-focus averaging in Jones-matrix optical coherence tomography

Author(s): Lida Zhu, Shuichi Makita, Yiheng Lim, Junya Tamaoki, Yiqiang Zhu, Makoto Kobayashi, Yoshiaki Yasuno, Univ. of Tsukuba (Japan)

Coffee Break 9:30 AM - 10:00 AM

SESSION 6: NOVEL SAMPLE ARM DESIGN

10:00 AM - 11:30 AM

Moscone Center, Room 201 (Level 2 South)

Session chair: Kostadinka Bizheva, Univ. of Waterloo (Canada)

12367-35 • 10:00 AM - 10:15 AM

Extended depth of focus in spectral-domain optical coherence tomography using in-situ ultrasonic virtual tunable optical waveguides

Author(s): Yasin Karimi, Carnegie Mellon Univ. (United States); Hang Yang, Junze Liu, B. Hyle Park, Univ. of California, Riverside (United States); Maysamreza Chamanzar, Carnegie Mellon Univ. (United States)

Conference 12367

12367-36 • 10:15 AM - 10:30 AM

Simulation study of aberration-diverse optical coherence tomography for deep tissue imaging

Author(s): Benjamin Shearer, Steven G. Adie, Siyang Liu, Meiqi Wu, Cornell Univ. (United States)

12367-37 • 10:30 AM - 10:45 AM

Diffused-illumination full-field swept-source optical coherence tomography

Author(s): Léo Puyo, Institut für Biomedizinische Optik, Univ. of Lübeck (Germany), Medizinisches Laserzentrum Lübeck GmbH (Germany); Clara Pfäffle, Hendrik Spahr, Institut für Biomedizinische Optik, Univ. of Lübeck (Germany); Daniel Bublitz, Carl Zeiss AG (Germany); Dierck Hillmann, Vrije Univ. Amsterdam (Netherlands); Gereon M. Hüttmann, Institut für Biomedizinische Optik, Univ. of Lübeck (Germany), Medizinisches Laserzentrum Lübeck GmbH (Germany), Airway Research Ctr. North (ARCN), Deutsches Zentrum für Lungenforschung (Germany)

12367-38 • 10:45 AM - 11:00 AM

Real-time line-field oct using low-cost high-speed camera

Author(s): Kai Neuhaus, Shuibin Ni, Shanjida Khan, Omkar Tharawe, Siyu Chen, David Huang, Yifan Jian, Oregon Health & Science Univ. (United States)

12367-39 • 11:00 AM - 11:15 AM

Powell lens-based line-scan SD-OCT

Author(s): Keyu Chen, Weixiang Song, Le Han, Kostadinka Bizheva, Univ. of Waterloo (Canada)

12367-40 • 11:15 AM - 11:30 AM

DMD-based structured illumination full-field optical coherence tomography

Author(s): Yue Zhu, Nanjing Univ. of Science and Technology (China), Univ. of Tsukuba (Japan); Yuan Zhou, Sir Run Run Shaw Hospital, Zhejiang Univ. School of Medicine (China); Zhenyan Guo, Nanjing Univ. of Science and Technology (China); Haoying Tian, College of Design and Engineering (Singapore), Nanjing Univ. of Science and Technology (China)

Lunch/Exhibition Break 11:30 AM - 1:00 PM

SESSION 7: OCT NEW TECHNOLOGY

1:00 PM - 3:00 PM

Moscone Center, Room 201 (Level 2 South)

Session chair: Rainer A. Leitgeb, Medizinische Univ. Wien (Austria)

12367-41 • 1:00 PM - 1:15 PM

Integrated time-stepped optical frequency comb laser sources for time-discrete OCT

Author(s): Norman Lippok, Wellman Ctr. for Photomedicine, Harvard Medical School (United States); Jeffrey Holzgrafe, Harvard John A. Paulson School of Engineering and Applied Sciences, Harvard Univ. (United States); Georgios Kyriazidis, Harvard John A. Paulson School of Engineering and Applied Sciences (United States); Yongjoo Kim, Wellman Ctr. for Photomedicine, Harvard Medical School (United States); Xinrui Zhu, Yaowen Hu, Gage Hills, Marko Loncar, Harvard John A. Paulson School of Engineering and Applied Sciences (United States); Benjamin J. Vakoc, Wellman Ctr. for Photomedicine, Harvard Medical School (United States); Hana Warner, Harvard John A. Paulson School of Engineering and Applied Sciences (United States)

12367-42 • 1:15 PM - 1:30 PM

Overall performance of compressed sensing of human breast OCT data using a predictive coding algorithm

Author(s): Diego M. Song Cho, Christine P. Hendon, Columbia Univ. (United States)

12367-43 • 1:30 PM - 1:45 PM

Functionally multiplexed optical coherence tomography for comprehensive and volumetric analysis of tissue microstructure

Author(s): Taylor M. Cannon, Rachel H. Chae, Brett E. Bouma, Néstor Uribe-Patarroyo, Wellman Ctr. for Photomedicine (United States)

12367-44 • 1:45 PM - 2:00 PM

Subpixel motion correction for phase-sensitive optical coherence tomography

Author(s): Huakun Li, Nanyang Technological Univ. (Singapore); Bingyao Tan, Nanyang Technological Univ. (Singapore), SERI-NTU Advanced Ocular Engineering (STANCE) (Singapore), Singapore Eye Research Institute, Singapore National Eye Ctr. (Singapore); Vimal P. Pandiyan, Univ. of Washington (United States); Veluchamy A. Barathi, Singapore Eye Research Institute (Singapore); Ramkumar Sabesan, Univ. of Washington (United States); Leopold Schmetterer, Tong Ling, Nanyang Technological Univ. (Singapore), SERI-NTU Advanced Ocular Engineering (STANCE) (Singapore), Singapore Eye Research Institute (Singapore)

12367-45 • 2:00 PM - 2:15 PM

Multimodal imaging with ultraviolet photoacoustic remote sensing and interferometric synthetic aperture microscopy

Author(s): Matthew T. Martell, Nathaniel J. M. Haven, Brendon S. Restall, Roger J. Zemp, Univ. of Alberta (Canada)

12367-46 • 2:15 PM - 2:30 PM

Visualization of backscattering photon distribution with beam-offset OCT

Author(s): Weiming Xu, Hui Wang, Miami Univ. (United States)

12367-47 • 2:30 PM - 2:45 PM

Rotational distortion and compensation in optical coherence tomography

Author(s): Guangying Ma, Taeyun Son, Tobiloba Adejumo, Xincheng Yao, Univ. of Illinois at Chicago (United States)

12367-48

Fast iterative 2D method empowered by GPU acceleration for Fourier-domain optical coherence tomography image reconstruction

Author(s): Mengyuan Wang, Zhenxing Dong, Yuye Ling, Yikai Su, Shanghai Jiao Tong Univ. (China); Yu Gan, Stevens Institute of Technology (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 8: NOVEL CONTRAST

3:30 PM - 5:30 PM

Moscone Center, Room 201 (Level 2 South)

Session chair: Yoshiaki Yasuno, Univ. of Tsukuba (Japan)

12367-49 • 3:30 PM - 3:45 PM

Visible-light optical coherence microscopy for corneal imaging

Author(s): Shanjida Khan, Kai Neuhaus, Omkar Thaware, Mini Aga, Oregon Health & Science Univ. (United States); Alireza Karimi, Department of Ophthalmology and Visual Sciences, University of Alabama at Birmingham (United States); Mary Kelley, Travis Redd, Ted Acott, Oregon Health & Science Univ. (United States); Myeong Jin Jin, The Univ. of British Columbia (Canada); David Huang, Yifan Jian, Oregon Health & Science Univ. (United States)

12367-50 • 3:45 PM - 4:00 PM

In-vivo quantification of total hemoglobin concentrations with visible-light spectroscopic optical coherence tomography

Author(s): Carlos Cuartas-Vélez, Nienke Bosschaart, Univ. Twente (Netherlands)

12367-51 • 4:00 PM - 4:15 PM

Bond-selective full-field optical coherence tomography

Author(s): Haonan Zong, Celalettin Yurdakul, Jian Zhao, Zian Wang, Fukai Chen, M. Selim Ünlü, Ji-Xin Cheng, Boston Univ. (United States)

12367-52 • 4:15 PM - 4:30 PM

Classifying tumor heterogeneity of human esophageal cancer biopsies by dynamic contrast OCT with deep learning

Author(s): Zhen Hua, Purdue Univ. (United States); Shadia I. Jalal, Indiana Univ. (United States); John J. Turek, David Nolte, Purdue Univ. (United States)

12367-53 • 4:30 PM - 4:45 PM

Precision of attenuation coefficient measurements by optical coherence tomography

Author(s): Linda B. Neubrand, Ton G. van Leeuwen, Dirk J. Faber, Amsterdam UMC (Netherlands)

12367-54 • 4:45 PM - 5:00 PM

Improving the estimation accuracy of the scatterer density estimation by accounting for the spatial property of the noise in optical coherence tomography

Author(s): Thitiya Seesan, Pradipta Mukherjee, Ibrahim G. Abd El-Sadek, Yiheng Lim, Shuichi Makita, Univ. of Tsukuba (Japan); Prathan Buranasiri, King Mongkut's Institute of Technology Ladkrabang (Thailand); Yoshiaki Yasuno, Univ. of Tsukuba (Japan)

12367-55 • 5:00 PM - 5:15 PM

Attenuation coefficient measurements with OCT Monte Carlo simulations compared with experimental OCT measurements on intralipid

Author(s): Gijs Buist, Vrije Univ. Amsterdam (Netherlands); Johannes Kuebler, Jörg Fischer, Heidelberg Engineering GmbH (Germany); Arjen Amelink, Johannes F. de Boer, Vrije Univ. Amsterdam (Netherlands)

12367-56 • 5:15 PM - 5:30 PM

Early identification of low-grade acute radiation dermatitis using in vivo optical coherence tomography (OCT) images of human head and neck

Author(s): Christos Photiou, Univ. of Cyprus (Cyprus); Iosif Strouthos, Constantina Cloconi, German Oncology Ctr. (Cyprus); Costas Pitris, KIOS CoE, Univ. of Cyprus (Cyprus)

WEDNESDAY 1 FEBRUARY**SESSION 9: PSOCT**

8:00 AM - 9:30 AM

Moscone Center, Room 201 (Level 2 South)

Session chair: Johannes F. de Boer, Vrije Univ. Amsterdam (Netherlands)

12367-59 • 8:00 AM - 8:15 AM

Polarization sensitive optical coherence tomography for endoscopic imaging in bronchial thermoplasty treated asthma patients

Author(s): Tatiana Soldati, Margherita Vaselli, Vrije Univ. Amsterdam (Netherlands); Pieta P. C. Wijsman, Amsterdam UMC (Netherlands); Joy Willemse, Vrije Univ. Amsterdam (Netherlands); Jouke T. Annema, Peter I. Bonta, Amsterdam UMC (Netherlands); Johannes F. de Boer, Vrije Univ. Amsterdam (Netherlands)

12367-58 • 8:15 AM - 8:30 AM

In-vivo retinal nerve fiber bundle polarimetry with probabilistic Stokes polarization-sensitive optical coherence tomography

Author(s): Sebastián Ruiz-Lopera, Massachusetts General Hospital (United States); René Restrepo, Univ. EAFIT (Colombia); Martin Villiger, Massachusetts General Hospital (United States); Brett E. E. Bouma, Massachusetts General Hospital (United States), Institute for Medical Engineering and Science (United States); Néstor Uribe-Patarroyo, Massachusetts General Hospital (United States)

12367-57 • 8:30 AM - 8:45 AM

In-vivo polarization sensitive optical coherence tomography for fibrosis quantification in interstitial lung disease

Author(s): Margherita Vaselli, Vrije Univ. Amsterdam (Netherlands); Kirsten A. Kalverda, Jouke T. Annema, Peter I. Bonta, Amsterdam UMC (Netherlands); Johannes F. de Boer, Tatiana Soldati, Vrije Univ. Amsterdam (Netherlands)

12367-60 • 8:45 AM - 9:00 AM

Epidermal-dermal segmentation and polarization feature analysis using advanced Jones matrix optical coherence tomography

Author(s): Sina Maloufi, Xin Zhou, Daniel C. Louie, The Univ. of British Columbia (Canada); Tim K. Lee, BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada); Shuo Tang, The Univ. of British Columbia (Canada)

12367-61 • 9:00 AM - 9:15 AM

Catheter-based polarization sensitive optical coherence tomography with a single input polarization state

Author(s): Georgia Thomas, Brett E. Bouma, Massachusetts General Hospital (United States), Massachusetts Institute of Technology (United States); Martin Villiger, Massachusetts General Hospital (United States)

Conference 12367

12367-62 • 9:15 AM - 9:30 AM

Triple-input polarization sensitive optical coherence tomography improves the birefringence sensitivity by reconstruction of full Mueller matrix of the sample

Author(s): Xinyu Liu, Liqin Jiang, Jacqueline Chua, Quan V. Hoang, Bingyao Tan, Singapore Eye Research Institute (Singapore); Valentina Bellemo, Nanyang Technological Univ. (Singapore); Veluchamy A. Barathi, Singapore Eye Research Institute (Singapore); Martin Villiger, Massachusetts General Hospital (United States); Leopold Schmetterer, Nanyang Technological Univ. (Singapore)

Coffee Break 9:30 AM - 10:00 AM

SESSION 10: OPTICAL COHERENCE ELASTOGRAPHY

10:00 AM - 11:30 AM

Moscone Center, Room 201 (Level 2 South)

Session chair: Kirill V. Larin, Univ. of Houston (United States)

12367-63 • 10:00 AM - 10:15 AM

High-resolution 3D biomechanical mapping of embryos with reverberant optical coherence elastography (Rev-OCE)

Author(s): Christian Zevallos Delgado, Yogeshwari S. Ambekar, Taye T. Mekonnen, Univ. of Houston (United States); Fernando Zvietcovich, Pontificia Univ. Católica del Perú (Peru); Nadine Nijem, Manmohan Singh, Arne C. Lekven, Salavat R. Aglyamov, Kirill V. Larin, Univ. of Houston (United States)

12367-64 • 10:15 AM - 10:30 AM

In vivo quantitative micro-elastography for detection of residual cancer during breast-conserving surgery

Author(s): Peijun Gong, The Univ. of Western Australia (Australia); Synn Lynn Chin, Fiona Stanley Hospital (Australia); Wes M. Allen, The Univ. of Western Australia (Australia); Helen Ballal, Fiona Stanley Hospital (Australia); James D. Anstie, Lixin Chin, Hina Ismail, Renate Zilkens, Devina D. Lakhiani, The Univ. of Western Australia (Australia); Matthew McCarthy, OncoRes Medical Pty. Ltd. (Australia); Qi Fang, Daniel Firth, Kyle Newman, Caleb Thomas, Jiayue Li, Rowan W. Sanderson, Ken Y. Foo, The Univ. of Western Australia (Australia); Chris Yeomans, Benjamin F. Dessauvagie, Bruce Latham, PathWest Lab. Medicine WA (Australia); Christobel M. Saunders, Brendan F. Kennedy, The Univ. of Western Australia (Australia)

12367-65 • 10:30 AM - 10:45 AM

Enabling quantitative shear wave elastography in conventional optical coherence tomography in vivo

Author(s): Ginger J. Schmidt, Wellman Ctr. for Photomedicine (United States), Institute for Medical Engineering and Science, Massachusetts Institute of Technology (United States); Taylor M. Cannon, Wellman Ctr. for Photomedicine (United States), Institute for Medical Engineering and Science (United States); Brett E. Bouma, Wellman Ctr. for Photomedicine (United States), Institute for Medical Engineering and Science, Massachusetts Institute of Technology (United States); Néstor Uribe-Patarroyo, Wellman Ctr. for Photomedicine (United States)

12367-66 • 10:45 AM - 11:00 AM

Phase analysis strategies for MHz OCE in the large displacement regime

Author(s): Sazgar Burhan, Institut für Biomedizinische Optik, Univ. zu Lübeck (Germany); Nicolas Detrez, Medizinisches Laserzentrum Lübeck GmbH (Germany); Katharina Rewerts, Madita Göb, Institut für Biomedizinische Optik, Univ. zu Lübeck (Germany); Steffen Buschschlüter, Söring GmbH (Germany); Christian Hagel, Universitätsklinikum Hamburg-Eppendorf (Germany); Matteo M. Bonsanto, Klinik für Neurochirurgie, Universitätsklinikum Schleswig-Holstein (Germany); Dirk Theisen-Kunde, Medizinisches Laserzentrum Lübeck GmbH (Germany); Robert A. Huber, Ralf Brinkmann, Institut für Biomedizinische Optik, Univ. zu Lübeck (Germany), Medizinisches Laserzentrum Lübeck GmbH (Germany)

12367-67 • 11:00 AM - 11:15 AM

Highly sensitive and robust strain retrieval in optical coherence elastography

Author(s): Balazs Dura-Kovacs, Andrea Mazzolani, Jakub Zalesak, Univ. College London (United Kingdom); Jiayue Li, Matt S. Hepburn, Brendan F. Kennedy, The Univ. of Western Australia (Australia); Peter R. T. Munro, Univ. College London (United Kingdom)

12367-68 • 11:15 AM - 11:30 AM

In-vivo multimodal single-shot off-axis FF-OCT (SO-FF-OCT) imaging: optical tomography and shear wave elastography

Author(s): Emmanuel Martins Seromenho, Agathe Marmin, Sybille Facca, Nadia Bahlouli, Amir Nahas, ICube (France)

Lunch/Exhibition Break 11:30 AM - 1:00 PM

SESSION 11: MACHINE LEARNING AND IMAGE PROCESSING

1:00 PM - 2:45 PM

Moscone Center, Room 201 (Level 2 South)

Session chair: Wolfgang Drexler, Medizinische Univ. Wien (Austria)

12367-69 • 1:00 PM - 1:15 PM

Morphological segmentation and fractal analysis for the classification of colon polyps from en face optical coherence tomography (OCT) images

Author(s): Costas Pitris, Univ. of Cyprus (Cyprus); Andrew D. Thrapp, Massachusetts General Hospital, Harvard Medical School (United States); Guillermo J. Tearney, Massachusetts General Hospital, Harvard Medical School (United States)

12367-70 • 1:15 PM - 1:30 PM

Robust classification of diabetic retinopathy from small, weakly labeled OCTA datasets using multiple instance learning

Author(s): Philipp Matten, Julius Scherer, Thomas Schlegl, Jonas Nienhaus, Heiko Stino, Andreas Pollreisz, Wolfgang Drexler, Rainer A. Leitgeb, Medizinische Univ. Wien (Austria); Tilman Schmoll, Medizinische Univ. Wien (Austria), Carl Zeiss Meditec Inc. (United States)

12367-71 • 1:30 PM - 1:45 PM

Real-time neural-network-based denoising for intraoperative 4D-OCT

Author(s): Jonas Nienhaus, Allgemeines Krankenhaus der Stadt Wien (Austria), Medizinische Univ. Wien (Austria); Philipp Matten, Anja Britten, Thomas Schlegl, Medizinische Univ. Wien (Austria); Eva Höck, Alexander Freytag, Carl Zeiss AG (Germany); Matt J. Everett, Carl Zeiss Meditec, Inc. (United States); Nancy Hecker-Denschlag, Carl Zeiss Meditec AG (Germany); Wolfgang Drexler, Rainer A. Leitgeb, Medizinische Univ. Wien (Austria); Tilman Schmoll, Medizinische Univ. Wien (Austria), Carl Zeiss Meditec, Inc. (United States)

12367-72 • 1:45 PM - 2:00 PM

Angular compounding for physically informed training of speckle suppression algorithms

Author(s): Pelham Keahey, Brett E. Bouma, Martin Villiger, Wellman Ctr. for Photomedicine (United States)

12367-73 • 2:00 PM - 2:15 PM

Optical sectioning in a single camera shot using deep learning-assisted Full-field OCT

Author(s): Viacheslav Mazlin, Albert Claude Boccara, Samer Alhaddad, Institut Langevin (France)

12367-74 • 2:15 PM - 2:30 PM

Complex conjugate artifact removal in FD-OCT using generative adversarial network

Author(s): Valentina Bellemo, Nanyang Technological Univ. (Singapore), SERI-NTU Advanced Ocular Engineering (STANCE) Lab. (Singapore); Leopold Schmetterer, Singapore Eye Research Institute (Singapore), Nanyang Technological Univ. (Singapore), SERI-NTU Advanced Ocular Engineering (STANCE) Lab. (Singapore); Xinyu Liu, Singapore Eye Research Institute (Singapore)

12367-75 • 2:30 PM - 2:45 PM

Learning to reconstruct structural OCT images from raw data using deep learning

Author(s): Thomas Schlegl, Medizinische Univ. Wien (Austria); Ali Salehi, Matt J. Everett, Niranchana Manivannan, Homayoun Bagherinia, Carl Zeiss Meditec, Inc. (United States); Michael Niederleithner, Andreas Pollreis, Wolfgang Drexler, Rainer A. Leitgeb, Medizinische Univ. Wien (Austria); Tilman Schmoll, Carl Zeiss Meditec, Inc. (United States)

Coffee Break 2:45 PM - 3:15 PM

SESSION 12: IN VITRO AND SMALL ANIMAL

3:15 PM - 5:15 PM

Moscone Center, Room 201 (Level 2 South)

Session chair: Marinko V. Sarunic, Simon Fraser Univ. (Canada)

12367-76 • 3:15 PM - 3:30 PM

Subcellular mechano-microscopy for mechanobiology of 3D cell spheroid cultures

Author(s): Alireza Mowla, Brendan F. Kennedy, Matt S. Hepburn, Jiayue Li, Yu Suk Choi, Samuel Maher, Danielle Vahala, The Univ. of Western Australia (Australia)

12367-77 • 3:30 PM - 3:45 PM

Low- and high-resolution volumetric dynamic optical coherence tomography of in vitro cell cultures

Author(s): Rion Morishita, Univ. of Tsukuba (Japan); Ibrahim G. Abd El-Sadek, Univ. of Tsukuba (Japan), Damietta Univ. (Egypt); Pradipta Mukherjee, Tomoko Mori, Univ. of Tsukuba (Japan); Suzuki Toshio, Univ. of Tsukuba (Japan), HiLung Inc. (Japan); Antonia Lichtengger, Zentrum für Medizinische Physik und Biomedizinische Technik, Medizinische Univ. Wien (Austria); Yiheng Lim, Zhu Yiqiang, Shuichi Makita, Univ. of Tsukuba (Japan); Yuki Yamamoto, Tetsuharu Nagamoto, HiLung Inc. (Japan); Satoshi Matsusaka, Yoshiaki Yasuno, Univ. of Tsukuba (Japan)

Interface self-referencing dynamic full-field optical coherence tomography for 3D live imaging of samples on glass slides

Author(s): Tual Monfort, Institut de la Vision, Sorbonne Univ., CNRS (France), Ctr. Hospitalier National d'Ophtalmologie des Quinze-Vingts (France); Salvatore Azzollini, Institut de la Vision, Sorbonne Univ., CNRS (France), INSERM (France); Kate F. Grieve, Institut de la Vision, Sorbonne Univ., CNRS (France), Ctr. Hospitalier National d'Ophtalmologie des Quinze-Vingts (France); Olivier Thouvenin, Institut Langevin (France), Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (France), CNRS (France)

Volumetric longitudinal live imaging with a multi-modal platform to monitor the morphological and functional development of human heart organoids

Author(s): Kibeom Park, Senyue Hao, Fei Wang, Washington Univ. in St. Louis (United States); Volmert D. Brett, Michigan State Univ. (United States); Marcello M. Amaral, Washington Univ. in St. Louis (United States); Yilin Li, Washington Univ. in St. Louis (United States); Aitor Aguirre, Michigan State Univ. (United States); Chao Zhou, Washington Univ. in St. Louis (United States)

12367-80 • 4:15 PM - 4:30 PM

Revealing the in vivo process of newt lens regeneration with OCT and OCTA

Author(s): Weihao Chen, Georgios Tsissios, Katia Del Rio-Tsonis, Hui Wang, Miami Univ. (United States)

12367-81 • 4:30 PM - 4:45 PM

Graphene-enabled optical cardiac control in Drosophila melanogaster

Author(s): Abby Matt, Hongwu Liang, Matthew Fishman, Elena Gracheva, Fei Wang, Xinyuan Zhang, Washington Univ. in St. Louis (United States); Alex Savchenko, Elena Molokanova, Univ. of California, San Diego (United States); Chao Zhou, Washington Univ. in St. Louis (United States)

12367-82 • 4:45 PM - 5:00 PM

Sensorless adaptive optics multi-modal functional small animal imaging for age-related macular degeneration mouse model

Author(s): Jun Song, Yusi Miao, The Univ. of British Columbia (Canada); Destiny Hsu, Simon Fraser Univ. (Canada); Joanne A. Matsubara, The Univ. of British Columbia (Canada); Marinko V. Sarunic, Simon Fraser Univ. (Canada); Myeong Jin Ju, The Univ. of British Columbia (Canada)

Conference 12367

12367-83 • 5:00 PM - 5:15 PM

Characterization of age-related follicle changes in mice ovaries using optical coherence tomography

Author(s): Marcello M. Amaral, Washington Univ. in St. Louis (United States), Univ. Brasil (Brazil); Aixia Sun, Michigan State Univ. (United States); Yilin Li, Chao Ren, Anh Truong, Washington Univ. in St. Louis (United States); Zexu Jiao, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States); Ping Wang, Michigan State Univ. (United States); Chao Zhou, Washington Univ. in St. Louis (United States)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12367-89 • On demand | Presenting live 28 January 2023

Learning OCT segmentation from a single label

Author(s): Haoran Zhang, Jianlong Yang, Xubo Tang, Botao Guo, Jingqian Zhang, Xinyi Wang, Aili Zhang, Shanghai Jiao Tong Univ. (China)

Conference 12368

30 January - 1 February 2023 | Moscone Center, Room 308 (Level 3 South)

Advanced Biomedical and Clinical Diagnostic and Surgical Guidance Systems XXI

Conference Chairs: **Caroline Boudoux**, Polytechnique Montréal (Canada); **James W. Tunnell**, The Univ. of Texas at Austin (United States)

Program Committee: **Muyinatu A. Lediju Bell**, Johns Hopkins Univ. (United States); **Dirk J. Faber**, Amsterdam UMC (Netherlands); **Daniel X. Hammer**, U.S. Food and Drug Administration (United States); **Christine P. Hendon**, Columbia Univ. (United States); **Zhiwei Huang**, National Univ. of Singapore (Singapore); **Beop-Min Kim**, Korea Univ. (Korea, Republic of); **Hui Min Leung**, Massachusetts General Hospital (United States); **Anita Mahadevan-Jansen**, Vanderbilt Univ. (United States); **Francisco E. Robles**, Georgia Institute of Technology & Emory Univ. School of Medicine (United States); **Tuan Vo-Dinh**, Fitzpatrick Institute For Photonics, Duke Univ. (United States)

SATURDAY 28 JANUARY

SESSION 1: SURGICAL GUIDANCE I

8:00 AM - 10:10 AM

Moscone Center, Room 308 (Level 3 South)

Session chair: James W. Tunnell, The Univ. of Texas at Austin (United States)

12368-1 • 8:00 AM - 8:30 AM

Real-time ultrasonic needle tip tracking with an integrated fibre-optic hydrophone *(Invited Paper)*

Author(s): Christian Baker, Miguel Xochicale, Francois Joubert, Fang-Yu Lin, King's College London (United Kingdom); Sunish J. Mathews, Univ. College London (United Kingdom); Dzhoshkun I. Shakir, Sebastien Ourselin, King's College London (United Kingdom); Anna David, Univ. College London (United Kingdom); Brian Dromey, Univ. College Hospital (United Kingdom); Adrien E. Desjardins, Univ. College London (United Kingdom); Tom Vercauteren, Wenfeng Xia, King's College London (United Kingdom)

12368-2 • 8:30 AM - 8:50 AM

Feasibility of using polarization-sensitive optical coherence tomography (PS-OCT) in epidural anesthesia guidance

Author(s): Chen Wang, Yunlong Liu, Paul Calle, Feng Yan, The Univ. of Oklahoma (United States); Alberto J. de Armendi, Shashank S. Shettar, Kar-Ming Fung, The Univ. of Oklahoma Health Sciences Ctr. (United States); Chongle Pan, Qinggong Tang, The Univ. of Oklahoma (United States)

12368-3 • 8:50 AM - 9:10 AM

Evaluation of AR image tracking for AR-guided surgical applications

Author(s): Jimmy Qiu, Trinetta Wright, Daniel Lin, Stephanie Williams, Stefan Hofer, Univ. Health Network (Canada); Blake Murphy, Unity Health Toronto (Canada)

Intraoperative detection of IDH-mutant glioma subtype using fluorescence lifetime imaging

Author(s): Silvia N. Noble Anbunesan, Alba Alfonso-Garcia, Xiangnan Zhou, Julien Bec, Matthew Bobinski, Han Sung Lee, Lee-way Jin, Orin Bloch, Laura Marcu, Univ. of California, Davis (United States)

Intraoperative laser speckle contrast imaging to visualize blood flow dynamics in neurosurgery

Author(s): Alexis Dimanche, David R. Miller, The Univ. of Texas at Austin (United States); Johannes Goldberg, Cedric Kissling, Timothy Müller, Mandy Müller, Michael Murek, David Bervini, Andreas Raabe, Inselspital (Switzerland); Andrew K. Dunn, The Univ. of Texas at Austin (United States)

12368-6 • 9:50 AM - 10:10 AM

Fiber-optic needle probe system for intra-operative Raman spectroscopic assessment of tumor resection margins

Author(s): Gerwin J. Puppels, RiverD International B.V. (Netherlands), Erasmus MC (Netherlands); Yassine Aaboubout, Erasmus MC (Netherlands); Tom C. Bakker Schut, RiverD International B.V. (Netherlands), Erasmus MC (Netherlands); Maria R. Soares-Nunes, RiverD International B.V. (Netherlands); Robert J. Baatenburg de Jong, Erasmus MC (Netherlands); Martin G. van der Wolf, RiverD International B.V. (Netherlands); Iskander Usenov, Viacheslav G. Artyushenko, art photonics GmbH (Germany); Senada Koljenovic, Univ. Ziekenhuis Antwerpen (Belgium)

Coffee Break 10:10 AM - 10:40 AM

SESSION 2: SURGICAL GUIDANCE II

10:40 AM - 11:40 AM

Moscone Center, Room 308 (Level 3 South)

Session chair: Caroline Boudoux, Polytechnique Montréal (Canada)

12368-7 • 10:40 AM - 11:00 AM

In-cavity detection of residual cancer during breast-conserving surgery using in vivo quantitative micro-elastography

Author(s): Peijun Gong, The Univ. of Western Australia (Australia); Synn Lynn Chin, Fiona Stanley Hospital (Australia); Wes M. Allen, OncoRes Medical Pty. Ltd. (Australia); Helen Ballal, Fiona Stanley Hospital (Australia); James D. Anstie, Lixin Chin, OncoRes Medical Pty. Ltd. (Australia); Hina Ismail, Renate Zilkens, Devina D. Lakhiani, The Univ. of Western Australia (Australia); Matthew McCarthy, OncoRes Medical Pty. Ltd. (Australia); Qi Fang, Daniel Firth, Kyle Newman, Caleb Thomas, Jiayue Li, Rowan W. Sanderson, Ken Y. Foo, The Univ. of Western Australia (Australia); Chris Yeomans, Benjamin F. Dessauvage, Bruce Latham, PathWest Lab. Medicine WA (Australia); Christobel M. Saunders, The Univ. of Western Australia (Australia); Fiona Stanley Hospital (Australia); Brendan Kennedy, The Univ. of Western Australia (Australia)

12368-8 • 11:00 AM - 11:20 AM

Real-time 3D-photoacoustic tracking system for localisation of an intraoperative needle tip

Author(s): Christian Baker, Weidong Liang, Mengjie Shi, Tianrui Zhao, Francois Joubert, Sebastien Ourselin, Tom Vercauteren, King's College London (United Kingdom); Richard J. Colchester, Univ. College London (United Kingdom); Simeon J. West, Univ. College Hospital (United Kingdom); Adrien E. Desjardins, Univ. College London (United Kingdom); Wenfeng Xia, King's College London (United Kingdom)

Conference 12368

12368-9

Liver resection surgery in a swine model using indocyanine green and a novel near-infrared fluorescent dye (BL-760)

Author(s): Sailee Naik, Aneesh Naik, Christy Lee, Children's National Hospital (United States); Yoseph Kim, Optosurgical, LLC (United States); Jaepyeong Cha, Children's National Hospital (United States); So-Hyun Nam, Dong-A University Medical Center (Republic of Korea)

Lunch/Exhibition Break 11:40 AM - 1:30 PM

SESSION 3: OPTICAL COHERENCE TOMOGRAPHY

1:30 PM - 3:10 PM

Moscone Center, Room 308 (Level 3 South)

Session chair: Hui Min Leung, Massachusetts General Hospital (United States)

12368-11 • 1:30 PM - 1:50 PM

Guiding skin cancer therapy with combined confocal-OCT imaging

Author(s): Nicusor V. Iftimia, Gopi N. Maguluri, John Grimble, Mircea Mujat, Aliana Caron, Physical Sciences Inc. (United States); Aditi Sahu, Miguel A. Cordova, Milind Rajadhyaksha, Christopher A. Barker, Memorial Sloan-Kettering Cancer Ctr. (United States)

12368-12 • 1:50 PM - 2:10 PM

Intraoperative ophthalmic OCT system tracking surgical tools at 200 Hz

Author(s): Piotr Ciacka, International Ctr. for Translational Eye Research (Poland), Institute of Physical Chemistry (Poland); Karol Karnowski, International Ctr. for Translational Eye Research (Poland); Andrea Curatolo, International Ctr. for Translational Eye Research (Poland), Institute of Physical Chemistry (Poland)

12368-13 • 2:10 PM - 2:30 PM

Dual wavelength analysis and classification of brain tumor tissue with optical coherence tomography

Author(s): Paul Strenge, Birgit Lange, Medizinisches Laserzentrum Lübeck GmbH (Germany); Wolfgang Draxinger, Univ. zu Lübeck (Germany); Christian Hagel, Universitätsklinikum Hamburg-Eppendorf (Germany); Christin Grill, Veit Danicke, Dirk Theisen-Kunde, Medizinisches Laserzentrum Lübeck GmbH (Germany); Sonja Spahr-Hess, Matteo M. Bonsanto, Universitätsklinikum Schleswig-Holstein (Germany); Robert A. Huber, Heinz Handels, Univ. zu Lübeck (Germany); Ralf Brinkmann, Medizinisches Laserzentrum Lübeck GmbH (Germany), Univ. zu Lübeck (Germany)

12368-14 • 2:30 PM - 2:50 PM Optical coherence tomography enabled tissue architecture characterization of uterine tumors

Author(s): Arielle Joasil, Haiqiu Yang, Columbia Univ. (United States); Hanina Hibshoosh, Columbia Univ. Medical Ctr. (United States); Christine P. Hendon, Columbia Univ. (United States)

12368-15 • 2:50 PM - 3:10 PM

Three-dimensional tumor margin detection with the guidance of optical coherence tomography and optical coherence microscopy integrated surgical microscope

Author(s): Myung-Ju Kim, Eun Ji Lee, Sangjin Lee, Yujin Ahn, WoongGyu Jung, Ulsan National Institute of Science and Technology (Republic of Korea)

Coffee Break 3:10 PM - 3:40 PM

SESSION 4: MICROSCOPY

3:40 PM - 5:50 PM

Moscone Center, Room 308 (Level 3 South)

Session chair: Jason B. King, The Univ. of Texas at Austin (United States)

12368-16 • 3:40 PM - 4:10 PM

Miniaturized microscope for non-invasive clinical diagnosis of severe inflammation in sepsis (Invited Paper)

Author(s): Arutyun Bagramyan, Juwell W. Wu, Charles P. Lin, Massachusetts General Hospital (United States), Harvard Medical School (United States)

12368-18 • 4:10 PM - 4:30 PM

Nonlinear imaging histopathology: a method to correlate the gold-standard hematoxylin and eosin staining with modern nonlinear microscopy

Author(s): Kayvan F. Tehrani, Jaena Park, Eric J. Chaney, Haohua Tu, Stephen A. Boppart, Univ. of Illinois (United States)

12368-17 • 4:30 PM - 4:50 PM

Analysis of deep ultraviolet fluorescence images for intraoperative breast tumor margin assessment

Author(s): Tongtong Lu, Marquette Univ. (United States); Julie M. Jorns, Medical College of Wisconsin (United States); Dong Hye Ye, Marquette Univ. (United States); Mollie Patton, Medical College of Wisconsin (United States); Taly Gilat Schmidt, Marquette Univ. (United States); Tina Yen, Medical College of Wisconsin (United States); Bing Yu, Marquette Univ. (United States)

12368-19 • 4:50 PM - 5:10 PM

Time resolved SPAD micro-camera probe for wide-field FLIm in microendoscopy

Author(s): Dario Angelone, Sanathana Konugolu Venkata Sekar, Walter Messina, Irish Photonic Integration Ctr., Tyndall National Institute (Ireland); Andrew B. Matheson, Ahmet T. Erdogan, Robert K. Henderson, The Univ. of Edinburgh (United Kingdom); Ray Burke, Irish Photonic Integration Ctr., Tyndall National Institute (Ireland); Stefan Andersson-Engels, Irish Photonic Integration Ctr., Tyndall National Institute (Ireland), Univ. College Cork (Ireland)

12368-20 • 5:10 PM - 5:30 PM

A combined fluorescence lifetime and depth imaging system for medical imaging and surgical guidance

Author(s): Charlotte Hopkinson, Andrew B. Matheson, Neil Finlayson, Robert K. Henderson, The Univ. of Edinburgh (United Kingdom)

12368-42 • 5:30 PM - 5:50 PM

Intraoperative label-free histological imaging of human lung adenocarcinomas with ultraviolet single-plane illumination microscopy

Author(s): Yan Zhang, Bingxin Huang, Lei Kang, Victor T. C. Tsang, Lo Tung Kei, Terence T. W. Wong, Hong Kong Univ. of Science and Technology (Hong Kong, China)

SUNDAY 29 JANUARY

SESSION 5: MACHINE LEARNING AND DEEP LEARNING

8:10 AM - 10:10 AM

Moscone Center, Room 308 (Level 3 South)

Session chair: Christine P. Hendon, Columbia Univ. (United States)

12368-21 • 8:10 AM - 8:30 AM

Resection margin assessment in breast lumpectomy specimens using deep learning-based hyperspectral imaging

Author(s): Lynn-Jade Jong, The Netherlands Cancer Institute (Netherlands), Univ. Twente (Netherlands); Naomi de Kruif, Technische Univ. Eindhoven (Netherlands); Freija Geldof, Dinusha Veluponnar, Joyce Sanders, Marie-Jeanne Vrancken Peeters, Frederieke van Duijnhoven, The Netherlands Cancer Institute (Netherlands); Henricus J. C. M. Sterenborg, The Netherlands Cancer Institute (Netherlands), Amsterdam UMC (Netherlands); Behdad Dashtbozorg, The Netherlands Cancer Institute (Netherlands), Technische Univ. Eindhoven (Netherlands); Theo J. M. Ruers, The Netherlands Cancer Institute (Netherlands), Univ. Twente (Netherlands)

12368-22 • 8:30 AM - 8:50 AM

SpecFlow: an end-to-end framework for specular reflection restoration in endoscopy videos using flow-guided video completion

Author(s): Haoli Yin, Rachel L. Eimen, Audrey K. Bowden, Vanderbilt Univ. (United States)

12368-23 • 8:50 AM - 9:10 AM

Faster RCNN based parathyroid detection by using an automated annotation algorithm with a paired color and near-infrared imaging

Author(s): Naomi Kifle, Saardhak Bhugubanda, Johns Hopkins Univ. (United States); Yoseph Kim, John's Hopkins Univ. (United States); Khalid M. Ali, The John's Hopkins Hospital (United States); Samantha Wolfe, Johns Hopkins Univ. (United States); Jonathan O. Russell, The John's Hopkins Hospital (United States); Jaepyeong Cha, Children National Hospital (United States)

12368-24 • 9:10 AM - 9:30 AM

Optical coherence tomography texture analysis and classification of breast biopsies

Author(s): Margherita Firenze, Yunhe Liu, Diana Mojahed, Nisha Gandhi, Hanina Hibshoosh, Richard Ha, Christine P. Hendon, Columbia Univ. (United States)

12368-25 • 9:30 AM - 9:50 AM

Demonstration of in vivo real-time 3D motion-compensated OCT volumetric imaging using a CNN-based algorithm

Author(s): Ruizhi Zuo, Johns Hopkins Univ. (United States); Kristina Irsch, Institut de la Vision (France), Johns Hopkins Univ. (United States); Jin U. Kang, Johns Hopkins Univ. (United States)

12368-26 • 9:50 AM - 10:10 AM

Virtual HER2 staining of label-free breast tissue using autofluorescence imaging and deep learning

Author(s): Bijie Bai, Hongda Wang, Yuzhu Li, Kevin de Haan, Francesco Colonnese, Yujie Wan, Jingyi Zuo, Ngan B. Doan, Xiaoran Zhang, Yijie Zhang, Jingxi Li, Xilin Yang, Wenjie Dong, Univ. of California, Los Angeles (United States); Morgan A. Darrow, Elham Kamangar, Han Sung Lee, Univ. of California, Davis (United States); Yair Rivenson, Aydogan Ozcan, Univ. of California, Los Angeles (United States)

Coffee Break 10:10 AM - 10:40 AM

SESSION 6: RAMAN

10:40 AM - 12:00 PM

Moscone Center, Room 308 (Level 3 South)

Session chair: Jason B. King, The Univ. of Texas at Austin (United States)

12368-29 • 11:20 AM - 11:40 AM

Raman arthroscopic probe for early stage osteoarthritis diagnostics

Author(s): Masumeh Kazemi, Chenhao Yu, Farida Korna, Dev R. Mehrotra, Juncheng Zhang, Mark W. Grinstaff, Boston Univ. (United States); Brian D. Snyder, Ctr. for Advanced Orthopaedic Studies, Beth Israel Deaconess Medical Ctr. (United States); Mads S. Bergholt, Magnus Jensen, King's College London (United Kingdom); Michael B. Albro, Boston Univ. (United States)

12368-28 • 11:00 AM - 11:20 AM

Dual wavelengths inverse spatially offset Raman spectroscopy for bone characterization

Author(s): Hui Ma, Tyndall National Institute (Ireland), Univ. College Cork (Ireland); Rekha Gautam, Sanathana Konugolu Venkata Sekar, Tyndall National Institute (Ireland); Carrie O'Flynn, Patrick Henn, ASSERT Ctr., Univ. College Cork (Ireland); Stefan Andersson-Engels, Tyndall National Institute (Ireland), Univ. College Cork (Ireland)

12368-27 • 10:40 AM - 11:00 AM

Raman arthroscopy towards in-vivo monitoring of engineered cartilage growth

Author(s): Dev R. Mehrotra, Juncheng Zhang, Tianbai Wang, Diya Desai, Mark W. Grinstaff, Boston Univ. (United States); Brian D. Snyder, Beth Israel Deaconess Medical Ctr. (United States); Mads S. Bergholt, King's College London (United Kingdom); Michael B. Albro, Boston Univ. (United States)

12368-30 • 11:40 AM - 12:00 PM

Optical biopsy technique for detection of aganglionosis in Hirschsprung disease by Raman spectroscopy combined with deep learning

Author(s): Yuki Matsumoto, Univ. of Toyama (Japan); Katsuhiro Ogawa, Oita Univ. (Japan); Kai Tamura, Rena Yagi, Univ. of Toyama (Japan); Shun Onishi, Satoshi Ieiri, Kagoshima Univ. (Japan); Tsuyoshi Etoh, Masafumi Inomata, Oita Univ. (Japan); Takashi Katagiri, Yusuke Oshima, Univ. of Toyama (Japan)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

Conference 12368

SESSION 7: SPECTROSCOPY

1:30 PM - 3:10 PM

Moscone Center, Room 308 (Level 3 South)

Session chair: Leah S. Wilk, Amsterdam UMC (Netherlands)

12368-31 • 1:30 PM - 1:50 PM **Diffuse reflectance spectroscopy for in-vivo stomach and oesophageal tissue classification during upper gastrointestinal cancer surgery**

Author(s): Ioannis Gkouzionis, Scarlet Nazarian, Nisha Patel, Ara W. Darzi, Christopher J. Peters, Daniel S. Elson, Imperial College London (United Kingdom)

12368-32 • 1:50 PM - 2:10 PM

Human skin phototype and apparent age classification based on machine learning methods of autofluorescence and diffuse reflectance spectroscopic data acquired in vivo

Author(s): Ahmed Amine Zghal, Clément Fauvel, Valentin Kupriyanov, Thomas Elsen, Univ. de Lorraine (France); Grégoire Khairallah, Univ. de Lorraine (France), Ctr. Hospitalier Régional de Metz-Thionville (France); Walter C. P. M. Blondel, Marine Amouroux, Univ. de Lorraine (France)

12368-33 • 2:10 PM - 2:30 PM

Integrating hyperspectral imaging in an existing intra-operative environment for detection of intrinsic brain tumors

Author(s): Roeland Vandebriel, Siri Luthman, Kathleen Vunckx, Murali Jayapala, Wouter Charle, Imec VZW (Belgium); Lien Solie, Steven De Vleeschouwer, Univ. Ziekenhuis Leuven (Belgium), Leuven Brain Institute, KU Leuven (Belgium); Tommaso Giannantonio, Anna Alperovich, Carl Zeiss AG (Germany); Xiaohan Zhang, Carl Zeiss Meditec AG (Germany)

12368-34 • 2:30 PM - 2:50 PM

GASMAS for the non-invasive monitoring of oxygen gas in healthy neonates

Author(s): Sri Rama Pranav Kumar Lanka, Tyndall National Institute (Ireland); Jurate Panaviene, Cork Univ. Maternity Hospital (Ireland); Konstantin Grygoryev, Sanathana Konugolu Venkata Sekar, Tyndall National Institute (Ireland); Eugene Dempsey, Cork Univ. Maternity Hospital (Ireland); Stefan Andersson-Engels, Tyndall National Institute (Ireland)

12368-35 • 2:50 PM - 3:10 PM

Imaging protein aggregation in biopharmaceutical formulation with stimulated Raman scattering microscopy

Author(s): Brian Wong, Univ. of Washington (United States); Xi Zhao, Merck & Co., Inc. (United States); Yongchao Su, Merck Research Labs. (United States); Dan Fu, Univ. of Washington (United States)

Coffee Break 3:10 PM - 3:40 PM

SESSION 8: NOVEL TECHNIQUES

3:40 PM - 5:20 PM

Moscone Center, Room 308 (Level 3 South)

Session chair: Muyinatu A. Lediju Bell, Johns Hopkins Univ. (United States)

12368-36 • 3:40 PM - 4:00 PM

Development and label-free cell classification with hybrid ghost cytometer surpassing the conventional flow cytometer

Author(s): Takeshi Sugiyama, Takuya Kuwana, Sayuri Tomoda, Kohei Yamada, Yusuke Konishi, Sysmex Corp. (Japan); Keisuke Toda, Hikari Morita, Toru Imai, ThinkCyte Inc. (Japan); JianYin Lu, Ayato Tagawa, Kazuhiro Yamada, Sysmex Corp. (Japan)

12368-37 • 4:00 PM - 4:20 PM

Characterization of brain tumor tissue by time-resolved phase-sensitive optical coherence elastography at 3.2 MHz line rate

Author(s): Sazgar Burhan, Univ. zu Lübeck (Germany); Nicolas Detrez, Medizinisches Laserzentrum Lübeck GmbH (Germany); Katharina Rewerts, Madita Göb, Univ. zu Lübeck (Germany); Christian Hagel, Universitätsklinikum Hamburg-Eppendorf (Germany); Matteo M. Bonsanto, Universitätsklinikum Schleswig-Holstein (Germany); Dirk Theisen-Kunde, Medizinisches Laserzentrum Lübeck GmbH (Germany); Robert A. Huber, Ralf Brinkmann, Univ. zu Lübeck (Germany), Medizinisches Laserzentrum Lübeck GmbH (Germany)

12368-38 • 4:20 PM - 4:40 PM

Design and characterization of a single-pixel imaging system using double hyperbolic-elliptical objective lens for THz spherical scanning of cornea with a large field-of-view

Author(s): Arjun Virk, Zachery B. Harris, M. Hassan Arbab, Stony Brook Univ. (United States)

12368-39 • 4:40 PM - 5:00 PM

Bringing blue light cystoscopy to the office: digital staining on matched white and blue light cystoscopy videos

Author(s): Shuang Chang, Ali Abbasi, Vanderbilt Univ. (United States); Kristen Scarpato, Amy N. Luckenbaugh, Sam S. Chang, Vanderbilt Univ. Medical Ctr. (United States); Soheil Kolouri, Audrey K. Bowden, Vanderbilt Univ. (United States)

12368-40 • 5:00 PM - 5:20 PM

Multiplatform and synergetic photothermal heating using plasmonic gold nanostars

Author(s): Ren A. Odion, Yang Liu, Stephen J. Norton, Tuan Vo-Dinh, Duke Univ. (United States)

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM - 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12368-41

A multi-functional biosensor based on impedance and photochemical measurements to detect CE81T and OE21 esophageal cancer, A549 lung adenocarcinoma, and TSGH-8301 bladder cancer cells

Author(s): Arvind Mukundan, Hsiang-Chen Wang, National Chung Cheng Univ. (Taiwan); Yu-Ping Hsiao, Chung Shan Medical Univ. Hospital (Taiwan); Wei-Chung Chen, Ming-Tsang Wu, Kaohsiung Medical Univ. (Taiwan); Shang-Chin Hsieh, Kaohsiung Armed Forces General Hospital (Taiwan)

12368-43 • On demand | Presented live 29 January 2023

Fiber-based ATR-IR spectroscopy for an intraoperative diagnosis of normal pancreatic tissue, pancreatitis, and malignant pancreatic lesions

Author(s): Rimante Bandzeviciute, Vilnius Univ. (Lithuania); Gerald Steiner, Katja Liedel, Universitätsklinikum Carl Gustav Carus Dresden (Germany); Jonas Golde, Edmund Koch, TU Dresden (Germany); Thilo Welsch, St. Elisabethen-Klinikum (Germany); Christoph Kahlert, Daniel Stange, Marius Distler, Jürgen Weitz, Universitätsklinikum Carl Gustav Carus Dresden (Germany); Justinas Ceponkus, Valdas Sablinskas, Vilnius Univ. (Lithuania); Christian Teske, Universitätsklinikum Carl Gustav Carus Dresden (Germany)

12368-44 • On demand | Presented live 29 January 2023

Developing optoelectronic methods for real-time tissue characterization in minimally invasive surgery

Author(s): Meenakshi Narayan, Mithun Bhowmick, Miami Univ. (United States)

12368-45 • On demand | Presented live 29 January 2023

Surgical guiding enhancement of chronic otitis media using optical coherence tomography with the microscope

Author(s): Hayoung Kim, Mansik Jeon, Jeehyun Kim, Kyungpook National Univ. (Republic of Korea)

12368-46 • On demand | Presented live 29 January 2023

Endoscopic entire 3D image acquisition of the digestive tract

Author(s): Naoki Ishii, Osaka City Univ. (Japan); Kayo Yoshimoto, Hideya Takahashi, Osaka Metropolitan Univ. (Japan)

12368-47

Device size selection support system for minimally invasive cardiac surgery

Author(s): Keigo Yasuda, Osaka City Univ. (Japan); Kayo Yoshimoto, Yosuke Takahashi, Toshihiko Shibata, Hideya Takahashi, Osaka Metropolitan Univ. (Japan)

12368-48

Contrast performance measurements in augmented reality microscopy

Author(s): Paul Lemaillet, Chumin Zhao, U.S. Food and Drug Administration (United States)

12368-49

A new optical neurosurgical navigation system: polarization sensitive optical coherence tomography (PS-OCT)

Author(s): Shadi Masoumi, Ludovick Bégin, Ctr. de Recherche CERVO, Univ. Laval (Canada); Martin Villiger, Wellman Ctr. for Photomedicine, Massachusetts General Hospital (United States), Harvard Medical School (United States); Mireille Quemener, Martin Parent, Ctr. de Recherche CERVO, Univ. Laval (Canada); Damon T. DePaoli, Wellman Ctr. for Photomedicine, Massachusetts General Hospital (United States), Harvard Medical School (United States); Daniel C. C. Côté, Ctr. de Recherche CERVO, Univ. Laval (Canada)

12368-50 • On demand | Presented live 29 January 2023

Design and evaluation of an industrial robot arm end-effector for robot-assisted surgery

Author(s): Andy Young, Shail Gandhi, Meenakshi Narayan, Miami Univ. (United States)

12368-51 • On demand | Presented live 29 January 2023

Stabilized two-photon intravital imaging using dexmedetomidine

Author(s): Youngkyu Kim, Biomedical Engineering Research Ctr., Asan Institute for Life Sciences, Asan Medical Ctr. (Republic of Korea); Minju Cho, Univ. of Ulsan College of Medicine (Republic of Korea); Bjorn Paulson, Biomedical Engineering Research Ctr., Asan Institute for Life Sciences, Asan Medical Ctr. (Republic of Korea); Sung-Hoon Kim, Asan Medical Ctr. (Republic of Korea); Jun Ki Kim, Biomedical Engineering Research Ctr., Asan Institute for Life Sciences, Asan Medical Ctr. (Republic of Korea)

12368-52 • On demand | Presented live 29 January 2023

Multimodal optical spectroscopic approach to design a complete protocol for early diagnosis of oral cancer

Author(s): Siddra Maryam, Daniyal Ghauri, Tyndall National Institute (Ireland); Edward Fahy, Cork Univ. Dental School & Hospital (Ireland); Sanathana Konugolu Venkata Sekar, Huihui Lu, Alida Russo, Marcelo Saito Nogueira, Ray Burke, Tyndall National Institute (Ireland); Linda Feeley, ENTO Research Institute, Univ. College Cork (Ireland); Patrick Sheahan, South Infirmary Victoria Univ. Hospital (Ireland); Richeal Ni Riordain, Cork Univ. Dental School & Hospital (Ireland); Stefan Andersson-Engels, Kiang Wei Kho, Rekha Gautam, Tyndall National Institute (Ireland)

12368-53 • On demand | Presented live 29 January 2023

Potential of educational cystoscopy atlas for augmented intelligence

Author(s): Okyaz Eminaga, Mark A. Laurie, Timothy K. Lee, Xiao Jia, Lei Xing, Joseph C. Liao, Stanford Univ. School of Medicine (United States)

12368-54

A hex achromatic bioinspired camera for near-infrared endoscopic imaging of lung cancer with multiple tumor-specific fluorophores

Author(s): Benjamin Lew, Mebin George, Steven M. Blair, Zuodong Liang, Zhongmin Zhu, Univ. of Illinois (United States); Sunil Singhal, Univ. of Pennsylvania (United States); Shuming Nie, Viktor Gruev, Univ. of Illinois (United States)

12368-51

Characterization the viscosity of middle ear effusion in Otitis Media using Raman Spectroscopy

Author(s): Sean T. Fitzgerald, Morgan Butts, Anita Mahadevan-Jansen, Vanderbilt University (United States)

Conference 12369

28 - 29 January 2023 | Moscone Center, Room 314 (Level 3 South)

Optics and Biophotonics in Low-Resource Settings IX

Conference Chairs: **David Levitz**, Imaging and Analytics Consulting LTD (Israel); **Aydogan Ozcan**, Univ. of California, Los Angeles (United States)

Program Committee: **David Erickson**, Cornell Univ. (United States); **Gerard L. Coté**, Texas A&M Univ. (United States); **Wolfgang Drexler**, Medizinische Univ. Wien (Austria); **Matthew D. Keller**, Intellectual Ventures Lab. (United States); **Avi Rasooly**, National Institutes of Health (United States); **Chetan A. Patil**, Temple Univ. (United States); **Eric A. Swanson**, Acacia Communications, Inc. (United States); **Sebastian Wachsmann-Hogiu**, McGill Univ. (Canada); **Ian M. White**, Univ. of Maryland, College Park (United States); **Hatice C. Koydemir**, Texas A&M Univ. (United States); **Aniruddha Ray**, The Univ. of Toledo (United States); **Qingshan Wei**, North Carolina State Univ. (United States)

SATURDAY 28 JANUARY

SESSION 1: EMERGING TECHNOLOGIES I

8:20 AM - 10:10 AM

Moscone Center, Room 314 (Level 3 South)

Session chair: David Levitz

12369-38 • 8:20 AM - 8:40 AM

Reverse tuning of whispering gallery mode microresonators

Author(s): Maxwell Adolphson, Abraham J Qavi, Leo Shmuylovich, Jie Liao, Gaya K. Amarasinghe, Lan Yang, Washington Univ in St Louis (United States)

12369-7 • 8:40 AM - 9:00 AM

Light-assisted drying (LAD) for anhydrous preservation of biologics: processing of samples inside glass lyophilization vials

Author(s): Anteneh A. Tsegaye, Gunnar D. Olson, Jude K. Yoshino, Susan R. Trammell, The Univ. of North Carolina at Charlotte (United States)

12369-8 • 9:00 AM - 9:20 AM

Smartphone videoscopy for luminescence lifetime imaging

Author(s): Yan Wang, Sina Sadeghi, Rajesh Paul, Evgeny O. Danilov, North Carolina State Univ. (United States); Fran S. Ligler, Texas A&M Univ. (United States); Qingshan Wei, North Carolina State Univ. (United States)

12369-9 • 9:20 AM - 9:40 AM

Static and dynamic full field optical transmission tomography in the 100 to 500 dollar range

Author(s): Albert Claude Boccara, Samer Alhaddad, Institut Langevin (France); Olivier A. Thouvenin, Viacheslav Mazlin, Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris, Univ. PSL (France); Martine BOCCARA, Ecole Normale Supérieure, Univ. PSL (France)

12369-31 • 9:40 AM - 10:10 AM

Deep learning-based virtual staining of histological tissues (Invited Paper)

Author(s): Kevin de Haan, Yair Rivenson, Pictor Labs (United States); Aydogan Ozcan, University of California Los Angeles (United States)

Coffee Break 10:10 AM - 10:40 AM

SESSION 2: EMERGING TECHNOLOGIES II

10:40 AM - 12:20 PM

Moscone Center, Room 314 (Level 3 South)

Session chairs: Bijie Bai, UCLA Samueli School of Engineering (United States), Yijie Zhang, UCLA Samueli School of Engineering (United States)

12369-27 • 10:40 AM - 11:00 AM

A compact fluorescence sensor for low-cost non-invasive monitoring of gut permeability in undernutrition

Author(s): Elena Monfort Sánchez, James Avery, Imperial College London (United Kingdom), The Hamlyn Ctr., Institute of Global Health Innovation, Imperial College London (United Kingdom); Jonathan Gan, Jingjing Qian, Imperial College London (United Kingdom); Mulima Mwiinga, Rosemary Banda, Tropical Gastroenterology and Nutrition Group (Zambia); Jonathan Hoare, Hutan Ashrafian, Imperial College London (United Kingdom); Ara Darzi, Imperial College London (United Kingdom), The Hamlyn Ctr, Institute of Global Health Innovation, Imperial College London (United Kingdom); Paul Kelly, Blizzard Institute, Queen Mary Univ. of London (United Kingdom), Tropical Gastroenterology and Nutrition Group, Univ. of Zambia (Zambia); Alex J. Thompson, Imperial College London (United Kingdom), The Hamlyn Ctr, Institute of Global Health Innovation, Imperial College London (United Kingdom)

12369-28 • 11:00 AM - 11:20 AM

Low-cost multimodal micro-endoscopic system for oral cancer screening in low resource setting

Author(s): Pramila Thapa, Sunil Bhatt, Priyanka Mann, Indian Institute of Technology Delhi (India); Vivek Nayyar, Deepika Mishra, All India Institute of Medical Sciences, New Delhi (India); Dalip S. Mehta, Indian Institute of Technology Delhi (India)

12369-29 • 11:20 AM - 11:40 AM

Low-resource and cost-effective camera-based optical palpation for breast cancer detection and burn scar assessment

Author(s): Qi Fang, Rowan W. Sanderson, Seokhyun Choi, Aiden Taba, Harry Perkins Institute of Medical Research (Australia); Andrea Curatolo, International Ctr. for Translational Eye Research (Poland); Devina D. Lakhiani, Renate Zilkens, Kyle Newman, Harry Perkins Institute of Medical Research (Australia); Benjamin F. Dessauvage, Helen M. DeJong, Fiona M. Wood, The Univ. of Western Australia (Australia); Christobel M. Saunders, The Univ. of Melbourne (Australia); Brendan F. Kennedy, Harry Perkins Institute of Medical Research (Australia)

12369-30 • 11:40 AM - 12:00 PM

Two-dimensional microlens array for low-cost high-resolution bio-imaging

Author(s): Somaiyeh Khoubafarin, Peuli Nath, Hannah Popofski, Aniruddha Ray, The Univ. of Toledo (United States)

12369-39 • 12:00 PM - 12:20 PM

pH-sensitive optical micro-resonator based on PAA/PVA gel swelling

Author(s): Médéric Loyez, Maxwell Adolphson, Jie Liao, Sanskar Thakur, Lan Yang, Washington University (United States)

Lunch/Exhibition Break 12:20 PM - 1:30 PM

SESSION 3: ADVANCES IN AUTOMATED VISUAL EVALUATION IN CERVICAL APPLICATIONS

1:30 PM - 3:20 PM

Moscone Center, Room 314 (Level 3 South)

Session chair: Matthew D. Keller, Global Health Labs., Inc. (United States)

12369-1 • 1:30 PM - 2:00 PM Accelerating the impact of technology and innovation for global cervical cancer prevention (*Invited Paper*)

Author(s): Nirmala Ramanujam, Duke Univ. (United States)

12369-2 • 2:00 PM - 2:20 PM

Multi-modal mobile colposcope for real-time cervical precancer detection: a pilot study in Mozambique

Author(s): Jackson Coole, Ruchika Mitbander, David Brenes, Alex Kortum, Yajur Maker, Rice Univ. (United States); Eliane Monteiro, Arlete Mariano, Hospital Geral e Ctr. de Saúde de Mavalane (Mozambique); Ricardina Rangeiro, Maputo Central Hospital (Mozambique); Guilhermina Tivir, Populations Services International (Mozambique); Hira Atif, Celda Mavume, Nafissa Osman, Univ. Eduardo Mondlane (Mozambique); Carla Carrilho, Univ. Eduardo Mondlane (Mozambique); Rosita Mugolo, Ministry of Health (Mozambique); Andrea Neves, Jose Macamo General Hospital (Mozambique); Shababa Matin, Rice360 Institute for Global Health Technologies (United States); Richard A. Schwarz, Jennifer Carns, Rice Univ. (United States); Mila P. Salcedo, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); Nirmala Ramanujam, Duke Univ. (United States); Ellen Baker, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); Cesaltina Lorenzoni, Univ. Eduardo Mondlane (Mozambique), Ministry of Health (Mozambique); Kathleen M. Schmeler, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); Rebecca R. Richards-Kortum, Rice Univ. (United States)

12369-3 • 2:20 PM - 2:40 PM

Comparison of performance of different automated visual evaluation quality assessment modules

Author(s): Pedro Dias, Francisca Morgado, NILG.ai LLC (United States); Reuven Weiser, DL Analytics, LLC (United States); Kelwin Fernandes, NILG.ai LLC (United States); David Levitz, DL Analytics, LLC (United States)

12369-4 • 2:40 PM - 3:00 PM

Approaches to blur reduction in cervical images for automated visual evaluation

Author(s): Francisca Morgado, Pedro Dias, NILG.ai LLC (United States); Reuven Weiser, DL Analytics, LLC (United States); Kelwin Fernandes, NILG.ai LLC (United States); David Levitz, DL Analytics, LLC (United States)

12369-5 • 3:00 PM - 3:20 PM

Automated Visual Evaluation (AVE) of cervical precancerous lesions with integrated patient meta-information: An initial study

Author(s): Ishan Shah, Matthew P. Horning, Liming Hu, Global Health Labs., Inc. (United States)

Coffee Break 3:20 PM - 3:50 PM

SESSION 4: NEW SPECTRAL METHODS IN SENSING AND IMAGING

3:50 PM - 5:10 PM

Moscone Center, Room 314 (Level 3 South)

Session chairs: Aydogan Ozcan, UCLA Samueli School of Engineering (United States), Yuzhu Li, Univ. of California, Los Angeles (United States)

12369-12 • 3:50 PM - 4:10 PM

Smartphone oxygenation measuring device to differentiate low-risk stable and chronic diabetic foot ulcers from high-risk complicated ulcers: a pilot study in India

Author(s): Kacie Kaile, Alexander Trinidad, Florida International Univ. (United States); Venkatabashyam Ramnarayan, Dr. Mohan Diabetes Specialties Ctr. (India); Coimbatore Subramanian Shanthi Rani, Madras Diabetes Research Foundation (India); Ranjit Mohan Anjana, Vishwanathan Mohan, Dr. Mohan's Diabetes Specialties Ctr. (India), Madras Diabetes Research Foundation (India); Ganesan Uma Sankari, Kumaradas Gini Venisha, Madras Diabetes Research Foundation (India); Anuradha Godavarty, Florida International Univ. (United States)

12369-13 • 4:10 PM - 4:30 PM

Evaluating color correction algorithms for automated interpretation of urinalysis dipsticks with low-cost image sensors

Author(s): Wenbo Wang, James W. Stafford, Global Health Labs., Inc. (United States); Andrew Miller, Global Health Labs. (United States); Rose M. Buchmann, Global Health Labs., Inc. (United States); Ethan Spencer, Global Health Labs. (United States); Angela Michelle T. San Juan, Global Health Labs., Inc. (United States), Texas A&M Univ. (United States); Jamie Purcell, Matthew D. Keller, Global Health Labs., Inc. (United States)

12369-14 • 4:30 PM - 4:50 PM Point-of-care device for rapid phenotypic antibiotic susceptibility testing using pathogen autofluorescence

Author(s): Keerthana S., Krishna Sree S., Harish Kumar D, Mohamed Irfan, Jagdish A Krishnaswamy, Adiuvo Diagnostics, Ltd. (India); Bala Pesala, Geethanjali Radhakrishnan, Adiuvo Diagnostics Pvt. Ltd. (India)

12369-15 • 4:50 PM - 5:10 PM

Synthetic bioluminescence image data generation tool for artificial neural network training

Author(s): Avi Balsam, Jonas Kuehne, Victoria Rodríguez de León, Xinyue Yu, Jansen Wong, Sara Sánchez Vargas, Anna Noyvert, Davidson Institute of Science Education, Weizmann Institute of Science (Israel); Vyacheslav Kalchenko, Weizmann Institute of Science (Israel)

Conference 12369

SUDAY 29 JANUARY

SESSION 5: MOBILE SENSING AND POINT-OF-CARE TECHNOLOGIES

8:00 AM - 10:00 AM

Moscone Center, Room 314 (Level 3 South)

Session chair: Gerard L. Coté, Texas A&M Univ. (United States)

12369-16 • 8:00 AM - 8:20 AM

Rapid detection and classification of bacterial colonies using a thin film transistor (TFT) image sensor and deep learning

Author(s): Yuzhu Li, Tairan Liu, Hatice C. Koydemir, Hongda Wang, Keelan O'Riordan, Bijie Bai, Univ. of California, Los Angeles (United States); Yuta Haga, Junji Kobashi, Hitoshi Tanaka, Takaya Tamaru, Kazunori Yamaguchi, Japan Display, Inc. (Japan); Aydogan Ozcan, Univ. of California, Los Angeles (United States)

12369-17 • 8:20 AM - 8:40 AM

Portable smartphone-controlled microscopy for the automated diagnosis of helminth infections from Kato-Katz fecal stains

Author(s): Oliver Higgins, Julien Reboud, Jonathan M. Cooper, Univ. of Glasgow (United Kingdom)

12369-18 • 8:40 AM - 9:00 AM

Oblique back illumination cell phone microscopy for point-of-care blood analysis

Author(s): Marisa M. Morakis, Gregory N. McKay, Eli J. Foster, Johns Hopkins Univ. (United States); Julie L. Bentley, Univ. of Rochester (United States); Nicholas J. Durr, Johns Hopkins Univ. (United States)

12369-19 • 9:00 AM - 9:20 AM

Computational paper-based vertical flow assay for Lyme disease diagnosis

Author(s): Hyounarm Joung, Zachary S. Ballard, Univ. of California, Los Angeles (United States); Rajesh Ghosh, Univ. of California, Los Angeles (United States); Raymond J. Dattwyler, Paul M. Arnaboldi, New York Medical College (United States); Omai B. Garner, Dino Di Carlo, Univ. of California, Los Angeles (United States); Aydogan Ozcan, Univ. of California, Los Angeles (United States)

12369-20 • 9:20 AM - 9:40 AM

Stain-free, rapid, and quantitative viral plaque assay using deep learning and time-lapse holographic imaging

Author(s): Yuzhu Li, Tairan Liu, Univ. of California, Los Angeles (United States); Hatice C. Koydemir, Univ. of California, Los Angeles (United States); Yijie Zhang, Ethan Yang, Hongda Wang, Jingxi Li, Bijie Bai, Aydogan Ozcan, Univ. of California, Los Angeles (United States)

12369-21 • 9:40 AM - 10:00 AM

Label-free bio-aerosol detection and classification using a virtual impactor and deep learning

Author(s): Yi Luo, Yijie Zhang, Tairan Liu, Alan Yu, Yichen Wu, Aydogan Ozcan, UCLA Samueli School of Engineering (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 6: ADVANCES IN OCT SYSTEMS

10:30 AM - 12:00 PM

Moscone Center, Room 314 (Level 3 South)

Session chairs: Jingxi Li, UCLA Samueli School of Engineering (United States), Yuzhu Li, Univ. of California, Los Angeles (United States)

12369-22 • 10:30 AM - 11:00 AM

OCT at home: technology, applications, and infrastructure to make it possible *(Invited Paper)*

Author(s): Nishant Mohan, Notal Vision, Inc. (United States)

12369-23 • 11:00 AM - 11:20 AM

Optoelectronic system based on photonic integrated circuits to miniaturize spectral domain optical coherence tomography

Author(s): Anja Agneter, Elisabeth A. Rank, Medizinische Univ. Wien (Austria); Marko Vlašković, ams-OSRAM AG (Austria); Stefan Nevlacsil, AIT Austrian Institute of Technology GmbH (Austria); Pietro Cipriano, ams-OSRAM AG (Austria); Quang Nguyen, Ryan Santosa, Medizinische Univ. Wien (Austria); Alejandro Maese Novo, AIT Austrian Institute of Technology GmbH (Austria); Dana Seyringer, FH Vorarlberg (Austria); Moritz Eggeling, AIT Austrian Institute of Technology GmbH (Austria); Martin Sagmeister, ams-OSRAM AG (Austria); Ernst Bodenstorfer, Laurin Ginner, AIT Austrian Institute of Technology GmbH (Austria); Jochen Kraft, Gerald Meinhardt, ams-OSRAM AG (Austria); Horst Zimmermann, Technische Univ. Wien (Austria); Rainer Hainberger, Paul Müllner, AIT Austrian Institute of Technology GmbH (Austria); Rainer A. Leitgeb, Wolfgang Drexler, Medizinische Univ. Wien (Austria)

12369-24 • 11:20 AM - 11:40 AM

Thermally tuned VCSEL-based SS-OCT system

Author(s): Milana Kendrisic, Matthias Salas, Vladislav Agafonov, Lorenzo Ferrara, Wolfgang Drexler, Rainer A. Leitgeb, Medizinische Univ. Wien (Austria)

12369-25 • 11:40 AM - 12:00 PM

Raspberry pi-based low-cost portable optical coherence tomography to deliver health care services

Author(s): Hoseong Cho, Kyungpook National Univ. (Republic of Korea); Pilun Kim, LG Electronics Inc. (Republic of Korea); Hye Ree Kim, Kyungpook National Univ. (Republic of Korea); Ruchire E. H. Wijesinghe, Univ. of Sri Jayewardenepura (Sri Lanka); Mansik Jeon, Jeehyun Kim, Kyungpook National Univ. (Republic of Korea)

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM
Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM – 5:00 PM

View poster presentation guidelines and set-up instructions at:
<https://spie.org/PW/Poster-Guidelines>

12369-26 • On demand | Presented live 29 January 2023

High-grade cervical intraepithelial neoplasia treatment comparing two photodynamic therapy protocols

Author(s): Natalia M. Inada, Instituto de Física de São Carlos (Brazil); Cynthia A. de Castro, Federal Univ. de São Carlos (Brazil); Carolina F. da Silva, Wellington Lombardi, Woman Health Ambulatory, UNIARA (Brazil); Vanderlei Salvador Bagnato, Instituto de Física de São Carlos (Brazil), Hagler Institute for Advanced Study, Texas A&M Univ. (United States)

Conference 12370

28 January 2023 | Moscone Center, Room 303 (Level 3 South)

Design and Quality for Biomedical Technologies XVI

Conference Chairs: **Jeeseong Hwang**, National Institute of Standards and Technology (United States); **Gracie Vargas**, The Univ. of Texas Medical Branch (United States)

Conference Co-Chair: **T. Joshua Pfefer**, U.S. Food and Drug Administration (United States)

Program Committee: **David W. Allen**, National Institute of Standards and Technology (United States); **Anthony J. Durkin**, Beckman Laser Institute and Medical Clinic (United States); **Sang-Won Lee**, Korea Research Institute of Standards and Science (Korea, Republic of); **Rongguang Liang**, Wyant College of Optical Sciences (United States); **Robert J. Nordstrom**, National Institutes of Health (United States); **Ramesh Raghavachari**, U.S. Food and Drug Administration (United States); **Eric J. Seibel**, Univ. of Washington (United States); **Behrouz Shabestari**, National Institutes of Health (United States); **Rudolf M. Verdaasdonk**, Vrije Univ. Medical Ctr. (Netherlands); **William C. Vogt**, U.S. Food and Drug Administration (United States); **Heidrun Wabnitz**, Physikalisch-Technische Bundesanstalt (Germany)

SATURDAY 28 JANUARY

SESSION 1: NOVEL PHANTOMS AND DESIGNS

8:00 AM - 9:40 AM

Moscone Center, Room 303 (Level 3 South)

Session chair: Gracie Vargas, The Univ. of Texas Medical Branch (United States)

12370-1 • 8:00 AM - 8:20 AM

Development of a glass-based imaging phantom to model the optical properties of human tissue

Author(s): Mingze Yang, Yunle Wei, The Univ. of Adelaide (Australia); Philipp Reineck, RMIT Univ. (Australia); Heike Ebendorff-Heidepriem, Jiawen Li, Robert A. McLaughlin, The Univ. of Adelaide (Australia)

12370-3 • 8:20 AM - 8:40 AM

New method for traceable refractive index determination by measuring the angle of minimum deviation

Author(s): Martine Kuiper, Amsterdam UMC (Netherlands), VSL Dutch Metrology Institute (Netherlands); Richard Kooops, VSL Dutch Metrology Institute (Netherlands); Rienk Nieuwland, Ton G. van Leeuwen, Edwin van der Pol, Amsterdam UMC (Netherlands)

12370-4 • 8:40 AM - 9:00 AM

Multi-directional adjustable two-camera housing module for medical applications

Author(s): Saardhak Bhrugubanda, Johns Hopkins Univ. (United States); Hun Chan Lee, Boston Univ. (United States); Naomi Kifle, Yoseph Kim, Johns Hopkins Univ. (United States); Jaepyeong Cha, Johns Hopkins Univ. (United States), Children's National Health System (United States)

12370-5 • 9:00 AM - 9:20 AM

Practical guidance for researchers and engineers to introduce your MedTech innovation to the European market (MDR prove)

Author(s): Rudolf M. Verdaasdonk, Keshen Mathura, Lisette van Gemert, Saskia Kelder, Univ. Twente (Netherlands)

12370-32 • 9:20 AM - 9:40 AM

Epoxy resin tissue phantoms with spectra-fitted optical properties for broadband and multiband applications

Author(s): Alec B. Walter, E. Duco Jansen, Vanderbilt Univ (United States)

Coffee Break 9:40 AM - 10:10 AM

SESSION 2: QUALITY IN DESIGN

10:10 AM - 12:50 PM

Moscone Center, Room 303 (Level 3 South)

Session chair: William C. Vogt, U.S. Food and Drug Administration (United States)

12370-6 • 10:10 AM - 10:30 AM

Photon economy in pulse sampling fluorescence lifetime imaging

Author(s): Xiangnan Zhou, Julien Bec, Laura Marcu, Univ. of California, Davis (United States)

12370-7 • 10:30 AM - 10:50 AM

Photon counting with analog photodetection for high-signal-rate quantitative nonlinear microscopy

Author(s): Geng Wang, Janet E. Sorrells, Rishyashring R. Iyer, Stephen A. Boppart, Haohua Tu, Univ. of Illinois (United States)

12370-8 • 10:50 AM - 11:10 AM

Design and characterization of handheld multiphoton probe for intraoral imaging

Author(s): Tyler Peterson, Hongzhang Ma, The Univ. of Arizona (United States); Paula Villarreal, The Univ. of Texas Medical Branch (United States); Xingde Li, The Johns Hopkins Univ. School of Medicine (United States); Gracie Vargas, The Univ. of Texas Medical Branch (United States); Rongguang Liang, The Univ. of Arizona (United States)

12370-9 • 11:10 AM - 11:30 AM

Analysis considerations for multimodal based approaches in diagnostics

Author(s): Gracie Vargas, Paula Villarreal, Suimin Qiu, The Univ. of Texas Medical Branch (United States); Xingde Li, Johns Hopkins Univ. (United States); Rongguang Liang, The Univ. of Arizona (United States)

12370-20 • 11:30 AM - 11:50 AM

Evaluation of the air leakage around facial masks in view of effective aerosol protection using thermal imaging and modeling

Author(s): Rudolf M. Verdaasdonk, Jelle Room, Frans de Jongh, Univ. Twente (Netherlands)

12370-31 • 11:50 AM - 12:10 PM

3D Cell Model monitoring using Multimodal Optical Microscopy Imaging System

Author(s): Hyunji Lee, Jae-Won Choi, Min-Beom Heo, Sang-Won Lee, Korea Research Institute of Standards and Science (Republic of Korea)

12370-33 • 12:10 PM - 12:30 PM

Radiometric characterization methods for fluorescence guidance imaging systems using a calibrated solid-state emitter

Author(s): Alberto J. Ruiz, QUEL Imaging, LLC (United States), Thayer School of Engineering at Dartmouth (United States); Edwin Robledo, Eammon Littler, Ethan P.M LaRochelle, Quel Imaging, LLC (United States)

12370-2 • 12:30 PM - 12:50 PM

A solid optical phantom recipe and tools based on upconverting nanoparticles for biomedical applications

Author(s): Sanathana Konugolu-Venkata-Sekar, Irish Photonic Integration Ctr. (IPIC) (Ireland), BioPixS Ltd. (Ireland); Gokhan Dumlupinar, BioPixS Ltd. (Ireland), Univ. College Cork (Ireland); Claudia Nunzia Guadagno, BioPixS Ltd. (Ireland); Jean S. Matias, Univ. College Cork (Ireland); Sri Rama Pranav Kumar Lanka, Chris K. W. Kho, Stefan Andreesson-Engels, BioPixS Ltd. (Ireland)

Lunch/Exhibition Break 12:50 PM - 2:20 PM

SESSION 3: OXIMETRY: EFFECTS OF SKIN PIGMENTATION

2:20 PM - 3:50 PM

Moscone Center, Room 303 (Level 3 South)

Session chair: Jessica C. Ramella-Roman, Florida International Univ. (United States)

12370-10 • 2:20 PM - 2:40 PM

Melanometry for objective evaluation of skin pigmentation in pulse oximetry studies: a critical analysis

Author(s): Sandhya Vasudevan, William C. Vogt, Sandy Weininger, Joshua Pfefer, U.S. Food and Drug Administration (United States)

12370-11 • 2:40 PM - 3:00 PM

Comparison of pulse oximetry measurements between high and low skin pigmentation

Author(s): Victor J. Ochoa-Gutierrez, Univ. of Glasgow (United Kingdom); Selene Guerrero-Zuñiga, INER (Mexico); Julien Reboud, Mauro Pazmino-Betancourth, Andrew Harvey, Jonathan Cooper, Univ. of Glasgow (United Kingdom)

12370-12 • 3:00 PM - 3:30 PM

Impact of skin tone on photoacoustic signal generation, depth penetration, and oximetry (*Invited Paper*)

Author(s): Jesse V. Jokerst, Yash Mantri, Wonjun Yim, Univ. of California, San Diego (United States)

12370-13 • 3:30 PM - 3:50 PM

Assessing impact of skin pigmentation on photoacoustic imaging oximetry using a phantom-based test method

Author(s): William C. Vogt, Keith A. Wear, Joshua Pfefer, U.S. Food and Drug Administration (United States)

Coffee Break 3:50 PM - 4:20 PM

SESSION 4: QUALITY IN OXIMETRY AND FUNCTIONAL OPTICAL IMAGING

4:20 PM - 6:10 PM

Moscone Center, Room 303 (Level 3 South)

Session chair: Bofan Song, Wyant College of Optical Sciences (United States)

12370-14 • 4:20 PM - 4:50 PM

The influence of obesity on the skin's optical properties (*Invited Paper*)

Author(s): Jessica C. Ramella-Roman, Cristina Palacios, Ajmal Ajmal, Tananant Boonya-Ananta, Andres J. Rodriguez, Florida International Univ. (United States)

12370-15 • 4:50 PM - 5:10 PM

Non-invasive quantification of changes in blood oxygen saturation of the internal jugular vein: theoretical evaluation and in-vivo demonstration

Author(s): Hsin-Yuan Hsieh, Chin-Hsuan Sun, Yi-Siang Syu, Yin-Fu Chen, Hao-Wei Lee, Kuang Yang, Kung-Bin Sung, National Taiwan Univ. (Taiwan)

12370-16 • 5:10 PM - 5:30 PM

Tissue mimicking material selection and finger phantom design for pulse oximetry

Author(s): Andres J. Rodriguez, Florida International Univ. (United States); Sandhya Vasudevan, Masoud Farahmand, Sandy Weininger, William C. Vogt, Christopher Scully, U.S. Food and Drug Administration (United States); Jessica C. Ramella-Roman, Florida International Univ. (United States); T. Joshua Pfefer, U.S. Food and Drug Administration (United States)

12370-17 • 5:30 PM - 5:50 PM

Blood flow signatures from an ex-corpus human blood flow system for physiological control in retina-mimicking silicone phantoms

Author(s): Vincent S. Zoutenbier, Vrije Univ. Amsterdam (Netherlands); Arjen Amelink, Vrije Univ. Amsterdam (Netherlands), TNO (Netherlands); Johannes F. de Boer, Vrije Univ. Amsterdam (Netherlands)

12370-18 • 5:50 PM - 6:10 PM

Compact linear flow phantom model for retinal blood flow evaluation

Author(s): Achyut Raghavendra, Univ. of Maryland School of Medicine (United States); Anant Agrawal, Zhuolin Liu, Daniel X. Hammer, Ctr. for Devices and Radiological Health, U.S. Food and Drug Administration (United States); Osamah J. Saeedi, Univ. of Maryland School of Medicine (United States)

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

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Conference 12370

12370-23

Identification of image based markers of human oral squamous cell carcinoma (OSCC) using multiphoton microscopy

Author(s): Paula Villarreal, The Univ. of Texas Medical Branch (United States); Rahul Pal, Massachusetts General Hospital (United States); Suimin Qiu, Orly Coblens, Gracie Vargas, The Univ. of Texas Medical Branch (United States)

12370-24

Optical Redox imaging to evaluate Glioblastoma cell responses to ECM stiffness

Author(s): Christina Payne, Paula Villarreal, Bartosz Szczesny, Massoud Motamedi, Gracie Vargas, The Univ. of Texas Medical Branch (United States)

12370-19

Quantifying optical parameters of human muscle and superficial tissue in-vivo by diffuse reflectance spectroscopy in the wavelength range of 700-880 nm

Author(s): Hao-Wei Lee, Hsin-Yuan Hsieh, Yi-Siang Syu, Yin-Fu Chen, Kuang Yang, Kung-Bin Sung, National Taiwan Univ. (Taiwan)

12370-21

Simple optical design with Python raytracing module: getting numbers

Author(s): Valérie Pineau Noël, Shadi Masoumi, Elahe Parham, Gabriel Genest, Ludovick Bégin, Marc-André Vigneault, Mireille Quémener, Daniel C. Côté, Univ. Laval (Canada), Ctr. d'optique, photonique et laser (Canada), Ctr. de Recherche CERVO (Canada)

12370-22

Radioluminescent imaging dosimetry of proton therapy beams with high spatiotemporal resolution

Author(s): Arash Darafsheh, Washington Univ. School of Medicine in St Louis (United States); Yao Hao, Jufri Setianegara, Tianyu Zhao, Washington Univ. School of Medicine in St. Louis (United States); Sreekrishna M. Goddu, Washington Univ. School of Medicine in St Louis (United States)

12370-35

Design of multimode reflected dark-field microscopy with single camera for label free biological tissue analysis

Author(s): Ik Hwan Kwon, Tae Geol Lee, Sang-Won Lee, Korea Research Institute of Standards and Science (Republic of Korea)

Conference 12371

28 January 2023 | Moscone Center, Room 202 (Level 2 South)

Multimodal Biomedical Imaging XVIII

Conference Chairs: **Fred S. Azar**, InterSystems (United States); **Xavier Intes**, Rensselaer Polytechnic Institute (United States); **Qianqian Fang**, Northeastern Univ. (United States)

Program Committee: **Caroline Boudoux**, Ecole Polytechnique de Montréal (Canada); **Yu Chen**, Univ. of Maryland, College Park (United States); **Gultekin Gulsen**, Univ. of California, Irvine (United States); **Kirill V. Larin**, Univ. of Houston (United States); **Brian W. Pogue**, Thayer School of Engineering at Dartmouth (United States); **Sava Sakadzic**, Massachusetts General Hospital (United States); **Vivek J. Srinivasan**, Univ. of California, Davis (United States); **Arjun G. Yodanis**, Univ. of Pennsylvania (United States)

SATURDAY 28 JANUARY

SESSION 1: MULTIMODAL MICROSCOPY I

8:00 AM - 10:10 AM

Moscone Center, Room 202 (Level 2 South)

Session chairs: Caroline Boudoux, Polytechnique Montréal (Canada), Abbas Yaseen, Northeastern Univ. (United States)

12371-1 • 8:00 AM - 8:30 AM

Co-localized micro-optical coherence tomography-fluorescence confocal microscopy (μ OCT-FCM) (Invited Paper)

Author(s): Linhui Yu, Hui M. Leung, Wellman Ctr. for Photomedicine, Massachusetts General Hospital (United States), Harvard Medical School (United States); Courtney F. Petty, Gregory Fleming James Cystic Fibrosis Research Ctr., The Univ. of Alabama at Birmingham School of Medicine (United States), The Univ. of Alabama at Birmingham (United States); Anagha Arvind, Miquela O. Murray, Massachusetts General Hospital (United States); Susan E. Birket, Gregory Fleming James Cystic Fibrosis Research Ctr., The Univ. of Alabama at Birmingham School of Medicine (United States); Steven M. Rowe, Gregory Fleming James Cystic Fibrosis Research Ctr., The Univ. of Alabama at Birmingham School of Medicine (United States); Guillermo J. Tearney, Massachusetts General Hospital (United States), Harvard Medical School (United States), Wellman Ctr. for Photomedicine, Massachusetts General Hospital (United States)

12371-2 • 8:30 AM - 8:50 AM

Identification of cardiac scar by extending multimodal optical imaging with multiparametric analysis and radiomics

Author(s): Arno M. Krause, Gabriel Giardina, Medizinische Univ. Wien (Austria); James Marchant, Richard Walton, Hôpital Xavier Arnozan, IHU Liryc (France); Laszlo Papp, Rainer A. Leitgeb, Wolfgang Drexler, Angelika Unterhuber, Marco Andreana, Medizinische Univ. Wien (Austria)

12371-3 • 8:50 AM - 9:10 AM

Multipath contrast imaging in endoscopic multimodal optical coherence tomography

Author(s): Adrian Tanskanen, Jeanie Malone, The Univ. of British Columbia (Canada), BC Cancer Research Institute (Canada); Calum E. MacAulay, BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada); Pierre M. Lane, BC Cancer Research Institute (Canada), Simon Fraser Univ. (Canada), The Univ. of British Columbia (Canada)

12371-4 • 9:10 AM - 9:30 AM

Correlative imaging and quantification of the tumor microenvironment of triple-negative-breast-cancer using lightsheet microscopy, scanning laser optical tomography, and TPEF

Author(s): Hannes Kamin, Laser Zentrum Hannover e.V. (Germany); Jochen Maurer, Elmar Stickeler, Klinik für Gynäkologie und Geburtshilfe, Uniklinik RWTH Aachen (Germany); Sonja Johannsmeier, Laser Zentrum Hannover e.V. (Germany); Alexander Heisterkamp, Niedersächsisches Zentrum für Biomedizintechnik, Implantatforschung und Entwicklung (Germany), Institut für Quantenoptik, Leibniz Univ. Hannover (Germany); Dag Heinemann, Institute für Gartenbauliche Produktionssysteme, Leibniz Univ. Hannover (Germany), Hannoversches Zentrum für Optische Technologien, Leibniz Univ. Hannover (Germany); Tammo Ripken, Laser Zentrum Hannover e.V. (Germany), Niedersächsisches Zentrum für Biomedizintechnik, Implantatforschung und Entwicklung (Germany)

12371-5 • 9:30 AM - 9:50 AM

Multimodal optical coherence tomography and two-photon selective-plane illumination microscopy for embryonic imaging

Author(s): Md Mobarak Karim, Ruijiao Sun, Behzad Khajavi, Manmohan Singh, Harshdeep S. Chawla, Yogeshwari S. Ambekar, Alexander W. Schill, David Mayerich, Mary E. Dickinson, Kirill V. Larin, Univ. of Houston (United States)

12371-6 • 9:50 AM - 10:10 AM

Combined optical coherence tomography and near-infrared fluorescence for esophageal cancer imaging

Author(s): Tyla Danskin, Margherita Vaselli, Johannes F. de Boer, Vrije Univ. Amsterdam (Netherlands)

Coffee Break 10:10 AM - 10:40 AM

SESSION 2: MULTIMODAL MICROSCOPY II

10:40 AM - 12:00 PM

Moscone Center, Room 202 (Level 2 South)

Session chair: Abbas Yaseen, Northeastern Univ. (United States)

12371-7 • 10:40 AM - 11:00 AM

Photonics-based multimodal optical imaging of formalin-fixed paraffin-embedded tissue sections

Author(s): Vishesh Kumar Dubey, Azeem Ahmad, Luis E. Villegas, Hong Mao, Mona Nystad, Ganesh Acharya, Balpreet Singh Ahluwalia, UiT The Arctic Univ. of Norway (Norway)

12371-8 • 11:00 AM - 11:20 AM

CANCELED: Multimodal imaging co-registration techniques for hyperspectral imaging, spectral-domain OCT, and reflectance Mueller matrix polarimetry

Author(s): Natzem A. Lima, Travis W. Sawyer, Wyant College of Optical Sciences (United States)

Conference 12371

12371-9 • 11:20 AM - 11:40 AM

Multipath contrast of optical coherence tomography for early cancer detection

Author(s): Jeanie Malone, Adrian Tanskanen, BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada); Lien Hoang, The Univ. of British Columbia (Canada), Vancouver General Hospital (Canada); Jessica N. McAlpine, The Univ. of British Columbia (Canada), Vancouver General Hospital (Canada); Calum E. MacAulay, BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada), Vancouver General Hospital (Canada); Pierre M. Lane, BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada), Simon Fraser Univ. (Canada)

12371-10 • 11:40 AM - 12:00 PM

Functional, structural, and molecular imaging of corneal nerves

Author(s): Matthew T. McPheeters, Eric Lu, Brecken J. Blackburn, Made Airanthi K. Widjaja-Adhi, Junwoo Suh, Maryse Lapierre-Landry, Case Western Reserve Univ. (United States); William J. Dupps, Cole Eye Institute, Cleveland Clinic (United States); Andrew M. Rollins, Marcin Golczak, Michael W. Jenkins, Case Western Reserve Univ. (United States)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 3: DIFFUSE OPTICS

1:30 PM - 3:00 PM

Moscone Center, Room 202 (Level 2 South)

Session chairs: Qianqian Fang, Northeastern Univ. (United States), Farouk Nouzi, John Tu & Thomas Yuen Ctr. for Functional Onco-Imaging (United States)

12371-11 • 1:30 PM - 2:00 PM

Multiwavelength photo-magnetic imaging: a novel high-resolution optical molecular imaging modality (*Invited Paper*)

Author(s): Farouk Nouzi, Maha Algarawi, John Tu & Thomas Yuen Ctr. for Functional Onco-Imaging, Univ. of California, Irvine (United States); Hakan Erkol, Bogaziçi Univ. (Turkey); Gultekin Gulsen, John Tu & Thomas Yuen Ctr. for Functional Onco-Imaging, Univ. of California, Irvine (United States)

12371-12 • 2:00 PM - 2:20 PM

MRI-guided near-infrared spectroscopic tomographic system for breast cancer imaging: phantom and normal-subject studies

Author(s): Mengyang Zhao, Xu Cao, Mingwei Zhou, Dartmouth College (United States); Jinchao Feng, Beijing Univ. of Technology (China); Luxi Xia, Brian W. Pogue, Keith D. Paulsen, Shudong Jiang, Dartmouth College (United States)

12371-13 • 2:20 PM - 2:40 PM

Real-time photorealistic 3D spectral rendering of human skin appearance

Author(s): Alexander Doronin, Marc Gluyas, Victoria Univ. of Wellington (New Zealand)

12371-14 • 2:40 PM - 3:00 PM

Micro-CT guided deep neural network for 3D reconstructions in widefield diffuse optical tomography

Author(s): Navid Ibtehaj I. Nizam, Marien Ochoa, Jason T. Smith, Xavier R. Intes, Rensselaer Polytechnic Institute (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 4: DEEP LEARNING

3:30 PM - 5:10 PM

Moscone Center, Room 202 (Level 2 South)

Session chairs: Xavier R. Intes, Rensselaer Polytechnic Institute (United States), Lei Tian, Boston Univ. (United States)

12371-15 • 3:30 PM - 3:50 PM

Multimodal image fusion of time-domain mesoscopic fluorescence molecular tomography and short wave infrared imaging for resolution enhancement

Author(s): Luis Chavez, Shan Gao, Xavier R. Intes, Rensselaer Polytechnic Institute (United States)

12371-16 • 3:50 PM - 4:10 PM

CANCELED: Correlative multimodal imaging of vascularization in Murine tumors in its data handling

Author(s): Andreas Walter, Hochschule Aalen - Technik und Wirtschaft (Germany)

12371-17 • 4:10 PM - 4:30 PM

Virtual stain-to-stain transformations via cascaded deep neural networks

Author(s): Xilin Yang, Bijie Bai, Yuzhu Li, Yijie Zhang, Tairan Liu, Kevin de Haan, Aydogan Ozcan, UCLA Samueli School of Engineering (United States)

12371-18 • 4:30 PM - 4:50 PM

Machine learning-assisted label-free multimodal optical bioimaging for biopharmaceutical CHO cell line characterization

Author(s): Jindou Shi, Univ. of Illinois (United States); Alexander Ho, Corey E. Snyder, Univ. of Illinois (United States); Eric J. Chaney, Univ. of Illinois (United States); Janet E. Sorrells, Univ. of Illinois (United States); Aneesh Alex, GlaxoSmithKline (United States); Remben V. Talaban, GlaxoSmithKline (United Kingdom); Darold R. Spillman, Univ. of Illinois (United States); Marina Marjanovic, Univ. of Illinois (United States); Steve R. Hood, GlaxoSmithKline (United Kingdom); Stephen A. Boppart, Univ. of Illinois (United States)

12371-20 • 4:50 PM - 5:10 PM

Deep-learning based image denoising techniques for enhancing 3D Monte Carlo simulations

Author(s): Matin Raayai Ardakani, Northeastern Univ. (United States); Leiming Yu, Analogic Corp. (United States); David R. Kaeli, Qianqian Fang, Northeastern Univ. (United States)

SESSION 5: SURGICAL GUIDANCE

5:10 PM - 6:10 PM

Moscone Center, Room 202 (Level 2 South)

Session chairs: Fred S. Azar, InterSystems Corp. (United States), Samuel H. Chung, Northeastern Univ. (United States)

12371-21 • 5:10 PM - 5:30 PM

Multimodal imaging system with ultrasound, photoacoustics, and optical coherence tomography for optical biopsy of melanoma

Author(s): Anatoly Fedorov Kukuk, Di Wu, Leibniz Univ. Hannover (Germany); Evelyn Gaffal, University Hospital Magdeburg (Germany); Rüdiger Panzer, Steffen Emmert, Klinik und Poliklinik für Dermatologie und Venerologie, Universitätsmedizin Rostock (Germany); Bernhard Roth, Leibniz Univ. Hannover (Germany), Cluster of Excellence PhoenixD (Germany)

12371-22 • 5:30 PM - 5:50 PM

A retrofit colonoscope for in-vivo human multispectral, topographic, and blood flow imaging

Author(s): Taylor L. Bobrow, Ethan Levy, John Han, Nicholas J. Durr, Johns Hopkins Univ. (United States)

12371-23 • 5:50 PM - 6:10 PM

Comparison of surface dose during whole breast radiation therapy on Halcyon and TrueBeam using Cherenkov imaging

Author(s): Daniel A. Alexander, Olivia Certa, Taoran Li, Neil K. Taunk, Timothy C. Zhu, Univ. of Pennsylvania (United States)

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM PST | Moscone Center, Level 2 West

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12371-24 • On demand | Presented live 29 January 2023

Combined multiphoton microscopy and somatostatin receptor type 2 imaging of pancreatic neuroendocrine tumors

Author(s): Noelle Daigle, Thomas G. Knapp, Suzann Duan, David W. Jones, The Univ. of Arizona (United States); Ali Azhdarinia, Sukhen C. Ghosh, Solmaz AghaAmiri, The University of Texas Health Science Center at Houston (United States); Naruhiko Ikoma, Jeannelyn Estrella, The University of Texas MD Anderson Cancer Center (United States); Martin J. Schnermann, National Cancer Institute (United States); Juanita L. Merchant, Travis W. Sawyer, The Univ. of Arizona (United States)

12371-25

Co-registered fluorescence and coherent multi-contrast depth-resolved imaging of bladder tumor

Author(s): Feng Yan, Chen Wang, The Univ. of Oklahoma (United States); Venkateshwar Madka, Chinthalapally V. Rao, The Univ. of Oklahoma Health Sciences Ctr. (United States); Qinggong Tang, The Univ. of Oklahoma (United States)

12371-26 • On demand | Presented live 29 January 2023

Hyperspectral microscopy-based label-free semi-automatic segmentation of eye tissues

Author(s): Na Yu, You Liang, Janakkumar Bhanushali, Toronto Metropolitan Univ. (Canada); Xun Zhou, Keanu Uchida, Michael Lapinski, Robert Kalisky, Unity Health Toronto (Canada); Tomasz S. Tkaczyk, Rice Univ. (United States); Neeru Gupta, Yeni Yucel, Unity Health Toronto (Canada)

12371-27 • On demand | Presented live 29 January 2023

End-to-end reconstruction for mesoscopic fluorescence molecular tomography via deep learning

Author(s): Shan Gao, Mengzhou Li, Navid I. Nizam, Intes R. Xavier, Rensselaer Polytechnic Institute (United States)

12371-41

Flexible and tunable nonlinear microscopy platform

Author(s): Gregor Hehl, Helmut-Schmidt Univ. (Germany); Semyon Goncharov, Helmut Schmidt University (Germany); Kilian Fritsch, Helmut Schmidt Univ. (Germany); Oleg Pronin, Helmut-Schmidt Univ. (Germany)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12371-28 • On demand | Presented live 28 January 2023

Spectral unmixing for multispectral fluorescence imaging using prior knowledge of spectral signatures

Author(s): Ruirui Zhang, Duofang Chen, Shenghan Ren, Xidian Univ. (China); Feng Chen, Shanghai Electro-Mechanical Engineering Institute (China); Xueli Chen, Xidian Univ. (China)

Conference 12372

28 - 30 January 2023 | Moscone Center, Room 312 (Level 3 South)

Optical Fibers and Sensors for Medical Diagnostics, Treatment and Environmental Applications XXIII

Conference Chairs: **Israel Gannot**, Johns Hopkins Univ. (United States), Tel Aviv Univ. (Israel); **Katy Roodenko**, MAX IR Labs (United States)

Program Committee: **James P. Clarkin**, Polymicro Technologies, A Subsidiary of Molex Incorporated (United States); **Ilko Ilev**, U.S. Food and Drug Administration (United States); **Jin U. Kang**, Johns Hopkins Univ. (United States); **Pierre Lucas**, The Univ. of Arizona (United States); **Yuji Matsuura**, Tohoku Univ. (Japan); **Angela B. Seddon**, The Univ. of Nottingham (United Kingdom); **Zhenpeng Qin**, The Univ. of Texas at Dallas (United States)

SATURDAY 28 JANUARY

SESSION 1: OPTICAL FIBERS AND SENSORS I

8:20 AM - 10:00 AM

Moscone Center, Room 312 (Level 3 South)

Session chair: Zhenpeng Qin, The Univ. of Texas at Dallas (United States)

12372-1 • 8:20 AM - 8:40 AM

Toward the development of direct emission yellow fiber lasers for biomedical applications

Author(s): Valentina Serafini, Diego Pugliese, Aurora Bellone, Politecnico di Torino (Italy); Joris Lousteau, Politecnico di Milano (Italy); Foroogh Khozayemeh Sarbishe, Federica Poli, Annamaria Cucinotta, Univ. degli Studi di Parma (Italy); Guido Perrone, Politecnico di Torino (Italy)

12372-2 • 8:40 AM - 9:00 AM

Advanced fiber solutions for process-spectroscopy applications in 0.3-16 μ m range

Author(s): Viacheslav G. Artyushenko, art photonics GmbH (Germany); Dmitry S. Starodubov, FOMS Inc. (United States)

12372-3 • 9:00 AM - 9:20 AM

Photonic crystal multimode fiber-tip sensors

Author(s): Mildred S. Cano-Velázquez, Luca Picelli, Arnoud Loopstra, Omar Abdel-Aal, Arthur L. Hendriks, René P. J. van Veldhoven, Andrea Fiore, Technische Univ. Eindhoven (Netherlands)

12372-4 • 9:20 AM - 9:40 AM

Reliable and easy-to-use SERS spectroscopy platform based on a tapered opto-fluidic photonic crystal fiber

Author(s): Amine Benazza, Flavien Beffara, Jean-Louis Auguste, XLIM (France); Dinish U.S., Malini C. Olivo, Singapore Bioimaging Consortium (Singapore); Georges J. Humbert, XLIM (France)

12372-6 • 9:40 AM - 10:00 AM

Distributed optical sensing for 2D pressure mapping in biomedical applications

Author(s): Zhanerke Katrenova, Shakhriyat Alisherov, Turar Abdol, Madina Yergibay, Zhanat Kappassov, Daniele Tosi, Carlo Molardi, Nazarbayev Univ. (Kazakhstan)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: OPTICAL FIBERS AND SENSORS II

10:30 AM - 12:10 PM

Moscone Center, Room 312 (Level 3 South)

Session chair: Israel Gannot, Tel Aviv Univ. (Israel)

12372-7 • 10:30 AM - 11:10 AM

2P fiberscopy for brain imaging in freely-behaving rodents (Keynote Presentation)

Author(s): Xingde Li, Haolin Zhang, Hyeon-Cheol Park, Honghua Guan, Dawei Li, Ang Li, Johns Hopkins Univ. (United States); Hui Lu, The George Washington Univ. (United States); Ming-Jun Li, Corning Incorporated (United States)

12372-9 • 11:10 AM - 11:30 AM

Transabdominal fetal heart rate measurement through fiber based frequency-modulated continuous-wave near-infrared spectroscopy

Author(s): Shing-Jiuan Liu, Su Yeon Lee, Christopher D. Pivetti, Edwin Kulubya, Aijun Wang, Diana L. Farmer, Soheil Ghiasi, Weijian Yang, Univ. of California, Davis (United States)

12372-10 • 11:30 AM - 11:50 AM

Common-path optical coherence tomography guided vertical pneumodissection for DALK

Author(s): Yaning Wang, Shoujing Guo, Justin D. Opfermann, James Kaluna, Johns Hopkins Univ. (United States); Bill G. Gensheimer, Dartmouth-Hitchcock Medical Ctr. (United States); Axel Krieger, Jin U. Kang, Johns Hopkins Univ. (United States)

12372-72 • 11:50 AM - 12:10 PM

Nanomaterials tools for neuroscience and brain therapeutics (NanoBrain)

Author(s): Zhenpeng Qin, The Univ. of Texas at Dallas (United States)

Lunch/Exhibition Break 12:10 PM - 1:10 PM

SESSION 3: OPTICAL FIBERS AND SENSORS III

1:10 PM - 3:10 PM

Moscone Center, Room 312 (Level 3 South)

Session chair: Yuji Matsuura, Tohoku Univ. (Japan)

12372-11 • 1:10 PM - 1:30 PM

Positioning of catheter with optical fiber using dynamics of laser-induced bubbles near thrombus

Author(s): Yohei Takata, Hamamatsu Photonics K.K. (Japan), The Graduate School for the Creation of New Photonics Industries (Japan); Hideo Eda, The Graduate School for the Creation of New Photonics Industries (Japan), Photonics Innovations Co., Ltd. (Japan); Hiroyuki Okada, Hamamatsu Photonics K.K. (Japan)

12372-12 • 1:30 PM - 1:50 PM

Quantifying hypoxia with diffuse reflectance spectroscopy for advanced prognostication and response monitoring in rectal cancer: an in-vivo hypoxia characterization study

Author(s): Teddy Fletcher, Elena Monfort-Sanchez, Meysam Keshavarz, James Avery, Hutan Ashrafian, Ara W. Darzi, Alex J. Thompson, Imperial College London (United Kingdom)

12372-14 • 1:50 PM - 2:10 PM

Development of optical fiber arrays for snapshot imaging spectroscopy and OCT using 2-photon polymerization technique

Author(s): Haimu Cao, Christopher Flynn, Rice Univ. (United States); Brian E. Applegate, The Univ. of Southern California (United States); Tomasz S. Tkaczyk, Rice Univ. (United States)

12372-15 • 2:10 PM - 2:30 PM

Lossy mode resonance-based optical-fibre sensor for SARS-CoV-2 detection

Author(s): Kamil Kosiel, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland), Warsaw Univ. of Technology (Poland); Joanna Jankowska-Sliwińska, Anna Szerling, Piotr Polak, Krzysztof Grabczewski, Maciej Kozubal, Karina S. Wojciechowska, Laura Stanco, Renata Kruska, Ryszard Buczyński, Grzegorz Stępniewski, Dariusz Pysz, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); Michal O. Szymanski, Warsaw Univ. of Life Sciences-SGGW (Poland); Krzysztof Domański, Piotr Prokaryn, Konrad Dudziński, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland)

12372-16 • 2:30 PM - 2:50 PM

Dual-comb biosensing of SARS-CoV-2 nucleocapsid protein antigen

Author(s): Shogo Miyamura, Ryo Oe, Takuya Nakahara, Tokushima Univ. (Japan); Shuji Taue, Kochi Univ. of Technology (Japan); Yu Tokizane, Takeo Minamikawa, Tokushima Univ. (Japan); Taira Kajisa, Toyo Univ. (Japan); Takeshi Yasui, Tokushima Univ. (Japan)

12372-17 • 2:50 PM - 3:10 PM

Aperiodic multi-core fibers for lens-less endoscopy

Author(s): Ronja Stephan, Leibniz Univ. Hannover (Germany); Elias Scharf, TU Dresden (Germany); Kinga Zolnacz, Wroclaw Univ. of Science and Technology (Poland); Katharina Hausmann, Matthias Ließmann, Lea Kötters, Detlev Ristau, Leibniz Univ. Hannover (Germany); Jürgen W. Czarske, Robert Kuschmierz, TU Dresden (Germany); Michael Steinke, Leibniz Univ. Hannover (Germany)

12372-13 • 3:10 PM - 3:30 PM

CANCELED: An integrated graphene-optical biosensor for detection of breast cancer cell media

Author(s): Jiaxing Sun, Amanda Coutts, Xianfeng Chen, Nottingham Trent Univ. (United Kingdom)

Coffee Break 3:10 PM - 4:00 PM

SESSION 4: OPTICAL FIBERS AND SENSORS IV

4:00 PM - 5:00 PM

Moscone Center, Room 312 (Level 3 South)

Session chairs: James P. Clarkin, Polymicro Technologies (United States), Jin U. Kang, Johns Hopkins Univ. (United States)

12372-20 • 4:00 PM - 4:20 PM Ring core fiber: a novel design of PCF for SERS sensing

Author(s): Flavien Beffara, Georges J. Humbert, Jean-Louis Auguste, XLIM (France); Dinish U.S., Malini C. Olivo, Singapore Bioimaging Consortium (Singapore)

12372-21 • 4:20 PM - 4:40 PM

Online monitoring of a proton beam with perfluorinated polymer optical fibre

Author(s): Olugbenga Jeremiah Olusoji, Univ. of Limerick (Ireland); Crystal Penner, TRIUMF (Canada); Wern Kam, Univ. of Limerick (Ireland); Camille Bélanger-Champagne, Cornelia Hoehr, TRIUMF (Canada); Sinead O'Keeffe, Univ. of Limerick (Ireland)

12372-22 • 4:40 PM - 5:00 PM

Fabrication of optical fibers and fiber couplers using 2-photon lithography

Author(s): Christopher Flynn, Haimu Cao, Rice Univ. (United States); Brian E. Applegate, The Univ. of Southern California (United States); Tomasz S. Tkaczyk, Rice Univ. (United States)

SUNDAY 29 JANUARY

SESSION 5: OPTICAL FIBERS AND SENSORS V

8:00 AM - 10:00 AM

Moscone Center, Room 312 (Level 3 South)

Session chair: Dmitry S. Starodubov, FOMS Inc. (United States)

12372-55 • 8:00 AM - 8:20 AM

Influence of light-sources on UV fiber damage measured with DIN standard 58145

Author(s): Philipp Raithel, Lytegate GmbH (Germany); Andreas Langner, Heraeus Quarzglas GmbH & Co. KG (Germany); Mathias Belz, Lytegate GmbH (Germany); Steffen Kaiser, Daniel Reul, Heraeus Quarzglas GmbH & Co. KG (Germany); Karl-Friedrich Klein, Lytegate GmbH (Germany), FOFB e.K. (Germany)

12372-68 • 8:20 AM - 8:40 AM

Optical fiber based de-speckler for fluorescence microscopy and imaging

Author(s): Devinder Saini, Luke Westbrook, Ron Mehl, Fiberguide Industries, Inc. (United States); Mike Dorey, Molex, LLC (United States); Joshua Ramm, Molex (United States)

12372-23 • 8:40 AM - 9:00 AM

Advances in multispectral fiber sensing for biomedical applications

Author(s): Iskander Usenov, Alexander Novikov, art photonics GmbH (Germany), Technische Univ. Berlin (Germany); Andrey Bogomolov, Samara State Technical Univ. (Russian Federation); Tatiana Sakharova, Alexey Bocharnikov, Viacheslav G. Artyushenko, art photonics GmbH (Germany); Dmitry S. Starodubov, FOMS Inc. (United States)

Conference 12372

12372-24 • 9:00 AM - 9:20 AM

Fiber laser design for biomedical applications

Author(s): Jeffrey J. Perkins, Triple Ring Technologies, Inc. (United States); Logan R. Chieffo, Kevin F. Wall, NKT Photonics Inc. (United States)

12372-26 • 9:20 AM - 9:40 AM

All-fiber sensors for radiation measurements in radiotherapy

Author(s): Aurora Bellone, Massimo Olivero, Politecnico di Torino (Italy); Wilfried Blanc, Mourad Benabdesselam, Franck Mady, Univ. Côte d'Azur (France); Alberto Vallan, Guido Perrone, Politecnico di Torino (Italy)

12372-27 • 9:40 AM - 10:00 AM

Down-conversion polymer end-capped optical fiber probes for UV fluorescence monitoring

Author(s): Rodolfo A. Carrillo-Betancourt, Juan Hernández-Cordero, Univ. Nacional Autónoma de México (Mexico)

Coffee Break 10:00 AM - 10:30 AM

SESSION 6: OPTICAL FIBERS AND SENSORS VI

10:30 AM - 12:40 PM

Moscone Center, Room 312 (Level 3 South)

Session chair: Katy Roodenko, Max-IR Labs., LLC (United States)

12372-29 • 10:30 AM - 11:10 AM

Spectroscopic techniques and sensors for the exploration of extraterrestrial environments: a review (Keynote Presentation)

Author(s): Michael Gensch, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

12372-30 • 11:10 AM - 11:40 AM

Plasmonic terahertz imaging and spectroscopy systems (Invited Paper)

Author(s): Mona Jarrahi, UCLA Samueli School of Engineering (United States)

12372-31 • 11:40 AM - 12:10 PM

Multiscale IR polarimetry of anisotropic nanofibers (Invited Paper)

Author(s): Karsten Hinrichs, Leibniz-Institut für Analytische Wissenschaften-ISAS-e.V. (Germany); Brianna Blevins, The Univ. of Georgia (United States); Andreas Furchner, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany); Nataraja Sekhar Yadavalli, Sergiy Minko, The Univ. of Georgia (United States); Raphael Horvath, Markus Mangold, IRsweep AG (Switzerland)

12372-32 • 12:10 PM - 12:40 PM

High peak power quantum cascade laser arrays with top-metal distributed Bragg reflector (Invited Paper)

Author(s): Arkadiy A. Lyakh, Luke Milboker, Univ. of Central Florida (United States); Enrique Cristobal, Hong Shu, Irglare, LLC (United States)

Lunch/Exhibition Break 12:40 PM - 2:10 PM

SESSION 7: OPTICAL FIBERS AND SENSORS VII

2:10 PM - 3:50 PM

Moscone Center, Room 312 (Level 3 South)

Session chair: Pierre Lucas, The Univ. of Arizona (United States)

12372-33 • 2:10 PM - 2:40 PM

Can QCLs have a strong impact on health and environmental applications (Invited Paper)

Author(s): Mariano Troccoli, Evolution Photonics Inc. (United States)

12372-34 • 2:40 PM - 3:10 PM

Surface analysis and hyperspectral imaging with quantum cascade lasers (Invited Paper)

Author(s): Andrew Mendizabal, Peter G. Loges, Block Engineering, LLC (United States)

12372-35 • 3:10 PM - 3:30 PM

Wastewater treatment monitoring and process control with infrared sensors

Author(s): Trey B. Daunis, Bach Le, Jennifer C. Dussor, Kevin P. Clark, Dennis I. Robbins, Katy Roodenko, Max-IR Labs., LLC (United States)

12372-36 • 3:30 PM - 3:50 PM

Improved method for rapid characterization of microplastics in environmental samples with QCL-IR based microscopy and micro spectroscopy

Author(s): Matthias Godejohann, MG Optical Solutions GmbH (Germany)

Coffee Break 3:50 PM - 4:20 PM

SESSION 8: OPTICAL FIBERS AND SENSORS VIII

4:20 PM - 5:40 PM

Moscone Center, Room 312 (Level 3 South)

Session chair: Devinder Saini, Fiberguide Industries, Inc. (United States)

12372-71 • 4:20 PM - 4:40 PM

Nanoclay-based hydrogel for packaging of optical resonator sensors

Author(s): Sanskar Thakur, Jie Liao, Mederic Loyez, Maxwell Adolphson, Lan Yang, Washington Univ. in St. Louis (United States)

12372-40 • 4:40 PM - 5:00 PM

Design and experimental analysis of TiO₂ coated eFBG sensor for chemical sensing

Author(s): Azhar Shadab, Sanjeev Kumar Raghuwanshi, Indian Institute of Technology (Indian School of Mines), Dhanbad (India); Md Tauseef Iqbal Ansari, Indian Institute of Technology (Indian School of Mines) Dhanbad, Dhanbad (India); Santosh Kumar, Liaocheng Univ. (China)

12372-38 • 5:00 PM - 5:20 PM

Mid-infrared photoacoustic spectroscopy using piezoelectric transducer

Author(s): Ryota Sasaki, Saiko Kino, Yuji Matsuura, Tohoku Univ. (Japan)

12372-39 • 5:20 PM - 5:40 PM

Optical evanescent-wave hydrogen fiber sensor based on Bragg grating coated with nanoparticles

Author(s): Ahmad Abdalwareth, Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); Günter Flachenecker, Martin Angelmahr, Wolfgang Schade, Fraunhofer-Institut für Nachrichtentechnik (Germany)

MONDAY 30 JANUARY

SESSION 9: OPTICAL FIBERS AND SENSORS IX

8:00 AM - 10:00 AM

Moscone Center, Room 312 (Level 3 South)

Session chair: Angela B. Seddon, The Univ. of Nottingham (United Kingdom)

12372-41 • 8:00 AM - 8:30 AM

Nanoparticle enabled optical fibers to side-emit germicidal ultraviolet light for biofilm control (Invited Paper)

Author(s): Paul Westerhoff, Zhe Zhao, Nora Shapiro, Arizona State Univ. (United States)

12372-42 • 8:30 AM - 8:50 AM

Combined optical water quality monitoring and sanitization system

Author(s): Chiara Bellezza Prinsi, Ritjola Kulluri, Politecnico di Torino (Italy); Gabriella Motta, ALITE SRL (Italy); Guido Perrone, Politecnico di Torino (Italy)

12372-43 • 8:50 AM - 9:20 AM

Current and future analytical needs for water quality measurements in the drinking, industrial, and wastewater sectors (Invited Paper)

Author(s): Mahmut S. Ersan, Paul Westerhoff, Arizona State Univ. (United States)

12372-44 • 9:20 AM - 9:40 AM

Quantum photonics detection of environmental microplastics

Author(s): Jürgen Schnekenburger, Alvaro Barroso Pena, Björn Kemper, Westfälische Wilhelms-Univ. Münster (Germany)

12372-45 • 9:40 AM - 10:00 AM

Optical tastebuds for water quality testing

Author(s): Justin R. Sperling, Laurie Savage, Liam T. Wilson, Calum Cuthill, Katie McGuire, Jill Robbie, William D. Sloan, Caroline Gauchotte-Lindsay, William J. Peveler, Alasdair W. Clark, Univ. of Glasgow (United Kingdom)

Coffee Break 10:00 AM - 10:30 AM

SESSION 10: OPTICAL FIBERS AND SENSORS X

10:30 AM - 11:30 AM

Moscone Center, Room 312 (Level 3 South)

Session chair: Mathias Belz, Lytegate GmbH (Germany)

12372-46 • 10:30 AM - 10:50 AM

Laser-based dew detection

Author(s): Robin Gaetani, Institut des Nanotechnologies de Lyon (France); François Feugier, Greenshield Technology (France); Bruno Masenelli, Institut des Nanotechnologies de Lyon (France)

12372-47 • 10:50 AM - 11:10 AM

Nanoplasmonic ecosystem sensors

Author(s): Greig Govenlock, Univ. of Glasgow (United Kingdom); Lars Boehme, University of St. Andrews (United Kingdom); Alasdair Clark, Univ. of Glasgow (United Kingdom)

12372-49 • 11:10 AM - 11:30 AM

Arsenic detection in drinking water using evanescent fiber cavity ring down spectroscopy

Author(s): Ubaid Ullah, Daniyal Ghauri, Falak Sher, M. Imran Cheema, Lahore Univ. of Management Sciences (Pakistan)

POSTERS-MONDAY

30 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the Monday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM - 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12372-51

Temperature and vibration OTDR measurements with a single mode-multimode-single mode fiber structure

Author(s): Aleksandr Y. Igumenov, Moscow Institute of Physics and Technology (Russian Federation), T8 LLC (Russian Federation); Igor V. Melnikov, Moscow Institute of Physics and Technology (Russian Federation), Institute of Dynamics of Geospheres RAS (Russian Federation); Arsenii A. Afanasiev, Sandaara S. Popova, Moscow Institute of Physics and Technology (Russian Federation); Sergey N. Lukinykh, T8 LLC (Russian Federation), M. V. Lomonosov Moscow State Univ. (Russian Federation); Igor A. Tambaov, Institute of Physics L. V. Kirensky SB RAS (Russian Federation); Alexei S. Lagutchev, Purdue Univ. (United States)

12372-52

Sensitive detection of vitamin C using etched SMS based LSPR biosensor

Author(s): Shikha Niyaal, Kuldeep Choudhary, DIT Univ. (India); Sanjeev Kumar Raghuwanshi, Indian Institute of Technology (Indian School of Mines), Dhanbad (India); Surbhi Sachdev, DIT Univ. (India); Santosh Kumar, Liaocheng Univ. (China)

12372-55

Tunable optical delay line using UV-stretchable polymer-coated chirped fiber Bragg gratings

Author(s): Seung Seok Lee, Hyunsung Kim, JeongMin Seo, Young Min Ko, Tae-Jung Ahn, Eun-Seo Choi, Chosun Univ. (Korea, Republic of)

12372-28 • 5:30 PM - 7:00 PM

1250 nm broadband wavelength-swept laser for optical fiber sensors

Author(s): Gi Hyen Lee, Soyeon Ahn, Min Su Kim, Ji Su Kim, Byeong Kwon Choi, Min Yong Jeon, Chungnam National Univ. (Republic of Korea)

12372-69 • 5:30 PM - 7:00 PM

Digitally photocorroding stack of GaAs/AlGaAs nanoheterostructures: towards a regenerable biosensor of bacteria

Author(s): Ishika Ishika, Walid M. Hassen, Jonathan Vermette, Univ. de Sherbrooke (Canada); Houman Moteshareie, Azam F. Tayabali, Health Canada (Canada), Univ. de Sherbrooke (Canada); Jan J. Dubowski, Univ. de Sherbrooke (Canada)

Conference 12373

31 January - 1 February 2023 | Moscone Center, Room 302 (Level 3 South)

Optical Biopsy XXI: Toward Real-Time Spectroscopic Imaging and Diagnosis

Conference Chairs: **Robert R. Alfano**, The City College of New York (United States); **Angela B. Seddon**, The Univ. of Nottingham (United Kingdom); **Lingyan Shi**, Univ. of California, San Diego (United States)

Program Committee: **Nicole J. Crane**, Naval Medical Research Ctr. (United States); **Amir Gandjbakhche**, National Institutes of Health (United States); **Israel Gannot**, Johns Hopkins Univ. (United States), Tel Aviv Univ. (Israel); **Michael G. Giacomelli**, Univ. of Rochester (United States); **Zhiwei Huang**, National Univ. of Singapore (Singapore); **Nicutor V. Iftimia**, Physical Sciences Inc. (United States); **Igor V. Meglinski**, Univ. of Oulu (Finland), Aston Univ. (United Kingdom); **Yang Pu**, Davinci Applied Technologies Inc. (United States); **Milind Rajadhyaksha**, Memorial Sloan-Kettering Cancer Ctr. (United States); **Gennady B. Shvets**, Cornell Univ. (United States); **Ganesan Singaravelu**, Anna Univ., Chennai (India); **Binlin Wu**, Southern Connecticut State Univ. (United States); **Min Xu**, Hunter College (United States); **Anna N. Yaroslavsky**, Univ. of Massachusetts Lowell (United States); **Siavash Yazdanfar**, Corning Incorporated (United States)

MONDAY 30 JANUARY

POSTERS-MONDAY

30 January 2023 • 5:30 PM - 7:00 PM PST | Moscone Center, Level 2 West

Conference attendees are invited to attend the poster Session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster Sessions.

Poster Setup: Monday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12373-32 • On demand | Presented live 30 January 2023

Comparison of UV protection by skin color based on UV reflection image pixel value

Author(s): Juhyun Kim, TaeYeon Gil, Onseok Lee, Soonchunhyang Univ. (Republic of Korea)

12373-33

Development of large-field label-free multispectral fluorescence lifetime imaging microscopy for imaging unstained tissue slide

Author(s): Soonyong Kwon, Jeong Moo Han, Hyeong Soo Nam, KAIST (Republic of Korea); Bomi Gweon, Sejong Univ. (Republic of Korea); Jaeyeon Seok, College of Medicine, Gachon Univ. (Republic of Korea); Hongki Yoo, KAIST (Republic of Korea)

12373-34 • On demand | Presented live 30 January 2023

Optical characterization of vascular health in sickle cell disease

Author(s): Kathryn Jaroszynski, Timothy Quang, Eunice Kennedy Shriver National Institute of Child Health and Human Development (United States); Julia Xu, Ingrid Frey, National Heart, Lung, and Blood Institute (United States); Elise Berning, Brian Hill, Eunice Kennedy Shriver National Institute of Child Health and Human Development (United States); Swee Lay Thein, National Heart, Lung, and Blood Institute (United States); Bruce Tromberg, National Institute of Biomedical Imaging and Bioengineering (United States)

TUESDAY 31 JANUARY

SESSION 1: SPECTRAL IMAGING I

8:20 AM - 10:40 AM

Moscone Center, Room 302 (Level 3 South)

Session chair: Lingyan Shi, Univ. of California, San Diego (United States)

12373-1 • 8:20 AM - 8:40 AM

Opening remarks

Author(s): Robert R. Alfano, The City College of New York (United States); Angela B. Seddon, The Univ. of Nottingham (United Kingdom)

12373-2 • 8:40 AM - 9:20 AM

Photoacoustic tomography and compressed ultrafast photography (Keynote Presentation)

Author(s): Lihong V. Wang, Caltech (United States)

12373-3 • 9:20 AM - 10:00 AM

Uncovering new utility in infrared spectroscopic imaging by pushing the limits of accuracy, speed, and resolution (Keynote Presentation)

Author(s): Rohit Bhargava, Kevin L. Yeh, Seth Kenkel, Beckman Institute for Advanced Science and Technology (United States); Yamuna D. Phal, Ruo-Jing Ho, Kianoush Falahkheirkhah, Univ. of Illinois (United States)

12373-4 • 10:00 AM - 10:40 AM

High-resolution high-speed chemical imaging through mid-infrared photothermal microscopy (Keynote Presentation)

Author(s): Ji-Xin Cheng, Boston Univ. (United States)

Coffee Break 10:40 AM - 11:10 AM

SESSION 2: SPECTRAL IMAGING II

11:10 AM - 1:10 PM

Moscone Center, Room 302 (Level 3 South)

Session chairs: Lingyan Shi, Univ. of California, San Diego (United States); Angela B. Seddon, The Univ. of Nottingham (United Kingdom)

12373-6 • 11:10 AM - 11:30 AM

Broadband hyperspectral imaging across visible and infrared biological windows using a single camera

Author(s): Stephen Mead, Sarah E. Bohndiek, Calum Williams, Graham Spicer, Univ. of Cambridge (United Kingdom)

12373-7 • 11:30 AM - 11:50 AM

Time-correlated Raman imaging with a SPAD line sensor

Author(s): Neil Finlayson, Heather McEwan, Gillian Brown, Alistair Gorman, Andrey Gromov, Colin Campbell, Ahmet Erdogan, Robert Henderson, Gareth Williams, The Univ. of Edinburgh (United Kingdom)

12373-8 • 11:50 AM - 12:10 PM

Automatic early detection of esophageal cancer based on snap-shot hyperspectral imaging technology

Author(s): Arvind Mukundan, Hsiang-Chen Wang, National Chung Cheng Univ. (Taiwan); Cho-Lun Tsai, Ditmanson Medical Foundation Chia-Yi Christian Hospital (Taiwan); Yi-Hsun Chen, Kaohsiung Medical Univ. Hospital (Taiwan); Chen-Shuan Chung, Far Eastern Memorial Hospital (Taiwan); Yao-Kuang Wang, Kaohsiung Medical Univ. Hospital (Taiwan); Tsung-Hsien Chen, Ditmanson Medical Foundation Chia-Yi Christian Hospital (Taiwan); Yu-Sheng Tseng, National Chung Cheng Univ. (Taiwan); Chien-Wei Huang, Kaohsiung Armed Forces General Hospital (Taiwan); I-Chen Wu, Kaohsiung Medical Univ. Hospital (Taiwan)

12373-21 • 12:10 PM - 12:30 PM

Subcellular resolution imaging of metabolic dynamics under excess L-methionine regulation in amyotrophic lateral sclerosis

Author(s): Khang Hoang, Chan-yu Kuo, Hongje Jang, Sirasit Prayotamornkul, Hetvi Trivedi, Pegah Bagheri, Lingyan Shi, Univ. of California, San Diego (United States)

12373-9 • 12:30 PM - 1:10 PM

Multimodal non-linear optical super resolution imaging of metabolism during aging and diseases (Keynote Presentation)

Author(s): Lingyan Shi, Univ. of California, San Diego (United States)

Lunch/Exhibition Break 1:10 PM - 2:40 PM

SESSION 3: NOVEL TECHNIQUES I

2:40 PM - 4:40 PM

Moscone Center, Room 302 (Level 3 South)

Session chair: Binlin Wu, Southern Connecticut State Univ. (United States)

12373-10 • 2:40 PM - 3:20 PM

Ultrasensitive and ultra selective liquid biopsy: nanophotonics-driven digital resolution biomolecule sensing combined with target molecule recycling (Keynote Presentation)

Author(s): Brian T. Cunningham, Univ. of Illinois (United States)

12373-11 • 3:20 PM - 3:50 PM

Assessment of twisted light localization in turbid tissue-like scattering media using 3D geometrical exploration (Invited Paper)

Author(s): Alexander Doronin, Victoria Univ. of Wellington (New Zealand); Tatiana Novikova, Ecole Polytechnique (France), Florida International Univ. (United States); Nicolás Vera, Juan P. Staforelli, Univ. de Concepción (Chile); Igor Meglinski, Aston Univ. (United Kingdom), Univ. of Oulu (Finland)

12373-12 • 3:50 PM - 4:10 PM

Photoacoustic biopsy using a translational needle probe

Author(s): Guan Xu, Univ. of Michigan Kellogg Eye Ctr. (United States); Linyu Ni, Wei-Kuan Lin, Jay Guo, Xueding Wang, Univ. of Michigan (United States)

12373-45 • 4:10 PM - 4:40 PM

Ultrashort pulsed laser in deep head tissues penetration for non-invasive optogenetics in near-IR windows (Invited Paper)

Author(s): Diana Galiakhmetova, Viktor Dremine, Aleksandr Kovarirov, Dmitrii Stoliarov, Neville Ngum, Raghavan Chinnambedu-Murugesan, Rheinallt Parri, Sergei Sokolovski, Edik Rafailov, Aston Univ. (United Kingdom)

Coffee Break 4:40 PM - 4:50 PM

SESSION 4: NOVEL TECHNIQUES II

4:50 PM - 6:10 PM

Moscone Center, Room 302 (Level 3 South)

Session chair: Binlin Wu, Southern Connecticut State Univ. (United States)

12373-13 • 4:50 PM - 5:10 PM

Characterizing metabolic signatures of human biofluid-derived extracellular vesicles using label-free multimodal nonlinear optical microscopy

Author(s): Janet E. Sorrells, Jaena Park, Edita Aksamitiene, Elisabeth M. Martin, Eric J. Chaney, Marina Marjanovic, Univ. of Illinois (United States); Anna M. Higham, Kimberly A. Craddock, Zheng G. Liu, Carle Foundation Hospital (United States); Stephen A. Boppart, Univ. of Illinois (United States)

12373-14 • 5:10 PM - 5:30 PM

Hand-held OCT probe for transcutaneous use to assess various pathologies in real-time

Author(s): Aliana Caron, John Grimbale, Gopi Maguluri, Physical Sciences Inc. (United States); Rahul Anil Sheth, Savitri Krishnamurthy, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); Nick Iftimia, Physical Sciences Inc. (United States)

12373-15 • 5:30 PM - 5:50 PM

A large area dual wavelength laser speckle contrast imaging (LSCI) for measurement of blood perfusion and oxygenation

Author(s): Chang-Seok Kim, Im Deok Kim, NaYoung Kim, Pusan National Univ. (Republic of Korea); Chang Hyun Park, Pusan National Univ. Hospital (Republic of Korea); Yeong Jin Kim, Pusan National Univ. Hospital (Republic of Korea); Hyung-Hoi Kim, Pusan National Univ. (Republic of Korea)

Conference 12373

12373-16 • 5:50 PM - 6:10 PM

Autofluorescence lifetime imaging with low photon budget

Author(s): Jenu V. Chacko, Univ. of Wisconsin-Madison (United States); Kevin W. Eliceiri, Univ. of Wisconsin-Madison (United States), Morgridge Institute for Research (United States)

POSTERS-TUESDAY

31 January 2023 • 6:00 PM - 8:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the LASE poster Session on Tuesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster Sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12373-35 • 6:00 PM - 8:00 PM

Human glioma tumor diagnosis using visible resonance Raman spectroscopy and deep learning

Author(s): Binlin Wu, Southern Connecticut State Univ. (United States)

12373-46 • 6:00 PM - 8:00 PM

Raman spectroscopy from different types of lung cancers for application in bronchoscopy

Author(s): Binlin Wu, Southern Connecticut State Univ. (United States); Sandra Mamani, Henry Meyer, Cheng-Hui Liu, The City College of New York (United States); Nicholas Bernards, Tsukasa Ishiwata, Yuki Sata, Kazuhiro Yasufuku, University Health Network (Canada); Brian C. Wilson, University of Toronto and Princess Margaret Cancer Centre (Canada); Robert R. Alfano, The City College of New York (United States)

WEDNESDAY 1 FEBRUARY

SESSION 5: SPECTROSCOPIC METHODS I

8:50 AM - 10:00 AM PST

Moscone Center, Room 302 (Level 3 South)

Session chairs: Gennady B. Shvets, Cornell Univ. (United States), Angela B. Seddon, The Univ. of Nottingham (United Kingdom)

12373-18 • 8:50 AM - 9:20 AM

Identification of precancer oral lesions using minimally invasive sampling techniques and Raman microspectroscopy (Invited Paper)

Author(s): Isha Behl, Genecy Calado, Technological Univ. Dublin (Ireland); Stephen Flint, Sheila Galvin, Claire Healy, Trinity College Dublin (Ireland); Hugh J. Byrne, Fiona M. Lyng, Technological Univ. Dublin (Ireland)

12373-19 • 9:20 AM - 9:40 AM

In vivo Raman spectroscopy for sensing esophageal biomolecular changes in children with eosinophilic esophagitis

Author(s): Ezekiel Haugen, Andrea Locke, Vanderbilt Biophotonics Ctr., Vanderbilt Univ. (United States); Hernan Correa, Regina Tyree, Vanderbilt Univ. Medical Ctr. (United States); Girish Hiremath, Vanderbilt Univ. Medical Ctr. (United States), Vanderbilt Biophotonics Ctr., Vanderbilt Univ. (United States); Justin Baba, Vanderbilt Biophotonics Ctr., Vanderbilt Univ. (United States); Anita Mahadevan-Jansen, Vanderbilt Biophotonics Ctr., Vanderbilt Univ. (United States), Vanderbilt Univ. Medical Ctr. (United States)

12373-20 • 9:40 AM - 10:00 AM

Towards in-vivo monitoring of disease progression of inflammatory arthritis in rodent models using fibre-optic Raman spectroscopy

Author(s): Anders R. Walther, Univ. of Southern Denmark (Denmark); Elzbieta Stepula, King's College London (United Kingdom); Nicholas Ditzel, Moustapha Kassem, Odense Univ. Hospital (Denmark), Univ. of Southern Denmark (Denmark); Mads S. Bergholt, King's College London (United Kingdom); Martin A. B. Hedegaard, Univ. of Southern Denmark (Denmark)

Coffee Break 10:00 AM - 10:30 AM

SESSION 6: SPECTRAL DATA PROCESSING

10:30 AM - 12:00 PM

Moscone Center, Room 302 (Level 3 South)

Session chairs: Isha Behl, Technological Univ. Dublin (Ireland), Angela B. Seddon, The Univ. of Nottingham (United Kingdom)

12373-22 • 10:30 AM - 11:00 AM

Evaluation of chemotherapeutic effects on malignant cells using dual-wavelength fluorescence spectroscopy and machine learning (Invited Paper)

Author(s): Binlin Wu, Southern Connecticut State Univ. (United States)

12373-23 • 11:00 AM - 11:20 AM

Deep learning-based virtual staining of defocused autofluorescence images of label-free tissue

Author(s): Yijie Zhang, Luzhe Huang, Tairan Liu, Keyi Cheng, Kevin de Haan, Yuzhu Li, Bijie Bai, Aydogan Ozcan, Univ. of California, Los Angeles (United States)

12373-24 • 11:20 AM - 11:40 AM

Assessing the effectiveness of multimodal data fusion methods for in-vivo diagnosis of pre-cancerous skin conditions in a preclinical model

Author(s): Valentin Kupriyanov, Ctr. de recherche en automatique de Nancy (France), National Research Tomsk State Univ. (Russian Federation); Walter Blondel, Christian Daul, Marine Amouroux, Ctr. de recherche en automatique de Nancy (France); Yury Kistenev, National Research Tomsk State Univ. (Russian Federation)

12373-26 • 11:40 AM - 12:00 PM

Analysis of early-stage breast cancer using smartphone-based fluorescence imaging and spectroscopy during intra-operative procedure

Author(s): Pramila Thapa, Veena Singh, Indian Institute of Technology Delhi (India); Komal Gupta, Anurag Srivastava, All India Institute of Medical Sciences, New Delhi (India); Dalip S. Mehta, Indian Institute of Technology Delhi (India)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 7: SPECTROSCOPIC METHODS II

1:30 PM - 4:00 PM

Moscone Center, Room 302 (Level 3 South)

Session chairs: Angela B. Seddon, The Univ. of Nottingham (United Kingdom), Lingyan Shi, Univ. of California, San Diego (United States)

12373-27 • 1:30 PM - 2:00 PM

Plasmonic metasurface integrated with multi-well cell culture chamber for metasurface-enhanced Infrared spectroscopy of live cells *(Invited Paper)*

Author(s): Steven H. Huang, Giovanni Sartorello, Po-Ting Shen, Gennady Shvets, Cornell Univ. (United States)

12373-28 • 2:00 PM - 2:20 PM

Live stimulated Raman histology for the near-instant assessment of central nervous system samples

Author(s): Barbara Sarri, Institut Fresnel (France), Lightcore Technologies (France); Sandro Heuke, Institut Fresnel (France); Chang Liu, Lightcore Technologies (France); Sebastien Boissonneau, Assistance Publique Hôpitaux de Marseille (France); Hervé Rigneault, Institut Fresnel (France); Romain Appay, Assistance Publique Hôpitaux de Marseille (France)

12373-29 • 2:20 PM - 2:40 PM

Detection of cutaneous melanin based on Raman spectroscopy with optical coherence tomography localization

Author(s): Di Wu, Anatoly Fedorov Kuk, Bernhard Roth, Leibniz Univ. Hannover (Germany)

12373-30 • 2:40 PM - 3:00 PM

Application of Raman spectroscopy and multivariate analysis to detect ionizing radiation-induced changes in blood plasma

Author(s): Amiel Beausoleil-Morrison, Connor McNairn, Xiaoke Qin, Carleton Univ. (Canada); Cristian Ciobanu, McGill Univ. (Canada); Kaitlyn Altwasser, Health Canada (Canada); Sanjeena Subedi, Carleton Univ. (Canada); Vinita Chauhan, Health Canada (Canada); Sangeeta Murugkar, Carleton Univ. (Canada)

12373-31 • 3:00 PM - 3:20 PM

Amyloid beta and tau protein metabolic changes detected by visible resonance Raman scattering microscopy in Alzheimer's disease mouse model

Author(s): Lingyan Shi, Univ. of California, San Diego (United States); Yan Zhou, The General Hospital of the Air Force, PLA (China); Binlin Wu, CSCU Ctr. for Nanotechnology, Southern Connecticut State Univ. (United States); Ke Zhu, Institute of Physics (China); Shengjia Zhang, Jiangsu Raman Medical Equipment Co., Ltd, (China); Susie Boydston-White, Borough of Manhattan Community College (United States); Lin Zhang, Institute for Ultrafast Spectroscopy and Lasers (United States); Zhe Pei, Thien-An Nguyen, Cheng-Hui Liu, Robert R. Alfano, Institute for Ultrafast Spectroscopy and Lasers (United States)

12373-36 • 3:20 PM - 4:00 PM

Photon entanglement in brain-disease diagnosis *(Keynote Presentation)*

Author(s): Enrique J. Galvez, Baibhav Sharma, Colgate Univ. (United States); Lingyan Shi, Univ. of California, San Diego (United States); Robert R. Alfano, The City College of New York (United States)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12373-17 • On demand | Presenting live 28 January 2023

Towards peripheral neuron regeneration: imaging nerve biomechanics using Brillouin spectroscopy

Author(s): Vsevolod Cheburkanov, Texas A&M Univ. (United States); Junwei Du, Mikhail Berezin, Washington University School of Medicine in St. Louis (United States); Vladislav V. Yakovlev, Texas A&M Univ. (United States)

12373-5 • On demand | Presenting live 28 January 2023

Intra-operative brain tumor detection with deep learning-optimized hyperspectral imaging

Author(s): Tommaso Giannantonio, Anna Alperovich, Carl Zeiss AG (Germany); Piercosimo Semeraro, Carl Zeiss AG (Germany); Univ. degli Studi di Padova (Italy); Manfredo Atzori, Univ. degli Studi di Padova (Italy), HES-SO Valais-Wallis, Haute Ecole Spécialisée de Suisse Occidentale (Switzerland); Xiaohan Zhang, Christoph Hauger, Carl Zeiss Meditec AG (Germany); Alexander Freytag, Carl Zeiss AG (Germany); Siri Luthman, Roeland Vandebriel, Murali Jayapala, imec (Belgium); Lien Solie, Steven de Vleeschouwer, Univ. Hospitals Leuven (Belgium), Univ. Ziekenhuis Leuven (Belgium)

Conference 12374

29 - 30 January 2023 | Moscone Center, Room 202 (Level 2 South)

Microfluidics, BioMEMS, and Medical Microsystems XXI

Conference Chairs: **Bonnie L. Gray**, Simon Fraser Univ. (Canada); **Bastian E. Rapp**, Univ. of Freiburg (Germany)

Conference Co-Chair: **Colin Dalton**, Univ. of Calgary (Canada)

Program Committee: **Hatice Altug**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Brian W. Anthony**, Massachusetts Institute of Technology (United States); **Jaione Tirapan Azpiroz**, IBM Research - Brazil (Brazil); **Holger Becker**, microfluidic ChipShop GmbH (Germany); **Yolanda Fintschenko**, FounderTraction (United States); **Albert K. Henning**, Aquarian Microsystems (United States); **Yu-Cheng Lin**, National Cheng Kung Univ. (Taiwan); **Yuehe Lin**, Pacific Northwest National Lab. (United States); **Ian Papautsky**, Univ. of Illinois at Chicago (United States); **Sindy Kam-Yan Tang**, Stanford Univ. (United States); **Hayden K. Taylor**, Univ. of California, Berkeley (United States); **Julian Thiele**, Leibniz-Institut für Polymerforschung Dresden e.V. (Germany); **Bernhard H. Weigl**, Global Health Labs., Inc. (United States); **Richard D. Oleschuk**, Queen's Univ. (Canada)

SUNDAY 29 JANUARY

SESSION 1: MICROFLUIDICS I

9:00 AM - 10:10 AM

Moscone Center, Room 202 (Level 2 South)

Session chair: Bastian E. Rapp, Univ. of Freiburg (Germany)

12374-1 • 9:00 AM - 9:30 AM

Microfluidics: an enabling platform for biomedical applications (*Invited Paper*)

Author(s): Carolyn Ren, Univ. of Waterloo (Canada)

12374-2 • 9:30 AM - 9:50 AM

Development of 3D printed milli-fluidic passive mixers for point of care analysis of biofluids

Author(s): Pablo Gonzalez Polanco, Nicholas Uvanovich, Seemantini K. Nadkarni, Wellman Ctr. for Photomedicine (United States)

12374-3 • 9:50 AM - 10:10 AM

A predictive machine learning model to optimize flow rates on an integrated microfluidic pumping system for peptide-based 3D bioprinting

Author(s): Noofa S. Hammad, Zainab N. Khan, Alexander U. Valle-Pérez, Charlotte Hauser, King Abdullah Univ. of Science and Technology (Saudi Arabia)

Coffee Break 10:10 AM - 10:40 AM

SESSION 2: MICROFABRICATION

0:40 AM - 11:30 AM

Moscone Center, Room 202 (Level 2 South)

Session chair: Colin Dalton, Univ. of Calgary (Canada)

12374-4 • 10:40 AM - 11:10 AM

Development of liquid metal microfluidics for (Bio-) MEMS applications (*Invited Paper*)

Author(s): Pegah Pezeshkpour, Univ. of Waterloo (Canada)

12374-5 • 11:10 AM - 11:30 AM

A method for the rapid fabrication of solid metal microneedles

Author(s): Kazim Haider, Thomas M. Lijnse, Catherine Betancourt Lee, Colin Dalton, Univ. of Calgary (Canada)

Lunch/Exhibition Break 11:30 AM - 2:00 PM

SESSION 3: OPTOFLUIDICS I

2:00 PM - 3:30 PM

Moscone Center, Room 202 (Level 2 South)

Session chair: Bonnie L. Gray, Simon Fraser Univ. (Canada)

12374-7 • 2:00 PM - 2:30 PM **otonic biosensing: towards portable diagnostics at the point of need** (*Invited Paper*)

Author(s): Samantha M. Grist, Lauren S. Puumala, Mohammed A. Al-Qadasi, Avineet Randhawa, Sheri Jahan Chowdhury, Kithmin Wickremasinghe, So Jung Kim, Yas Oloumi Yazdi, Luis G. Alde, Yifei Liu, Nicholas C. Tang, Matthew Mitchell, Lukas Chrostowski, Sudip Shekhar, Karen C. Cheung, The Univ. of British Columbia (Canada)

12374-8 • 2:30 PM - 2:50 PM

A microfluidic chip with immobilization chambers for cardiac organoid imaging

Author(s): Khashayar Moshksayan, Anirudha Harihara, Sudip Mondal, Evan Hegarty, Janet Zoldan, Adela Ben-Yakar, The Univ. of Texas at Austin (United States)

12374-9 • 2:50 PM - 3:10 PM

Whole blood spectroscopy using a PMUT optofluidic integration (POI)

Author(s): Kaustav Roy, Eshani Sarkar, Akshay Kumar, Rudra Pratap, Indian Institute of Science, Bengaluru (India)

12374-40 • 3:10 PM - 3:30 PM

High-performance, low-cost optical coherence tomography (OCT) on a silicon photonic chip platform

Author(s): Diana Mojahed, Maarten Peters, Juejun Hu, Massachusetts Institute of Technology (United States)

Coffee Break 3:30 PM - 4:00 PM

SESSION 4: MICROFLUIDICS II

4:00 PM - 5:00 PM

Moscone Center, Room 202 (Level 2 South)

Session chair: Carolyn L. Ren, Univ. of Waterloo (Canada)

12374-10 • 4:00 PM - 4:30 PM

Molecular diagnostics on smartphone (*Invited Paper*)

Author(s): Tae Seok Seo, Kyung Hee Univ. (Republic of Korea)

12374-6 • 4:30 PM - 5:00 PM

Textile-based electronic and fluidic platforms towards wearable diagnostic sensor systems *(Invited Paper)*

Author(s): Bonnie L. Gray, Simon Fraser Univ. (Canada)

MONDAY 30 JANUARY

SESSION 5: APPLICATIONS

9:50 AM - 11:30 AM

Moscone Center, Room 202 (Level 2 South)

Session chair: Bastian E. Rapp, Univ. of Freiburg (Germany)

12374-13 • 9:50 AM - 10:20 AM

Engineered microtissues for disease modelling and drug screening *(Invited Paper)*

Author(s): Mohsen Akbari, Univ. of Victoria (Canada)

12374-14 • 10:20 AM - 10:40 AM

Modeling carbon dioxide trapping at microscopic pore scale with digital rock representations

Author(s): Jaione Tirapu-Azpiroz, Rodrigo Neumann Barros Ferreira, Ronaldo Giro, Marcio Nogueira Pereira da Silva, Matheus Esteves Ferreira, Mariana Del Grande, Manuela Fernandes Blanco Rodriguez, IBM Research - Brazil (Brazil); Ricardo Luis Ohta, David Alejandro Lazo Vasquez, IBM Research (Brazil); Ademir Ferreira da Silva, IBM Research - Brazil (Brazil); Benjamin H. Wunsch, IBM Research (United States); Mathias B. Steiner, IBM Research - Brazil (Brazil)

12374-15 • 10:40 AM - 11:00 AM

Evaluation of electrical characteristics of bovine eyes for detection of uveal melanoma

Author(s): Yaibhav B. Yadav, Northern Illinois Univ. (United States); Alison Skalet, Oregon Health & Science Univ. (United States); Mohammad J. Moghimi, Northern Illinois Univ. (United States)

12374-16 • 11:00 AM - 11:30 AM

CANCELED: The next generation high-content and high-throughput microfluidic platforms for whole animal screening *(Invited Paper)*

Author(s): Adela Ben-Yakar, The Univ. of Texas at Austin (United States)

Lunch Break 11:30 AM - 1:30 PM

SESSION 7: OPTOFLUIDICS II

1:30 PM - 2:40 PM PST | Moscone Center, Room 202 (Level 2 South)

Session chair: Samantha M. Grist, The Univ. of British Columbia (Canada)

12374-19 • 1:30 PM - 2:00 PM

Multiplexed coagulation profiling to predict hemorrhage at the point the care *(Invited Paper)*

Author(s): Seemantini K. Nadkarni, Wellman Ctr. for Photomedicine (United States)

12374-20 • 2:00 PM - 2:20 PM

Fast chemical and spatial characterization of aqueous suspensions using QCL-IR-based hyperspectral microscopy

Author(s): Matthias Godejohann, MG Optical Solutions GmbH (Germany)

12374-21 • 2:20 PM - 2:40 PM

Speckle imaging offers sensitive detection of bacterial growth in microdroplet antibiotic susceptibility testing assays

Author(s): Shreyas Vasantham, Shakeel Ahmad, Piotr Garstecki, Abhay Kotnala, Institute of Physical Chemistry PAS (Poland)

Coffee Break 2:40 PM - 3:00 PM

SESSION 8: MEDICAL DEVICES

3:00 PM - 3:50 PM

Moscone Center, Room 202 (Level 2 South)

Session chair: Colin Dalton, Univ. of Calgary (Canada)

12374-22 • 3:00 PM - 3:30 PM Noninvasive medical microsystems on flexible substrates *(Invited Paper)*

Author(s): Mohammad J. Moghimi, Northern Illinois Univ. (United States)

12374-21 • 3:30 PM - 3:50 PM

Vibration Transmissibility of Unimorph Piezoelectric Actuator on Flexible Substrate for Conductive Hearing Aids

Author(s): Courtney Bradley, Northern Illinois Univ. (United States); Miriam Redleaf, Univ. of Illinois (United States); Mohammad J. Moghimi, Northern Illinois Univ. (United States)

Coffee Break 3:50 PM - 4:20 PM

SESSION 9: PANEL DISCUSSION AND AWARD CEREMONY FOR MICROFLUIDICS, BIOMEMS, AND MEDICAL MICROSYSTEMS

4:20 PM - 5:20 PM

Moscone Center, Room 202 (Level 2 South)

Please join us to discuss microfluidics, bioMEMS, and medical microsystems and honor the best papers in the conference.

MODERATOR:

Bastian Rapp, Neptune Lab, Department of Microsystems Engineering (IMTEK), University of Freiburg (Germany)

PANELISTS:

Colin Dalton, Microsystems Hub, University of Calgary (Canada)

Bonnie Gray, Simon Fraser Univ. (Canada)

Yolanda Fintschenko, i-GATE Innovation Hub (United States)

Frederik Kotz-Helmer, Glassomer GmbH (Germany)

Jaione Tirapu Azpiroz, IBM Research (Brazil)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12374-12 • On demand | Presenting live 28 January 2023

Study of different membrane shapes for integrated pneumatically actuated microvalves with PDMS

Author(s): Kavitha Ravi, L. Sujatha, Madhankumar P., Rajalakshmi Engineering College (India)

Conference 12375

28 January 2023 | Moscone Center, Room 154 (Upper Mezzanine South)

Biophotonics in Exercise Science, Sports Medicine, Health Monitoring Technologies, and Wearables IV

Conference Chairs: **Babak Shadgan**, International Collaboration On Repair Discoveries (Canada); **Amir H. Gandjbakhche**, Eunice Kennedy Shriver National Institute of Child Health and Human Development (United States)

Program Committee: **Afrouz A. Anderson**, National Institutes of Health (United States); **Willy N. J. M. Colier**, Artinis Medical Systems B.V. (Netherlands); **Guy D. Dumont**, The Univ. of British Columbia (Canada); **Marco Ferrari**, Univ. degli Studi dell'Aquila (Italy); **Takafumi Hamaoka M.D.**, Tokyo Medical Univ. (Japan); **Andrew J. Macnab M.D.**, The Univ. of British Columbia (Canada); **Anita Mahadevan-Jansen**, Vanderbilt Univ. (United States); **Behrouz Shabestari**, National Institute of Biomedical Imaging and Bioengineering (United States); **Robert V. Warren**, Hamamatsu Ventures (United States); **Mireille C.P. Van Beekvelt**, Norwegian Univ. of Science and Technology (Norway)

SATURDAY 28 JANUARY

SESSION 1: OPTICAL MONITORING OF TISSUE OXYGENATION AND ORGAN HEMODYNAMICS

8:00 AM - 10:00 AM PST | Moscone Center, Room 154 (Upper Mezzanine South)

Session chairs: Babak Shadgan, International Collaboration On Repair Discoveries (Canada), Andrew J. Macnab, The Univ. of British Columbia (Canada)

12375-2 • 8:00 AM - 8:20 AM

Wearable compact laser Doppler flowmetry sensor monitoring cardiovascular conditions at multiple points

Author(s): Sergei G. Sokolovski, Viktor Dremine, Aston Univ. (United Kingdom); Ilya Rafailov, Aston Medical Technology Ltd. (United Kingdom); Edik Rafailov, Aston Univ. (United Kingdom)

12375-3 • 8:20 AM - 8:40 AM

Robust optical and acoustic sensor system for field assessment of vital signs

Author(s): Lise L. Randeberg, Norwegian Univ. of Science and Technology (Norway), Nordiq Products AS (Norway); Mats Hetling, Nordiq Products AS (Norway); Bjorn Hagen, Yngve Brathaug, Inventas AS (Norway); Viggo Henriksen, SINTEF (Norway)

12375-4 • 8:40 AM - 9:00 AM

Continuous blood pressure monitoring from an autonomic nervous system perspective

Author(s): Ting-Yu Chiang, Shih-Lun Tai, Yu-Ting Liu, Jiun-Woei Huang, National Taiwan Univ. (Taiwan); Shu-Sheng Lee, National Taiwan Ocean Univ. (Taiwan); Hsiang-Chieh Lee, Chih-Kung Lee, National Taiwan Univ. (Taiwan)

12375-14 • 9:00 AM - 9:20 AM

Transcutaneous monitoring of oxygen and carbon dioxide using wearable devices

Author(s): Juan Pedro Cascales Sandoval, Emmanuel Roussakis, Xiaolei Li, Daniel A. Greenfield, Wellman Ctr. for Photomedicine (United States); Lilian Witthauer, Wellman Ctr. for Photomedicine (United States), Inselspital (Switzerland); Avery Goss, Helen Keshishian, John Q. Nguyen, Haley L. Marks, Wellman Ctr. for Photomedicine (United States); Adina E. Draghici, Jason W. Hamner, J. Andrew Taylor, Harvard Medical School (United States); Conor L. Evans, Wellman Ctr. for Photomedicine (United States)

12375-15 • 9:20 AM - 9:40 AM

Innovations and new applications of a wearable device for remote monitoring of transcutaneous tissue oxygenation

Author(s): Daniel A. Greenfield, Juan Pedro Cascales Sandoval, Conor L. Evans, Wellman Ctr. for Photomedicine (United States)

12375-8 • 9:40 AM - 10:00 AM

A phosphorescent microneedle array for measurement of oxygen partial pressure in tissue

Author(s): Matthias Müller, Juan Pedro Cascales Sandoval, Haley L. Marks, Michael Wang-Evers, Dieter Manstein, Conor L. Evans, Massachusetts General Hospital (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: EXPERIMENTAL BIOPHOTONICS

10:30 AM - 12:10 PM

Moscone Center, Room 154 (Upper Mezzanine South)

Session chairs: Amir H. Gandjbakhche, National Institutes of Health (United States), Afrouz A. Anderson, National Institutes of Health (United States)

12375-6 • 10:30 AM - 10:50 AM

Acute hypotension induced by thigh cuff release and cerebral oxygenation alternations

Author(s): Atsuhiko Tsubaki, Danni Qu, Weixiang Qin, Yuta Tokunaga, Sho Kojima, Hiyori Matsushashi, Niigata Univ. of Health and Welfare (Japan); Shinichiro Morishita, Fukushima Medical University (Japan); Kazuki Hotta, Kitasato University (Japan); Hajime Tamiya, Tatsuro Inoue, Ryo Ikegami, Niigata Univ. of Health and Welfare (Japan)

12375-7 • 10:50 AM - 11:10 AM

Characterizing and overcoming the confounding effects of skin pigmentation for improved quantification of tissue oxygenation and hemodynamic changes across all skin types

Author(s): Robert H. Wilson, Gordon T. Kennedy, Thinh Phan, Wei Jin, Anthony J. Durkin, Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (United States)

12375-10 • 11:10 AM - 11:30 AM

Non-invasive assessment of hydration status by in-vivo Raman spectroscopy

Author(s): Gerwin J. Puppels, RiverD International B.V. (Netherlands), Erasmus MC (Netherlands); Maria R. Soares, Claudio Nico, Elena Sokolova, RiverD International B.V. (Netherlands); Jelmer Almsa, Erasmus MC (Netherlands)

12375-22 • 11:30 AM - 11:50 AM

Multiwavelength based approach to calculate tissue oxygen saturation using Near-infrared Spectroscopy

Author(s): Thien Nguyen, Soongho Park, Brian Hill, Amir H. Gandjbakhche, National Institutes of Health (United States)

12375-28 • 11:50 AM - 12:10 PM

Active noise cancelling in near-infrared spectroscopy

Author(s): Shahbaz Askari, Zoya Bastany, Guy Dumont, Babak Shadgan, The Univ. of British Columbia (Canada)

Lunch/Exhibition Break 12:10 PM - 1:30 PM

SESSION 3: OPTICAL MONITORING OF CENTRAL NERVOUS CENTRE

1:30 PM - 3:00 PM

Moscone Center, Room 154 (Upper Mezzanine South)

Session chairs: Robert V. Warren, Hamamatsu Corp. (United States), Guy D. Dumont, The Univ. of British Columbia (Canada)

12375-9 • 1:30 PM - 2:00 PM

Near infrared spectroscopy of the central nervous system: monitoring oxygenation in the neonatal brain and in the spinal cord following traumatic injury (Keynote Presentation)

Author(s): Andrew J. Macnab, The Univ. of British Columbia (Canada), Stellenbosch Institute for Advanced Study, Wallenberg Research Centre at Stellenbosch University (South Africa)

12375-11 • 2:00 PM - 2:20 PM

Temperature and hydration monitoring in tissue-simulating phantoms using novel silicon-photonics-based spectrophotometer

Author(s): Ariel Bohman, John Q. Nguyen, Rockley Photonics Ltd. (United States); Sanjana Parthasarathy, Rockley Photonics (United States); Mark A. Arnold, The Univ. of Iowa (United States)

12375-30 • 2:20 PM - 2:40 PM

Spreading depression and near-infrared spectroscopy during seizures in patients with medically intractable epilepsy

Author(s): Zoya Jafaryabanybastany, Shahbaz Askari, The Univ. of British Columbia (Canada); Ali Gorji, Westfälische Wilhelms-Univ. Münster (Germany); Christoph Kellinghaus, Klinikum Osnabrück GmbH (Germany); Nayyereh Akbari, Shahid Beheshti Univ. of Medical Sciences (Iran, Islamic Republic of); Guy A. Dumont, The Univ. of British Columbia (Canada)

12375-1 • 2:40 PM - 3:00 PM

A wearable optical sensor monitoring bladder urine volume to aid rehabilitation following spinal cord injury

Author(s): Andrew J. Macnab, The Univ. of British Columbia (Canada), Stellenbosch Institute for Advanced Study (South Africa); Parivash Pourabbassi, Naser Hakimi, Willy N. J. M. Colier, Artinis Medical Systems B.V. (Netherlands); Lynn Stothers, The Univ. of British Columbia (Canada), International Collaboration On Repair Discoveries (Canada)

Coffee Break 3:00 PM - 3:30 PM

SESSION 4: OPTICS IN EXERCISE AND SPORTS MEDICINE

3:30 PM - 4:50 PM

Moscone Center, Room 154 (Upper Mezzanine South)

Session chairs: Takafumi Hamaoka, Tokyo Medical Univ. (Japan), Robert V. Warren, Hamamatsu Corp. (United States)

12375-12 • 3:30 PM - 3:50 PM

Application of a recurrent neural network to predict the oxygenated recovery state following maximum isometric hand gripping exercise

Author(s): Bram Pol, Radboud Univ. Nijmegen (Netherlands); Thierry R. Willigenburg, Wout J. W. Kregting, Artinis Medical Systems B.V. (Netherlands), Train.Red B.V. (Netherlands); Sofia Sappia, Jörn Horschig, Willy N. J. M. Colier, Artinis Medical Systems B.V. (Netherlands)

12375-13 • 3:50 PM - 4:10 PM

Assessing stability and accuracy of a novel commercial wearable near-infrared spectroscopy device

Author(s): Ivo da Mota Moreira, Thierry R. Willigenburg, Wout J. W. Kregting, Erwin R. C. Van Steijn, Train.Red B.V. (Netherlands); Marianne J. Floor-Westerdijk, Willy N. J. M. Colier, Artinis Medical Systems B.V. (Netherlands)

12375-19 • 4:10 PM - 4:30 PM

The relationship between strength training-induced changes in brown-like adipose tissue parameters and systemic body fat parameters

Author(s): Riki Tanaka, Sayuri Fuse-Hamaoka, Miyuki Kuroiwa, Yuko Kurosawa, Tokyo Medical Univ. (Japan); Tasuki Endo, Tokyo Medical Univ. (Japan); Meijo Univ. (Japan); Ryotaro Kime, Takafumi Hamaoka, Tokyo Medical Univ. (Japan)

12375-31 • 4:30 PM - 4:50 PM

Predicting the anaerobic threshold by using a wearable optical sensor during exercise

Author(s): Aaron J. Mah, Mehdi Nourizadeh, Justin Wyss, Shahbaz Askari, Babak Shadgan, The Univ. of British Columbia (Canada)

SESSION 5: OPTICS IN HEALTH MONITORING

4:50 PM - 6:30 PM

Moscone Center, Room 154 (Upper Mezzanine South)

Session chairs: Babak Shadgan, International Collaboration On Repair Discoveries (Canada), Amir H. Gandjbakhche, National Institutes of Health (United States)

12375-20 • 4:50 PM - 5:10 PM

COVID-19 patient monitoring system using wearable NIRS device and deep learning algorithm

Author(s): Jinho Park, Amir H. Gandjbakhche, Soongho Park, Thien Nguyen, National Institutes of Health (United States)

12375-21 • 5:10 PM - 5:30 PM

Monitoring of Fetal Heart Rate using Near-infrared Spectroscopy

Author(s): Thien Nguyen, Soongho Park, National Institutes of Health (United States); Dahiana Gallo, Tomi Kanninen, Wayne State Univ. (United States); Zeyu Zhang, George Downey, AmpX Technologies, Inc. (United States); Roberto Romero, Amir H. Gandjbakhche, National Institutes of Health (United States)

12375-27 • 5:30 PM - 5:50 PM

Investigation of the potential of a Multimodal Biosensor in Screening and Monitoring Infectious Respiratory Diseases

Author(s): Vinay Veluvolu, Thien Nguyen, Soongho Park, Amir Gandjbakhche, Eunice Kennedy Shriver National Institute of Child Health and Human Development (United States)

Conference 12375

12375-100 • 5:50 PM - 6:10 PM

3D-printed, wireless, and battery-free wearable sensor system for on-demand personal health monitoring

Author(s): Sahar Najafikhoshnoo, Rahim Esfandyarpour, Univ. of California, Irvine (United States)

12375-32 • 6:10 PM - 6:30 PM

Optical monitoring of transplanted free flaps using an implantable near-infrared spectroscopy sensor

Author(s): Aaron J. Mah, The Univ. of British Columbia (Canada), International Collaboration On Repair Discoveries (Canada); Donald Anderson, The Univ. of British Columbia (Canada); Shahbaz Askari, The Univ. of British Columbia (Canada), International Collaboration On Repair Discoveries (Canada); Sadra Khosravi, QCADesigner (Canada), International Collaboration On Repair Discoveries (Canada); Oleksandr Butskiy, The Univ. of British Columbia (Canada); Babak Shadgan, The Univ. of British Columbia (Canada), International Collaboration On Repair Discoveries (Canada)

POSTERS-MONDAY

30 January 2023 • 5:30 PM - 7:00 PM
Moscone Center, Level 2 West

Conference attendees are invited to attend the poster Session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster Sessions.

Poster Setup: Monday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12375-29 • On demand | Presented live 30 January 2023

Smartphone-compatible NIRS for sleep apnea monitoring

Author(s): Nina Opem, Amir Sadikov, Sully F. Chen, Timothy Quang, Brian Hill, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health (United States); Robert V. Warren, Rami Khayat, Ruth Benca, Univ. of California, Irvine (United States); Bruce Tromberg, National Institute of Biomedical Imaging and Bioengineering, National Institutes of Health (United States)

Conference 12376

30 January - 1 February 2023 | Moscone Center, Room 154 (Upper Mezzanine South)

Optical Tomography and Spectroscopy of Tissue XV

Conference Chairs: **Sergio Fantini**, Tufts Univ. (United States); **Paola Taroni**, Politecnico di Milano (Italy)

Program Committee: **Erin M. Buckley**, Emory Univ. (United States); **Regine Choe**, Univ. of Rochester (United States); **Hamid Dehghani**, The Univ. of Birmingham (United Kingdom); **Mamadou Diop**, Lawson Health Research Institute (Canada); **Amir H. Gandjbakhche**, National Institutes of Health (United States); **Sylvain Gioux**, Intuitive Surgical, Sàrl (Switzerland); **Andreas H. Hielscher**, New York Univ. (United States); **Shudong Jiang**, Thayer School of Engineering at Dartmouth (United States); **Jana M. Kainerstorfer**, Carnegie Mellon Univ. (United States); **Anand T. N. Kumar**, Harvard Medical School (United States); **Frederic Leblond**, Ecole Polytechnique de Montréal (Canada); **Mark J. Niedre**, Northeastern Univ. (United States); **Eiji Okada**, Keio Univ. (Japan); **Thomas D. O'Sullivan**, Univ. of Notre Dame (United States); **Antonio Pifferi**, Politecnico di Milano (Italy); **Anne Planat-Chrétien**, CEA-LETI (France); **Valentina Quaresima**, Univ. degli Studi dell'Aquila (Italy); **Darren M. Roblyer**, Boston Univ. (United States); **Ilias Tachtsidis**, Univ. College London (United Kingdom); **Yukio Ueda**, Hamamatsu Photonics K.K. (Japan); **Anna N. Yaroslavsky**, Univ. of Massachusetts Lowell (United States); **Quing Zhu**, Washington Univ. in St. Louis (United States)

MONDAY 30 JANUARY

SESSION 1: METHODS IN CW AND PHANTOMS

8:00 AM - 10:00 AM

Moscone Center, Room 154 (Upper Mezzanine South)

Session chair: Qianqian Fang, Northeastern Univ. (United States)

12376-1 • 8:00 AM - 8:30 AM

Determination of the absorption and reduced scattering coefficients by CW spatially resolved spectroscopy with long source-detector distances at high and low internal reflection (*Invited Paper*)

Author(s): Yukio Yamada, National Institute of Advanced Industrial Science and Technology (Japan), The Univ. of Electro-Communications (Japan); Hiroshi Kawaguchi, Toru Yamada, National Institute of Advanced Industrial Science and Technology (Japan)

12376-2 • 8:30 AM - 8:50 AM

Uncertainty analysis in perturbation Monte Carlo simulations of radiative transport

Author(s): Mahsa Parsanasab, Carole Hayakawa, Jerome Spanier, Yanning Shen, Vasana Venugopalan, Univ. of California, Irvine (United States)

12376-3 • 8:50 AM - 9:10 AM

Study of inverse solution for multiparameter spectrophotometry by three photodiodes

Author(s): Zachary Jones, East Carolina Univ. (United States); Jiahong Jin, Department of Physics, East Carolina University (United States), Institute for Advanced Optics, Hunan Institute of Science and Technology (China), School of Physics & Electronic Science, Hunan Institute of Science and Technology (China); Jun Q. Lu, Xin-Hua Hu, Department of Physics, East Carolina University (United States), Institute for Advanced Optics, Hunan Institute of Science and Technology (China)

12376-4 • 9:10 AM - 9:30 AM

Ideal light scatterer for near-infrared spectroscopy tissue mimicking phantoms

Author(s): Rasa Eskandari, Western Univ. (Canada); Mamadou Diop, Western Univ. (Canada), Lawson Health Research Institute (Canada)

12376-5 • 9:30 AM - 10:00 AM

Direct 3D printing of heterogeneous optical phantoms with programmable optical properties using a multi-filament extruder (*Invited Paper*)

Author(s): Rahul Ragunathan, Miguel Mireles, Morris Vanegas, Edward Xu, Aiden Lewis, Qianqian Fang, Northeastern Univ. (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: METHODS IN THE FREQUENCY DOMAIN

10:30 AM - 12:30 PM

Moscone Center, Room 154 (Upper Mezzanine South)

Session chair: Hamid Dehghani, Univ. of Birmingham (United Kingdom)

12376-6 • 10:30 AM - 10:50 AM

High-speed spatial parameter recovery using multi-distance frequency-domain diffuse optical spectroscopy

Author(s): Robin Dale, Univ. of Birmingham (United Kingdom); Thomas D. O'Sullivan, Scott Howard, Chris Campbell, Univ. of Notre Dame (United States); Felipe Orihuela-espina, Hamid Dehghani, Univ. of Birmingham (United Kingdom)

12376-7 • 10:50 AM - 11:10 AM

Comparison of multi-distance and multi-frequency methods in frequency-domain near-infrared spectroscopy

Author(s): Ola S. A. Abdalsalam, Thomas D. O'Sullivan, Univ. of Notre Dame (United States); Silvina Laura Ferrada, Indiana Univ. (United States); Nicholas Ross, Univ. of Notre Dame (United States); Robin Dale, Guy A. Perkins, Hamid Dehghani, Univ. of Birmingham (United Kingdom)

12376-8 • 11:10 AM - 11:30 AM

Calibration-free measurement of absolute optical properties of scattering samples in a standard cuvette

Author(s): Giles Blaney, Angelo Sassaroli, Cristianne Fernandez, Tapan Das, Sergio Fantini, Tufts Univ. (United States)

12376-9 • 11:30 AM - 11:50 AM

Multi paradigm frequency domain workflow for human brain imaging

Author(s): Guy A. Perkins, Hamid Dehghani, Univ. of Birmingham (United Kingdom)

Conference 12376

12376-10 • 11:50 AM - 12:10 PM

Estimating the optical properties of multi-layered tissue models using structured interrogation frequency-domain near-infrared spectroscopy

Author(s): Ola S. A. Abdalsalam, Thomas D. O'Sullivan, Scott Howard, Univ. of Notre Dame (United States)

12376-67 • 12:10 PM - 12:30 PM

A miniaturized frequency-domain near-infrared spectroscopy instrument compatible with the dual-slope method featuring custom application specific integrated circuit analog front end

Author(s): Alper Kiliç, Giles Blaney, Cristianne Fernandez, Angelo Sassaroli, Sergio Fantini, Valencia M. J. Koomson, Tufts Univ. (United States)

Lunch Break 12:30 PM - 1:40 PM

SESSION 3: METHODS IN THE TIME AND FREQUENCY DOMAINS

1:40 PM - 3:20 PM

Moscone Center, Room 154 (Upper Mezzanine South)

Session chairs: Mamadou Diop, Western Univ. (Canada), Angelo Sassaroli, Tufts Univ. (United States)

12376-11 • 1:40 PM - 2:00 PM

Improved utilization of frequency-domain data for optical tomographic imaging of the human brain

Author(s): Pauliina Hirvi, Ilkka Nissilä, Aalto Univ. (Finland); Ambika Maria, University of Turku and Turku University Hospital, Department of Psychiatry, Finland (Finland); Qianqian Fang, Northeastern Univ. (United States); Kalle Kotilahti, Aalto Univ. (Finland), Institute of Clinical Medicine, Turku Brain and Mind Ctr., Univ. of Turku (Finland), SpectroCor Oy (Finland); Juha Heiskala, HUS Medical Imaging Ctr., Helsinki Univ. Central Hospital (Finland); Jetro J. Tuulari, Turku Univ. Hospital, Univ. of Turku (Finland), Institute of Clinical Medicine, Turku Brain and Mind Ctr., Univ. of Turku (Finland); Linnea Karlsson, Turku Univ. Hospital, Univ. of Turku (Finland), Institute of Clinical Medicine, Turku Brain and Mind Ctr., Univ. of Turku (Finland); Antti Hannukainen, Aalto Univ. (Finland); Hasse Karlsson, Turku Univ. Hospital, Univ. of Turku (Finland), Institute of Clinical Medicine, Turku Brain and Mind Ctr., Univ. of Turku (Finland); Nuutti Hyvönen, Aalto Univ. (Finland)

12376-13 • 2:00 PM - 2:20 PM Novel data types for diffuse optical imaging and spectroscopy in the frequency domain

Author(s): Angelo Sassaroli, Giles Blaney, Cristianne Fernandez, Tapan Das, Sergio Fantini, Tufts Univ. (United States)

12376-14 • 2:20 PM - 2:40 PM

Amplitude-independent two-layer fitting algorithm for hyperspectral time-resolved near-infrared spectroscopy

Author(s): David J. F. Cohen, Seva Ioussoufovitch, Western Univ. (Canada); Mamadou Diop, Lawson Health Research Institute (Canada), Western Univ. (Canada)

12376-15 • 2:40 PM - 3:00 PM

Detection of physiological changes in rheumatoid arthritis using time-domain near-infrared imaging: an in silico phantom study

Author(s): Seva Ioussoufovitch, Mamadou Diop, Western Univ. (Canada)

12376-12 • 3:00 PM - 3:20 PM

CANCELED: Extraction of photon time-of-flight distribution using an optimization technique based deconvolution algorithm

Author(s): Vasudha Chandrashekar, Dirk J. Faber, Ton G. van Leeuwen, Amsterdam UMC (Netherlands); Henricus J. C. M. Sterenborg, The Netherlands Cancer Institute (Netherlands); Xavier A. Attendu, Paul R. Bloemen, Amsterdam UMC (Netherlands)

Coffee Break 3:20 PM - 3:30 PM

SESSION 4: AI/ML/DL FOR DIFFUSE OPTICS

3:30 PM - 5:20 PM PST | Moscone Center, Room 154 (Upper Mezzanine South)

Session chair: Antonio Pifferi, Politecnico di Milano (Italy)

12376-16 • 3:30 PM - 3:50 PM

Machine learning analysis of blood flow oscillation using diffuse speckle contrast analysis

Author(s): Hanbeen Jung, Chaebeom Yeo, Eunsil Jang, Yeonhee Chang, Cheol Song, Daegu Gyeongbuk Institute of Science & Technology (Republic of Korea)

12376-17 • 3:50 PM - 4:20 PM

Classification of breast lesions with deep learning combining diffuse optical tomography frequency-domain data and coregistered ultrasound images (Invited Paper)

Author(s): Menghao Zhang, Shuying Li, Minghao Xue, Quing Zhu, Washington Univ. in St. Louis (United States)

12376-18 • 4:20 PM - 4:40 PM

System-driven convolutional feature extraction improves FD-fNIRS BCI

Author(s): Robin Dale, Hamid Dehghani, Univ. of Birmingham (United Kingdom)

12376-19 • 4:40 PM - 5:00 PM

Deep learning-based near-infrared spectroscopy time-series analysis with long short-term memory

Author(s): Jingyi Wu, Shaojie Bai, Jana M. Kainerstorfer, Carnegie Mellon Univ. (United States)

12376-20 • 5:00 PM - 5:20 PM

Optimal tomography of dynamically evolving objects using machine learning algorithms

Author(s): Mahshad Javidan, Hadi Esfandi, Florida Atlantic Univ. (United States), Univ. of Wisconsin-Madison (United States); Ramin Pashaie, Florida Atlantic Univ. (United States)

POSTERS-MONDAY

30 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the Monday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM – 5:00 PM

View poster presentation guidelines and set-up instructions at:
<https://spie.org/PW/Poster-Guidelines>

12376-51 • On demand | Presented live 30 January 2023

Random laser-based noninvasive sensor for direct measurements of scattering samples

Author(s): Federico Tommasi, Lorenzo Fini, Fabrizio Martelli, Stefano Cavalieri, Univ. degli Studi di Firenze (Italy)

12376-52 • On demand | Presented live 30 January 2023

Relation between fluence rate and mean photons pathlengths: an interesting option for Monte Carlo-based fluence calculations in biomedical optics

Author(s): Fabrizio Martelli, Univ. degli Studi di Firenze (Italy); Angelo Sassaroli, Tufts Univ. (United States); Federico Tommasi, Lorenzo Fini, Stefano Cavalieri, Univ. degli Studi di Firenze (Italy)

12376-53 • On demand | Presented live 30 January 2023

Verification test of Monte Carlo codes for biomedical optics applications with arbitrary accuracy

Author(s): Fabrizio Martelli, Federico Tommasi, Univ. degli Studi di Firenze (Italy); Angelo Sassaroli, Tufts Univ. (United States); Lorenzo Fini, Stefano Cavalieri, Univ. degli Studi di Firenze (Italy)

12376-54 • On demand | Presented live 30 January 2023

Line scan reflectance diffuse optical tomography for breast cancer imaging

Author(s): Kenji Yoshimoto, Hiroko Wada, Etsuko Ohmae, Hamamatsu Photonics K.K. (Japan); Nobuko Yoshizawa, Kei Koizumi, Hiroaki Suzuki, Shu Homma, Tetsuya Mimura, Norihiro Suzuki, Hamamatsu Photonics K.K. (Japan); Hatsuko Nasu, Yuko Asano, Satoshi Goshima, Hamamatsu Univ. School of Medicine (Japan); Yukio Ueda, Hamamatsu Photonics K.K. (Japan)

12376-35

Coherence of spontaneous cerebral hemodynamic oscillations in the low-frequency range

Author(s): Tapan Das, Cristianne Fernandez, Giles Blaney, Zachary Haga, Thomas McWilliams, Julia Mertens, Angelo Sassaroli, Sergio Fantini, Tufts Univ. (United States)

TUESDAY 31 JANUARY**SESSION 5: ADVANCES IN INSTRUMENTATION**

8:00 AM - 10:40 AM

Moscone Center, Room 154 (Upper Mezzanine South)

Session chair: Jana M. Kainerstorfer, Carnegie Mellon Univ. (United States)

12376-21 • 8:00 AM - 8:20 AM

Demonstration of motion-resistant three-wavelength spatial frequency domain imaging system with ambient light suppression using an pixel 8-tap CMOS image sensor

Author(s): Yu Feng, Yuto Shimada, Chen Cao, Keita Yasutomi, Shoji Kawahito, Shizuoka Univ. (Japan); Gordon T. Kennedy, Anthony J. Durkin, Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (United States); Keiichi Kagawa, Shizuoka Univ. (Japan)

12376-22 • 8:20 AM - 8:50 AM

Novel design of a low-cost heterodyne frequency domain-diffuse optical spectroscopy instrument (Invited Paper)

Author(s): Joseph B. Majeski, Vincent D. Ching-Roa, Michael G. Giacomelli, Regine Choe, Univ. of Rochester (United States)

12376-23 • 8:50 AM - 9:10 AM

Hyperspectral time-resolved compressive sensing spectroscopy for monitoring cytochrome-c-oxidase and blood oxygenation

Author(s): Natalie C. Li, Seva Ioussoufovitch, Mamadou Diop, Western Univ. (Canada)

12376-24 • 9:10 AM - 9:30 AM

Superconducting nanowire detector for interstitial null-separation time-domain diffuse optical spectroscopy

Author(s): Vamshi Krishna Damagatla, Politecnico di Milano (Italy); Pranav Lanka, Tyndall National Institute (Ireland); Andrea Farina, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Annalisa Brodu, Niels Noordzijc, Jessie Qin-Dregely, Single Quantum B.V. (Netherlands); Antonio Pifferi, Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy)

Multistate time-multiplexed system for functional time-domain diffuse correlation spectroscopy with SNSPDs

Author(s): Marco Renna, Zachary Starkweather, Athinola A. Martinos Ctr. for Biomedical Imaging (United States); Mitchell B. Robinson, Athinola A. Martinos Ctr. for Biomedical Imaging (United States), Massachusetts Institute of Technology (United States); Nisan Ozana, Alyssa Martin, Stefan A. Carp, Maria Angela Franceschini, Athinola A. Martinos Ctr. for Biomedical Imaging (United States)

12376-26 • 9:50 AM - 10:10 AM

Multi-wavelength multi-distance diffuse correlation spectroscopy system for assessment of premature infants' cerebral hemodynamics

Author(s): Nikola Otic, Boston Univ. (United States), Massachusetts General Hospital (United States); John Sunwoo, Massachusetts General Hospital (United States); Yujing Huang, Alyssa Martin, Massachusetts General Hospital (United States); Mitchell B. Robinson, Massachusetts Institute of Technology (United States), Massachusetts General Hospital (United States); Bernhard Zimmermann, Boston Univ. (United States); Stefan A. Carp, Maria A. Franceschini, Marco Renna, Massachusetts General Hospital (United States)

Brain-specific imaging via highly parallel interferometric diffusing wave spectroscopy (iDWS) with time-of-flight discrimination (Invited Paper)

Author(s): Mingjun Zhao, NYU Langone Health (United States); Wenjun Zhou, Univ. of California, Davis (United States), China Jiliang Univ. (China); Santosh Aparanji, Dibyan Mazumder, NYU Langone Health (United States); Vivek Srinivasan, NYU Langone Health (United States), Univ. of California, Davis (United States)

Coffee Break 10:40 AM - 11:10 AM

Conference 12376

SESSION 6: BRAIN APPLICATIONS I

11:10 AM - 12:20 PM

Moscone Center, Room 154 (Upper Mezzanine South)

Session chair: Mamadou Diop, Western Univ. (Canada)

12376-28 • 11:10 AM - 11:30 AM **Evaluating neurovascular coupling in patients undergoing extracorporeal membrane oxygenation**

Author(s): Irfaan A. Dar, Univ. of Rochester (United States); Imad R. Khan, Olga Selioutski, Univ. of Rochester Medical Ctr. (United States); Regine Choe, Univ. of Rochester (United States)

12376-29 • 11:30 AM - 11:50 AM

Assessing extracerebral contamination in cerebral blood flow pulsatility measured by diffuse correlation spectroscopy

Author(s): Jignesh Mistry, Leena Shoemaker, Daniel Milej, Keith St. Lawrence, Western Univ. (Canada)

12376-30 • 11:50 AM - 12:20 PM

Pulsatile microvascular cerebral blood flow waveforms as a biomarker of vascular health (*Invited Paper*)

Author(s): Tara M. Urner, Kyle Cowdrick, Eashani Sathialingam, Erin M. Buckley, Emory Univ. (United States)

Lunch/Exhibition Break 12:20 PM - 1:50 PM

SESSION 7: BRAIN APPLICATIONS II

1:50 PM - 2:50 PM

Moscone Center, Room 154 (Upper Mezzanine South)

Session chair: Quing Zhu, Washington Univ. in St. Louis (United States)

12376-32 • 1:50 PM - 2:10 PM

Sensitivity of a full-head coverage high-density time-resolved NIRS device to carotid compressions

Author(s): Farah Kamar, Leena Shoemaker, Androu Abdalmalak, Daniel Milej, Keith St. Lawrence, Mamadou Diop, Western Univ. (Canada)

12376-33 • 2:10 PM - 2:30 PM

Mapping of coherent cerebral hemodynamics with dual-slope imaging

Author(s): Cristianne Fernandez, Giles Blaney, Angelo Sassaroli, Tapan Das, Sergio Fantini, Tufts Univ. (United States)

12376-66 • 2:30 PM - 2:50 PM

Sensitivity of cerebral blood flow and oxygenation to high-intracranial pressure

Author(s): Sule Karagulleoglu Kunduraci, Western Univ. (Canada), Lawson Health Research Institute (Canada); Mamadou Diop, Western University (Canada), Lawson Health Research Institute (Canada)

Coffee Break 2:50 PM - 3:20 PM

SESSION 8: BREAST CANCER APPLICATIONS

3:20 PM - 4:50 PM

Moscone Center, Room 154 (Upper Mezzanine South)

Session chair: Quing Zhu, Washington Univ. in St. Louis (United States)

12376-36 • 3:20 PM - 3:40 PM

An automated clinical study pipeline for breast cancer diagnosis using diffuse optical tomography

Author(s): Minghao Xue, Menghao Zhang, Shuying Li, Yun Zou, Quing Zhu, Washington Univ. in St. Louis (United States)

12376-37 • 3:40 PM - 4:00 PM

Breast lesion classification based on absorption and composition parameters: a look at SOLUS first outcomes

Author(s): Giulia Maffei, Antonio Pifferi, Alberto D. Dalla Mora, Laura Di Sieno, Rinaldo Cubeddu, Alberto Tosi, Enrico Conca, Politecnico di Milano (Italy); Andrea Giudice, Alessandro Ruggeri, Simone Tisa, Micro Photon Devices S.r.l. (Italy); Alexander Flocke, IC-Haus GmbH (Germany); Bogdan Rosinski, Vermon S.A. (France); Jean-Marc Dinten, Mathieu Perriollat, CEA-LETI (France); Christophe Fraschini, Jonathan Lavaud, SuperSonic Imagine (France); Simon Arridge, Giuseppe Di Sciacca, Univ. College London (United Kingdom); Andrea Farina, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Pietro Panizza, Elena Venturini, Ospedale San Raffaele - Milano (Italy); Peter Gordebeke, European Institute for Biomedical Imaging Research (Austria); Paola Taroni, Politecnico di Milano (Italy)

31 January 2023 PST | Moscone Center, Room 154 (Upper Mezzanine South)

Show Abstract +

12376-38 • 4:00 PM - 4:30 PM

Early prediction of neoadjuvant chemotherapy outcome with longitudinal breast diffuse optical tomography (*Invited Paper*)

Author(s): Bin Deng, Athinola A. Martinos Ctr. for Biomedical Imaging (United States), Massachusetts General Hospital (United States), Harvard Medical School (United States); Ailis Muldoon, Athinola A. Martinos Ctr. for Biomedical Imaging (United States), Massachusetts General Hospital (United States); Jayne Cormier, Massachusetts General Hospital (United States); Mansi A. Saksena, Massachusetts General Hospital (United States), Harvard Medical School (United States); Steven J. Isakoff, Cancer Ctr., Massachusetts General Hospital (United States), Harvard Medical School (United States); Stefan A. Carp, Athinola A. Martinos Ctr. for Biomedical Imaging (United States), Massachusetts General Hospital (United States), Harvard Medical School (United States)

12376-39 • 4:30 PM - 4:50 PM Monitoring neoadjuvant chemotherapy through time domain diffuse optical spectroscopy: preliminary clinical results

Author(s): Nikhitha Mule, Ospedale San Raffaele - Milano (Italy), Politecnico di Milano (Italy); Giulia Maffei, Politecnico di Milano (Italy); Carolina Santangelo, Ospedale San Raffaele - Milano (Italy); Rinaldo Cubeddu, Politecnico di Milano (Italy); Antonio Pifferi, Politecnico di Milano (Italy), Istituto di Fotonica e Nanotecnologie, Consiglio Nazionale delle Ricerche (Italy); Pietro Panizza, Ospedale San Raffaele - Milano (Italy); Paola Taroni, Politecnico di Milano (Italy), Istituto di Fotonica e Nanotecnologie, Consiglio Nazionale delle Ricerche (Italy)

WEDNESDAY 1 FEBRUARY

SESSION 9: TISSUE CHARACTERIZATION AND DIAGNOSTICS

8:00 AM - 9:50 AM

Moscone Center, Room 154 (Upper Mezzanine South)

Session chair: Darren M. Roblyer, Boston Univ. (United States)

12376-40 • 8:00 AM - 8:20 AM

Temperature dependent changes in ex-vivo skin reflectance

Author(s): Tyler W. Iorizzo, Univ. of Massachusetts Lowell (United States); Victor A. Neel, Massachusetts General Hospital (United States); Anna N. Yaroslavsky, Univ. of Massachusetts Lowell (United States)

12376-41 • 8:20 AM - 8:40 AM

Temporal evolution of optical properties at different temperatures of biological tissues

Author(s): Alessandro Bossi, Leonardo Bianchi, Paola Saccomandi, Antonio Pifferi, Politecnico di Milano (Italy)

12376-42 • 8:40 AM - 9:10 AM

Scattering and hemodynamic changes after a high-fat meal measured with shortwave infrared spatial frequency domain imaging (SWIR SFDI) *(Invited Paper)*

Author(s): Anahita Pilvar, Declan W. Smith, Boston Univ. (United States); Thomas Livecchi, Mark Pierce, Rutgers, The State Univ. of New Jersey (United States); Jorge Plutzky, Harvard Medical School (United States); Darren Roblyer, Boston Univ. (United States)

12376-43 • 9:10 AM - 9:30 AM

Tissue classification during colorectal cancer surgery using diffuse reflectance spectroscopy at the fingertip: design and performance of a compact side-firing probe

Author(s): Freija Geldof, Mark Witteveen, The Netherlands Cancer Institute-Antoni van Leeuwenhoek Hospital (Netherlands); Henricus J. C. M. Sterenborg, The Netherlands Cancer Institute-Antoni van Leeuwenhoek Hospital (Netherlands), Amsterdam UMC (Netherlands); Behdad Dashtbozorg, The Netherlands Cancer Institute-Antoni van Leeuwenhoek Hospital (Netherlands); Theo Ruers, The Netherlands Cancer Institute-Antoni van Leeuwenhoek Hospital (Netherlands), Univ. Twente (Netherlands)

12376-443 • 9:30 AM - 9:50 AM

Age stratified differences in 5th metatarsal hemodynamics determined by co-registered speckle contrast and frequency domain-diffuse optical tomography

Author(s): Joseph B. Majeski, Regine Choe, Univ. of Rochester (United States)

Coffee Break 9:50 AM - 10:20 AM

SESSION 10: FLUORESCENCE AND BIOLUMINESCENCE

10:20 AM - 12:30 PM

Moscone Center, Room 154 (Upper Mezzanine South)

Session chair: Anand T.N. Kumar, Massachusetts General Hospital (United States)

12376-45 • 10:20 AM - 10:50 AM

Modeling and optimization of system parameters for small animal fluorescence lifetime tomography *(Invited Paper)*

Author(s): Murali K., Athinoula A. Martinos Ctr. for Biomedical Imaging, Massachusetts General Hospital (United States), Harvard Medical School (United States); Rahul Pal, Anand T. N. Kumar, Athinoula A. Martinos Ctr. for Biomedical Imaging (United States)

12376-46 • 10:50 AM - 11:10 AM In-vivo fluorescence lifetime tomography for detection and quantification of programmed death ligand-1

Author(s): Rahul Pal, Aya Matsui, Murali K., Satoru Morita, Homan Kang, Hak Soo Choi, Dan G. Duda, Anand Kumar, Massachusetts General Hospital (United States)

12376-47 • 11:10 AM - 11:30 AM

Evaluation of the timing performance of silicon photomultiplier detectors array and its preliminary application in fluorescence lifetime sensing and diffuse optics

Author(s): Elisabetta Avanzi, Alberto Ghezzi, Politecnico di Milano (Italy); Andrea Farina, Consiglio Nazionale delle Ricerche (Italy); Cosimo D'Andrea, Alberto Dalla Mora, Laura Di Sieno, Politecnico di Milano (Italy)

12376-48 • 11:30 AM - 11:50 AM

A continuous line scanning method for fast temperature modulated fluorescence tomography

Author(s): Farouk Nouizi, John Tu & Thomas Yuen Ctr. for Functional Onco-Imaging, Univ. of California, Irvine (United States); Hakan Erkol, Bogaziçi Univ. (Turkey); Deniz Nikkhah, Tiffany C. Kwong, Gultekin Gulsen, John Tu & Thomas Yuen Ctr. for Functional Onco-Imaging, Univ. of California, Irvine (United States)

12376-49 • 11:50 AM - 12:10 PM

Bioluminescence tomography-guided system for pre-clinical radiotherapy research and quantitative tumor imaging

Author(s): Zhishen Tong, Xiangkun Xu, Zijian Deng, Ken Kang-Hsin Wang, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States)

12376-50 • 12:10 PM - 12:30 PM

Bioluminescence tomography-guided system for pre-clinical pancreatic cancer research

Author(s): Zijian Deng, Xiangkun Xu, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States); Hamid Dehghani, Univ. of Birmingham (United Kingdom); Juvenal Reyes, John Wong, Phuoc Tran, Johns Hopkins Univ. (United States); Ken Kang-Hsin Wang, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12376-34 8 On demand | Presenting live 28 January 2023

Fuzzy neurofeedback control induces designed modulation in presence of physiological noise

Author(s): Mario De Los Santos - Hernández, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); Felipe Orihuela-Espina, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico), Univ. of Birmingham (United Kingdom); Gustavo Rodríguez Gómez, Javier Herrera-Vega, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); Javier Andreu-Pérez, Univ. of Essex (United Kingdom)

Conference 12377

28 - 29 January 2023 | Moscone Center, Room 152 (Upper Mezzanine South)

Optical Interactions with Tissue and Cells XXXIV

Conference Chairs: **Norbert Linz**, Univ. zu Lübeck (Germany); **Joel N. Bixler**, Air Force Research Lab. (United States)

Conference Co-Chair: **Anouk L. Post**, The Netherlands Cancer Institute (Netherlands)

Program Committee: **Bennett L. Ibey**, Air Force Research Lab. (United States); **Randolph Glickman**, The Univ. of Texas Health Science Ctr. at San Antonio (United States); **Steven L. Jacques**, Univ. of Washington (United States); **Beop-Min Kim**, Korea Univ. (Korea, Republic of); **Alexander J. Makowski**, Sciton, Inc. (United States); **Patience T. Mthunzi-Kufa**, CSIR National Laser Ctr. (South Africa); **William P. Roach**, Air Force Office of Scientific Research (United States); **Alex J. Walsh**, Texas A&M Univ. (United States)

SATURDAY 28 JANUARY

SESSION 1: NOVEL APPLICATIONS OF LASERS AND LIGHT IN BIOMEDICINE

2023 • 9:00 AM - 10:00 AM PST | Moscone Center, Room 152 (Upper Mezzanine South)

Session chair: Joel N. Bixler, Air Force Research Lab. (United States)

12377-2 • 9:00 AM - 9:20 AM

Detection of human immunodeficiency virus on a photonic crystal-based platform

Author(s): Masixole Y. Lugongolo, Saturnin S. Ombinda-Lemboumba, CSIR National Laser Ctr. (South Africa); Charles P. Maphanga, Patience T. Mthunzi-Kufa, CSIR National Laser Ctr. (South Africa), Univ. of KwaZulu-Natal (South Africa)

12377-3 • 9:20 AM - 9:40 AM

Light-induced cytotoxicity in cells utilizing an automated well plate illuminator

Author(s): Laura Vesala, Robert Perttälä, Elias Kokko, Johannes Kivelä, Modulight Corp. (Finland); Lasse Orsila, Modulight Corp. (Finland), Tampere Univ. Hospital (Finland); Petteri Uusimaa, Modulight Corp. (Finland)

12377-4 • 9:40 AM - 10:00 AM

Hybrid optogenetic and electrical stimulation of the auditory nerve

Author(s): Elise Ajay, Bionics Institute (Australia), The Univ. of Melbourne (Australia); Alexander C. Thompson, Bionics Institute (Australia); Andrew Wise, Bionics Institute (Australia), The Univ. of Melbourne (Australia); David B. Grayden, The Univ. of Melbourne (Australia), Bionics Institute (Australia); James Fallon, Rachael T. Richardson, Bionics Institute (Australia), The Univ. of Melbourne (Australia)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: NOVEL APPLICATIONS OF LASERS AND LIGHT IN BIOMEDICINE II

10:30 AM - 12:10 PM

Moscone Center, Room 152 (Upper Mezzanine South)

Session chair: Anouk L. Post, The Netherlands Cancer Institute (Netherlands)

12377-5 • 10:30 AM - 10:50 AM

Evaluating the retinal hazard from exposures to the supercontinuum generated by a NIR femtosecond laser

Author(s): Xomalin G. Peralta, Joseph E. Clary, Amanda M. Peterson, SAIC (United States); Amanda J. Tijerina, Conceptual MindWorks, Inc. (United States); Gary D. Noojin, Brian J. Lund, SAIC (United States); Semih S. Kumru, Francesco J. Echeverria, Benjamin A. Rockwell, Air Force Research Lab. (United States)

12377-6 • 10:50 AM - 11:10 AM

Effects of laser-induced shockwaves on light propagation in scattering media

Author(s): Grant Swajian, Univ. of California, Riverside (United States); Junsoo Lee, Univ. of California, Irvine (United States); Nitesh Katta, Beckman Laser Institute and Medical Clinic (United States); Bahman Anvari, Univ. of California, Riverside (United States); Thomas E. Milner, Beckman Laser Institute and Medical Clinic (United States)

12377-7 • 11:10 AM - 11:30 AM

The effects of cold storage on double integrating sphere optical properties measurements of porcine skin and subcutaneous fat

Author(s): Priscilla Lopez, The Univ. of Texas at San Antonio (United States); Michael P. DeLisi, Andrea L. Smith, Matthew E. Macasadia, Mark A. Keppler, SAIC (United States); Amanda J. Tijerina, Conceptual MindWorks, Inc. (United States); Robert L. Hood, The Univ. of Texas at San Antonio (United States); Joel N. Bixler, Air Force Research Lab. (United States)

12377-8 • 11:30 AM - 11:50 AM

High resolution mass spectrometry imaging using 3 micron laser ablation

Author(s): Ronan A. Battle, Imperial College London (United Kingdom); Daniel Simon, Imperial College London (United Kingdom), The Rosalind Franklin Institute (United Kingdom); Yuchen Xiang, Imperial College London (United Kingdom); Kenneth Robinson, The Rosalind Franklin Institute (United Kingdom); Timothy H. Runcorn, Robert T. Murray, James R. Taylor, Zoltan Takats, Imperial College London (United Kingdom)

12377-9 • 11:50 AM - 12:10 PM

High speed photo-mediated ultrasound therapy integrated with OCTA

Author(s): Yuchen Song, Shuang Wei, Yan Li, Beckman Laser Institute and Medical Clinic (United States)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

SESSION 3: NUMERICAL APPROACHES SIMULATING LASER-TISSUE INTERACTIONS AND RESPONSE

1:40 PM - 2:40 PM

Moscone Center, Room 152 (Upper Mezzanine South)

Session chair: Bennett L. Ibey, Air Force Research Lab. (United States)

12377-11 • 1:40 PM - 2:00 PM

Modeling the diffuse reflectance in spatial frequency domain imaging

Author(s): Anouk L. Post, The Netherlands Cancer Institute (Netherlands), Amsterdam UMC (Netherlands); Dirk J. Faber, Ton G. van Leeuwen, Amsterdam UMC (Netherlands)

12377-12 • 2:00 PM - 2:20 PM

Quantitative evaluation of light distribution in skin tissue for short-pulsed laser treatment using Monte Carlo simulation combined with nonlinear absorption model of melanin

Author(s): Yu Shimojo, Takahiro Nishimura, Kunio Awazu, Osaka Univ. (Japan)

12377-13 • 2:20 PM - 2:40 PM

A Monte Carlo-based full-wavelength image simulator of Fourier-domain optical coherence tomography

Author(s): Jianing Mao, Yuye Ling, Shanghai Jiao Tong Univ. (China); Ping Xue, Tsinghua Univ. (China); Yikai Su, Shanghai Jiao Tong Univ. (China); Hongshan Liu, Stevens Institute of Technology (United States)

Coffee Break 2:40 PM - 3:10 PM

SESSION 4: MECHANISMS OF PULSED LASER ABLATION

3:10 PM - 4:30 PM

Moscone Center, Room 152 (Upper Mezzanine South)

Session chair: Norbert Linz, Univ. zu Lübeck (Germany)

12377-14 • 3:10 PM - 3:30 PM

Mechanisms of pulse laser ablation visualized at 1 million frames per second

Author(s): Joel N. Bixler, Allen S. Kiester, Air Force Research Lab. (United States)

12377-15 • 3:30 PM - 3:50 PM

Bone ablation performance of a Ho:YAG laser

Author(s): Cigdem Cetin, Sandra Drusová, Arsham Hamidi, Yakub A. Bayhaqi, Georg Rauter, Philippe C. Cattin, Univ. Basel (Switzerland); Azhar Zam, New York Univ. Abu Dhabi (United States); Ferda Canbaz, Univ. Basel (Switzerland)

12377-16 • 3:50 PM - 4:10 PM

Precision resection of soft tissue using picosecond laser pulses

Author(s): Rainer J. Beck, Ioannis Bitharas, Katjana Ehrlich, Heriot-Watt Univ. (United Kingdom); Thomas I. Maisey, Ryan K. Mathew, Univ. of Leeds (United Kingdom); Andrew J. Moore, Heriot-Watt Univ. (United Kingdom); James Moor, Univ. of Leeds (United Kingdom); Robert R. Thomson, Heriot-Watt Univ. (United Kingdom); David G. Jayne, Univ. of Leeds (United Kingdom); Jonathan D. Shephard, Heriot-Watt Univ. (United Kingdom)

12377-32 • 4:10 PM - 4:30 PM

Efficient and tissue-saving bone ablation with a pulsed 3 μ m laser source

Author(s): Christina Giesen, Fraunhofer-Institut für Lasertechnik ILT (Germany); Lazar Bocharov, Leo Müller, Sebastian Nyga, Fraunhofer Institute for Laser Technology (Germany); Peter Reinacher, Fraunhofer Institute for Laser Technology (Germany), University Hospital Freiburg (Germany); Achim Lenzenbach, Fraunhofer Institute for Laser Technology (Germany)

SUNDAY 29 JANUARY

SESSION 5: OPTICAL PROPERTIES OF TISSUES AND CELLS I

8:40 AM - 10:00 AM

Moscone Center, Room 152 (Upper Mezzanine South)

Session chair: Bennett L. Ivey, Air Force Research Lab. (United States)

12377-31 • 8:40 AM - 9:00 AM

Bridging photon transport regimes in turbid media

Author(s): Leah S. Wilk, Maurice C. G. Aalders, Amsterdam UMC (Netherlands)

12377-17 • 9:00 AM - 9:20 AM

Monitoring the effects of heavy metal (Cu) on aquatic plant (Myriophyllum) using biospeckle optical coherence tomography and statistical interferometry technique.

Author(s): Zulpikar Muhammad, Hirofumi Kadono, Saitama Univ. (Japan); Uma Maheswari Rajagopalan, Shibaura Institute of Technology (Japan)

12377-18 • 9:20 AM - 9:40 AM

Evaluation of sub-nanometric plant growth activities under far-red light illumination using Statistical Interferometry Technique (SIT)

Author(s): Kai Yabuki, Hirofumi Kadono, Saitama Univ. (Japan)

12377-19 • 9:40 AM - 10:00 AM Laser biospeckle based novel method in the evaluation of far-red light effects on plant growth

Author(s): Hibiki Igarashi, Kairi Takemura, Takahiro Kono, Shibaura Institute of Technology (Japan); Hirofumi Kadono, Saitama Univ. (Japan); Jun Yamada, Uma Maheswari Rajagopalan, Shibaura Institute of Technology (Japan)

Coffee Break 10:00 AM - 10:30 AM

SESSION 6: OPTICAL PROPERTIES OF TISSUES AND CELLS II

10:30 AM - 12:10 PM

Moscone Center, Room 152 (Upper Mezzanine South)

Session chair: Alex J. Walsh, Texas A&M Univ. (United States)

12377-20 • 10:30 AM - 10:50 AM

Depth information in fluorescence tomography obtained from time resolved spectroscopy

Author(s): Judith Reisdorf, Jan Laufer, Franz-Josef Schmitt, Martin-Luther-Univ. Halle-Wittenberg (Germany)

12377-21 • 10:50 AM - 11:10 AM

Photonics probing of structural alterations in Alzheimer's disease in human brain cells and tissues

Author(s): Fatemah Alharthi, Ishmael Apachigawo, Mississippi State Univ. (United States); Mohammad Moshahid Khan, The Univ. of Tennessee Health Science Ctr. (United States); Prabhakar Pradhan, Mississippi State Univ. (United States)

Conference 12377

12377-22 • 11:10 AM - 11:30 AM

Monitoring of cell metabolic interactions in engineered brain tissue models using two-photon label-free imaging

Author(s): Yang Zhang, Volha Liaudanskaya, Maria T. Savvidou, Varshini Ramanathan, Ash Sze, Xinjie Chen, Thi Bui, Sevara Nasritdinova, Aonkon Dey, Tufts Univ. (United States); Aviva J. Symes, Uniformed Services Univ. of the Health Sciences (United States); David L. Kaplan, Irene Georgakoudi, Tufts Univ. (United States)

12377-23 • 11:30 AM - 11:50 AM

Fast and reliable micro-bioassay technique based on biospeckle

Author(s): Arti Devi, Hirofumi Kadono, Saitama Univ. (Japan); Uma Maheswari Rajagopalan, Shibaura Institute of Technology (Japan)

12377-24 • 11:50 AM - 12:10 PM

Analyzing helicity-based images of backscattered circularly polarized light and the effects of scatterer size and turbidity

Author(s): Michael Singh, Alex Vitkin, Univ. of Toronto (Canada)

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM – 5:00 PM

View poster presentation guidelines and set-up instructions at:
<https://spie.org/PW/Poster-Guidelines>

12377-25 • On demand | Presented live 29 January 2023

Optical detection of structural alteration of brain tissues in Parkinson's disease via Partial Wave Spectroscopy (PWS)

Author(s): Ishmael Apachigawo, Fatemah Alharthi, Mississippi State Univ. (United States); Mohammad Moshahid Khan, The Univ. of Tennessee Health Science Ctr. (United States); Prabhakar Pradhan, Mississippi State Univ. (United States)

12377-26 • On demand | Presented live 29 January 2023

Effect of Cell density and laser exposure duration on threshold temperature for photothermal damage

Author(s): Jason Z. Cui, Stanford Univ. (United States); Julia R. Wieland, The Univ. of Arizona (United States); Nathaniel J. Pope, Gary D. Noojin, SAIC (United States); Michael L. Denton, Air Force Research Lab. (United States)

12377-27

The effects of high-amplitude short-duration Laser pressures transients on intracellular calcium response and inflammatory immune response of neuron, astrocyte, and microglia monocultures

Author(s): John Logan Jenkins, Pratheepa kumari Rasiah, Jacob Hardenburger, Wilson R. Adams, Anita Mahadevan-Jansen, Bryan Millis, E. Duco Jansen, Vanderbilt Univ. (United States)

12377-1 • On demand | Presented live 29 January 2023

Low-level laser therapy for treatment of severe acute respiratory syndrome 2 infection

Author(s): Luleka Mngwengwe, Council for Scientific and Industrial Research (South Africa); Masixole Y. Lugongolo, Saturnin S. Ombinda-Lemboumba, CSIR National Laser Ctr. (South Africa); Patience T. Mthunzi-Kufa, Council for Scientific and Industrial Research (South Africa)

Conference 12378

29 - 30 January 2023 | Moscone Center, Room 156 (Upper Mezzanine South)

Dynamics and Fluctuations in Biomedical Photonics XX

Conference Chairs: **Valery V. Tuchin**, Saratov State Univ. (Russian Federation), Tomsk State Univ. (Russian Federation), Institute of Precision Mechanics and Control of the RAS (Russian Federation); **Martin J. Leahy**, National Univ. of Ireland, Galway (Ireland); **Ruikang K. Wang**, Univ. of Washington (United States)

Program Committee: **Wei R. Chen**, The Univ. of Oklahoma (United States); **Joseph P. Culver**, Washington Univ. School of Medicine in St. Louis (United States); **Turgut Durduran**, ICFO - Institut de Ciències Fotòniques (Spain); **Ling Fu**, Huazhong Univ. of Science and Technology (China); **Ekaterina I. Galanzha**, Univ. of Arkansas for Medical Sciences (United States); **Michael W. Jenkins**, Case Western Reserve Univ. (United States); **Jana M. Kainerstorfer**, Carnegie Mellon Univ. (United States); **Brendan F. Kennedy**, The Univ. of Western Australia (Australia); **Sean J. Kirkpatrick**, Michigan Technological Univ. (United States); **Jürgen M. Lademann**, Charité Universitätsmedizin Berlin (Germany); **Kirill V. Larin**, Univ. of Houston (United States); **Irina V. Larina**, Baylor College of Medicine (United States); **Peng Li**, Zhejiang Univ. (China); **Qian Liu**, Hainan Univ. (China); **Zhenhe Ma**, Northeastern Univ. at Qinhuangdao (China); **Teemu S. Myllylä**, Univ. of Oulu (Finland); **Andrew M. Rollins**, Case Western Reserve Univ. (United States); **Inga Saknite**, Vanderbilt Univ. Medical Ctr. (United States), Univ. of Latvia (Latvia); **Melissa C. Skala**, Univ. of Wisconsin-Madison (United States); **Vladislav Toronov**, Ryerson Univ. (Canada); **Anna N. Yaroslavsky**, Univ. of Massachusetts Lowell (United States); **Vladimir P. Zharov**, Univ. of Arkansas for Medical Sciences (United States); **Chao Zhou**, Washington Univ. in St. Louis (United States); **Dan Zhu**, Huazhong Univ. of Science and Technology (China)

SUNDAY 29 JANUARY

SESSION 1: OPTICAL COHERENCE TOMOGRAPHY

8:30 AM - 10:20 AM

Moscone Center, Room 156 (Upper Mezzanine South)

Session chair: Ruikang K. Wang, Univ. of Washington (United States)

12378-1 • 8:30 AM - 9:00 AM

Advancements in dynamic micro-optical coherence tomography for cell phenotyping (*Invited Paper*)

Author(s): Hui Min Leung, Massachusetts General Hospital, Harvard Medical School (United States); Linhui Yu, Zhewei Wang, Massachusetts General Hospital (United States); Zuzana Tatarova, Brigham and Women's Hospital (United States); Miquela O. Murray, Anagha Arvind, Amilcar Barrios, Estelle Danielle Sylvie Chiavassa, Sydney Kutowy, Hinnerk Schulz-Hildebrandt, Abigail L. Gregg, Joseph A. Gardecki, Massachusetts General Hospital (United States); Oliver H. Jonas, Brigham and Women's Hospital (United States); Markus D. Herrmann, Guillermo J. Tearney, Massachusetts General Hospital (United States)

12378-2 • 9:00 AM - 9:20 AM

Spectrally extended line-field optical coherence tomography angiography

Author(s): Si Chen, Kan Lin, Xi Chen, Nanyang Technological Univ. (Singapore); Shiliang Lou, Tianjin Univ. (China); Linbo Liu, Nanyang Technological Univ. (Singapore)

12378-3 • 9:20 AM - 9:40 AM

Disease modeling applications of dynamic full field optical coherence tomography module

Author(s): Salvatore Azzollini, Institut de la Vision (France); Tual Monfort, Institut de la Vision (France), Ctr. Hospitalier National d'Ophtalmologie des Quinze-Vingts (France); Olivier Thouvenin, Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (France), Institut Langevin (France); Kate F. Grieve, Institut de la Vision (France), Ctr. Hospitalier National d'Ophtalmologie des Quinze-Vingts (France)

12378-4 • 9:40 AM - 10:00 AM

In vivo dynamic quantitative imaging of cilia metachronal wave in mouse fallopian tube with optical coherence tomography

Author(s): Tian Xia, Baylor College of Medicine (United States); Shang Wang, Stevens Institute of Technology (United States); Irina V. Larina, Baylor College of Medicine (United States)

12378-5 • 10:00 AM - 10:20 AM

Dynamic optical coherence tomography for tumor-spheroid-based anti-cancer-drug testing

Author(s): Ibrahim G. Abd El-Sadek, Univ. of Tsukuba (Japan), Damietta Univ. (Egypt); Rion Morishita, Tomoko Mori, Shuichi Makita, Pradipta Mukherjee, Satoshi Matsusaka, Yoshiaki Yasuno, Univ. of Tsukuba (Japan)

Coffee Break 10:20 AM - 10:50 AM

SESSION 2: LASER SPECKLE TECHNIQUES

10:50 AM - 12:10 PM

Moscone Center, Room 156 (Upper Mezzanine South)

Session chairs: Sean J. Kirkpatrick, Michigan Technological Univ. (United States), Martin J. Leahy, National Univ. of Ireland, Galway (Ireland)

12378-6 • 10:50 AM - 11:20 AM

Impact of logarithmic and linear spaced camera exposure durations for multi-exposure speckle Imaging (*Invited Paper*)

Author(s): Adam Santorelli, Christopher J. Smith, Andrew K. Dunn, The Univ. of Texas at Austin (United States)

12378-7 • 11:20 AM - 11:40 AM

Complexity analysis of deep-tissue microcirculation on acupoints of LI Meridian with pressure stimulus: multi-channel diffuse speckle contrast analysis (DSCA) study

Author(s): Jae Yoon Park, Kijoon Lee, Daegu Gyeongbuk Institute of Science & Technology (Republic of Korea)

12378-8 • 11:40 AM - 12:10 PM

Modelling movement artefacts in handheld laser speckle contrast imaging (*Invited Paper*)

Author(s): Ata Chizari, Wilson Tsong, Tom Knop, Wiendelt Steenbergen, Univ. Twente (Netherlands)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

Conference 12378

SESSION 3: SPECTROSCOPY AND APPLICATIONS

1:40 PM - 3:20 PM

Moscone Center, Room 156 (Upper Mezzanine South)

Session chair: Walter C.P.M. Blondel, Univ. de Lorraine (France)

12378-9 • 1:40 PM - 2:10 PM

Dynamics of human cerebral fluids measured by near-infrared spectroscopy *(Invited Paper)*

Author(s): Teemu S. Myllylä, Martti Ilvesmäki, Sadegh Moradi, Priya Karthikeyan, Vesa Kiviniemi, Hany Ferdinando, Vesa Korhonen, Univ. of Oulu (Finland)

12378-10 • 2:10 PM - 2:30 PM

Parallel interferometric near-infrared spectroscopy (pNIRS) monitors blood flow and absorption changes of the human brain in-vivo

Author(s): Dawid Borycki, Institute of Physical Chemistry PAS (Poland); Saeed Samaei, Nalecz Institute of Biocybernetics and Biomedical Engineering PAN (Poland); Klaudia Nowacka, Institute of Physical Chemistry PAS (Poland)

12378-113 • 2:30 PM - 3:00 PM

Deep learning for hyperspectral imaging of human skin and automated extraction of its functional and optical properties *(Invited Paper)*

Author(s): Alexander Doronin, Victoria Univ. of Wellington (New Zealand); Igor V. Meglinski, Aston Univ. (United Kingdom), Univ. of Oulu (Finland); Alexander V. Bykov, Univ. of Oulu (Finland)

12378-12 • 3:00 PM - 3:20 PM

Interferometric diffusing wave spectroscopy with an optical time-of-flight switch

Author(s): Santosh Aparanji, Mingjun Zhao, Vivek J. Srinivasan, NYU Langone Health (United States)

Coffee Break 3:20 PM - 3:50 PM

SESSION 4: OPTICAL CLEARING

3:50 PM - 5:20 PM

Moscone Center, Room 156 (Upper Mezzanine South)

Session chairs: Teemu S. Myllylä, Univ. of Oulu (Finland), Alexander Doronin, Victoria Univ. of Wellington (New Zealand)

12378-13 • 3:50 PM - 4:20 PM

Clinical MRI contrast agent improves fluorescent imaging of red fluorescent protein expression in-vivo due to the effect of tissue optical clearing *(Invited Paper)*

Author(s): Alexei A. Bogdanov, Univ. of Massachusetts Medical School (United States); Valery V. Tuchin, Saratov State Univ. (Russian Federation); Natalia I. Kazachkina, Victoria V. Zherdeva, Fundamentals of Biotechnology of the RAS (Russian Federation); Lilya G. Maloshenko, Vavilov Institute of General Genetics (Russian Federation); Daria K. Tuchina, Saratov State Univ. (Russian Federation); Irina G. Meerovich, Ilya D. Solovyev, Alexander P. Savitsky, Fundamentals of Biotechnology of the RAS (Russian Federation)

12378-14 • 4:20 PM - 4:50 PM

discrimination of optical clearing agent diffusivity in ex vivo porcine dura mater using confocal Raman micro-spectroscopy *(Invited Paper)*

Author(s): Ali Jaafar, Ameer R. K. Nassrah, Wigner Research Ctr. for Physics (Hungary); Maxim E. Darvin, Charité Universitätsmedizin Berlin (Germany); Valery V. V. Tuchin, Saratov State Univ. (Russian Federation), Institute of Precision Mechanics and Control, RAS (Russian Federation); Miklós Veres, Wigner Research Ctr. for Physics (Hungary)

12378-15 • 4:50 PM - 5:20 PM

Characterization of human skin optical clearing based on confocal optical coherence tomography imaging and optical clearing agents for clinical use *(Invited Paper)*

Author(s): Sergey M. Zaytsev, Univ. de Lorraine (France), Saratov State Univ. (Russian Federation); Walter C. P. M. Blondel, Marine Amouroux, Univ. de Lorraine (France); Valery V. Tuchin, Elina A. Genina, Saratov State Univ. (Russian Federation)

MONDAY 30 JANUARY

SESSION 5: FUNCTIONAL IMAGING AND EVALUATIONS I

9:20 AM - 10:20 AM

Moscone Center, Room 156 (Upper Mezzanine South)

Session chairs: Ruikang K. Wang, Univ. of Washington (United States), Irina V. Larina, Baylor College of Medicine (United States)

12378-18 • 9:20 AM - 9:50 AM

Optical coherence angiography to assess the dose-effect relationship of prenatal alcohol exposure on fetal brain vasculature *(Invited Paper)*

Author(s): Jessica Gutierrez, Manmohan Singh, Salavat R. Aglyamov, Univ. of Houston (United States); Rajesh C. Miranda, Texas A&M Health Science Ctr. (United States); Kirill V. Larin, Univ. of Houston (United States)

12378-20 • 9:50 AM - 10:20 AM

An open-source highly-efficient method for 4D reconstruction of the mouse embryonic cardiodynamics and hemodynamics with optical coherence tomography *(Invited Paper)*

Author(s): Andre C. Faubert, Stevens Institute of Technology (United States); Irina V. Larina, Baylor College of Medicine (United States); Shang Wang, Stevens Institute of Technology (United States)

Coffee Break 10:20 AM - 10:50 AM

SESSION 6: FUNCTIONAL IMAGING AND EVALUATIONS II

10:50 AM - 12:20 PM

Moscone Center, Room 156 (Upper Mezzanine South)

Session chairs: Irina V. Larina, Baylor College of Medicine (United States), Ruikang K. Wang, Univ. of Washington (United States)

12378-21 • 10:50 AM - 11:20 AM

Quantitative OCT angiography toward 4D blood flow analysis in embryonic cardiovascular system *(Invited Paper)*

Author(s): Michaela A. McCown, Irina V. Larina, Baylor College of Medicine (United States)

12378-22 • 11:20 AM - 11:40 AM

Renal tubular structure and metabolism revealed by dynamic optical coherence tomography and OCT angiography

Author(s): Pradipta Mukherjee, Shinichi Fukuda, Donny Lukmanto, Toshiharu Yamashita, Kosuke Okada, Shuichi Makita, Ibrahim G. Abd El-Sadek, Yiheng Lim, Yoshiaki Yasuno, Univ. of Tsukuba (Japan)

12378-24 • 11:40 AM - 12:00 PM

An experimental study of the photoplethysmography waveform analysis method in estimation of blood pressure and vessel stiffness

Author(s): Hany Ferdinando, Univ. of Oulu (Finland), Univ. Kristen Petra (Indonesia); Aleksandra Zienkiewicz, Abdelrahman Abdelsamie, Erkki Vihriälä, Matti J. Huotari, Teemu S. Myllylä, Univ. of Oulu (Finland)

12378-35 • 12:00 PM - 12:20 PM

Functional imaging of olfactory bulb and somatosensory cortex in mice using small-animal blood flow imaging platform

Author(s): Ria Paul, Soumyajit Sarkar, Indian Institute of Technology Bombay (India); Shruti D Marathe, Indian Institute of Science Education and Research, Pune (India); Murali K, Susweta Das, Indian Institute of Technology Bombay (India); Nixon M. Abraham, Indian Institute of Science Education and Research, Pune (India); Hari M. Varma, Indian Institute of Technology Bombay (India)

Lunch Break 12:20 PM - 1:50 PM

SESSION 7: SUPER-RESOLVED IMAGING

1:50 PM - 2:10 PM

Moscone Center, Room 156 (Upper Mezzanine South)

Session chair: Martin J. Leahy, National Univ. of Ireland, Galway (Ireland)

12378-28 • 1:50 PM - 2:10 PM

Visualization of the sub-wavelength structure of scattering objects with nano-sensitivity

Author(s): Sergey A. Alexandrov, Anand Arangath, Rajib Day, Ryan McAuley, Martin J. Leahy, National Univ. of Ireland, Galway (Ireland)

Coffee Break 2:10 PM - 3:20 PM

SESSION 8: KEYNOTE AND PANEL DISCUSSION ON OPTICAL SUPER-RESOLVED IMAGING

3:20 PM - 4:50 PM

Moscone Center, Room 156 (Upper Mezzanine South)

Please join us for a keynote talk and panel discussion on optical super-resolved imaging.

KEYNOTE SPEAKER:

Zeev Zalevsky, Bar-Ilan Univ. (Israel)

PANEL MODERATORS:

Martin J. Leahy, National Univ. of Ireland, Galway (Ireland)

PANELISTS:

Walter C. P. M. Blondel, Univ. de Lorraine (France)

Alexander Doronin, Victoria Univ. of Wellington (New Zealand)

Irina V. Larina, Baylor College of Medicine (United States)

Kirill V. Larin, Univ. of Houston (United States)

Teemu S. Myllylä, Univ. of Oulu (Finland)

Guillermo J. Tearney, Massachusetts General Hospital (United States)

Ruikang K. Wang, Univ. of Washington (United States)

Zeev Zalevsky, Bar-Ilan Univ. (Israel)

12378-25 • 3:00 PM - 3:40 PM

Optical super-resolved imaging (Keynote Presentation)

Author(s): Zeev Zalevsky, Bar-Ilan Univ. (Israel)

POSTERS-MONDAY

30 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the Monday BIOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM - 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12378-26 • On demand | Presented live 30 January 2023

Evaluating the efficacy of different data processing methods in diagnosing precancerous skin conditions in a preclinical in-vivo model using bimodal spectroscopy

Author(s): Valentin Kupriyanov, Univ. de Lorraine (France), Tomsk State Univ. Lab. of Laser Molecular Imaging and Machine Learning (Russian Federation); Walter C. P. M. Blondel, Christian Daul, Marine Amouroux, Univ. de Lorraine (France); Yury V. Kistenev, National Research Tomsk State Univ. (Russian Federation)

12378-27

Effect of coating of upconversion nanoparticles on optical parameters of biological tissues

Author(s): Irina Y. Yanina, Daria K. Tuchina, Ekaterina N. Lazareva, Anna A. Doronkina, Saratov State Univ. (Russian Federation); Artem M. Mylnikov, Nikita A. Navolokin, Saratov State Medical Univ. (Russian Federation); Vyacheslav I. Kochubey, Saratov State Univ. (Russian Federation)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12378-23 • On demand | Presenting live 28 January 2023

Dynamic inverse SNR-decorrelation OCT angiography with GPU acceleration

Author(s): Kaiyuan Liu, Tiepei Zhu, Xiaoting Yin, Juan Ye, Peng Li, Zhejiang Univ. (China)

Conference 12379

29 January - 1 February 2023 | Moscone Center, Room 211 (Level 2 South)

Photons Plus Ultrasound: Imaging and Sensing 2023

Conference Chairs: **Alexander A. Oraevsky**, TomoWave Labs, Inc. (United States); **Lihong V. Wang**, Caltech (United States)

Program Committee: **Mark A. Anastasio**, Washington Univ. in St. Louis (United States); **Paul C. Beard**, Univ. College London (United Kingdom); **A. Claude Boccara**, Institut Langevin Ondes et Images (France); **Sarah E. Elizabeth Bohndiek**, Univ. of Cambridge (United Kingdom); **Peter Burgholzer**, Research Ctr. for Non Destructive Testing GmbH (Austria); **Stanislav Y. Emelianov**, Georgia Institute of Technology (United States); **Rinat O. Esenaliev**, The Univ. of Texas Medical Branch (United States); **Martin Frenz**, Univ. Bern (Switzerland); **Miya Ishihara**, National Defense Medical College (Japan); **Chulhong Kim**, Pohang Univ. of Science and Technology (Korea, Republic of); **Changhui Li**, Peking Univ. (China); **Pai-Chi Li**, National Taiwan Univ. (Taiwan); **Srirang Manohar**, Univ. of Twente (Netherlands); **Vasilis Ntziachristos**, Helmholtz Zentrum München GmbH (Germany); **Matthew O'Donnell**, Univ. of Washington (United States); **Günther Paltauf**, Karl-Franzens-Univ. Graz (Austria); **Daniel Razansky**, ETH Zurich (Switzerland); **Wiendelt Steenbergen**, Univ. of Twente (Netherlands); **Xueding Wang**, Univ. of Michigan (United States); **Roger J. Zemp**, Univ. of Alberta (Canada); **Qifa Zhou**, The Univ. of Southern California (United States); **Quing Zhu**, Washington Univ. in St. Louis (United States)

SUNDAY 29 JANUARY

SESSION 1: CLINICAL IMAGING

8:30 AM - 10:00 AM

Moscone Center, Room 211 (Level 2 South)

Session chair: Alexander A. Oraevsky, TomoWave Laboratories, Inc. (United States)

12379-1 • 8:30 AM - 8:45 AM

Introduction to Photons Plus Ultrasound: Imaging and Sensing 2023

Author(s): Alexander A. Oraevsky, TomoWave Laboratories, Inc. (United States)

12379-3 • 8:45 AM - 9:00 AM

Assessment of kidney transplant quality using photoacoustic imaging: initial findings from a first-in-the-world clinical trial

Author(s): Eno Hysi, Alexander Koven, Robert Stewart, Monical Farcas, Michael Ordon, Kenneth Pace, Adriana Krizova, Xiaolin He, St. Michael's Hospital (Canada); Michael C. Kolios, Toronto Metropolitan Univ. (Canada); Darren A. Yuen, St. Michael's Hospital (Canada)

12379-4 • 9:00 AM - 9:15 AM

Development of an AI-assisted multi-spectral photoacoustic imaging for volumetric molecular tissue composition: a multi-frequency translational approach

Author(s): Valeria Grasso, FUJIFILM VisualSonics, Inc. (Netherlands), Christian-Albrecht-Univ. zu Kiel (Germany); Regine Willumeit-Roemer, Helmholtz-Zentrum Hereon GmbH (Germany), Christian-Albrecht-Univ. zu Kiel (Germany); Jithin Jose, FUJIFILM VisualSonics, Inc. (Netherlands)

12379-5 • 9:15 AM - 9:30 AM

Quantitative ionizing radiation acoustic imaging (iRAI) for mapping the dose deep in the liver during radiation therapy

Author(s): Wei Zhang, Univ. of Michigan Medical School (United States); Ibrahim Oraiqat, Moffitt Cancer Ctr. (United States); Dale Litzenberg, Univ. of Michigan Medical School (United States); Kai-Wei Chang, Scott Hadley, Noora Sunbul, Martha Matuszak, Univ. of Michigan (United States); Christopher Tichacek, Eduardo G. Moros, Moffitt Cancer Ctr. (United States); Paul Carson, Kyle Cuneo, Xueding Wang, Univ. of Michigan (United States); Issam M. El Naqa, Moffitt Cancer Ctr. (United States)

12379-7 • 9:30 AM - 9:45 AM

Assessment of prostate cancer progression using a translational needle photoacoustic sensing probe: preliminary study with intact human prostates ex-vivo

Author(s): Linyu Ni, Wei-Kuan Lin, Amy Kasputis, Deborah Postiff, Javed Siddiqui, Univ. of Michigan (United States); Matthew Allaway, Perineologic (United States); Matthew S. Davenport, John T. Wei, Jay L. Guo, Todd M. Morgan, Aaron M. Udager, Xueding Wang, Guan Xu, Univ. of Michigan (United States)

12379-8 • 9:45 AM - 10:00 AM

The International Photoacoustic Standardisation Consortium (IPASC): strategic road mapping to accelerate the development of photoacoustic imaging standards

Author(s): Sarah E. Bohndiek, Cancer Research UK Cambridge Institute (United Kingdom); Ben T. Cox, Univ. College London (United Kingdom); Janek Gröhl, Lina Hacker, Cancer Research UK Cambridge Institute (United Kingdom); James Joseph, Univ. of Dundee (United Kingdom); Stefan Morscher, iThera Medical GmbH (Germany); William C. Vogt, U.S. Food and Drug Administration (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: ADVANCES IN ENDOSCOPY

10:30 AM - 11:15 AM

Moscone Center, Room 211 (Level 2 South)

Session chair: Lihong V. Wang, Caltech (United States)

12379-9 • 10:30 AM - 10:45 AM

Torque coil-based highly-flexible photoacoustic and ultrasonic mini-probe for use in the instrument channel of a clinical video endoscope

Author(s): Minjae Kim, Ulsan National Institute of Science and Technology (Republic of Korea); Kang Won Lee, Korea Univ. College of Medicine (Republic of Korea); KiSik Kim, Oleksandra Gulenko, Cheol Lee, Ulsan National Institute of Science and Technology (Republic of Korea); Bora Keum, Hoon Jai Chun, Hyuk Soon Choi, Korea Univ. College of Medicine (Republic of Korea); Chae Un Kim, Joon-Mo Yang, Ulsan National Institute of Science and Technology (Republic of Korea)

12379-10 • 10:45 AM - 11:00 AM

Fiber-scanning GRIN-lens-based photoacoustic endomicroscope for early colon cancer detection

Author(s): Tse-Shao Chang, HaiJun Li, Gaoming Li, Tong Li, Xiaoli Wu, Kenn R. Oldham, Thomas D. Wang, Univ. of Michigan (United States)

12379-12 • 11:00 AM - 11:15 AM

Towards all-optical endoscopic photoacoustic tomography through a multimode fiber using wavefront shaping

Author(s): Benjamin Keenlyside, Maxim N. Cherkashin, Univ. College London (United Kingdom); Dylan Marques, Univ. of Birmingham (United Kingdom); Edward Z. Zhang, Paul C. Beard, Univ. College London (United Kingdom); James A. Guggenheim, Univ. of Birmingham (United Kingdom)

Lunch/Exhibition Break 11:15 AM - 1:00 PM

SESSION 3: BEST PAPER COMPETITION I

1:00 PM - 2:30 PM

Moscone Center, Room 211 (Level 2 South)

Session chair: Vasilis Ntziachristos, Helmholtz Zentrum München GmbH (Germany)

12379-14 • 1:00 PM - 1:15 PM

Transurethral photoacoustic and ultrasonic endoscopic probe developed for bladder cancer diagnosis

Author(s): KiSik Kim, Jin Young Youm, Ulsan National Institute of Science and Technology (Republic of Korea); Eun Hye Lee, Kyungpook National Univ. Chilgok Hospital (Republic of Korea); Oleksandra Gulenko, Minjae Kim, Ulsan National Institute of Science and Technology (Republic of Korea); Bo Hyun Yoon, Minji Jeon, Kyungpook National Univ. Chilgok Hospital (Republic of Korea); Tae Hyo Kim, Dong-A Univ. (Republic of Korea); Yun-Sok Ha, Kyungpook National Univ. Chilgok Hospital (Republic of Korea); Joon-Mo Yang, Ulsan National Institute of Science and Technology (Republic of Korea)

12379-15 • 1:15 PM - 1:30 PM

High-resolution photoacoustic and ultrasound endoscope based on the transparent ultrasound transducer

Author(s): Jaewoo Kim, Dasom Heo, Jeongwoo Park, Seonghee Cho, Joongho Ahn, Jongbeom Kim, Mingyu Ha, Hyung Ham Kim, Chulhong Kim, Pohang Univ. of Science and Technology (Republic of Korea)

12379-16 • 1:30 PM - 1:45 PM

Deep learning based on coregistered ultrasound and photoacoustic imaging improves assessment of rectal cancer chemoradiotherapy response

Author(s): Yixiao Lin, Sitai Kou, Haolin Nie, Quing Zhu, Washington Univ. in St. Louis (United States)

12379-17 • 1:45 PM - 2:00 PM

Clinical 3D microvascular imaging using the Fabry Perot photoacoustic scanner

Author(s): Nam Trung Huynh, Univ. College London (United Kingdom); Olivia Francies, Imperial College Healthcare NHS Trust (United Kingdom); Jiaqi Zhu, Katerina Soteriou, Univ. College London (United Kingdom); Filip Kuklis, Jiri Jaros, Brno Univ. of Technology (Czech Republic); Edward Z. Zhang, Ben T. Cox, Andrew Plumb, Paul C. Beard, Univ. College London (United Kingdom)

12379-18 • 2:00 PM - 2:15 PM

Numerical investigation of impact of skin phototype on three-dimensional optoacoustic tomography of the breast

Author(s): Seonyeong Park, Univ. of Illinois (United States); Umberto Villa, The Univ. of Texas at Austin (United States); Alexander A. Oraevsky, TomoWave Laboratories, Inc. (United States); Mark A. Anastasio, Univ. of Illinois (United States)

12379-19 • 2:15 PM - 2:30 PM

An ultrasensitive photoacoustic tomography system based on a Fabry-Perot sensor interrogated by a Bessel beam

Author(s): Dylan M. Marques, Univ. of Birmingham (United Kingdom), Univ. College London (United Kingdom); Oliver J. Sheppard, Edward Z. Zhang, Paul C. Beard, Peter R. T. Munro, Univ. College London (United Kingdom); James A. Guggenheim, Univ. of Birmingham (United Kingdom), Univ. College London (United Kingdom)

Coffee Break 2:30 PM - 3:00 PM

SESSION 4: BEST PAPER COMPETITION II

3:00 PM - 4:45 PM

Moscone Center, Room 211 (Level 2 South)

Session chair: Alexander A. Oraevsky, TomoWave Laboratories, Inc. (United States)

12379-21 • 3:00 PM - 3:15 PM

Needle-shaped beam optical-resolution photoacoustic microscopy with an extended depth of field

Author(s): Rui Cao, Caltech (United States); Jingjing Zhao, Stanford Univ. (United States); Lei Li, Caltech (United States); Lin Du, Univ. of Pennsylvania (United States); Yide Zhang, Yilin Luo, Caltech (United States); Laiming Jiang, The Univ. of Southern California (United States); Samuel P. Davis, Caltech (United States); Qifa Zhou, The Univ. of Southern California (United States); Adam de la Zerda, Stanford Univ. (United States); Lihong V. Wang, Caltech (United States)

12379-22 • 3:15 PM - 3:30 PM

Photoacoustic and ultrasound image-guided cancer immunotherapy using nanoparticle-tagged T cells

Author(s): Jinhwan Kim, Kelsey P. Kubelick, Myeongsoo Kim, Jeungyeon Lee, Anamik Jhunjhunwala, Anthony Yu, Stanislav Y. Emelianov, Georgia Institute of Technology (United States)

12379-23 • 3:30 PM - 3:45 PM

Longitudinal tracking of transplanted human-induced pluripotent stem cells in-vivo using multimodality photoacoustic microscopy, optical coherence tomography, and fluorescence imaging

Author(s): Van Phuc Nguyen, Univ. of Michigan Kellogg Eye Ctr. (United States); Wei Qian, IMRA America, Inc. (United States); Karoukis Athanasios, Perera Dayanthi, Linsheng Chen, Qitao Zhang, Josh Zhe, Jessica Henry, Univ. of Michigan Kellogg Eye Ctr. (United States); Bing Liu, IMRA America, Inc. (United States); Wei Zhang, Univ. of Michigan Medical School (United States); Fahim Abigail, Xueding Wang, Yannis M. Paulus, Univ. of Michigan Kellogg Eye Ctr. (United States)

Conference 12379

12379-24 • 3:45 PM - 4:00 PM

A dual-mode photoacoustic and ultrasound imaging system for whole-body small animal studies

Author(s): Alissa Silva, Michael D. Brown, Khoa Pham, Olumide Ogunlade, Univ. College London (United Kingdom); Edward Z. Zhang, Paul C. Beard, Univ. College London (United Kingdom), Wellcome/EPSRC Ctr. for Surgical and Interventional Sciences, Univ. College London (United Kingdom); Ben T. Cox, Univ. College London (United Kingdom)

12379-25 • 4:00 PM - 4:15 PM

Photoacoustic vector tomography for deep hemodynamic imaging

Author(s): Yang Zhang, Joshua Olick-Gibson, Anjul Khadria, Lihong V. Wang, Caltech (United States)

12379-27 • 4:15 PM - 4:30 PM

Three-dimensional photoacoustic tomography of angiographic anatomy and hemodynamics for fatty liver study

Author(s): Xin Tong, Li Lin, Peng Hu, Rui Cao, Yang Zhang, Joshua E. Olick-Gibson, Lihong V. Wang, Caltech (United States)

12379-26 • 4:30 PM - 4:45 PM

Non-invasive photoacoustic computed tomography of cardiac anatomy and function in rats

Author(s): Xin Tong, Li Lin, Caltech (United States); Susana Cavallero, Univ. of California, Los Angeles (United States); Yide Zhang, Shuai Na, Rui Cao, Caltech (United States); Tzung K. Hsiai, Univ. of California, Los Angeles (United States); Lihong V. Wang, Caltech (United States)

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BIOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM – 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12379-98

Photoacoustic-guided drug delivery with eutectic gallium-indium nanoparticles

Author(s): Marvin Xavierselvan, Tufts Univ. (United States); Sumeeyra Gokalp, Michelle Foster, Univ. of Massachusetts Boston (United States); Srivalleesha Mallidi, Tufts Univ. (United States)

12379-99 • On demand | Presented live 29 January 2023

Photoacoustic imaging of pure temperature during photothermal therapy for cancer: a key treatment guidance element for clinical translation

Author(s): Ivan Kosik, Univ. Health Network (Canada); Robert A. Weersink, Univ. of Toronto (Canada); Sangeet Ghai, Univ. Health Network (Canada); Theodore D. F. Husby, Andrew Effat, Univ. of Toronto (Canada); Brian C. Wilson, Univ. Health Network (Canada)

12379-100 • On demand | Presented live 29 January 2023

Arbitrary pattern projection through long and unfixed multimode fiber with wavefront shaping

Author(s): Shengfu Cheng, Tianting Zhong, Chi Man Woo, Puxiang Lai, The Hong Kong Polytechnic Univ. (Hong Kong, China)

12379-101 • On demand | Presented live 29 January 2023

Implementation of a flexible angular illumination adjustment technique for photoacoustic computed tomography

Author(s): Rayyan Manwar, Juliana B. Benavides, Ravi Prakash, Kamran Avanaki, Univ. of Illinois at Chicago (United States)

12379-102

CANCELED: Feasibility study of bone fracture assessment based on photoacoustic technique

Author(s): Yousong Fang, Ting Feng, Chenyin Ni, Nanjing Univ. of Science and Technology (China); Chengcheng Liu, Fudan Univ. (China); Qian Cheng, Institute of Acoustics, Tongji Univ. (China); Dean Ta, Fudan Univ. (China)

12379-103

Understanding ischemic reperfusion injury in kidney transplants using photoacoustic imaging

Author(s): Eno Hysi, Xiaolin He, Caitriona McEvoy, Luisa Ulloa-Severino, St. Michael's Hospital (Canada); Michael C. Kolios, Toronto Metropolitan Univ. (Canada); Darren A. Yuen, St. Michael's Hospital (Canada)

12379-104 • On demand | Presented live 29 January 2023

Minimum-variance Hilbert transform based delay-multiply and sum beamforming for photoacoustic array image reconstruction

Author(s): Chun-Hsien Chiang, Meng-Lin Li, National Tsing Hua Univ. (Taiwan)

12379-105

Deep learning-based algorithm for electromagnetic interference noise removal in photoacoustic endoscopic image processing

Author(s): Oleksandra Gulenko, Hyunmo Yang, KiSik Kim, Jin Young Youm, Minjae Kim, Yunho Kim, Woonggyu Jung, Joon-Mo Yang, Ulsan National Institute of Science and Technology (Republic of Korea)

12379-106 • On demand | Presented live 29 January 2023

Evaluation of light beam distribution according to concentration of ultrasound-induced gas bubbles

Author(s): Haemin Kim, Jinwoo Kim, Jin Ho Chang, Daegu Gyeongbuk Institute of Science & Technology (Republic of Korea)

12379-107

Non-contact ultrasound sensing for biomedical imaging

Author(s): Xing Long, Changhui Li, Peking Univ. (China)

12379-108

Developing a real-time dual-modal photoacoustic and fluorescence small animal imaging system

Author(s): Yu Sun, Wenzhao Li, Yibing Wang, Changhui Li, Peking Univ. (China)

12379-109

CANCELED: Photoacoustic signal propagation modes in bone tissue: a simulation study

Author(s): Shijie Liang, Ting Feng, Nanjing Univ. of Science and Technology (China); Chengcheng Liu, Fudan Univ. (China); Qian Cheng, Tongji Univ. (China); Dean Ta, Fudan Univ. (China)

12379-110 • On demand | Presented live 29 January 2023

Interleave-sampled photoacoustic (PA) imaging: a doubled and equivalent sampling rate for high-frequency imaging

Author(s): Lei Fu, Jesse V. Jokerst, Univ. of California, San Diego (United States)

12379-111 • On demand | Presented live 29 January 2023

Oxygen saturation imaging using dual-wavelength LED-based photoacoustics

Author(s): Mithun Kuniyil Ajith Singh, Cyberdyne, Inc. (Netherlands); Naoto Sato, Cyberdyne, Inc. (Japan); Yasuyuki Tsunoi, Satoko Kawauchi, National Defense Medical College Research Institute (Japan); Fumiyuki Ichihashi, Yoshiyuki Sankai, Cyberdyne, Inc. (Japan)

12379-112 • On demand | Presented live 29 January 2023

Investigating the feasibility of a hand-held photoacoustic imaging probe for margin assessment during breast conserving surgery

Author(s): Elina Rascevska, Lawrence C. M. Yip, Western Univ. (Canada), Lawson Health Research Institute (Canada); Parsa Omid, Lawson Health Research Institute (Canada); Muriel Brackstone, Western Univ. (Canada); Jeffrey J. L. Carson, Lawson Health Research Institute (Canada), Western Univ. (Canada)

12379-113 • On demand | Presented live 29 January 2023

Improving 3D imaging capability of LED-based photoacoustic imaging for high resolution human vascular imaging applications

Author(s): Mithun Kuniyil Ajith Singh, Cyberdyne, Inc. (Netherlands); Naoto Sato, Fumiyuki Ichihashi, Yoshiyuki Sankai, Cyberdyne, Inc. (Japan)

12379-114 • On demand | Presented live 29 January 2023

Relationship between skull phantoms physical characteristics and acoustic signal features

Author(s): Loïc Saint-Martin, Deepika Aggrawal, Rayyan Manwar, Dan Schonfeld, Kamran Avanaki, Univ. of Illinois at Chicago (United States)

12379-115 • On demand | Presented live 29 January 2023

Sensitivity in laser scanning photoacoustic microscopy

Author(s): Mohsin Zafar, Md Tarikul Islam, Rayyan Manwar, Kamran Avanaki, Univ. of Illinois at Chicago (United States)

12379-116 • On demand | Presented live 29 January 2023

Model-based photoacoustic image reconstruction by stabilizing the linear equation system using simulated annealing (SA) algorithm

Author(s): Ravi Prakash, Rayyan Manwar, Kamran Avanaki, Univ. of Illinois at Chicago (United States)

12379-117 • On demand | Presented live 29 January 2023

Development and characterization of thermoacoustic imaging system using rotational single element transducer

Author(s): Md Tarikul Islam, Mohsin Zafar, Ravi Prakash, Rayyan Manwar, Danilo Erricolo, James Lin, Kamran Avanaki, Univ. of Illinois at Chicago (United States)

12379-118 • On demand | Presented live 29 January 2023

Transducer misplacement compensation for in-lab-made 3D photoacoustic tomography systems using Cuckoo search algorithm

Author(s): Jarjish Rahaman, National Chemical Lab., Council of Scientific & Industrial Research (India); Ravi Prakash, Mohsen Ranjbaran, Rayyan Manwar, Kamran Avanaki, Univ. of Illinois at Chicago (United States)

12379-119 • On demand | Presented live 29 January 2023

E-Unet: a deep learning method for photoacoustic signal enhancement

Author(s): Deepika Aggrawal, Mohsin Zafar, Md Tarikul Islam, Rayyan Manwar, Dan Schonfeld, Kamran Avanaki, Univ. of Illinois at Chicago (United States)

12379-120 • On demand | Presented live 29 January 2023

Near-full-view photoacoustic detection with optimization through negativity artifact reduction

Author(s): Lawrence C. M. Yip, Parsa Omid, Elina Rascevska, Jeffrey J. L. Carson, Lawson Health Research Institute (Canada)

12379-121

Multi-wave photoacoustic signal separation with short delays and high noise

Author(s): Zheng Qu, Chao Liu, Jingyi Zhu, Yachao Zhang, Yingying Zhou, City Univ. of Hong Kong (Hong Kong, China); Lidai Wang, City Univ. of Hong Kong (Hong Kong, China), Shenzhen Research Institute, The Hong Kong Polytechnic Univ. (China)

12379-122

Freehand scanning photoacoustic microscopy

Author(s): Jiangbo Chen, City Univ. of Hong Kong (Hong Kong, China); Yachao Zhang, Jingyi Zhu, Lidai Wang, City Univ. of Hong Kong (China)

12379-123 • On demand | Presented live 29 January 2023

Photoacoustic microscopy using supercontinuum light for in vivo microscopic imaging of living tissue dynamics

Author(s): Takeshi Hirasawa, Kazuyoshi Tachi, Manami Miyashita, Tomohiro Ishikawa, Keiichi Ito, Miya Ishihara, National Defense Medical College (Japan)

12379-125 • On demand | Presented live 29 January 2023

Model-based reconstruction in optical-resolution photoacoustic microscopy

Author(s): Guenther Paltauf, Robert Nuster, Karl-Franzens-Univ. Graz (Austria)

12379-126 • On demand | Presented live 29 January 2023

Noise limited spatial resolution in photoacoustic reconstructions from photothermal measurements

Author(s): Peter Burgholzer, Research Ctr. for Non Destructive Testing GmbH (Austria); Gregor Thummerer, Guenther Mayr, Josef Ressel Ctr. for Thermal NDE of Composites, FH Oberösterreich (Austria)

Conference 12379

12379-127 • On demand | Presented live 29 January 2023

Multimodal photoacoustic and ultrasound imaging of organs during ex-vivo machine perfusion

Author(s): Robert Nuster, Karl-Franzens-Univ. Graz (Austria); Bettina Leber, Medizinischen Univ. Graz (Austria); Guenther Paltauf, Karl-Franzens-Univ. Graz (Austria); Philipp Stiegler, Medizinischen Univ. Graz (Austria)

12379-128

Nano-pulsed laser therapy (NPLT) of hippocampal neural stem cells decreases sensitivity to AD-related toxic oligomers

Author(s): M. Adelaide Micci, Kevin J. Johnson, Auston C. Grant, Kathia M. Johnson, Giulio Tagliatalata, Rinat O. Esenaliev, The Univ. of Texas Medical Branch (United States)

12379-129 • On demand | Presented live 29 January 2023

Comparison of flexible array with laparoscopic transducer for photoacoustic-guided surgery

Author(s): Jiaxin Zhang, Johns Hopkins Univ. (United States); Alycen Wiacek, Oakland Univ. (United States); Ziwei Feng, Kai Ding, Muyinatu A. Lediju Bell, Johns Hopkins Univ. (United States)

12379-130 • On demand | Presented live 29 January 2023

Experimental studies of high power diode lasers under high current short pulses for photoacoustics biomedical imaging

Author(s): Miguel Sánchez Rodas, Daniel C. Gallego, Horacio Lamela, Univ. Carlos III de Madrid (Spain)

Show Abstract +

12379-131 • On demand | Presented live 29 January 2023

Laser ultrasound emitter using low cost and compact high power diode laser for ultrasound biomedical imaging

Author(s): Miguel Sánchez Rodas, Daniel C. Gallego, Univ. Carlos III de Madrid (Spain); Alexander A. Oraevsky, TomoWave Laboratories, Inc. (United States); Horacio Lamela, Univ. Carlos III de Madrid (Spain)

12379-20

Photoacoustic wavefront shaping with a long coherence length laser

Author(s): Maxim N. Cherkashin, Benjamin Keenlyside, Thomas J. Allen, Paul C. Beard, Univ. College London (United Kingdom); James A. Guggenheim, Univ. of Birmingham (United Kingdom)

MONDAY 30 JANUARY

SESSION 5: PHANTOMS AND CONTRAST AGENTS

8:00 AM - 10:00 AM

Moscone Center, Room 211 (Level 2 South)

Session chairs: Rinat O. Esenaliev, The Univ. of Texas Medical Branch (United States); Srirang Manohar, Univ. Twente (Netherlands)

12379-29 • 8:00 AM - 8:15 AM

Biodegradable silk as an ultrasound and photoacoustic phantom material

Author(s): Srivalleesha Mallidi, Christopher D. Nguyen, Skye A. Edwards, Tufts Univ. (United States); Tyler W. Iorizzo, Univ. of Massachusetts Lowell (United States); Brooke N. Longo, Tufts Univ. (United States); Anna N. Yaroslavsky, Univ. of Massachusetts Lowell (United States); David L. Kaplan, Tufts Univ. (United States)

12379-30 • 8:15 AM - 8:30 AM

A novel test phantom for testing the stability of a hybrid multi-spectral photoacoustic-ultrasound breast imager

Author(s): Rianne F. G. Bulthuis, Alette J. Tjibburg, Johan C. G. van Hespren, Univ. Twente (Netherlands); Felix Lucka, Ctr. Wiskunde & Informatica (Netherlands); Ashkan Javaherian, Ben T. Cox, Univ. College London (United Kingdom); Srirang Manohar, Univ. Twente (Netherlands)

12379-31 • 8:30 AM - 8:45 AM

Additive manufacturing for multimodal photoacoustic ophthalmoscopy

Author(s): Richard Haindl, Nanyang Technological Univ. (Singapore), Medizinische Univ. Wien (Austria); Valentina Bellemo, Nanyang Technological Univ. (Singapore), Singapore National Eye Ctr., Singapore Eye Research Institute (Singapore); Praveenbalaji Rajendran, Nanyang Technological Univ. (Singapore); Bingyao Tan, SERI-NTU Advanced Ocular Engineering (STANCE) (Singapore), Singapore Eye Research Institute (Singapore); Mengyang Liu, Medizinische Univ. Wien (Austria), Singapore National Eye Ctr., Singapore Eye Research Institute (Singapore); Rainer Leitgeb, Wolfgang Drexler, Medizinische Univ. Wien (Austria); Leopold Schmetterer, Singapore Eye Research Institute (Singapore), SERI-NTU Advanced Ocular Engineering (STANCE) (Singapore), Ctr. for Medical Physics and Biomedical Engineering, Medizinische Univ. Wien (Austria); Manojit Pramanik, Nanyang Technological Univ. (Singapore)

12379-32 • 8:45 AM - 9:00 AM

Photoacoustic oxygen imaging for prediction of radiation therapy efficacy

Author(s): Janggun Jo, Jeff Folz, Celina Kleer, Raoul Kopelman, Xueding Wang, Univ. of Michigan (United States)

12379-33 • 9:00 AM - 9:15 AM

Indocyanine green-based in-vivo photoacoustic imaging contrast agent platform

Author(s): Giovanni Giammanco, Shrishti Singh, Chih-hsiang Hu, Joshua Bush, Leandro S. Cordova, George Mason Univ. (United States); Dylan J. Lawrence, PhotoSound Technologies, Inc. (United States); Jeffrey L. Moran, Parag V. Chitnis, Remi Veneziano, George Mason Univ. (United States)

12379-34 • 9:15 AM - 9:30 AM

Deep-tissue photoacoustic tomography of novel amphibian biliverdin-binding proteins

Author(s): Carlos Taboada, Tri Vu, Junjie Yao, Duke Univ. (United States)

12379-35 • 9:30 AM - 9:45 AM

Feasibility of spectra-based quantification algorithm for non-linear photoacoustic contrast agents

Author(s): Liudmila Serebrennikova, Shang Gao, Ryo Murakami, Worcester Polytechnic Institute (United States); Srikanth Boinapally, Martin G. Pomper, Sangeeta Ray, The Johns Hopkins Univ. School of Medicine (United States); Haichong K. Zhang, Worcester Polytechnic Institute (United States)

12379-36 • 9:45 AM - 10:00 AM

Single-chain nanoparticles as contrast agents for photoacoustic pump-probe imaging

Author(s): Guo Tang, Farzin Golmohamadi, Jan Laufer, Martin-Luther-Univ. Halle-Wittenberg (Germany); Franz-Josef Schmitt, Technische Univ. Berlin (Germany); Justus Friedrich Thuemmler, Wolfgang Binder, Martin-Luther-Univ. Halle-Wittenberg (Germany)

Coffee Break 10:00 AM - 10:30 AM

SESSION 6: QUANTITATIVE IMAGING

10:30 AM - 12:00 PM

Moscone Center, Room 211 (Level 2 South)

Session chair: Paul C. Beard, Univ. College London (United Kingdom)

12379-37 • 10:30 AM - 10:45 AM

Photoacoustic preclinical imaging study on tumor stroma quantification in breast cancer

Author(s): Francis Kalloor Joseph, Wiendelt Steenbergen, Jai Prakash, Tao Lu, Univ. Twente (Netherlands)

12379-38 • 10:45 AM - 11:00 AM

Characterizing intestinal fibrosis using endoscopic strain-photoacoustic and spectroscopic imaging

Author(s): Linyu Ni, Yunhao Zhu, Xiaorui Peng, Guorong Hu, Laura A. Johnson, Kathryn A. Eaton, Jonathan M. Rubin, Xueding Wang, Peter D. R. Higgins, Guan Xu, Univ. of Michigan (United States)

12379-39 • 11:00 AM - 11:15 AM

PATATO: a Python photoacoustic tomography analysis toolkit

Author(s): Thomas R. Else, Janek Gröhl, Lina Hacker, Sarah E. Bohndiek, Cancer Research UK Cambridge Institute (United Kingdom), Univ. of Cambridge (United Kingdom)

12379-40 • 11:15 AM - 11:30 AM

Toward cancer characterization using light backscattering spectroscopy and quantitative ultrasound

Author(s): Cyril Malinet, Pauline Muleki-Seya, CREATIS, CNRS (France); Aurélie Dutour, Iveta Fajnorova, Ctr. de Recherche en Cancérologie de Lyon (France), Ctr. Léon Bérard (France); Hervé Liebgott, CREATIS, CNRS (France); Bruno Montcel, CREATIS, CNRS (France)

12379-41 • 11:30 AM - 11:45 AM

Non-alcoholic fatty liver disease assessment by transmission-reflection optoacoustic ultrasound (TROPUS) computed tomography

Author(s): Berkan Lafci, ETH Zurich (Switzerland), Univ. Zürich (Switzerland); Anna Hadjihambi, Christos Konstantinou, The Roger Williams Institute of Hepatology, Foundation for Liver Research (United Kingdom); Joaquin L. Herraiz, Univ. Complutense de Madrid (Spain); Neal C. Burton, iThera Medical GmbH (Germany); Xosé Luís Deán-Ben, Daniel Razansky, ETH Zurich (Switzerland), Univ. Zürich (Switzerland)

12379-42 • 11:45 AM - 12:00 PM

Photoacoustic imaging of collagen and oxygenation in mouse kidneys and livers with respiratory corrections

Author(s): Eno Hysi, Xiaolin He, Darren A. Yuen, St. Michael's Hospital (Canada); Michael C. Kolios, Toronto Metropolitan Univ. (Canada)

Lunch Break 12:00 PM - 1:30 PM

SESSION 7: SIGNAL AND IMAGE PROCESSING

1:30 PM - 3:15 PM

Moscone Center, Room 211 (Level 2 South)

Session chair: Wiendelt Steenbergen, Univ. Twente (Netherlands)

12379-43 • 1:30 PM - 1:45 PM

Costas sparse arrays for high-resolution 3D photoacoustic imaging

Author(s): Mohammad Hadi Masoumi, Tarek Kaddoura, Roger J. Zemp, Univ. of Alberta (Canada)

12379-44 • 1:45 PM - 2:00 PM

Multiview compounding for linear array-based 3D photoacoustic imaging

Author(s): Yash Ajay Garje, Yichuan Tang, Enxhi Jaupi, Haichong Zhang, Worcester Polytechnic Institute (United States)

12379-45 • 2:00 PM - 2:15 PM

Photoacoustic hyper-beamformation array imaging

Author(s): Chun-Hsien Chiang, Meng-Lin Li, National Tsing Hua Univ. (Taiwan)

12379-46 • 2:15 PM - 2:30 PM

The International Photoacoustic Standardisation Consortium (IPASC): open-source implementation and systematic comparison of image reconstruction algorithms for linear array transducers

Author(s): Janek Gröhl, Lina Hacker, Cancer Research UK Cambridge Institute (United Kingdom); Ben T. Cox, Univ. College London (United Kingdom)

12379-47 • 2:30 PM - 2:45 PM

Frequency wavelength multiplexed optoacoustic tomography

Author(s): Antonios Stylogiannis, Helmholtz Zentrum München GmbH (Germany)

12379-48 • 2:45 PM - 3:00 PM

The International Photoacoustic Standardisation Consortium (IPASC): a proposal for a standard metadata format

Author(s): Janek Gröhl, Lina Hacker, Cancer Research UK Cambridge Institute (United Kingdom); Ben T. Cox, Univ. College London (United Kingdom); Stefan Morscher, iThera Medical GmbH (Germany); William C. Vogt, U.S. Food and Drug Administration (United States); Sarah E. Bohndiek, Cancer Research UK Cambridge Institute (United Kingdom)

12379-49 • 3:00 PM - 3:15 PM

Enhancing the performance of localization optoacoustic tomography (LOT) by aligning motion-affected frames

Author(s): Jim Zhao, Daniil Nozdriukhin, Xosé Luís Deán-Ben, Daniel Razansky, Univ. Zürich (Switzerland)

Coffee Break 3:15 PM - 3:45 PM

Conference 12379

SESSION 8: NOVEL SYSTEMS INCLUDING WAVEFRONT SHAPING

3:45 PM - 5:15 PM

Moscone Center, Room 211 (Level 2 South)

Session chair: Albert Claude Boccara, Institut Langevin (France)

12379-50 • 3:45 PM - 4:00 PM

Clinical-translatable high-fidelity photoacoustic tomography enhanced by virtual point sources

Author(s): Yuqi Tang, Duke Univ. (United States); Shanshan Tang, Chengwu Huang, Shigao Chen, Mayo Clinic (United States); Junjie Yao, Duke Univ. (United States)

12379-51 • 4:00 PM - 4:15 PM

Label-free vasculature imaging using total absorption photoacoustic remote sensing

Author(s): James A. Tummon Simmons, Nima Abbasi, Benjamin R. Ecclestone, Parsin Haji Reza, Univ. of Waterloo (Canada)

12379-52 • 4:15 PM - 4:30 PM

High-resolution photoacoustic 3D imaging system for animal experiments using a hemispherical detector array

Author(s): Yasufumi Asao, Kenichi Nagae, Hiroyuki Sekiguchi, Sadakazu Aiso, Luxonus Inc. (Japan); Shigeaki Watanabe, Marika Sato, Shinae Kizaka-Kondoh, Tokyo Institute of Technology (Japan); Takayuki Yagi, Luxonus Inc. (Japan)

12379-54 • 4:30 PM - 4:45 PM

Gigantic acousto-optic modulation in multiphoton fluorescence imaging

Author(s): Justin P. Little, NYU Grossman School of Medicine (United States); Behnam Tayebi, Inscopix, Inc. (United States); Ezra Guralnik, NYU Tandon School of Engineering (United States); Michal Balberg, Holon Institute of Technology (Israel); Shy Shoham, NYU Grossman School of Medicine (United States)

12379-55 • 4:45 PM - 5:00 PM

Fourier-transform acousto-optic imaging

Author(s): Maïmouna Bocoum, Institut Langevin (France)

12379-56 • 5:00 PM - 5:15 PM

Photoacoustic wavefront shaping to focus light deep in tissue: a computational feasibility study

Author(s): Jake Bewick, Peter R. T. Munro, Simon R. Arridge, Univ. College London (United Kingdom); James A. Guggenheim, Univ. of Birmingham (United Kingdom)

POSTERS-MONDAY

30 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the Monday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM - 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12379-133 • On demand | Presented live 30 January 2023

Photoacoustic method for quantifying blood flow in bone

Author(s): Caitlin Smith, Jami L. Shepherd, Kasper van Wijk, The Univ. of Auckland (New Zealand), Dodd-Walls Ctr. for Photonic and Quantum Technologies (New Zealand); Guillaume Renaud, Technische Univ. Delft (Netherlands)

12379-134 • On demand | Presented live 30 January 2023

Utilizing variational autoencoders in photoacoustic tomography

Author(s): Teemu Sahlström, Univ. of Eastern Finland (Finland); Tanja Tarvainen, Univ. of Eastern Finland (Finland), Univ. College London (United Kingdom)

12379-135

The scale optimization of photoacoustic conversion for rotating gold nano ellipsoid based on theoretical study

Author(s): YueXin Qi, Rui Peng, Hui Cao, Jianzhong Guo, Key Lab. of Ultrasound of Shaanxi Province (China)

12379-136 • On demand | Presented live 30 January 2023

Breath compensated in vivo 3D whole-body imaging of small animals with mechanical scanning of a single-element transducer

Author(s): Haeni Lee, Seongyi Han, Pusan National Univ. (Republic of Korea); Sinyoung Park, Seonghee Cho, Chulhong Kim, Pohang Univ. of Science and Technology (Republic of Korea); Jeeseu Kim, Pusan National Univ. (Republic of Korea)

12379-137 • On demand | Presented live 30 January 2023

Biodegradable and biocompatible semiconductor nanocrystals as NIR-II photoacoustic imaging contrast agents

Author(s): Vinoin Devpaul Vincely, Swathi P. Katakam, Kristie Huda, Tulane Univ. (United States); Xingjian Zhong, Joshua Kays, Allison Dennis, Boston Univ. (United States); Carolyn L. Bayer, Tulane Univ. (United States)

12379-138

Distinguishing muscle hypertrophy in intestinal strictures: a feasibility study

Author(s): Xiaorui Peng, Laura A. Johnson, Linyu Ni, Kathryn A. Eaton, Peter D. R. Higgins, Xueding Wang, Guan Xu, Univ. of Michigan (United States)

12379-139 • On demand | Presented live 30 January 2023

Image reconstruction in quantitative photoacoustic tomography using adaptive optical Monte Carlo

Author(s): Niko Hänninen, Aki Pulkkinen, Univ. of Eastern Finland (Finland); Simon R. Arridge, Univ. College London (United Kingdom); Tanja Tarvainen, Univ. of Eastern Finland (Finland)

12379-140 • On demand | Presented live 30 January 2023

Single scan functional photosacoustic imaging with a wavelength tunable light source pumped by few tens KHz pulsed laser

Author(s): Yong-Jae Lee, Gwangju Institute of Science and Technology (Republic of Korea), Busan National Univ. (Republic of Korea); Dat Thanh Le, Chonnam National Univ. (Republic of Korea); Changho Lee, Chonnam National Univ. Hwasun Hospital (Republic of Korea); Tae Joong Eom, Pusan National Univ. (Republic of Korea)

12379-141 • On demand | Presented live 30 January 2023

Combination of photoacoustic and fluorescence in-vivo imaging using bioavailable nanoparticles containing a fluorescent dye

Author(s): Miya Ishihara, Takeshi Hirasawa, Manami Miyashita, National Defense Medical College (Japan); Yuya Yoshimoto, Takahiro Sato, Takuma Adachi, Koichi Saito, Yoshiaki Tsubata, Sumitomo Chemical Co., Ltd. (Japan)

12379-142

Photoacoustic spectrum analysis for spherical target size and optical property determination: a feasibility study

Author(s): Maura Dantuma, Damien Gasteau, Srirang Manohar, Univ. Twente (Netherlands)

12379-143 • On demand | Presented live 30 January 2023

Dual-wavelength low-cost high-resolution photoacoustic microscopy system for blood oxygenation imaging

Author(s): Xiufeng Li, Bingxin Huang, Hong Kong Univ. of Science and Technology (Hong Kong, China); Kylie Yeung, Hong Kong Univ. of Science and Technology (Hong Kong, China), Univ. College London (United Kingdom); Victor T. C. Tsang, Claudia Tung Kei Lo, Terence T. W. Wong, Hong Kong Univ. of Science and Technology (Hong Kong, China)

12379-144 • On demand | Presented live 30 January 2023

Closed-loop contrast source regulation through real-time spectroscopic photoacoustic imaging: phantom evaluation

Author(s): Ryo Murakami, Shang Gao, Haichong K. Zhang, Worcester Polytechnic Institute (United States)

12379-145 • On demand | Presented live 30 January 2023

Deep learning based high frame rate photoacoustic tomography

Author(s): Praveenbalaji Rajendran, Manojit Pramanik, Nanyang Technological Univ. (Singapore)

12379-146 • On demand | Presented live 30 January 2023

Evaluations of radiotherapy in small animal models of pancreatic cancer with oxygen enhanced-dynamic contrast enhanced multispectral optoacoustic tomography (OE-DCE MSOT)

Author(s): Shreya Goel, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States), The Univ. of Utah (United States); Jorge de la Cerda, William Schuler, Aikaterini Kotrotsou, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); Julio Cardenas-Rodriguez, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States), Data Translators, LLC (United States); Mark Pagel, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States)

12379-147 • On demand | Presented live 30 January 2023

Photoacoustic monitoring of corticosteroids' vasoconstrictive effects in the skin

Author(s): Donggyu Kim, Joongho Ahn, Eunwoo Park, Jin Young Kim, Chulhong Kim, Pohang Univ. of Science and Technology (Republic of Korea)

12379-148 • On demand | Presented live 30 January 2023

Photoacoustic-only preamplification in simultaneous photoacoustic and ultrasound imaging using switchable preamplifier

Author(s): Donghyeon Oh, Jinhee Yoo, Pohang Univ. of Science and Technology (Republic of Korea); Jiyong Um, Kumoh National Institute of Technology (Republic of Korea); Hyung Ham Kim, Chulhong Kim, Pohang Univ. of Science and Technology (Republic of Korea)

12379-149 • On demand | Presented live 30 January 2023

An optically transparent focused P(VDF-TrFE) transducer for photoacoustic microscopy (PAM)

Author(s): Cheng Fang, Zijie Zhao, Jie Fang, Jun Zou, Texas A&M Univ. (United States)

12379-150 • On demand | Presented live 30 January 2023

Monitoring a tumor-targeting BODIPY-based theranostic nanomaterial with photoacoustic imaging

Author(s): Sinyoung Park, Pohang Univ. of Science and Technology (Republic of Korea); Eun-Yeong Park, Stanford Univ. (United States); Nahyun Kwon, Ewha Womans university (Republic of Korea); Kwang H. Kim, Yejin Cho, Severance Biomedical Science Institute, Yonsei University College of Medicine (Republic of Korea); Junha Lim, Pohang Univ. of Science and Technology (Republic of Korea); Seda Çetindere, Süreyya Oğuz Tümay, Gebze Technical University (Turkey); Wonjong Kim, Pohang Univ. of Science and Technology (Republic of Korea); Xingshu Li, Fuzhou University (China); Ki Taek Nam, Yonsei University (Republic of Korea); Serkan Yeşilot, Gebze Technical University (Turkey); Juyoung Yoon, Ewha Womans university (Republic of Korea); Chulhong Kim, Pohang Univ. of Science and Technology (Republic of Korea)

12379-151 • On demand | Presented live 30 January 2023

Integrated wearable and mobile ultrasound and photoplethysmography device via transparent ultrasound transducer

Author(s): Jeongwoo Park, Byullee Park, Donggyu Kim, Joongho Ahn, Jin Young Kim, Hyung Ham Kim, Chulhong Kim, Pohang Univ. of Science and Technology (Republic of Korea)

12379-152 • On demand | Presented live 30 January 2023

Tapered fiber-based shear force scanning photoacoustic microscopy

Author(s): Moongyu Han, Byullee Park, Hongyoon Kim, Jinhee Yoo, Dong Kyo Oh, Seongwon Moon, Joongho Ahn, Pohang Univ. of Science and Technology (Republic of Korea); Hae Gyun Lim, Pukyong National University (Republic of Korea); Inki Kim, Sungkyunkwan University (Republic of Korea); Hyung Ham Kim, Junsuk Rho, Chulhong Kim, Pohang Univ. of Science and Technology (Republic of Korea)

12379-153 • On demand | Presented live 30 January 2023

Photoacoustic image reconstruction on a mobile platform

Author(s): Hui Xie, Praveenbalaji Rajendran, Muhamad Ar Iskandar Zulkifli, Manojit Pramanik, Nanyang Technological Univ. (Singapore)

Conference 12379

12379-154

Visualisation of medical needles using photoacoustic imaging with candle soot composites coatings and deep learning

Author(s): Mengjie Shi, King's College London (United Kingdom); Semyon Bodian, Univ. College London (United Kingdom); Simeon J. West, Univ. College Hospital (United Kingdom); Sanjayan Sathasivam, Univ. College London (United Kingdom); Ross J. Gordon, Paul Collier, Johnson Matthey Plc (United Kingdom); Adrien E. Desjardins, Sacha Noimark, Univ. College London (United Kingdom); Tom Vercauteren, Wenfeng Xia, King's College London (United Kingdom)

12379-155

Characterising the potential for racial bias in photoacoustic imaging

Author(s): Thomas R. Else, Cancer Research UK Cambridge Institute (United Kingdom), Univ. of Cambridge (United Kingdom); Lina Hacker, Cancer Research UK Cambridge Institute (United Kingdom), Univ. of Cambridge (United Kingdom); Janek Gröhl, Ellie Bunce, Cancer Research UK Cambridge Institute (United Kingdom), Univ. of Cambridge (United Kingdom); Amit Roshan, Cancer Research UK Cambridge Institute (United Kingdom), Cambridge Univ. Hospitals NHS Foundation Trust (United Kingdom); Sarah E. Bohndiek, Cancer Research UK Cambridge Institute (United Kingdom), Univ. of Cambridge (United Kingdom)

12379-156

Spatiotemporal SVD for denoising in LED-based photoacoustic imaging

Author(s): Mengjie Shi, Tom Vercauteren, Wenfeng Xia, King's College London (United Kingdom)

12379-157

Contrast mechanisms in photoacoustic imaging of fluorescent proteins using pump-probe excitation

Author(s): Farzin Ghane Golmohamadi, Hoang T. Phan, Amna Shah Mehmood, Franz-Josef Schmitt, Jan Laufer, Martin-Luther-Univ. Halle-Wittenberg (Germany)

12379-158 • On demand | Presented live 30 January 2023

Noise reduction in LED light source-based photoacoustic imaging using M-sequences coding

Author(s): Keisuke Fukuda, Kazuma Hashimoto, Uma Maheswari Rajagopalan, Takahiro Kono, Jun Yamada, Shibaura Institute of Technology (Japan)

12379-160

High-precision dual site neural stimulation by a highly efficient candle soot-based fiber optoacoustic emitter

Author(s): Guo Chen, Linli Shi, Lu Lan, Runyu Wang, Yueming Li, Zhiyi Du, Mackenzie Hyman, Ji-Xin Cheng, Chen Yang, Boston Univ. (United States)

12379-161

Detecting inflammation of COVID-19 Vaccine site using photoacoustic imaging

Author(s): Janggun Jo, Univ. of Michigan (United States); David M. Mills, GE Research (United States); Elena Schiopu, Girish Gandikota, Xueding Wang, Univ. of Michigan (United States)

12379-162 • On demand | Presented live 30 January 2023

Development of a semi-anthropomorphic photoacoustic calcaneus phantom based on micro computed tomography and stereolithography 3D printing

Author(s): Zhanpeng Xu, Conor S. Locke, Univ. of Michigan (United States); Richard Morris, IF, LLC (United States); DeAndre Jamison, Kenneth M. Kozloff, Xueding Wang, Univ. of Michigan (United States)

12379-163 • On demand | Presented live 30 January 2023

Photoacoustic viscoelastic testing of soft tissues using annular beam illumination

Author(s): Zijie Zhao, Jun Zou, Texas A&M University (United States)

12379-164 • On demand | Presented live 30 January 2023

Simulations-informed optimization of photoacoustic imaging depth and validation with phantoms

Author(s): Vinoin Devpaul Vincely, Carolyn L. Bayer, Tulane Univ. (United States)

TUESDAY 31 JANUARY

SESSION 9: SMALL-ANIMAL IMAGING I

8:15 AM - 10:00 AM

Moscone Center, Room 211 (Level 2 South)

Session chair: Roger J. Zemp, Univ. of Alberta (Canada)

12379-57 • 8:15 AM - 8:30 AM

Characterization of embryonic cardiac function using noninvasive volumetric optoacoustic tomography

Author(s): Maryam Hatamimoslehabadi, Univ. of Houston (United States); Ali Özbek, Xosé Luís Deán-Ben, Univ. Zürich (Switzerland); Jessica Gutierrez, Alexander W. Schill, Yogeshwari S. Ambekar, Univ. of Houston (United States); Daniel Razansky, ETH Zurich (Switzerland); Kirill V. Larin, Univ. of Houston (United States)

12379-58 • 8:30 AM - 8:45 AM

Multimodal photoacoustic microscopy and optical coherence tomography molecular imaging of laser induced choroidal neovascularization in living rabbits

Author(s): Van Phuc Nguyen, Jessica Henry, Josh Zhe, Wei Zhang, Xueding Wang, Yannis M. Paulus, Univ. of Michigan Kellogg Eye Ctr. (United States)

12379-59 • 8:45 AM - 9:00 AM

Three-dimensional multimodal brain imaging of ischemic stroke by integrated photoacoustic, ultrasound, and angiographic tomography (PAUSAT)

Author(s): Luca Menozzi, Tri Vu, Angela del Aguila, Chenshuo Ma, Wei Yang, Junjie Yao, Mucong Li, Duke Univ. (United States)

12379-60 • 9:00 AM - 9:15 AM

Distinguishing ectopic placental calcification with multi-parametric ultrasound and photoacoustic imaging

Author(s): Skye A. Edwards, Deeksha M. Sankepalle, Tufts Univ. (United States); Ana Branco, Mother Infant Research Institute, Tufts Univ. School of Medicine (United States); Mary C. Wallingford, Tufts Univ. (United States), Mother Infant Research Institute, Tufts Univ. School of Medicine (United States), Molecular Cardiology Research Institute, Tufts Univ. School of Medicine (United States); Srivalleesha Mallidi, Tufts Univ. (United States)

12379-61 • 9:15 AM - 9:30 AM

In-vivo demonstration and validation of U-net based real-time photoacoustic imaging with LED arrays

Author(s): Avijit Paul, Allison Sweeney, Christopher D. Nguyen, Srivalleesha Mallidi, Tufts Univ. (United States)

12379-62 • 9:30 AM - 9:45 AM

Dynamic image reconstruction to monitor tumor vascular perfusion in small animals using 3D photoacoustic computed-tomography imagers with rotating gantries

Author(s): Refik Mert Cam, Seonyeong Park, Univ. of Illinois (United States); Weylan Thompson, Sergey A. Ermilov, PhotoSound Technologies, Inc. (United States); Mark A. Anastasio, Univ. of Illinois (United States); Umberto Villa, Oden Institute, The Univ. of Texas at Austin (United States)

12379-64 • 9:45 AM - 10:00 AM

Deep-tissue photoacoustic imaging and optogenetic manipulation of a near-infrared photoswitchable transgenic mouse model

Author(s): Chenshuo Ma, Duke Univ. (United States); Ludmila A. Kasatkina, Mikhail E. Matlashov, Albert Einstein College of Medicine (United States); Tri Vu, Mucong Li, Duke Univ. (United States); Andrii A. Kaberniuk, Albert Einstein College of Medicine (United States); Junjie Yao, Duke Univ. (United States); Vladislav V. Verkhusha, Albert Einstein College of Medicine (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 10: SMALL-ANIMAL IMAGING II

10:30 AM - 12:00 PM

Moscone Center, Room 211 (Level 2 South)

Session chair: Janek Gröhl, Cancer Research UK Cambridge Institute (United Kingdom)

12379-66 • 10:30 AM - 10:45 AM

Visually-evoked hemodynamic responses in deep mouse brain using photoacoustic computed tomography

Author(s): Kai-Wei Chang, Xueding Wang, Kwoon Y. Wong, Guan Xu, Univ. of Michigan (United States)

12379-67 • 10:45 AM - 11:00 AM

Combined photoacoustic microscopy and optical coherence tomography ocular biomarkers imaging in Alzheimer's disease mice

Author(s): Wei Zhang, Univ. of Michigan Medical School (United States); Wei Qian, IMRA America, Inc. (United States); Yannis M. Paulus, Xueding Wang, Univ. of Michigan (United States)

12379-68 • 11:00 AM - 11:15 AM

longitudinal study of rheumatoid arthritis development in rodent model

Author(s): Xiaorui Peng, Zhanpeng Xu, Univ. of Michigan (United States); Aaron M. Dentinger, Steven Gray, Soumya Ghose, GE Research (United States); Shivangi Kewalramani, Janggun Jo, Nada Abdulaziz, Guan Xu, Girish Gandikota, Univ. of Michigan (United States); David M. Mills, GE Research (United States); Xueding Wang, Univ. of Michigan (United States)

12379-69 • 11:15 AM - 11:30 AM

Photoacoustic imaging reveals differences in perfusion-limited hypoxia in murine breast cancer models

Author(s): Lina Hacker, Thomas R. Else, Thierry L. Lefebvre, Paul W. Sweeney, Emma L. Brown, Sarah E. Bohndiek, Univ. of Cambridge (United Kingdom)

12379-70 • 11:30 AM - 11:45 AM

Spiral volumetric optoacoustic tomography (SVOT) of mice from head to tail

Author(s): Sandeep Kumar Kalva, Xosé Luís Deán-Ben, Michael Reiss, Daniel Razansky, Univ. Zürich (Switzerland), ETH Zurich (Switzerland)

12379-65 • 11:45 AM - 12:00 PM

Multimodal functional optoacoustic tomography in awake and anesthetized mice

Author(s): Sarah Shaykevich, Russell W. Chan, Justin P. Little, NYU Grossman School of Medicine (United States); Daniel Razansky, ETH Zurich (Switzerland); Kevin C. Chan, Shy Shoham, NYU Grossman School of Medicine (United States)

Lunch/Exhibition Break 12:00 PM - 1:45 PM

SESSION 11: MACHINE LEARNING: DEVELOPMENTS AND APPLICATIONS

1:45 PM - 3:15 PM

Moscone Center, Room 211 (Level 2 South)

Session chair: Seonyeong Park, Univ. of Illinois (United States)

12379-71 • 1:45 PM - 2:00 PM

Machine learning method for limited view 3D PAT reconstruction with curved array

Author(s): Yun Zou, Yixiao Lin, Sitai Kou, Quing Zhu, Washington Univ. in St. Louis (United States)

12379-72 • 2:00 PM - 2:15 PM

3D photoacoustic computed tomography enhanced by 3D progressive U-shaped enhancement network (3D-pU-net)

Author(s): Seongwook Choi, Jinge Yang, Soo Young Lee, Jiwoong Kim, Seungchul Lee, Chulhong Kim, Pohang Univ. of Science and Technology (Republic of Korea)

12379-73 • 2:15 PM - 2:30 PM

Self-supervised deep learning-based resolution enhancement in photoacoustic computed tomography

Author(s): Anthony DiSpirito, Tri Vu, Yuqi Tang, Junjie Yao, Duke Univ. (United States)

12379-74 • 2:30 PM - 2:45 PM

Deep learning boosts the imaging speed of photoacoustic endomicroscopy

Author(s): Tianrui Zhao, Mengjie Shi, Sébastien Ourselin, Tom Vercauteren, Wenfeng Xia, King's College London (United Kingdom)

12379-75 • 2:45 PM - 3:00 PM

Long-short-term-memory cells enable flexible deep learning-based photoacoustic oximetry

Author(s): Kevin Gu, Kylie Yeung, Michael Doherty, Lina Hacker, Thomas R. Else, Sarah E. Bohndiek, Janek Gröhl, Cancer Research UK Cambridge Institute (United Kingdom)

Conference 12379

12379-76 • 3:00 PM - 3:15 PM **Toward automated deep learning-based virtual histological staining of slide-free total absorption photoacoustic remote sensing (TA-PARS)**

Author(s): Marian Boktor, Univ. of Waterloo (Canada); Benjamin R. Ecclestone, Vlad Pekar, Univ. of Waterloo (Canada), illumiSonics Inc. (Canada); Deepak Dinakaran, John R. Mackey, Cross Cancer Institute, Univ. of Alberta (Canada); Paul W. Fieguth, Parsin Haji Reza, Univ. of Waterloo (Canada)

Coffee Break 3:15 PM - 3:45 PM

SESSION 12: ADVANCES IN ULTRASOUND DETECTION

3:45 PM - 5:30 PM

Moscone Center, Room 211 (Level 2 South)

Session chair: Peter Burgholzer, Research Ctr. for Non Destructive Testing GmbH (Austria)

12379-78 • 3:45 PM - 4:00 PM

Large-scale 2D surface-micromachined optical ultrasound transducer (SMOUT) array for 3D computed tomography

Author(s): Zhiyu Yan, Jun Zou, Texas A&M Univ. (United States)

12379-79 • 4:00 PM - 4:15 PM

PMUTs on a silicon substrate as photoacoustic imaging devices

Author(s): Kaustav Roy, Eshani Sarkar, Akshay Kalyan, Rudra Pratap, Indian Institute of Science, Bengaluru (India)

12379-80 • 4:15 PM - 4:30 PM

Photoacoustic detection of CO₂ using a H₂-filled mid-infrared fiber Raman laser source

Author(s): Yazhou Wang, Technical Univ. of Denmark (Denmark); Manoj Kumar Dasa, NKT Photonics A/S (Denmark); Jose E. Antonio-Lopez, Rodrigo Amezcua Correa, Univ. of Central Florida (United States); Christos Markos, Technical Univ. of Denmark (Denmark)

12379-81 • 4:30 PM - 4:45 PM

Photoacoustic signal propagation through human cranial bones

Author(s): Thomas Kirchner, Jan Laufer, Martin-Luther-Univ. Halle-Wittenberg (Germany)

12379-84 • 4:45 PM - 5:00 PM

Optoacoustic-ultrasound (OPUS) monitoring of high-intensity focused ultrasound (HIFU)-induced heating and cavitation with a multi-segment transducer array

Author(s): Çağla Özsoy, Berkan Lafci, ETH Zurich (Switzerland); Michael Reiss, Xosé Luís Deán-Ben, Daniel Razansky, Univ. Zürich (Switzerland)

12379-6 • 5:00 PM - 5:15 PM

Photoacoustic imaging for pre-transplantation kidney evaluation

Author(s): Anton V. Nikolaev, Yitian Fang, Kranthi Panth, Robert C. Minne, Jeroen Essers, Ron W. F. de Bruin, Gijs van Soest, Erasmus MC (Netherlands)

12379-83 • 5:15 PM - 5:30 PM

Custom design photoacoustic and ultrasound sensor fabrication with PVDF-TrFE/BaTiO₃ nanocomposite film for high-resolution diagnostic imaging

Author(s): Nagendra Singh, Samir Biswas, Amit Kumar, Indian Institute of Science Education and Research Mohali (India)

POSTERS-TUESDAY

31 January 2023 • 6:00 PM - 8:00 PM |

Moscone Center, Level 2 West

Conference attendees are invited to attend the poster Session on Tuesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster Sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12379-166

Fast superresolution multiscale photoacoustic imaging via a deep learning approach

Author(s): Jongbeom Kim, Gyuwon Kim, Pohang Univ. of Science and Technology (Republic of Korea); Lei Li, Caltech (United States); Pengfei Zhang, Tianjin Univ. (China); Jin Young Kim, Yeonggeun Kim, Hyung Ham Kim, Pohang Univ. of Science and Technology (Republic of Korea); Lihong V. Wang, Caltech (United States); Seungchul Lee, Chulhong Kim, Pohang Univ. of Science and Technology (Republic of Korea)

12379-167

Semi-transparent gold-carbon multilayer coating of silica substrates for combined laser ultrasound and optoacoustic imaging

Author(s): Daniil Nozdriukhin, Sandeep Kumar Kalva, Daniel Razansky, Xose Luis Dean Ben, Univ. Zürich (Switzerland), ETH Zurich (Switzerland)

12379-168 • On demand | Presented live 31 January 2023

Deep learning photoacoustic microscopy with three-dimensional undersampled data reconstruction

Author(s): Daewoon Seong, Euimin Lee, Yoonseok Kim, Hayoung Kim, Sangyeob Han, Juyeon Hong, Hyungseo Jeon, Youngae Gu, Shinheon Kim, Mansik Jeon, Jeehyun Kim, Kyungpook National Univ. (Republic of Korea)

Show Abstract +

12379-169

CANCELED: Decoupling of photoacoustic spectroscopy based on optimized SVR method for bone chemical composition assessment

Author(s): Jiayi Liu, Ting Feng, Yang Gao, Nanjing Univ. of Science and Technology (China); Weiya Xie, Qian Cheng, Tongji Univ. (China); Dean Ta, Fudan Univ. (China)

12379-170

Calibration-based iterative reconstruction in optoacoustic mesoscopy

Author(s): Urs A. T. Hofmann, ETH Zurich (Switzerland); Héctor Andrés Estrada Beltrán, Weiye Li, Univ. Zürich (Switzerland); Pavel Subochev, Russian Academy of Sciences (Russian Federation); Xose Luis Dean Ben, Daniel Razansky, Univ. Zürich (Switzerland)

12379-171

Unsupervised segmentation of 3D microvascular photoacoustic images using deep learning

Author(s): Paul W. Sweeney, Lina Hacker, Thierry L. Lefebvre, Janek Gröhl, Emma L. Brown, Sarah E. Bohndiek, Univ. of Cambridge (United Kingdom)

12379-172

Blood oxygenation estimations from multi-wavelength photoacoustic measurements on a realistic breast phantom

Author(s): Srirang Manohar, Maura Dantuma, Univ. Twente (Netherlands); Felix Lucka, Ctr. Wiskunde & Informatica (Netherlands); Ben T. Cox, Univ. College London (United Kingdom)

12379-173 • On demand | Presented live 31 January 202

Clinical tattoo tomography

Author(s): Niklas Holzwarth, Deutsches Krebsforschungszentrum (Germany), Ruprecht-Karls-Univ. Heidelberg (Germany); Marcella Staus, Josefine Günther, Universitätsklinikum Erlangen (Germany); Silvia Calderazzo, Deutsches Krebsforschungszentrum (Germany); Melanie Schellenberg, Deutsches Krebsforschungszentrum (Germany), Ruprecht-Karls-Univ. Heidelberg (Germany), HIDS4Health - Helmholtz Information and Data Science School for Health, Heidelberg (Germany); Werner Lang, Universitätsklinikum Erlangen (Germany); Lena Maier-Hein, Deutsches Krebsforschungszentrum (Germany), Ruprecht-Karls-Univ. Heidelberg (Germany); Ulrich Rother, Universitätsklinikum Erlangen (Germany); Alexander Seitel, Deutsches Krebsforschungszentrum (Germany)

12379-174 • On demand | Presented live 31 January 202

Photoacoustic image synthesis with SIMPA: updates and future directions

Author(s): Kris K. Dreher, Deutsches Krebsforschungszentrum (Germany), Ruprecht-Karls-Univ. Heidelberg (Germany); Janek Groehl, Cancer Research UK Cambridge Institute (United Kingdom); Tom Rix, Melanie Schellenberg, Niklas Holzwarth, Jan-Hinrich Noelke, Leonardo Ayala, Lena Maier-Hein, Deutsches Krebsforschungszentrum (Germany), Ruprecht-Karls-Univ. Heidelberg (Germany); Alexander Seitel, Deutsches Krebsforschungszentrum (Germany)

12379-175

Performance evaluation of mesoscopic photoacoustic imaging

Author(s): Lina Hacker, Emma L. Brown, Thierry L. Lefebvre, Paul W. Sweeney, Sarah E. Bohndiek, Univ. of Cambridge (United Kingdom)

12379-176

On the suitability of copolymer-in-oil phantoms for data-driven quantitative photoacoustic imaging

Author(s): Janek Gröhl, Lina Hacker, Thomas R. Else, Sarah E. Bohndiek, Cancer Research UK Cambridge Institute (United Kingdom)

12379-177 • On demand | Presented live 31 January 202

Phthalocyanine-based targetable photothermal theragnostic contrast agent for photoacoustic imaging and photothermal therapy

Author(s): Donghyeon Oh, Sinyoung Park, Pohang Univ. of Science and Technology (Republic of Korea); Mengyao Yang, Ewha Womans University (Republic of Korea); Yunyoung Nah, Junha Lim, Pohang Univ. of Science and Technology (Republic of Korea); Xingshu Li, Fuzhou University (China); Won Jong Kim, Pohang Univ. of Science and Technology (Republic of Korea); Juyoung Yoon, Ewha Womans University (Republic of Korea); Chulhong Kim, Pohang Univ. of Science and Technology (Republic of Korea)

12379-179

3D automatic imaging system of human hand rheumatoid arthritis

Author(s): Xiaorui Peng, Zhanpeng Xu, Univ. of Michigan (United States); Aaron M. Dentinger, Steven Gray, Soumya Ghose, YewTeck Tan, Zhaoyuan Yang, GE Research (United States); Shivangi Kewalramani, Janggun Jo, Nada Abdulaziz, Guan Xu, Girish Gandikota, Univ. of Michigan (United States); David M. Mills, GE Research (United States); Xueding Wang, Univ. of Michigan (United States)

12379-180 • On demand | Presented live 31 January 202

Increased laser penetration depth due to laser-induced microbubbles combined with ultrasound in scattering media

Author(s): Jinwoo Kim, Haemin Kim, Jin Ho Chang, Daegu Gyeongbuk Institute of Science & Technology (Republic of Korea)

12379-182

Low-cost adaptable freehand 3D ultrasound and photoacoustic imaging with simultaneous localization and mapping technology

Author(s): Deeksha M. Sankepalle, Skye A. Edwards, Tufts Univ. (United States); Brian W. Anthony, Massachusetts Institute of Technology (United States); Srivalleesha Mallidi, Tufts Univ. (United States)

12379-183

Fabrication and characterization of a translational photoacoustic needle sensing probe

Author(s): Wei-Kuan Lin, Linyu Ni, Jay L. Guo, Xueding Wang, Guan Xu, Univ. of Michigan (United States)

12379-184 • On demand | Presented live 31 January 202

An automatic image registration algorithm to align serial photoacoustic images: a step toward repeatable longitudinal imaging

Author(s): Bruno De Santi, Lucia Kim, Rianne F. G. Bulthuis, Univ. Twente (Netherlands); Felix Lucka, Ctr. Wiskunde & Informatica (Netherlands); Ben T. Cox, Univ. College London (United Kingdom); Srirang Manohar, Univ. Twente (Netherlands)

12379-185

PMUT acoustic sensor array for 3D image reconstruction in photoacoustic tomography

Author(s): Souradip Paul, Indian Institute of Science Education and Research Thiruvananthapuram (India)

Conference 12379

12379-186

Photoacoustic and ultrasound imaging of Caridea for quantification of pigments and hardness measurement

Author(s): Abhishek Ranjan, UiT The Arctic Univ. of Norway (Norway)

12379-188

Optical interferometry technique for shallow water depth measurement

Author(s): Diego R. Palacios, Bowen Zhai, Tachaka Ray, Michael R. Wang, Univ. of Miami (United States)

12379-189

Quantitative photoacoustic oximetry imaging in humans using multiple illumination learned spectral decoloring

Author(s): Thomas Kirchner, Martin-Luther-Univ. Halle-Wittenberg (Germany); Michael Jaeger, Martin Frenz, Univ. Bern (Switzerland)

12379-190 • On demand | Presented live 31 January 2023

Development and characterization of a durable tissue-mimicking phantom for calibration and standardization of photoacoustic imaging

Author(s): Valeria Grasso, FUJIFILM VisualSonics, Inc. (Netherlands), Christian-Albrechts-Univ. zu Kiel (Germany); Jason Raymond, Univ. of Oxford (United Kingdom); Regine Willumeit-Roemer, Christian-Albrechts-Univ. zu Kiel (Germany), Helmholtz-Zentrum Hereon GmbH (Germany); James Joseph, Univ. of Dundee (United Kingdom); Jithin Jose, FUJIFILM VisualSonics, Inc. (Netherlands)

12379-191

Next-generation high-speed wide-field photoacoustic microscopy with a 48-facet air-operating polygon scanner

Author(s): Van Tu Nguyen, Xiaoyi Zhu, Tri Vu, Duke Univ. (United States); Laiming Jiang, Qifa Zhou, The Univ. of Southern California (United States); Junjie Yao, Duke Univ. (United States)

12379-192

Label-free photoacoustic computed tomography of pharmacokinetic profiling and non-invasive temperature monitoring of plasmonic gold nanostars for photothermal therapy

Author(s): Aidan Canning, Tri Vu, Junjie Yao, Tuan Vo-Dinh, Duke Univ. (United States)

12379-193 • On demand | Presented live 31 January 2023

Light source-detector pair positioning to optimize tagging efficiency of focused ultrasound-modulated photons in a backward detection mode

Author(s): Mohammadreza Omidali, Ali Mardanshahi, Zuomin Zhao, Univ. of Oulu (Finland); Deepak Sonker, Univ. of Rochester (United States); Alexander V. Bykov, Teemu S. Myllylä, Univ. of Oulu (Finland)

12379-194 • On demand | Presented live 31 January 2023

Improving quality of less-view breast photoacoustic tomography reconstruction using deep learning neural networks

Author(s): Bruno De Santi, Fazel Ayatollahi, Univ. Twente (Netherlands); Felix Lucka, Ctr. Wiskunde & Informatica (Netherlands); Navchetan Awasthi, Univ. Twente (Netherlands); Ben T. Cox, Univ. College London (United Kingdom); Srirang Manohar, Univ. Twente (Netherlands)

12379-195

Development of photoacoustic microscopy for the detection of microplastics in fisheries and aquaculture

Author(s): Azeem Ahmad, UiT The Arctic Univ. of Norway (Norway); Debadarshee D. Mohapatra, Birla Institute of Technology and Science, Pilani (India); Balpreet Singh Ahluwalia, Frank Melandsø, Anowarul Habib, UiT The Arctic Univ. of Norway (Norway)

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12379-196

Enhancing quantitative molecular and functional photoacoustic imaging with low-frequency signals

Author(s): Tri Vu, Duke Univ. (United States); Paul Klippel, The Pennsylvania State Univ. (United States); Aidan Canning, Chenshuo Ma, Duke Univ. (United States); Huijuan Zhang, Univ. at Buffalo (United States); Ludmila A. Kasatkina, Albert Einstein College of Medicine (United States); Yuqi Tang, Duke Univ. (United States); Jun Xia, Univ. at Buffalo (United States); Vladislav V. Verkhusha, Albert Einstein College of Medicine (United States); Tuan Vo-Dinh, Duke Univ. (United States); Yun Jing, The Pennsylvania State Univ. (United States); Junjie Yao, Duke Univ. (United States)

12379-197

High-speed dual wavelength switchable SRS fiber amplifier at 1200 nm region for functional near-infrared photoacoustic microscopy

Author(s): Hwi Don Lee, Markus R. Seeger, Brett E. Bouma, Harvard Medical School (United States)

12379-198

Limited-view artifact removal in optoacoustic tomography by signal domain learning

Author(s): Berkan Lafci, ETH Zurich (Switzerland), Univ. Zürich (Switzerland); Anna Klimovskaia Susmelj, Firat Ozdemir, Swiss Data Science Ctr. (Switzerland); Neda Davoudi, ETH Zurich (Switzerland), Univ. Zürich (Switzerland); Xose Luis Dean-Ben, ETH Zurich (Switzerland), Univ. Zürich (Switzerland); Fernando Perez-Cruz, Swiss Data Science Ctr. (Switzerland); Daniel Razansky, ETH Zurich (Switzerland), Univ. Zürich (Switzerland)

12379-218

Noise Reduction and Image Reconstruction Based on modified Basis Pursuit algorithm for Photoacoustic Imaging

Author(s): Doyeon Kim, Korea Univ. (Republic of Korea), Korea Research Institute of Standards and Science (Republic of Korea)

WEDNESDAY 1 FEBRUARY

SESSION 13: OPTICAL SENSING OF PRESSURE AND DISPLACEMENT

8:15 AM - 10:00 AM

Moscone Center, Room 211 (Level 2 South)

Session chair: Guenther Paltauf, Karl-Franzens-Univ. Graz (Austria)

12379-85 • 8:15 AM - 8:30 AM

Ultrahigh-resolution optoacoustic tomography in vivo using silicon photonics

Author(s): Yoav Hazan, Ahiad Levi, Michael Nagli, Amir Rosenthal, Technion-Israel Institute of Technology (Israel)

12379-87 • 8:30 AM - 8:45 AM

Development of high sensitivity plano-concave optical microresonators sensors for photoacoustic imaging

Author(s): David Martin-Sanchez, Edward Z. Zhang, Zhixin Liu, Univ. College London (United Kingdom); James A. Guggenheim, Univ. of Birmingham (United Kingdom); Paul C. Beard, Univ. College London (United Kingdom)

12379-88 • 8:45 AM - 9:00 AM

Whole body small animal imaging using a multi-view Fabry Perot scanner

Author(s): Olumide Ogunlade, Edward Z. Zhang, Paul C. Beard, Ben T. Cox, Univ. College London (United Kingdom)

12379-89 • 9:00 AM - 9:15 AM

Photoacoustic remote sensing combined with autofluorescence surface excitation for virtual histology and metabolism imaging

Author(s): Brendon S. Restall, Brendyn D. Cikaluk, Matthew T. Martell, Nathaniel J. M. Haven, Roger J. Zemp, Univ. of Alberta (Canada)

12379-90 • 9:15 AM - 9:30 AM

Fabry-Perot sensors with homogeneous spacer thickness for parallelized detection using a camera-based tomograph

Author(s): Jan Sievers, Martin-Luther-Univ. Halle-Wittenberg (Germany); Claus Villringer, Technische Hochschule Wildau (Germany); Werner Lebek, Jan Laufer, Martin-Luther-Univ. Halle-Wittenberg (Germany)

12379-91 • 9:30 AM - 9:45 AM

High-density ultrasound array based on the fully parallelised read-out of a Fabry-Perot sensor for fast photoacoustic tomography

Author(s): Thomas J. Allen, Edward Z. Zhang, Paul C. Beard, Univ. College London (United Kingdom)

12379-92 • 9:45 AM - 10:00 AM

3D photoacoustic imaging with camera based ultrasound detection: sensitivity and resolution improvement

Author(s): Robert Nuster, Martin Niederwieser, Guenther Paltauf, Karl-Franzens-Univ. Graz (Austria)

Coffee Break 10:00 AM - 10:30 AM

SESSION 14: ADVANCES IN MICROSCOPY

10:30 AM - 11:45 AM

Moscone Center, Room 211 (Level 2 South)

Session chair: Chulhong Kim, Pohang Univ. of Science and Technology (Republic of Korea)

12379-93 • 10:30 AM - 10:45 AM

Combined ultraviolet confocal reflectance and photoacoustic remote sensing microscopy for generating virtual sectioned histology

Author(s): Nathaniel J. M. Haven, Matthew T. Martell, Jean Deschenes, Lashan Peiris, Nadia Giannakopoulos, Roger J. Zemp, Univ. of Alberta (Canada)

12379-94 • 10:45 AM - 11:00 AM

Clinical concordance of deep learning-enabled ultraviolet photoacoustic remote sensing virtual histology compared to frozen section analysis

Author(s): Matthew T. Martell, Nathaniel J. M. Haven, Ewan A. McAlister, Brendon S. Restall, Brendyn D. Cikaluk, Xingyu Li, Roger J. Zemp, Univ. of Alberta (Canada)

12379-95 • 11:00 AM - 11:15 AM

Rapid virtual histology of fresh tissue via photoacoustic remote sensing microscopy and a voice-coil scanning stage

Author(s): Brendyn D. Cikaluk, Brendon S. Restall, Matthew T. Martell, Nathaniel J. M. Haven, Roger J. Zemp, Univ. of Alberta (Canada)

12379-96 • 11:15 AM - 11:30 AM

Virtual histology with total-absorption photoacoustic remote sensing microscopy

Author(s): Benjamin R. Ecclestone, James Tweel, Marian Boktor, Krystal Li, Lixin Chu, Univ. of Waterloo (Canada); Hager Gaouda, illumiSonics Inc. (Canada); Kevan L. Bell, Univ. of Waterloo (Canada); Deepak Dinakaran, John R. Mackey, Univ. of Alberta (Canada); Parsin Haji Reza, Univ. of Waterloo (Canada)

12379-97 • 11:30 AM - 11:45 AM

Understanding the biomechanical behaviors of the perilimbal sclera and aqueous veins during intraocular pressure regulation using optical resolution photoacoustic microscopy

Author(s): Guan Xu, Univ. of Michigan Kellogg Eye Ctr. (United States); Linyu Ni, Univ. of Michigan (United States); Wonsuk Kim, Alexis Warchock, Erik Krawczyk, Univ. of Michigan-Dearborn (United States); John Riesterer, Univ. of Michigan (United States); Nikhil Gandikota, Kalamazoo College (United States); Sayoko E. Moroi, The Ohio State Univ. Wexner Medical Ctr. (United States); Alan Argento, Univ. of Michigan (United States)

SESSION 15: AWARDS CEREMONY

11:45 AM - 12:00 PM

Moscone Center, Room 211 (Level 2 South)

Session chairs: Alexander A. Oraevsky, TomoWave Laboratories, Inc. (United States), Lihong V. Wang, Caltech (United States)

Join the Photons Plus Ultrasound: Imaging and Sensing 2023 conference in celebrating the Best Paper Award winners!

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12379-53 • On demand | Presenting live 28 January 2023

Towards photoacoustic prostate imaging using continuous wave laser excitation

Author(s): Hamid Moradi, The Univ. of British Columbia (Canada); Keshuai Xu, Hyunwoo Song, Johns Hopkins Univ. (United States); Septimiu E. Salcudean, The Univ. of British Columbia (Canada); Emad M. Boctor, Johns Hopkins Univ. (United States)

Conference 12379

12379-82 • On demand | Presenting live 28 January 2023

On-chip photoacoustic transducer based on monolithic integration of piezoelectric micromachined ultrasonic transducers and metasurface lenses

Author(s): Yanfen Zhai, Takashi Sasaki, Mohssen Moridi, Silicon Austria Labs. GmbH (Austria); Ronghui Lin, Zahrah Alnakhli, Atif Shamim, Xiaohang Li, King Abdullah Univ. of Science and Technology (Saudi Arabia); Mohammad Younis, King Abdullah Univ. of Science and Technology (Saudi Arabia), Binghamton Univ., The State Univ. of New York (United States); Kazuhiro Hane, Tohoku Univ. (Japan); Lixiang Wu, Silicon Austria Labs. GmbH (Austria)

12379-178 • On demand | Presenting live 28 January 2023

Simulation of HIFU based lesion variation and its monitoring using photoacoustic imaging

Author(s): Sumit Yadav, Indian Institute of Technology Bombay (India); Souradip Paul, Aiswarya KS, Suheshkumar Singh, Indian Institute of Science Education and Research Thiruvananthapuram (India)

12379-181 • On demand | Presenting live 28 January 2023

Ocular imaging of *Carassius auratus* eyes using photoacoustic microscopy

Author(s): Deepayan Samanta, Arunima Mathew, Souradip Paul, Arijit Paramanick, Aiswarya K S, M Suheshkumar Singh, Indian Institute of Science Education and Research Thiruvananthapuram (India)

12379-187 • On demand | Presenting live 28 January 2023

Image quality enhancement of PMUT-based photoacoustic imaging

Author(s): Arijit Paramanick, Indian Institute of Science Education and Research Thiruvananthapuram (India); Kaustav Roy, Indian Institute of Science (India); Deepayan Samanta, School of Physics, Indian Institute of Science Education and Research Thiruvananthapuram, India (India); Aiswarya K S, Indian Institute of Science Education and Research Thiruvananthapuram (India); Rudra Pratap, Indian Institute of Science (India); M. Suheshkumar Singh, Indian Institute of Science Education and Research Thiruvananthapuram (India)

Conference 12380

Monday 30–30 January 2023 • Proceedings of SPIE Vol. 12380

Biophotonics and Immune Responses XVIII

Conference Chair: **Wei R. Chen**, The Univ. of Oklahoma (United States)

Program Committee: **Sandra O. Gollnick**, Roswell Park Comprehensive Cancer Ctr. (United States); **Tomas Hode**, Immunophotonics, Inc. (United States); **Yih-Chih Hsu**, Chung Yuan Christian Univ. (Taiwan); **Vyacheslav Kalchenko M.D.**, Weizmann Institute of Science (Israel); **Satoshi Kashiwagi**, Massachusetts General Hospital (United States); **Mladen Korbelik**, BC Cancer Research Ctr. (Canada); **Hong Liu**, The Univ. of Oklahoma (United States); **Mark F. Naylor**, Dermatology Associates of San Antonio (United States); **Junle Qu**, Shenzhen Univ. (China); **Oxana V. Semyachkina-Glushkovskaya**, Saratov State Univ. (Russian Federation); **Robert T. van Kooten**, Amsterdam UMC (Netherlands); **Xunbin Wei**, Shanghai Jiao Tong Univ. (China); **Sihua Yang**, South China Normal Univ. (China); **Zhihong Zhang**, Huazhong Univ. of Science and Technology (China); **Feifan Zhou**, Hainan Univ. (United States); **Hisataka Kobayashi**, National Cancer Institute (United States)

MONDAY 30 JANUARY

SESSION 1: PHOTO-IMMUNOTHERAPY FOR CANCER

8:00 AM - 9:55 AM

Moscone Center, Room 204 (Level 2 South)

Session chairs: Kaili Liu, The Univ. of Oklahoma (United States), Wei R. Chen, The Univ. of Oklahoma (United States)

12380-1 • 8:00 AM - 8:25 AM

Morphine-mediated abnormal neuronal activation boosts mitochondrial fragmentation (*Invited Paper*)

Author(s): Feifan Zhou, Jie Rao, Hainan Univ. (China)

12380-2 • 8:25 AM - 8:50 AM

Immunological functions of a biopolymer in enhancing laser phototherapy (*Invited Paper*)

Author(s): Kaili Liu, Ashley R. Hoover, Coline Furrer, Trisha I. Valerio, Wei R. Chen, The Univ. of Oklahoma (United States)

12380-3 • 8:50 AM - 9:15 AM

Modulations of tumor-infiltrating $\gamma\delta$ T cells by localized ablative immunotherapy (*Invited Paper*)

Author(s): Kaili Liu, Ashley R. Hoover, Wei R. Chen, The Univ. of Oklahoma (United States)

12380-4 • 9:15 AM - 9:35 AM

Immunologically modified graphene nanosystems for laser-initiated immunotherapy for cancer treatment

Author(s): Coline Furrer, Lin Wang, Ashley R. Hoover, Trisha I. Valerio, The Univ. of Oklahoma (United States); Sophie X. Patrock, The Univ. of Oklahoma College of Medicine (United States); Wei R. Chen, The Univ. of Oklahoma (United States)

12380-5 • 9:35 AM - 9:55 AM

Intelligent responsive hypoxia-overcoming nanoparticle mediated sonodynamic-immunotherapy for cutaneous squamous cell carcinoma

Author(s): Chunxiao Li, Shanghai Skin Disease Hospital (China)

Coffee Break 9:55 AM - 10:25 AM

SESSION 2: PDT AND IMMUNOMODULATION I

10:25 AM - 11:35 AM

Moscone Center, Room 204 (Level 2 South)

Session chairs: Satoshi Kashiwagi, Massachusetts General Hospital (United States), Huang-Chiao Huang, Univ. of Maryland, College Park (United States)

12380-6 • 10:25 AM - 10:50 AM

Near-infrared II photobiomodulation augments nitric oxide bioavailability via phosphorylation of endothelial nitric oxide synthase (*Invited Paper*)

Author(s): Shinya Yokomizo, Massachusetts General Hospital (United States), Tokyo Metropolitan Univ. (Japan); Dmitriy N. Atochin, MGH Cardiovascular Research Ctr. (United States); Satoshi Kashiwagi, Massachusetts General Hospital (United States)

12380-7 • 10:50 AM - 11:15 AM

The role of fluid shear stress in regulating photoimmunotherapy efficacy and immunogenic cell death (*Invited Paper*)

Author(s): Aaron Sorrin, Keri Zhou, Katherine May, Cindy Liu, Barry J. Liang, Univ. of Maryland, College Park (United States); Dana M. Roque, Univ. of Maryland School of Medicine (United States); Huang Chiao Huang, Univ. of Maryland, College Park (United States)

12380-9 • 11:15 AM - 11:35 AM

Optimizing photobiomodulation in the in vitro and in vivo models towards effective therapy of Alzheimer's disease

Author(s): Hao Xu, Tymish Y. Ohulchanskyy, Junle Qu, Shenzhen Univ. (China)

Lunch Break 11:35 AM - 1:05 PM

SESSION 3: NOVEL DETECTION TECHNOLOGY

1:05 PM - 2:45 PM

Moscone Center, Room 204 (Level 2 South)

Session chair: Yuchen Qiu, The Univ. of Oklahoma (United States)

12380-10 • 1:05 PM - 1:25 PM

Monitoring the microenvironment and microvasculature of primary pancreatic tumor under photothermal-induced immunotherapy by optical coherence tomography

Author(s): Feng Yan, Trisha I. Valerio, Chen Wang, Wei R. Chen, Qinggong Tang, The Univ. of Oklahoma (United States)

12380-11 • 1:25 PM - 1:45 PM

Longitudinally detecting collagen progression within multicellular pancreatic tumor spheroids using polarization-sensitive optical coherence tomography

Author(s): Trisha I. Valerio, Feng Yan, Chen Wang, Qinggong Tang, Wei R. Chen, The Univ. of Oklahoma (United States)

Conference 12380

12380-12 • 1:45 PM - 2:05 PM

Evaluating the depth of field for Fourier ptychography microscopy

Author(s): Ke Zhang, Patrik Gilley, Neman Abdoli, The Univ. of Oklahoma (United States); Kar-Ming Fung, The Univ. of Oklahoma Health Sciences Ctr. (United States); Yuchen Qiu, The Univ. of Oklahoma (United States)

12380-13 • 2:05 PM - 2:25 PM

Comparing the effectiveness of 2D and 3D features on predicting the response to chemotherapy for ovarian cancer patients

Author(s): Neman Abdoli, Patrik Gilley, Ke Zhang, Xuxin Chen, The Univ. of Oklahoma (United States); Theresa C. Thai, Kathleen Moore, Robert S. Mannel, The Univ. of Oklahoma Health Sciences Ctr. (United States); Yuchen Qiu, The Univ. of Oklahoma (United States)

12380-43 • 2:25 PM - 2:45 PM PST

Deep learning model enhanced skin cancer detection

Author(s): Srinivasakranthikaran Kolachina, Ruth Agada, Bowie State Univ. (United States); Wenting Li, Thomas Jefferson High School of Science and Technology (United States); Jie Yan, Bowie State Univ. (United States)

SESSION 4: MONITORING IMMUNE RESPONSES

2:45 PM - 3:50 PM

Moscone Center, Room 204 (Level 2 South)

Session chairs: Zhihong Zhang, Huazhong Univ. of Science and Technology (China), Qinggong Tang, The Univ. of Oklahoma (United States)

12380-14 • 2:45 PM - 3:10 PM

Intravital molecular imaging of fluorescent model antigen-elicited specific immune response against tumor (Invited Paper)

Author(s): Zhihong Zhang, Huazhong Univ. of Science and Technology (China)

12380-15 • 3:10 PM - 3:30 PM

Metabolic perturbations of macrophages on engineered collagen scaffolds with label-free fluorescence lifetime imaging

Author(s): Linghao Hu, Dhavan Sharma, Feng Zhao, Alex J. Walsh, Texas A&M Univ. (United States)

12380-16 • 3:30 PM - 3:50 PM

Single cell-based rapid natural killer cell activity measurement by using lens-free shadow imaging technology

Author(s): Ahyeon Lee, Inha Lee, Korea Univ. (Republic of Korea); Myung-Hyun Nam, Korea Univ. Anam Hospital (Republic of Korea); Hyun Sik Jun, Korea Univ. (Republic of Korea); Sungkyu Seo, Korea Univ. Sejong Campus (Republic of Korea)

Coffee Break 3:50 PM - 4:20 PM

SESSION 5: PDT AND IMMUNOMODULATION II

4:20 PM - 5:05 PM

Moscone Center, Room 204 (Level 2 South)

Session chair: Tymish Y. Ohulchanskyy, Shenzhen Univ. (China)

12380-17 • 4:20 PM - 4:45 PM

Revealing mechanisms of red and near infrared photobiomodulation through optical imaging of cell and animal models (Invited Paper)

Author(s): Tymish Y. Ohulchanskyy, Shenzhen Univ. (China)

12380-19 • 4:45 PM - 5:05 PM

Establishment of tumor model with B16F10 melanoma in SKH-1 mice

Author(s): Fuhe Zhang, Xiuli Wang, Shanghai Skin Disease Hospital (China)

POSTERS-MONDAY

30 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the Monday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM - 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12380-20 • On demand | Presented live 30 January 2023

Brief exposure of skin to near-infrared laser augments early vaccine responses

Author(s): Shinya Yokomizo, Massachusetts General Hospital (United States), Tokyo Metropolitan Univ. (Japan), National Defense Medical College (Japan); Yohei Maki, National Defense Medical College (Japan); Dmitriy N. Atochin, MGH Cardiovascular Research Ctr. (United States); Akihiko Kawana, Yoshifumi Kimizuka, National Defense Medical College (Japan); Satoshi Kashiwagi, Massachusetts General Hospital (United States)

12380-21 • On demand | Presented live 30 January 2023

The impact of external filtration on image quality and exposure time of an in-line phase-contrast x-ray breast imaging prototype

Author(s): Farid H. Omoumi, Xuxin Chen, Yuchen Qiu, Yuhua Li, Bin Zheng, Hong Liu, The Univ. of Oklahoma (United States)

12380-22

Multi-parameter structural analysis of multicellular tumor spheroids using optical coherence tomography

Author(s): Feng Yan, Trisha I. Valerio, Gokhan Gunay, The Univ. of Oklahoma (United States); Ji Hee Ha, The Univ. of Oklahoma Health Sciences Ctr. (United States); Chen Wang, The Univ. of Oklahoma (United States); Danny Dhanasekaran, The Univ. of Oklahoma Health Sciences Ctr. (United States); Handan Acar, Wei R. Chen, Qinggong Tang, The Univ. of Oklahoma (United States)

12380-23

Synergistic photobiomodulation with 808 nm and 1064 nm lasers to reduce the β -amyloid neurotoxicity in the in vitro Alzheimer's disease models

Author(s): Renlong Zhang, Junle Qu, Shenzhen Univ. (China)

12380-24

A novel cranial window for long-term in vivo imaging of β -Amyloid plaque in a mouse model of Alzheimer's disease

Author(s): Ziyi Luo, Shenzhen Univ. (China)

12380-25

Deep tumor penetration by ApoA-1 mimetic peptide-modified silicasome for enhanced phototheranostics

Author(s): Xingzhou Peng, Hainan Univ. (China); Junjie Wang, Wuhan National Lab. for Optoelectronics (China); Zhihong Zhang, Hainan Univ. (China), Huazhong Univ. of Science and Technology (China)

12380-30

5-Aminolaevulinic acid photodynamic therapy suppresses lipid secretion of primary sebocytes through AMPK/SREBP-1 pathway

Author(s): Jiayi Yang, Shanghai Jiao Tong Univ. School of Medicine (China); Lei Shi, HuaDong Hospital (China); De-Tian Xu, Jia Liu, Ling-Lin Zhang, Xiaojing Liu, Qingyu Zeng, Xiuli Wang, Shanghai Skin Disease Hospital (China)

12380-32

Photothermal therapy combined with topical immunotherapy against melanoma

Author(s): Lei Shi, HuaDong Hospital (China); Jia Yan, Fuhe Zhang, Shanghai Skin Disease Hospital (China); Wei R. Chen, The Univ. of Oklahoma (United States); Xiuli Wang, Shanghai Skin Disease Hospital (China)

12380-34

Fluorescence kinetics study of HpD during photodynamic therapy for nonmelanoma skin cancer

Author(s): Chunxiao Li, Shanghai Skin Disease Hospital (China)

12380-36

Application of different noninvasive diagnostic techniques used in HMME-PDT in the treatment of port wine stains

Author(s): Yunfeng Zhang, Shanghai Skin Disease Hospital (China)

12380-37

Modified 5-aminolevulinic acid photodynamic therapy to reduce pain in the treatment of moderate to severe acne vulgaris: a prospective randomized split-face study

Author(s): Yunfeng Zhang, Shanghai Skin Disease Hospital (China)

12380-38

Combatting metastatic tumors using a combination of laser phototherapy and the checkpoint inhibitors: anti-LAG3 and anti-IL6

Author(s): Jacob P. Adams, Kaili Liu, Trisha I. Valerio, Wei R. Chen, The Univ. of Oklahoma (United States)

Conference 12381

28 - 29 January 2023 | Moscone Center, Room 210 (Level 2 South)

Optical Elastography and Tissue Biomechanics X

Conference Chairs: **Kirill V. Larin**, Univ. of Houston (United States); **Giuliano Scarcelli**, Univ. of Maryland, College Park (United States)

Program Committee: **Steven G. Adie**, Cornell Univ. (United States); **Stefan Catheline**, Institut National de la Santé et de la Recherche Médicale (France); **Zhongping Chen**, Beckman Laser Institute and Medical Clinic (United States); **Jürgen W. Czarke**, TU Dresden (Germany); **Kishan Dholakia**, Univ. of St. Andrews (United Kingdom); **Christine P. Hendon**, Columbia Univ. (United States); **Irina V. Kabakova**, Univ. of Technology, Sydney (Australia); **Brendan F. Kennedy**, The Univ. of Western Australia (Australia); **Sean J. Kirkpatrick**, Michigan Technological Univ. (United States); **Susana Marcos**, Instituto de Óptica "Daza de Valdés" (Spain); **Seemantini K. Nadkarni**, Wellman Ctr. for Photomedicine (United States); **Amy L. Oldenburg**, The Univ. of North Carolina at Chapel Hill (United States); **Francesca Palombo**, Univ. of Exeter (United Kingdom); **Ivan M. Pelivanov**, Univ. of Washington (United States); **Cynthia J. Roberts**, The Ohio State Univ. (United States); **Jannick P. Rolland**, Univ. of Rochester (United States); **David D. Sampson**, Univ. of Surrey (United Kingdom); **Ian A. Sigal**, Univ. of Pittsburgh (United States); **Peter T. C. So**, Massachusetts Institute of Technology (United States); **Kandice Tanner**, National Cancer Institute (United States); **Peter Török**, Imperial College London (United Kingdom); **Frédérique Vanholsbeeck**, The Univ. of Auckland (New Zealand); **Vladislav V. Yakovlev**, Texas A&M Univ. (United States); **Seok Hyun A. Yun**, Wellman Ctr. for Photomedicine (United States); **Vladimir Y. Zaitsev**, Institute of Applied Physics of the RAS (Russian Federation); **Qifa Zhou**, The Univ. of Southern California (United States)

SATURDAY 28 JANUARY

SESSION 1: ELASTOGRAPHY MODELING AND FUNDAMENTALS

8:30 AM - 10:00 AM

Moscone Center, Room 210 (Level 2 South)

Session chairs: Kirill V. Larin, Univ. of Houston (United States), Ivan M. Pelivanov, Univ. of Washington (United States), Sean J. Kirkpatrick, Michigan Technological Univ. (United States)

12381-1 • 8:30 AM - 8:40 AM

Introduction to Optical Elastography and Tissue Biomechanics IX

Author(s): Kirill V. Larin, Univ. of Houston (United States)

12381-2 • 8:40 AM - 9:00 AM

Application of deep learning to strain retrieval in optical coherence elastography

Author(s): Andrea Mazzolani, Balázs Dura-Kovács, Callum M. Macdonald, Peter R. T. Munro, Univ. College London (United Kingdom)

12381-3 • 9:00 AM - 9:20 AM

Evaluating phase velocity of capillary waves on thin layer fluids using acoustic radiation force-based optical coherence elastography

Author(s): Hsiao-Chuan Liu, The Univ. of Southern California (United States), Massachusetts Institute of Technology (United States); Matthew W. Urban, Mayo Clinic (United States)

12381-4 • 9:20 AM - 9:40 AM

Improving strain retrieval in compression optical coherence elastography in the presence of speckle

Author(s): Peter R. T. Munro, Balázs Dura-Kovács, Andrea Mazzolani, Jakub Zalesak, Univ. College London (United Kingdom); Jiayue Li, Matt S. Hepburn, Brendan F. Kennedy, The Univ. of Western Australia (Australia)

12381-5 • 9:40 AM - 10:00 AM

Elastographic resolution in the dynamic OCE of bounded nearly incompressible media

Author(s): Gabriel Regnault, Mitchell A. Kirby, Maju Kuriakose, Ruikang K. Wang, Matthew O'Donnell, Ivan Pelivanov, Univ. of Washington (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: BRILLOUIN ELASTOGRAPHY TECHNOLOGY

10:30 AM - 12:00 PM

Moscone Center, Room 210 (Level 2 South)

Session chair: Jürgen W. Czarke, TU Dresden (Germany)

12381-7 • 10:30 AM - 11:00 AM

Quantum-enhanced Brillouin microscopy (*Invited Paper*)

Author(s): Vladislav V. Yakovlev, Texas A&M Univ. (United States)

12381-8 • 11:00 AM - 11:20 AM

Brillouin spectroscopy using laser induced circular dichroism in 87Rb atoms

Author(s): Romanus J. Hutchins, Giulia Zanini, Giuliano Scarcelli, Univ. of Maryland, College Park (United States)

12381-9 • 11:20 AM - 11:40 AM

Brillouin signal enhancement by recycling illumination light

Author(s): Chenjun Shi, Jitao Zhang, Wayne State Univ. (United States)

12381-10 • 11:40 AM - 12:00 PM

Impulsive stimulated Brillouin microscopy for high-speed biomedical diagnostics

Author(s): Nektarios Koukourakis, Leon Liebig, Jürgen W. Czarke, TU Dresden (Germany)

Lunch/Exhibition Break 12:00 PM - 1:20 PM

SESSION 3: KEYNOTE

1:20 PM - 2:05 PM

Moscone Center, Room 210 (Level 2 South)

Session chair: Kirill V. Larin, Univ. of Houston (United States)

12381-11 • 1:20 PM - 2:05 PM

The expanding frontier of optical elastography and diagnostic biomechanics (*Keynote Presentation*)

Author(s): Kevin Parker, Gary R. Ge, Jannick P. Rolland, Maiken Nedergaard, Univ. of Rochester (United States)

SESSION 4: OPTICAL COHERENCE ELASTOGRAPHY I

2:05 PM - 3:05 PM

Moscone Center, Room 210 (Level 2 South)

Session chairs: Qifa Zhou, The Univ. of Southern California (United States), Christine P. Hendon, Columbia Univ. (United States), Amy L. Oldenburg, The Univ. of North Carolina at Chapel Hill (United States)

12381-12 • 2:05 PM - 2:25 PM

Mapping the micro-scale strain tensor using tension-based optical coherence elastography

Author(s): Jiayue Li, Alireza Mowla, Ziming Chen, Matt S. Hepburn, Lixin Chin, Minghao Zheng, Brendan Kennedy, The Univ. of Western Australia (Australia)

12381-13 • 2:25 PM - 2:45 PM

Monitoring treatment response in a murine model of systemic sclerosis with optical coherence elastography

Author(s): Harshdeep Singh Chawla, Yanping Chen, Jessica Gutierrez, Chandra Mohan, Fernando Zvietcovich, Manmohan Singh, Salavat R. Aglyamov, Kirill V. Larin, Univ. of Houston (United States)

12381-14 • 2:45 PM - 3:05 PM

Quantitative micro-elastography for biomechanical evaluation of chronic liver injury in mouse models

Author(s): Alireza Mowla, Brendan Kennedy, George Yeoh, Rose Belford, The Univ. of Western Australia (Australia); Nina Tirmitz-Parker, Julia Koehn, Nathan Main, Curtin Univ. (Australia)

Coffee Break 3:05 PM - 3:30 PM**SESSION 5: CELL AND MATRIX MECHANICS: FROM MICRO TO MACRO**

3:30 PM - 6:00 PM

Moscone Center, Room 210 (Level 2 South)

Session chairs: Steven G. Adie, Cornell Univ. (United States), Seemantini K. Nadkarni, Wellman Ctr. for Photomedicine (United States)

12381-15 • 3:30 PM - 4:00 PM

Insights developed into nuclear mechanics by live cell imaging (*Invited Paper*)

Author(s): Tanmay P. Lele, Texas A&M Univ. (United States)

12381-16 • 4:00 PM - 4:20 PM

A pilot study of cervical squamous cell carcinoma elastic properties by compression OCT elastography

Author(s): Maria Loginova, Privilzhsky Research Medical Univ. (Russian Federation), Lobachevsky State Univ. of Nizhny Novgorod (Russian Federation); Arseniy Potapov, Privilzhsky Research Medical Univ. (Russian Federation); Ekaterina Gubarkova, Alexandra Bogomolova, Privilzhsky Research Medical Univ. (Russian Federation), Lobachevsky State Univ. of Nizhny Novgorod (Russian Federation); Stefka Radenska-Lopovok, I.M. Sechenov First Moscow State Medical Univ. (Russian Federation); Nadezhda Kanishcheva, Sergey Gamayunov, Nizhny Novgorod Regional Oncologic Hospital (Russian Federation); Vladimir Zaitsev, Institute of Applied Physics (Russian Federation); Natalia Gladkova, Privilzhsky Research Medical Univ. (Russian Federation); Marina Sirotkina, Privilzhsky Research Medical Univ. (Russian Federation), Lobachevsky State Univ. of Nizhny Novgorod (Russian Federation)

12381-17 • 4:20 PM - 4:40 PM

Air-Jet based optical coherence elastography: processing and mechanical interpretation of brain tumor data

Author(s): Nicolas Detrez, Medizinisches Laserzentrum Lübeck GmbH (Germany); Sazgar Burhan, Katharina Rewerts, Univ. zu Lübeck (Germany); Jessica Kren, Universitätsklinikum Schleswig-Holstein (Germany); Christian Hagel, Universitätsklinikum Hamburg-Eppendorf (Germany); Matteo M. Bonsanto, Universitätsklinikum Schleswig-Holstein (Germany); Dirk Theisen-Kunde, Medizinisches Laserzentrum Lübeck GmbH (Germany); Robert Huber, Univ. zu Lübeck (Germany), Medizinisches Laserzentrum Lübeck GmbH (Germany); Ralf Brinkmann, Medizinisches Laserzentrum Lübeck GmbH (Germany), Univ. zu Lübeck (Germany)

12381-18 • 4:40 PM - 5:00 PM

An open-source toolkit to visualize cellular morphology, motion, fluorescence, and forces

Author(s): Dhananjay T. Tambe, Sunita S. Paudel, Jessica Bell, Linn Ayers, Thomas C. Rich, Troy Stevens, Univ. of South Alabama (United States)

12381-19 • 5:00 PM - 5:20 PM

Wideband micromechanical spectroscopy of biopolymer constructs and tissue specimens with laser speckle microrheology

Author(s): Nichaluk Leartprapun, Brandon C. Matthews, Seemantini K. Nadkarni, Massachusetts General Hospital (United States)

12381-20 • 5:20 PM - 5:40 PM

Characterizing the micro-mechanical entropy in molecular subtypes of breast cancer by laser speckle rheological microscopy

Author(s): Zeinab Hajjarian Kashany, Seemantini Nadkarni, Harvard Medical School (United States)

12381-21 • 5:40 PM - 6:00 PM

Characterizing femtosecond laser effects on collagen

Author(s): Po-Yi Lee, Yuankai Lu, Marissa Quinn, Susannah Waxman, Fengting Ji, Gregory A. Gibson, Univ. of Pittsburgh (United States); Bin Yang, Duquesne Univ. (United States); Ian A. Sigal, Univ. of Pittsburgh (United States)

SUNDAY 29 JANUARY**SESSION 6: OCULAR BIOMECHANICAL PROPERTIES***Joint Session with Conferences 12381 and 12360*

8:15 AM - 10:00 AM

Moscone Center, Room 210 (Level 2 South)

Session chairs: Kirill V. Larin, Univ. of Houston (United States), Giuliano Scarcelli, Univ. of Maryland, College Park (United States)

Conference 12381

12360-30 • 8:15 AM - 8:30 AM

Cross-meridian air-puff deformation OCT for improved detection of early stage keratoconus

Author(s): Judith S. Birkenfeld, Instituto de Optica "Daza de Valdes" (Spain); Andrea Curatolo, International Ctr. for Translational Eye Research (Poland); Ashkan Eliasy, Univ. of Liverpool (United Kingdom); Alejandra Varea, Eduardo Martínez Enriquez, Instituto de Optica "Daza de Valdes" (Spain); Bernardo Lopes Teixeira, Ahmed Abass, Univ. of Liverpool (United Kingdom); Nicolas Alejandre-Alba, Hospital Univ. Fundación Jiménez Díaz (Spain); Jesus Merayo-Lloves, Fernández-Vega Ophthalmological Institute (Spain), Univ. de Valladolid (Spain); Ahmed Elsheikh, Univ. of Liverpool (United Kingdom); Susana Marcos, The Institute of Optics, Univ. of Rochester (United States)

12381-22 • 8:30 AM - 8:45 AM Biomechanical interactions of the perilimbal sclera and aqueous veins with intraocular pressure regulation

Author(s): Guan Xu, Univ. of Michigan Kellogg Eye Ctr. (United States); Linyu Ni, Univ. of Michigan (United States); Wonsuk Kim, Alexis Warchock, Erik Krawczyk, John Riesterer, Univ. of Michigan-Dearborn (United States); Sayoko Moroi, The Ohio State Univ. Wexner Medical Ctr. (United States); Alan Argento, Univ. of Michigan-Dearborn (United States)

12360-31 • 8:45 AM - 9:00 AM

Combining OCE and Brillouin microscopy to evaluate in vivo lens biomechanics in 3D

Author(s): Justin Schumacher, Univ. of Maryland, College Park (United States); Alexander W. Schill, Manmohan Singh, Univ. of Houston (United States); Fabrice Manns, Univ. of Miami (United States); Kirill V. Larin, Univ. of Houston (United States); Giuliano Scarcelli, Univ. of Maryland, College Park (United States)

12381-23 • 9:00 AM - 9:15 AM

Characterizing regional biomechanical properties of the porcine iris using optical coherence elastography

Author(s): Taye Mekonnen, Christian Zevallos Delgado, Univ. of Houston (United States); Babak N. Safa, Georgia Institute of Technology/Emory University (United States); Manmohan Singh, Salavat R. Aglyamov, Univ. of Houston (United States); C. Ross Ethier, Georgia Institute of Technology/Emory University (United States); Kirill V. Larin, Univ. of Houston (United States)

12360-32 • 9:15 AM - 9:30 AM

Detecting subclinical keratoconus by mapping corneal biomechanics using wave-based optical coherence elastography

Author(s): Fernando Zvietcovich, Alejandra Varea, Consejo Superior de Investigaciones Científicas (Spain); Nicolas Alejandre-Alba, Hospital Univ. Fundación Jiménez Díaz (Spain); Jesus Merayo-Lloves, Univ. de Oviedo (Spain); Judith S. Birkenfeld, Consejo Superior de Investigaciones Científicas (Spain); Susana Marcos, Univ. of Rochester (United States)

12381-24 • 9:30 AM - 10:00 AM

Ocular biomechanics (*Invited Paper*)

Author(s): Massimo Fazio, Legacy Devers Eye Institute (United States), The Univ. of Alabama at Birmingham (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 7: BRILLOUIN ELASTOGRAPHY APPLICATIONS

10:30 AM - 11:40 AM

Moscone Center, Room 210 (Level 2 South)

Session chairs: Vladislav V. Yakovlev, Texas A&M Univ. (United States); Francesca Palombo, Univ. of Exeter (United Kingdom)

12381-25 • 10:30 AM - 11:00 AM

Polarization gated Brillouin spectroscopy: new perspectives for turbid media analysis (*Invited Paper*)

Author(s): Silvia Caponi, Consiglio Nazionale delle Ricerche (Italy); Giulio Capponi, Martina Alunni Cardinali, Alessandra Anna Passeri, Daniele Fioretto, Maurizio Mattarelli, Univ. degli Studi di Perugia (Italy)

12381-27 • 11:00 AM - 11:20 AM

Biomechanical assessment of murine embryonic neural tube defects using multimodal OCT-Brillouin system

Author(s): Yogeshwari S. Ambekar, Univ. of Houston (United States); Carlo Donato Caiaffa, Baylor College of Medicine (United States); Manmohan Singh, Alexander W. Schill, Univ. of Houston (United States); John Steele, Baylor College of Medicine (United States); Salavat R. Aglyamov, Univ. of Houston (United States); Richard H. Finnell, Baylor College of Medicine (United States); Giuliano Scarcelli, Univ. of Maryland, College Park (United States); Kirill V. Larin, Univ. of Houston (United States)

12381-28 • 11:20 AM - 11:40 AM

On the relationship between shear and longitudinal moduli of hydrogels

Author(s): Raymundo Rodriguez López, Univ. of Maryland, College Park (United States); George Fytas, Max-Planck-Institut für Polymerforschung (Germany); Peter Kofinas, Univ. of Maryland, College Park (United States); Zuyuan Wang, Univ. of Electronic Science and Technology of China (China); Metecan Erdi, Giuliano Scarcelli, Univ. of Maryland, College Park (United States)

Lunch/Exhibition Break 11:40 AM - 1:20 PM

SESSION 8: NOVEL METHODS

1:20 PM - 3:10 PM

Moscone Center, Room 210 (Level 2 South)

Session chair: Peter T. C. So, Massachusetts Institute of Technology (United States)

12381-29 • 1:20 PM - 1:50 PM

Recent advances in laser speckle rheology (*Invited Paper*)

Author(s): Seemantini K. Nadkarni, Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States)

12381-30 • 1:50 PM - 2:10 PM

Characterizing intestinal fibrosis using endoscopic strain and spectroscopic photoacoustic imaging

Author(s): Linyu Ni, Xiaorui Peng, Yunhao Zhu, Laura Johnson, Kathryn A. Eaton, Jonathan Rubin, Peter Higgins, Xueding Wang, Guan Xu, Univ. of Michigan (United States)

12381-31 • 2:10 PM - 2:30 PM

Droplet microcavities for the study of tissue mechanics

Author(s): Gregor Pirnat, Matevž Marincic, Miha Ravnik, Jožef Stefan Institute (Slovenia), Univ. of Ljubljana (Slovenia); Matjaž Humar, Jožef Stefan Institute (Slovenia), Univ. of Ljubljana (Slovenia), CENN Nanocenter (Slovenia)

12381-32 • 2:30 PM - 2:50 PM

CANCELED: Elastographic measurements on tissue phantoms by imaging Rayleigh wave propagation

Author(s): Amandeep Singh, Renu John, Indian Institute of Technology Hyderabad (India)

12381-33 • 2:50 PM - 3:10 PM

Development of wireless cost-effective optical elastography probe towards intraoperative breast cancer detection

Author(s): Qi Fang, Aiden Taba, Seokhyun Choi, Kyle Newman, Renate Zilkens, Imogen Boman, Rowan W. Sanderson, Brendan F. Kennedy, Harry Perkins Institute of Medical Research (Australia)

Coffee Break 3:10 PM - 3:30 PM**SESSION 9: OPTICAL COHERENCE ELASTOGRAPHY II**

3:30 PM - 6:10 PM

Moscone Center, Room 210 (Level 2 South)

Session chairs: Brendan F. Kennedy, Harry Perkins Institute of Medical Research (Australia), Zhongping Chen, Beckman Laser Institute and Medical Clinic (United States)

12381-34 • 3:30 PM - 4:00 PM

Using dynamic optical coherence elastography to measure material properties *(Invited Paper)*

Author(s): Matthew W. Urban, Mayo Clinic (United States); Hsiao-Chuan Liu, The Univ. of Southern California (United States); Piotr Kijanka, AGH Univ. of Science and Technology (Poland)

12381-35 • 4:00 PM - 4:20 PM

Evaluation of skin care products using optical coherence elastography

Author(s): Rita Bernardo, José Paulo Domingues, Univ. de Coimbra (Portugal); Rui Bernardes, António Miguel Morgado, Ana Batista, Coimbra Institute for Biomedical Imaging and Translational Research, Univ. de Coimbra (Portugal)

12381-36 • 4:20 PM - 4:40 PM

A multifocal acoustic lens-transducer system for reverberant optical coherence elastography

Author(s): Taye Mekonnen, Christian Zevallos Delgado, Manmohan Singh, Univ. of Houston (United States)

12381-37 • 4:40 PM - 5:00 PM

Assessing the biomechanical properties of embryos using reverberant optical coherence elastography (Rev-OCE)

Author(s): Christian Zevallos Delgado, Taye T. Mekonnen, Yogeshwari S. Ambekar, Univ. of Houston (United States); Fernando Zvietcovich, Pontificia Univ. Católica del Perú (Peru); Manmohan Singh, Salavat R. Aglyamov, Kirill V. Larin, Univ. of Houston (United States)

12381-38 • 5:00 PM - 5:20 PM

Overcoming the spatial and temporal coherence limitations of reverberant elastography in raster-scanned OCT systems

Author(s): Ginger J. Schmidt, Taylor M. Cannon, Brett E. Bouma, Wellman Ctr. for Photomedicine (United States), Institute for Medical Engineering & Science (United States), Massachusetts Institute of Technology (United States); Néstor Uribe-Patarroyo, Wellman Ctr. for Photomedicine (United States)

12381-39 • 5:20 PM - 5:40 PM

Assessment of corneal stiffness ex-vivo at various IOPs measured by Heartbeat OCE

Author(s): Andres Bryan, Achuth Nair, Manmohan Singh, Salavat R. Aglyamov, Kirill V. Larin, Univ. of Houston (United States)

12381-40 • 5:40 PM - 6:10 PM

Optical coherence elastography for customized eye care: a success case of clinical translation *(Invited Paper)*

Author(s): Fernando Zvietcovich, Consejo Superior de Investigaciones Científicas (Spain), Pontificia Univ. Católica del Perú (Peru); Alejandra Varea, Instituto de Optica "Daza de Valdes" (Spain); Consejo Superior de Investigaciones Científicas (Spain); Nicolas Alejandro-Alba, Hospital Univ. Fundación Jiménez Díaz (Spain); Jesus Merayo, Univ. de Valladolid (Spain); Judith S. Birkenfeld, Instituto de Optica "Daza de Valdes" (Spain); Consejo Superior de Investigaciones Científicas (Spain); Susana Marcos, Univ. of Rochester (United States)

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM PST | Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM - 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12381-41

Simultaneous Hb-OCE and compression OCE to measure the biomechanical properties of the cornea in vivo

Author(s): Achuth Nair, Manmohan Singh, Salavat R. Aglyamov, Kirill Larin, Univ. of Houston (United States)

12381-42

Multimodal optical elastography assessment of a murine collagen XII knockout

Author(s): Achuth Nair, Yogeshwari S. Ambekar, Christian Zevallos Delgado, Univ. of Houston (United States); Mei Sun, Univ. of South Florida (United States); Manmohan Singh, Fernando Zvietcovich, Taye Mekonnen, Salavat R. Aglyamov, Univ. of Houston (United States); Manuel Koch, Univ. zu Köln (Germany); Giuliano Scarcelli, Univ. of Maryland, College Park (United States); Edgar Espana, Univ. of South Florida (United States); Kirill Larin, Univ. of Houston (United States)

Conference 12382

28 - 29 January 2023 | Moscone Center, Room 204 (Level 2 South)2

Polarized Light and Optical Angular Momentum for Biomedical Diagnostics 2023

Conference Chairs: **Jessica C. Ramella-Roman**, Florida International Univ. (United States); **Hui Ma**, Tsinghua Univ. Shenzhen International Graduate School (China); **Tatiana Novikova**, Lab. de Physique des Interfaces et des Couches Minces (France)

Conference Co-Chairs: **Daniel S. Elson**, Imperial College London (United Kingdom); **I. Alex Vitkin**, Univ. Health Network (Canada)

Program Committee: **Tananant Boonya-Ananta**, Florida International Univ. (United States); **Sophie Brasselet**, Institut Fresnel (France); **Christian Brosseau**, Univ. de Bretagne Occidentale (France); **Juan Campos**, Univ. Autònoma de Barcelona (Spain); **Russell A. Chipman**, Wyant College of Optical Sciences (United States); **Joseph Chue-Sang**, National Institute of Standards and Technology (United States); **Anabela Da Silva**, Institut Fresnel (France); **Nirmalya Ghosh**, Indian Institute of Science Education and Research Kolkata (India); **Viktor Gruev**, Univ. of Illinois (United States); **George S. D. Gordon**, The Univ. of Nottingham (United Kingdom); **Francois Hache**, Lab. d'Optique et Biosciences (France); **Steven L. Jacques**, Univ. of Washington (United States); **Olga Korotkova**, Univ. of Miami (United States); **Yanqiu Li**, Nikon Corp. (Japan); **Igor V. Meglinski**, Univ. of Oulu (Finland), Aston Univ. (United Kingdom); **Razvigor Ossikovski**, Lab. de Physique des Interfaces et des Couches Minces (France); **Angelo Pierangelo**, Lab. de Physique des Interfaces et des Couches Minces (France); **Valery V. Tuchin**, Saratov State Univ. (Russian Federation); **Anna N. Yaroslavsky**, Univ. of Massachusetts Lowell (United States)

SATURDAY 28 JANUARY

SESSION 1: CLINICAL APPLICATIONS OF POLARIMETRY

8:00 AM - 10:20 AM

Moscone Center, Room 204 (Level 2 South)

Session chair: Jessica C. Ramella-Roman, Florida International Univ. (United States)

12382-1 • 8:00 AM - 8:30 AM

TBD I (*Invited Paper*)

Author(s): Jessica C. Ramella-Roman, Florida International Univ. (United States)

12382-2 • 8:30 AM - 9:00 AM

Spin and Orbital Angular Momenta in Tissue Diagnosis: current practice and further perspectives (*Invited Paper*)

Author(s): Igor V. Meglinski, Univ. of Oulu (Finland); Alexander Doronin, Victoria Univ. of Wellington (New Zealand)

12382-4 • 9:00 AM - 9:20 AM

Mueller matrix polarimetry for in vivo scar tissue diagnostics

Author(s): Lennart Jütte, Leibniz Univ. Hannover (Germany); Bernhard Roth, Cluster of Excellence PhoenixD, Leibniz Univ. Hannover (Germany)

12382-3 • 9:20 AM - 9:40 AM

Evolution of polarimetric parameters of cadaver brain tissue with time and formaldehyde fixation in wide-field Mueller matrix images

Author(s): Romain Gros, Univ. Bern (Switzerland); Leonard A. Felger, Inselspital, Univ. Bern (Switzerland); Theoni Maragkou, Univ. Bern (Switzerland); Richard McKinley, Stefano Moriconi, Michael Murek, Inselspital, Univ. Bern (Switzerland); Tatiana Novikova, Lab. de Physique des Interfaces et des Couches Minces, CNRS (France), Ecole Polytechnique (France); Omar Rodríguez-Núñez, Philippe Schucht, Irena Zubak, Inselspital, Univ. Bern (Switzerland); Angelo Pierangelo, Lab. de Physique des Interfaces et des Couches Minces, CNRS (France), Ecole Polytechnique (France)

12382-5 • 9:40 AM - 10:00 AM

Polarimetric imaging of cervical pre-cancer aided by machine learning

Author(s): Alexander Doronin, Demelza Robinson, Bastiaan W. Kleijn, Victoria Univ. of Wellington (New Zealand); Jean Rehbinder, Jeremy Vizet, Angelo Pierangelo, Tatiana Novikova, Ecole Polytechnique (France)

12382-6 • 10:00 AM - 10:20 AM

Methylene blue fluorescence polarization assessment of breast cancer tumor grades and molecular subtypes

Author(s): Peter Jermain, Univ. of Massachusetts Lowell (United States); Dina Kandil, Univ. of Massachusetts Medical School (United States); Alona Muzikansky, Massachusetts General Hospital (United States); Ashraf Khan, Univ. of Massachusetts Medical School (United States); Anna N. Yaroslavsky, Univ. of Massachusetts Lowell (United States)

Coffee Break 10:20 AM - 10:50 AM

SESSION 2: PRE-CLINICAL APPLICATIONS OF POLARIMETRY I

28 January 2023 • 10:50 AM - 12:10 PM PST | Moscone Center, Room 204 (Level 2 South)

Session chair: Tatiana Novikova, Lab. de Physique des Interfaces et des Couches Minces (France)

12382-7 • 10:50 AM - 11:10 AM

A portable preterm imaging system: clinical study

Author(s): Tananant Boonya-Ananta, Jessica C. Ramella-Roman, Florida International Univ. (United States)

12382-8 • 11:10 AM - 11:30 AM

multi-centimeter fascicle tracing in ex-vivo porcine vagus nerve using PS-OCT

Author(s): Yong-Chul Yoon, Wellman Ctr. for Photomedicine, Massachusetts General Hospital (United States); Ilyas Saytashev, Ctr. for Devices and Radiological Health, U.S. Food and Drug Administration (United States); Rex Chin-Hao Chen, Univ. of Wisconsin-Milwaukee (United States); Fernando P. S. Guastaldi, Massachusetts General Hospital (United States); Abigail L. Gregg, Wellman Ctr. for Photomedicine, Massachusetts General Hospital (United States); Kip A. Luwdig, Univ. of Wisconsin-Madison (United States); Daniel X. Hammer, Ctr. for Devices and Radiological Health, U.S. Food and Drug Administration (United States); Benjamin J. Vakoc, Wellman Ctr. for Photomedicine, Massachusetts General Hospital (United States)

12382-9 • 11:30 AM - 11:50 AM

Multi-domain cotraining for tissue segmentation in fixed and fresh brain tissue using Mueller polarimetry

Author(s): Richard McKinley, Leonard A. Felger, Insel Gruppe AG (Switzerland); Romain Gros, Univ. Bern (Switzerland); Ekkehard Hewer, Ctr. Hospitalier Univ. Vaudois (Switzerland); Theoni Maragkou, Univ. Bern (Switzerland); Stefano Moriconi, Michael Murek, Insel Gruppe AG (Switzerland); Tatiana Novikova, Ecole Polytechnique (France); Omar Rodríguez-Núñez, Insel Gruppe AG (Switzerland); Angelo Pierangelo, Ecole Polytechnique (France); Philippe Schucht, Insel Gruppe AG (Switzerland)

12382-10 • 11:50 AM - 12:10 PM

Reflectance full Mueller matrix polarimetry for microstructural validation of diffusion magnetic resonance imaging

Author(s): Justina Bonaventura, Wyant College of Optical Sciences (United States); Rhea L. Carlson, Kellys K. Morara, Courtney Comrie, Elizabeth B. Hutchinson, Travis W. Sawyer, The Univ. of Arizona (United States)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

SESSION 3: PRE-CLINICAL APPLICATIONS OF POLARIMETRY II

1:40 PM - 3:00 PM

Moscone Center, Room 204 (Level 2 South)

Session chair: Anna N. Yaroslavsky, Univ. of Massachusetts Lowell (United States)

12382-11 • 1:40 PM - 2:00 PM

Evaluation of light penetration depth for Imaging Mueller polarimeter operating in a visible wavelength range in reflection geometry: ex-vivo studies of healthy brain white matter

Author(s): Omar Rodríguez-Núñez, Leonard A. Felger, Inselspital (Switzerland); Romain Gros, Theoni Maragkou, Univ. Bern (Switzerland); Richard McKinley, Stefano Moriconi, Michael Murek, Inselspital (Switzerland); Angelo Pierangelo, Lab. de Physique des Interfaces et des Couches Mince, CNRS (France), Ecole Polytechnique (France); Philippe Schucht, Irena Zubak, Inselspital (Switzerland); Tatiana Novikova, Lab. de Physique des Interfaces et des Couches Mince, CNRS (France), Ecole Polytechnique (France)

12382-12 • 2:00 PM - 2:20 PM

Polarization attributes of laser speckle for particle sizing in clinical and biomedical applications

Author(s): Zeinab Hajarian Kashany, Seemantini K. Nadkarni, Harvard Medical School (United States)

12382-13 • 2:20 PM - 2:40 PM

Polarized hyperspectral microscopic imaging for collagen visualization on pathologic slides of head and neck squamous cell carcinoma

Author(s): Ximing Zhou, Hasan K. Mubarak, The Univ. of Texas at Dallas (United States); Doreen Palsgrove, Baran D. Summer, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States); Baowei Fei, Ling Ma, The Univ. of Texas at Dallas (United States)

12382-14 • 2:40 PM - 3:00 PM

Cervical collagen and elastic fibers classification with Mueller matrix polarimetry

Author(s): Ajmal Ajmal, Tananant Boonya-Ananta, Jessica C. Ramella-Roman, Florida International Univ. (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 4: OTHER APPLICATIONS AND INSTRUMENTATION

3:30 PM - 5:10 PM PST | Moscone Center, Room 204 (Level 2 South)

Session chair: Alexander Doronin, Victoria Univ. of Wellington (New Zealand)

12382-16 • 3:30 PM - 3:50 PM

Enhancing biological tissue structures visualization through polarimetric parameters

Author(s): Mónica Canabal-Carbia, Carla Rodríguez, Irene Estévez Caride, Optics Group, Univ. Autònoma de Barcelona (Spain); Albert Van Eeckhout, ALBA Synchrotron Light Source (Spain), Optics Group (Spain); Emilio González-Arnay, Univ. de La Laguna (Spain); Enrique García-Caurel, Lab. de Physique des Interfaces et des Couches Mince, CNRS (France), Institut Polytechnique de Paris (France), Ecole Polytechnique (France); Teresa Garnatje, Botanical Institute of Barcelona (Spain); Angel Lizana Tutusa, Univ. Autònoma de Barcelona (Spain); Juan Campos Coloma, Optics Group, Univ. Autònoma de Barcelona (Spain)

12382-17 • 3:50 PM - 4:10 PM

Application of shaped light with orbital angular momentum in biomedical diagnosis and tissues characterization

Author(s): Ivan V. Lopushenko, Anton Y. Sdobnov, Alexander V. Bykov, Univ. of Oulu (Finland); Igor V. Meglinski, Univ. of Oulu (Finland), Aston Univ. (United Kingdom); Alexander Doronin, Victoria Univ. of Wellington (New Zealand)

12382-18 • 4:10 PM - 4:30 PM

Development of a Stokes vector polarization speckle system for in vivo clinical applications

Author(s): Daniel C. Louie, The Univ. of British Columbia (Canada), BC Cancer Agency (Canada); Lioudmila Tchvialeva, Univ. of British Columbia (Canada), BC Cancer Research Institute (Canada); Tim K. Lee, The Univ. of British Columbia (Canada), BC Cancer Research Institute (Canada)

12382-19 • 4:30 PM - 4:50 PM

Effective conversion of transverse spin angular momentum of light on tight focusing of radially polarized LG10 beam

Author(s): Ram Nandan Kumar, Indian Institute of Science Education and Research Kolkata (India)

12382-20 • 4:50 PM - 5:10 PM

Combining Mueller matrix imaging with spatial frequency domain imaging

Author(s): Thomas A. Germer, Joseph Chue-Sang, National Institute of Standards and Technology (United States)

SUNDAY 29 JANUARY

SESSION 5: ALGORITHMS AND COMPUTATIONAL APPROACHES

8:20 AM - 10:00 AM

Moscone Center, Room 204 (Level 2 South)

Session chair: Thomas A. Germer, National Institute of Standards and Technology (United States)

Conference 12382

12382-22 • 8:20 AM - 8:40 AM

Unravelling the origin of the survival and stronger memory effect of polarized vortex beams in turbid media

Author(s): Atharva A. Paranjape, Shyamal Guchhait, Nirmalya Ghosh, Indian Institute of Science Education and Research Kolkata (India); Athira B.S., Univ. of Washington (United States)

12382-24 • 8:40 AM - 9:00 AM

Information extraction in polarization-resolved second harmonic generation microscopy images of human tissues for automatic cancer diagnosis

Author(s): Catherine Baskiotis, Olga Assainova, Nadine Abdallah Saab, Marwa El Bouz, Ayman Alfalou, Institut Supérieur d'Electronique du Nord (France); Christian Brosseau, Lab. des Sciences et Techniques de l'Information, de la Communication et de la Connaissance (France), Univ. de Bretagne Occidentale (France)

12382-25 • 9:00 AM - 9:20 AM

Denosing diffusion networks applied to Mueller polarimetric images of brain tissue

Author(s): Stefano Moriconi, Leonard A. Felger, Inselspital (Switzerland); Romain Gros, Univ. Bern (Switzerland); Ekkehard Hewer, Ctr. Hospitalier Univ. Vaudois (Switzerland); Theoni Maragkou, Univ. Bern (Switzerland); Michael Murek, Inselspital (Switzerland); Tatiana Novikova, Ecole Polytechnique (France); Omar Rodríguez-Núñez, Inselspital (Switzerland); Angelo Pierangelo, Ecole Polytechnique (France); Philippe Schucht, Richard McKinley, Inselspital (Switzerland)

12382-26 • 9:20 AM - 9:40 AM

Validating polarization-sensitive OCT images of the human tympanic membrane by polarized light microscopy

Author(s): Svea Steuer, Jonas Golde, Lars Kirsten, Joseph Morgenstern, TU Dresden (Germany); Anett Jannasch, TU Dresden (Germany), Herzzentrum Dresden GmbH (Germany); Marcus Neudert, Edmund Koch, TU Dresden (Germany)

12382-27 • 9:40 AM - 10:00 AM Polarimetric diagnosis of biological tissue: complete versus partial Mueller polarimetry

Author(s): Tatiana Novikova, Lab. de Physique des Interfaces et des Couches Minces, CNRS (France), Ecole Polytechnique (France); Jessica C. Ramella-Roman, Florida International Univ. (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 6: MICROSCOPY AND OCT

10:30 AM - 11:50 AM

Moscone Center, Room 204 (Level 2 South)

Session chair: Tatiana Novikova, Lab. de Physique des Interfaces et des Couches Minces (France)

12382-30 • 10:30 AM - 10:50 AM

Automated peripheral nerve tissue classification based on PS-OCT derived multimodal volumes

Author(s): Ilyas Saytashev, Shivam Amin, U.S. Food and Drug Administration (United States); Yong-Chul Yoon, Wellman Ctr. for Photomedicine, Massachusetts General Hospital (United States); Stephanie Nam, Wellman Ctr. for Photomedicine (United States), U.S. Food and Drug Administration (United States); Benjamin J. Vakoc, Wellman Ctr. for Photomedicine (United States); Daniel X. Hammer, U.S. Food and Drug Administration (United States)

12382-31 • 10:50 AM - 11:10 AM

Polarized hyperspectral microscopic imaging for white blood cells on Wright's stained blood smear slides

Author(s): Ximing Zhou, Hasan K. Mubarak, The Univ. of Texas at Dallas (United States); Samuel Ortega, Gustavo M. Callicó, Univ. de Las Palmas de Gran Canaria (Spain); Edward A. Medina, Bradley B. Brimhall, Marisa Whitted, The Univ. of Texas Health Science Ctr. at San Antonio (United States); Baowei Fei, The Univ. of Texas at Dallas (United States); Doreen Palsgrove, University of Texas Southwestern Medical Center (United States); Ling Ma, University of Texas at Dallas (United States)

12382-44 • 11:10 AM - 11:30 AM

Study of the suitability of polarimetric metrics to implement tissue classification models based on artificial intelligence

Author(s): Irene Estévez, Carla Rodríguez, Mónica Canabal, Univ. Autònoma de Barcelona (Spain); Emilio González-Arnay, Hospital Univ. de Canarias (Spain), Univ. Autònoma de Madrid (Spain); Juan Campos, Ángel Lizana, Univ. Autònoma de Barcelona (Spain)

12382-45 • 11:30 AM - 11:50 AM

CANCELED: Extending fluorescence anisotropy to large complexes with switchable proteins

Author(s): Andrea Volpato, Dirk Ollech, Martina Damenti, Jonatan Alvelid, Ilaria Testa, KTH Royal Institute of Technology (Sweden)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12382-23 • On demand | Presenting live 28 January 2023

A Stokes imaging microscope system with a large field of view

Author(s): Yang Huibin, Jiawei Song, Nan Zeng, Hui Ma, Tsinghua Univ. Shenzhen International Graduate School (China)

12382-28 • On demand | Presenting live 28 January 2023

Comparative study of the influence of imaging resolution on polarization properties derived from Mueller matrix

Author(s): Yuxin Zhang, Conghui Shao, Honghui He, Hui Ma, Tsinghua Univ. (China)

12382-29 • On demand | Presenting live 28 January 2023

Automatic detection and quantitative evaluation of skin hair follicles based on Mueller matrix polarimetry

Author(s): Rui Hao, Zheng Zhang, Honghui He, Hui Ma, Tsinghua Univ. (China)

12382-32 • On demand | Presenting live 28 January 2023

Simultaneous measurement of the polarization characteristics and inherent optical properties of suspended particles

Author(s): Zhidi Liu, Nan Zeng, Ran Liao, Hui Ma, Tsinghua Univ. Shenzhen International Graduate School (China)

Conference 12383

30 January - 1 February 2023 | Moscone Center, Room 305 (Level 3 South)

Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues XXI

Conference Chairs: **Attila Tarnok**, Univ. Leipzig (Germany); **Jessica P. Houston**, New Mexico State Univ. (United States)

Conference Co-Chair: **Xuantao Su**, Shandong Univ. (China)

Program Committee: **Alba Alfonso García**, Univ. of California, Davis (United States); **Vadim Backman**, Northwestern Univ. (United States); **Adela Ben-Yakar**, The Univ. of Texas at Austin (United States); **Stephen A. Boppart**, Beckman Institute for Advanced Science and Technology (United States); **Christopher H. Contag**, Michigan State Univ. (United States); **Kishan Dholakia**, Univ. of St. Andrews (United Kingdom); **Paul M. W. French**, Imperial College London (United Kingdom); **Yuval Garini**, Bar-Ilan Univ. (Israel); **Keisuke Goda**, The Univ. of Tokyo (Japan); **Sona Hosseini**, Jet Propulsion Lab. (United States); **Bo Huang**, Univ. of California, San Francisco (United States); **Jae Youn Hwang**, Daegu Gyeongbuk Institute of Science & Technology (Korea, Republic of); **Anna Khimchenko**, Massachusetts General Hospital (United States); **Charles P. Lin**, Wellman Ctr. for Photomedicine (United States); **Sacha Loiseau**, Mauna Kea Technologies (France); **Mary-Ann Mycek**, Univ. of Michigan (United States); **Ramesh Raghavachari**, U.S. Food and Drug Administration (United States); **Volker Schweikhard**, Leica Microsystems CMS GmbH (Germany); **Nektarios Tavernarakis**, Foundation for Research and Technology-Hellas (Greece); **Sebastian Wachsmann-Hogiu**, McGill Univ. (Canada); **Elena V. Zagaynova M.D.**, Privozhsky Research Medical Univ. (Russian Federation)

MONDAY 30 JANUARY

SESSION 1: IMAGE PROCESSING AND ANALYSIS TECHNIQUES

2:10 PM - 3:00 PM

Moscone Center, Room 305 (Level 3 South)

Session chair: Silas J. Leavesley, Univ. of South Alabama (United States)

12383-1 • 2:10 PM - 2:40 PM

Oblique plane microscopy for 3D, multi-color, 8-day time-lapse imaging of genetically heterogeneous breast cancer spheroids in 384-well plates with quantitative 3D analysis (*Invited Paper*)

Author(s): Leo N. Rowe-Brown, Nathan Curry, Sandesh Meyler, Nina Moderau, Christopher W. Dunsby, Imperial College London (United Kingdom)

12383-3 • 2:40 PM - 3:00 PM **Extended depth-of-field microscopy using jointly-learned binary phase filter and image deconvolution**

Author(s): Baekcheon Seong, Woovin Kim, Jinwoo Cho, Chulmin Joo, Yonsei Univ. (Republic of Korea)

Coffee Break 3:00 PM - 3:20 PM

SESSION 2: FUNCTIONAL IMAGING I

3:20 PM - 5:10 PM

Moscone Center, Room 305 (Level 3 South)

Session chair: Jessica P. Houston, New Mexico State Univ. (United States)

12383-5 • 3:20 PM - 3:40 PM

Characterization of Chinese hamster ovary (CHO) cell lines by simultaneous label-free autofluorescence multi-harmonic (SLAM) microscopy for upstream bioprocessing

Author(s): Alexander Ho, Jindou Shi, Eric J. Chaney, Beckman Institute for Advanced Science and Technology, Univ. of Illinois (United States); Corey Snyder, Univ. of Illinois (United States); Aneesh Alex, GlaxoSmithKline (United States), Beckman Institute for Advanced Science and Technology, Univ. of Illinois (United States); Remben Talaban, GlaxoSmithKline (United Kingdom); Janet Sorrells, Darold R. Spillman, Marina Marjanovic, Beckman Institute for Advanced Science and Technology, Univ. of Illinois (United States); Steve R. Hood, GlaxoSmithKline (United States); Stephen A. Boppart, Beckman Institute for Advanced Science and Technology, Univ. of Illinois (United States)

12383-6 • 3:40 PM - 4:00 PM

Knowing your onions: using transparent soil and high throughput fluorescence microscopy to identify and characterize the infection of onion with the major phytopathogen *Aspergillus niger*

Author(s): Jordan Murray, Univ. of Strathclyde (United Kingdom); Daniel Patko, Univ. del País Vasco (Spain); Gloria Martinez De La Heras, Lionel X. Dupuy, NEIKER, Instituto Vasco de Investigaciones Agrarias (Spain); Gail McConnell, Univ. of Strathclyde (United Kingdom)

12383-7 • 4:00 PM - 4:20 PM

Modular, multispectral infrared imaging system for reflection and transmission measurements

Author(s): Rafał Stojek, VIGO System S.A. (Poland); Filip Łabaj, VIGO Photonics S.A. (Poland)

12383-8 • 4:20 PM - 4:40 PM

Multi-modal imaging with a parallelized 16-gigapixel microscope

Author(s): Kanghyun Kim, Kevin Zhou, Duke Univ. (United States); Mark Harfouche, Ramona Optics, Inc. (United States); Roarke Horstmeyer, Duke Univ. (United States)

Conference 12383

12383-13 • 4:40 PM - 5:10 PM

Quantitative phase imaging for tracing the motion of waveguide trapped bead particle (*Invited Paper*)

Author(s): Sunil Bhatt, Indian Institute of Technology Delhi (India), UiT The Arctic Univ. of Norway (Norway); Ankit Butola, Sebastian Acuña, Daniel Henry Hansen, Jean-Claude Tinguely, UiT The Arctic Univ. of Norway (Norway); Dalip Singh Mehta, Indian Institute of Technology Delhi (India); Balpreet Singh Ahluwalia, Krishna Agarwal, UiT The Arctic Univ. of Norway (Norway)

POSTERS-MONDAY

30 January 2023 • 5:30 PM - 7:00 PM
Moscone Center, Level 2 West

Conference attendees are invited to attend the Monday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM – 5:00 PM

View poster presentation guidelines and set-up instructions at:
<https://spie.org/PW/Poster-Guidelines>

12383-2 • On demand | Presented live 30 January 2023

Computational enhancement of lateral resolution using conventional fluorescent microscopes

Author(s): Saeed Bohlooli Darian, Univ. of Ulsan College of Medicine (Republic of Korea); Bjorn Paulson, Asan Institute for Life Sciences, Asan Medical Ctr. (Republic of Korea); Jeongmin Oh, Univ. of Ulsan College of Medicine (Republic of Korea); Jun Ki Kim, Asan Institute for Life Sciences, Asan Medical Ctr. (Republic of Korea)

12383-31 • On demand | Presented live 30 January 2023

Cell analysis tools: an open-source library for single-cell analysis of multi-dimensional microscopy images

Author(s): Emmanuel Contreras Guzman, Peter Rehani, Melissa C. Skala, Morgridge Institute for Research (United States)

12383-32 • On demand | Presented live 30 January 2023

White blood cells classification of peripheral blood smear based on machine learning

Author(s): TaeYeon Gil, Juhyun Kim, Soonchunhyang Univ. (Republic of Korea); Sukjun Lee, Cheongju Univ. (Republic of Korea); Onseok Lee, Soonchunhyang Univ. (Republic of Korea)

12383-33 • On demand | Presented live 30 January 2023

Semantic knowledge distillation for conjunctival goblet cell segmentation

Author(s): Seunghyun Jang, Kyungdeok Seo, Yonsei Univ. (Republic of Korea); Hyunyoung Kang, Yonsei University (Republic of Korea); Seonghan Kim, Pohang Univ. of Science and Technology (Republic of Korea); Seungyoung Kang, Yonsei University (Republic of Korea); Ki Hean Kim, Pohang Univ. of Science and Technology (Republic of Korea); Sejung Yang, Yonsei Univ. (Republic of Korea)

12383-34

Respiration triggered motion compensation by dynamic focusing in intravital microscopy

Author(s): Minseok Jang, KAIST (Republic of Korea); Joon Woo Song, Multimodal Imaging and Theranostic Lab., Cardiovascular Ctr., Korea Univ. Guro Hospital (Republic of Korea); Ungyo Kang, KAIST (Republic of Korea); Jin Won Kim, Multimodal Imaging and Theranostic Lab., Cardiovascular Ctr., Korea Univ. Guro Hospital (Republic of Korea); Hongki Yoo, KAIST (Republic of Korea)

12383-35

Combined light sheet microscopy and microlaser spectroscopy for novel biosensing applications

Author(s): Ross C. Cowie, Univ. of St. Andrews (United Kingdom), Univ. zu Köln (Germany); Malte C. Gather, Univ. zu Köln (Germany), Univ. of St. Andrews (United Kingdom); Marcel Schubert, Univ. zu Köln (Germany)

12383-36 • On demand | Presented live 30 January 2023

Hundreds of label-free cells tracking method based on multi-scale region of interest

Author(s): Sena Lee, Junghun Han, Hyeonyoung Kang, Seungyeop Choi, Sang Woo Lee, Sejung Yang, Yonsei Univ. (Republic of Korea)

12383-37

Label-free internal organ observation using optical coherence tomography in adult *Anopheles*, *Aedes albopictus*, and *Culex pipiens* mosquitoes

Author(s): Jannat Amrin Luna, Kyungpook National Univ. (Republic of Korea); Naresh Kumar Ravichandran, Korea Basic Science Institute (Republic of Korea); S.M. Abu Saleah, Kyungpook National Univ. (Republic of Korea); Ruchire Eranga Wijesinghe, Univ. of Sri Jayewardenepura (Sri Lanka); Mansik Jeon, Jeehyun Kim, Kyungpook National Univ. (Republic of Korea)

12383-39 • On demand | Presented live 30 January 2023

Proof of concept for microfluidic spectral flow cytometry

Author(s): Gillian McMahon, Los Alamos National Lab. (United States), Univ. of California, San Diego (United States); Kristen Wilding, Claire K. Sanders, Paul W. Fenimore, Los Alamos National Lab. (United States); Douglas J. Perkins, The Univ. of New Mexico (United States), Siaya County Referral Hospital (Kenya); Judith R. Mourant, Los Alamos National Lab. (United States)

12383-40 • On demand | Presented live 30 January 2023

Label-free characterization and subtyping of renal amyloidosis by Raman spectroscopy and machine learning

Author(s): Jeong Hee Kim, Ishan Barman, Johns Hopkins Univ. (United States)

TUESDAY 31 JANUARY

SESSION 3: BIOMEDICAL IMAGING USING A DMD OR OTHER ADVANCED TECHNIQUES I

Joint Session with Conferences 12383 and 12435

9:00 AM - 10:00 AM

Moscone Center, Room 305 (Level 3 South)

Session chair: John Ehmke, Texas Instruments Inc. (United States)

12435-4

Hyperspectral mid-infrared single-pixel microscopy

Author(s): Alexander Ebner, Paul Gatterer, Ivan Zorin, Markus Brandstetter, Christian Rankl, Research Ctr. for Non Destructive Testing GmbH (Austria)

31 January 2023 • 9:00 AM - 9:20 AM PST | Moscone Center, Room 305 (Level 3 South)

12435-5 • 9:20 AM - 9:40 AM

Massively parallel confocal dark field microscopy

Author(s): James S. Napier, Markus Schellenberg, Gerhard Kauer, Hochschule Emden-Leer (Germany); Walter Neu, Hochschule Emden-Leer (Germany), Carl von Ossietzky Univ. Oldenburg (Germany)

12435-6 • 9:40 AM - 10:00 AM

Single-pixel imaging through turbid media by combining a programmable light source and a DMD

Author(s): Erick F. Ipus Bados, Armin J. M. Lenz, Jesús Lancis, Univ. Jaume I (Spain); Alba M. Paniagua-Díaz, Pablo Artal, Univ. de Murcia (Spain); Enrique Tajahuerce, Univ. Jaume I (Spain)

SESSION 4: BIOMEDICAL IMAGING USING A DMD OR OTHER ADVANCED TECHNIQUES II

Joint Session with Conferences 12383 and 12435

10:30 AM - 12:00 PM

Moscone Center, Room 305 (Level 3 South)

Session chair: John Ehmke, Texas Instruments Inc. (United States)

12435-7 • 10:30 AM - 11:00 AM

Hybrid illumination DLP architecture for non-invasive, optical surveillance system of vascular access for hemodialysis patients *(Invited Paper)*

Author(s): Gal Goshen, Hagay Drori, Oz Seadia, PatenSee (Israel)

12435-8 • 11:00 AM - 11:20 AM

Facile incorporation of DMD-based photolithography and photopatterning techniques in soft condensed matter research

Author(s): Jordi Ignés-Mullol, Univ. de Barcelona (Spain)

12383-14 • 11:20 AM - 11:40 AM

Learning wavefront shaping through reinforcement learning in a simulation environment

Author(s): Rahmetullah Varol, Tülay Aydın, Univ. der Bundeswehr München (Germany)

12435-9 • 11:40 AM - 12:00 PM

Optimal fitting strategy for modulated illumination localization microscopy

Author(s): Hongfei Zhu, Renjie Zhou, The Chinese Univ. of Hong Kong (Hong Kong, China)

Coffee Break 12:00 PM - 12:30 PM

SESSION 5: CYTOMICS I

1:30 PM - 3:00 PM

Moscone Center, Room 305 (Level 3 South)

Session chair: Jingjing Zhao, Stanford Univ. (United States)

12383-15 • 1:30 PM - 2:00 PM

Correlating NAD(P)H lifetime shifts to treatment of breast cancer cells: a metabolic screening study with time-resolved flow cytometry *(Invited Paper)*

Author(s): Samantha Valentino, Karla Ortega-Sandoval, Kevin D. Houston, Jessica P. Houston, New Mexico State Univ. (United States)

12383-16 • 2:00 PM - 2:20 PM

Using a cell image classification workflow to identify cells based on fluorescence localization

Author(s): Michael D. Zordan, Su-Hui Chiang, Haipeng Tang, Thanh Nguyen, Albert Huang, Ming-Chang Liu, Sony Corp. of America (United States)

12383-17 • 2:20 PM - 2:40 PM

Spectral imaging fluorescence flow cytometer for high-content analysis

Author(s): Yong Han, Tsinghua Univ. (China); Jingjing Zhao, Stanford Univ. (United States); Zixi Chao, Zeheng Jiao, Tsinghua Univ. (China); Attila Tárnok, Univ. Leipzig (Germany); Zheng You, Tsinghua Univ. (China)

12383-18 • 2:40 PM - 3:00 PM

A UV-C LED-based reactor for continuous decontamination of the sheath fluid in a flow-cytometric cell sorter

Author(s): Konrad von Volkmann, APE Angewandte Physik & Elektronik GmbH (Germany); Jenny Kirsch, Kerstin Heinrich, Deutsches Rheuma-Forschungszentrum (Germany); Benjamin Grothe, APE Angewandte Physik & Elektronik GmbH (Germany); Johannes Glaab, Ferdinand-Braun-Institut (Germany); Toralf Kaiser, Deutsches Rheuma-Forschungszentrum (Germany)

Lunch/Exhibition Break 3:00 PM - 4:30 PM

SESSION 6: CYTOMICS II

3:30 PM - 5:10 PM

Moscone Center, Room 305 (Level 3 South)

Session chair: Jessica P. Houston, New Mexico State Univ. (United States)

12383-19 • 3:30 PM - 4:00 PM

High-throughput parallel 3D imaging flow cytometry *(Invited Paper)*

Author(s): Masashi Ugawa, Sadao Ota, The Univ. of Tokyo (Japan)

12383-20 • 4:00 PM - 4:20 PM

Real-time precision opto-control of chemical processes in live cells

Author(s): Matthew G. Clark, Gil A. Gonzalez, Yiyang Luo, Jesus Aldana-Mendoza, Mark S. Carlsen, Greg Eakins, Mingji Dai, Chi Zhang, Purdue Univ. (United States)

12383-21 • 4:20 PM - 4:50 PM

Metrological flow cytometry to traceably measure the size and refractive index of single nanoparticles *(Invited Paper)*

Author(s): Martine Kuiper, Amsterdam UMC (Netherlands), VSL Dutch Metrology Institute (Netherlands); Richard Koops, VSL Dutch Metrology Institute (Netherlands); Rienk Nieuwland, Ton van Leeuwen, Edwin van der Pol, Amsterdam UMC (Netherlands)

12383-22 • 4:50 PM - 5:10 PM

Dynamic region of interest histometry to analyze endogenous calcium activity in intact lung tissue

Author(s): Pallavi Sen, Jennifer M. Knighten, Takreem Aziz, Christian Macarilla, Na Gong, Mark S. Taylor, Christopher Francis, Univ. of South Alabama (United States)

Coffee Break 5:10 PM - 5:40 PM

Conference 12383

WEDNESDAY 1 FEBRUARY

SESSION 7: RAMAN SPECTROSCOPY AND SPECTRAL APPROACHES

8:20 AM - 10:10 AM

Moscone Center, Room 305 (Level 3 South)

Session chair: Jessica P. Houston, New Mexico State Univ. (United States)

12383-23 • 8:20 AM - 8:50 AM

Surface enhanced Raman spectroscopy based analysis of SARS-CoV-2 spike protein binding to ACE2 receptor (Invited Paper)

Author(s): Christoph Wetzel, Linda Jansen-Olliges, Carsten Zeilinger, Bernhard Roth, Leibniz Univ. Hannover (Germany)

12383-24 • 8:50 AM - 9:10 AM

Raman-based analysis and structural differentiation of potentially harmful algae and cyanobacteria

Author(s): Christoph Wetzel, Bernhard Roth, Leibniz Univ. Hannover (Germany)

12383-25 • 9:10 AM - 9:30 AM

Raman micro-spectroscopy reveals the spatial distribution of fumarate in living cells

Author(s): Marlous Kamp, Univ. of Cambridge (United Kingdom); Jakub Surmacki, Lodz Univ. of Technology (Poland); Vincent Zecchini, Univ. of Cambridge (United Kingdom); Karolina Chrabaszcz, Institute of Nuclear Physics (Poland); Marc S. Mondejar, Tim Young, Univ. of Cambridge (United Kingdom); Christian Frezza, Univ. zu Köln (Germany); Sarah E. Bohndiek, Univ. of Cambridge (United Kingdom)

12383-26 • 9:30 AM - 9:50 AM

Raman2RNA: Live-cell label-free prediction of single-cell expression profiles by Raman microscopy

Author(s): Koseki J. Kobayashi-Kirschvink, Broad Institute of MIT and Harvard (United States); Charles S. Comiter, Massachusetts Institute of Technology (United States); Ke Zhang, Massachusetts General Hospital (United States); Jeon Woong Kang, Massachusetts Institute of Technology (United States); Jian Shu, Massachusetts General Hospital (United States); Peter So, Massachusetts Institute of Technology (United States); Aviv Regev, Genentech, Inc. (United States)

12383-27 • 9:50 AM - 10:10 AM

Combined hyperspectral imaging, monolayer stress microscopy, and S8 image analysis approaches for simultaneously interrogating cellular signals and biomechanics

Author(s): Silas J. Leavesley, Santana Johnson, Sunita S. Paudel, Jennifer M. Knighten, Dhananjay T. Tambe, Michael M. Francis, Na Gong, Mark S. Taylor, Thomas C. Rich, Univ. of South Alabama (United States)

SESSION 8: FUNCTIONAL IMAGING II

10:40 AM - 11:40 AM

Moscone Center, Room 305 (Level 3 South)

Session chair: Jessica P. Houston, New Mexico State Univ. (United States)

12383-28 • 10:40 AM - 11:00 AM

Tracking early tuberous sclerosis complex diseased organoid development with quantitative oblique back-illumination microscopy

Author(s): Caroline E. Filan, Seleipiri Charles, Paloma Casteleiro Costa, Brian Cheng, Georgia Institute of Technology (United States); Hang Lu, Francisco Robles, Georgia Institute of Technology (United States), Interdisciplinary Program in Bioengineering, Georgia Institute of Technology (United States)

12383-29 • 11:00 AM - 11:20 AM

Automatic detection of tertiary lymphoid structures in whole-slide images of triple-negative breast cancer biopsies

Author(s): Madeleine S. Durkee, The Univ. of Chicago (United States); Rebecca Abraham, Marcus R. Clark, The Univ. of Chicago Medicine (United States); Maryellen L. Giger, The Univ. of Chicago (United States)

12383-30 • 11:20 AM - 11:40 AM

Micro-optical coherence tomography-confocal fluorescence microscopy (μ OCT-FCM) for probing cystic fibrosis pathogenesis

Author(s): Linhui Yu, Wellman Ctr. for Photomedicine, Massachusetts General Hospital (United States), Harvard Medical School (United States); Courtney F. Petty, Gregory Fleming James Cystic Fibrosis Research Ctr. (United States), The Univ. of Alabama at Birmingham School of Medicine (United States); Hui Min Leung, Wellman Ctr. for Photomedicine, Massachusetts General Hospital (United States), Harvard Medical School (United States); Susan E. Birket, Gregory Fleming James Cystic Fibrosis Research Ctr. (United States), The Univ. of Alabama at Birmingham School of Medicine (United States); Steven M. Rowe, Gregory Fleming James Cystic Fibrosis Research Ctr. (United States), The Univ. of Alabama at Birmingham (United States); Guillermo J. Tearney, Wellman Ctr. for Photomedicine, Massachusetts General Hospital (United States), Harvard Medical School (United States), Massachusetts General Hospital (United States)

Conference 12384

29 - 31 January 2023 | Moscone Center, Room 303 (Level 3 South)

Multiphoton Microscopy in the Biomedical Sciences XXIII

Conference Chairs: **Ammasi Periasamy**, Univ. of Virginia (United States); **Peter T. C. So**, Massachusetts Institute of Technology (United States); **Karsten König**, Univ. des Saarlandes (Germany), JenLab GmbH (Germany)

Program Committee: **Margarida Barroso**, Albany Medical College (United States); **Wolfgang Becker**, Becker & Hickl GmbH (Germany); **Paul J. Campagnola**, Univ. of Wisconsin-Madison (United States); **Ji-Xin Cheng**, Boston Univ. (United States); **Alberto Diaspro**, Istituto Italiano di Tecnologia (Italy); **Michelle Digman**, Univ. of California, Irvine (United States); **Chen-Yuan Dong**, National Taiwan Univ. (Taiwan); **Kevin W. Eliceiri**, Univ. of Wisconsin-Madison (United States); **Scott Fraser**, The Univ. of Southern California (United States); **Katsumasa Fujita**, Osaka Univ. (Japan); **Enrico Gratton**, Univ. of California, Irvine (United States); **Min Gu**, RMIT Univ. (Australia); **Stefan W. Hell**, Max-Planck-Institut für Biophysikalische Chemie (Germany); **Na Ji**, Univ. of California, Berkeley (United States); **Fu-Jen Kao**, National Yang-Ming Univ. (Taiwan); **Darryl McCoy**, Coherent Scotland Ltd. (United Kingdom); **Wei Min**, Columbia Univ. (United States); **Junle Qu**, Shenzhen Univ. (China); **Ian A. Read**, Spectra-Physics, a division of MKS Instruments (United States); **Angelika C. Rueck**, Univ. Ulm (Germany); **Lingyan Shi**, Univ. of California, San Diego (United States); **Klaus Suhling**, King's College London (United Kingdom); **Yuansheng Sun**, ISS, Inc. (United States); **Karissa Tilbury**, Univ. of Maine (United States); **Steven S. Vogel**, National Institutes of Health (United States); **Chris Xu**, Cornell Univ. (United States); **Elena V. Zagaynova**, Nizhny Novgorod State Medical Academy (Russian Federation); **Bernhard Zimmermann**, Carl Zeiss Jena GmbH (Germany)

SUNDAY 29 JANUARY

WELCOME AND INTRODUCTION

8:20 AM - 8:30 AM

Moscone Center, Room 303 (Level 3 South)

Session chair: Ammasi Periasamy, Univ. of Virginia (United States)

SESSION 1: KEYNOTE SESSION

8:30 AM - 10:00 AM

Moscone Center, Room 303 (Level 3 South)

Session chair: Melissa C. Skala, Morgridge Institute for Research (United States)

12384-1 • 8:30 AM - 9:00 AM

Towards widefield multiphoton mesoscopy with the Mesolens (*Keynote Presentation*)

Author(s): Shannan Foylan, William B. Amos, John Dempster, Gail McConnell, Univ. of Strathclyde (United Kingdom)

12384-2 • 9:00 AM - 9:30 AM

Multiphoton microscopy at high spatiotemporal resolution (*Keynote Presentation*)

Author(s): Na Ji, Univ. of California, Berkeley (United States)

12384-3 • 9:30 AM - 10:00 AM

The Phasor approach to FLIM: Metabolic imaging reveals how P53 and REV3L regulate energy metabolism in lung carcinoma cells (*Keynote Presentation*)

Author(s): Michelle Digman, Univ. of California, Irvine (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: WOMEN IN MULTIPHOTON MICROSCOPY I

10:30 AM - 12:10 PM

Moscone Center, Room 303 (Level 3 South)

Session chair: Angelika C. Rueck, Univ. Ulm (Germany)

12384-4 • 10:30 AM - 10:50 AM

Simultaneous NAD(P)H and FAD Fluorescence Lifetime Microscopy reveals long UVA-induced metabolic stress in reconstructed human skin (*Invited Paper*)

Author(s): Chiara Stringari, Thi Phuong Lien Ung, Seongbin Lim, Xavier Solinas, Pierre Mahou, Anatole Chessel, Ecole Polytechnique (France); Claire Marionnet, Thomas Bornschlößl, L'Oréal Recherche et Innovation (France); Emmanuel Beaupaire, CNRS, Ecole Polytechnique (France); Françoise Bernerd, Ana-Maria Pena, L'Oréal Recherche et Innovation (France)

12384-5 • 10:50 AM - 11:10 AM

Fluorescence lifetime imaging of NAD(P)H and FAD to monitor immune cell metabolism and function (*Invited Paper*)

Author(s): Melissa C. Skala, Morgridge Institute for Research (United States)

12384-6 • 11:10 AM - 11:30 AM

Intravital optical imaging of wound healing in human skin (*Invited Paper*)

Author(s): Mihaela Balu, Juvinch Vicente, Amanda Durkin, Beckman Laser Institute and Medical Clinic (United States); Kristen M. Kelly, Jessica Shiu, Anand K. Ganesan, Univ. of California, Irvine (United States)

12384-7 • 11:30 AM - 11:50 AM

In vivo melanin 3D quantification and z-epidermal distribution by multiphoton FLIM, phasor and Pseudo-FLIM analyses (*Invited Paper*)

Author(s): Ana-Maria Pena, L'Oréal Recherche et Innovation (France); Etienne Decencièrre, MINES ParisTech (France); Sébastien Brizion, Peggy Sextius, L'Oréal Recherche et Innovation (France); Serge Koudoro, MINES ParisTech (France); Thérèse Baldewick, L'Oréal Recherche et Innovation (France); Emmanuelle Tancrede-Bohin, L'Oréal Recherche et Innovation (France), Hôpital Saint-Louis (France)

Conference 12384

12384-8 • 11:50 AM - 12:10 PM

In vivo two-photon imaging of topically applied care cosmetics and pharmaceuticals in human skin (Invited Paper)

Author(s): Aisada König, Univ. des Saarlandes (Germany), JenLab GmbH (Germany); Karsten König, Univ. des Saarlandes (Germany), JenLab GmbH (Germany)

Lunch/Exhibition Break 12:10 PM - 1:30 PM

SESSION 3: WOMEN IN MULTIPHOTON MICROSCOPY II

1:30 PM - 2:50 PM

Moscone Center, Room 303 (Level 3 South)

Session chair: Margarida Barroso, Albany Medical College (United States)

12384-9 • 1:30 PM - 1:50 PM

Metabolic FLIM and oxygen PLIM/dFLIM: Techniques, algorithms and applications (Invited Paper)

Author(s): Angelika C. Rueck, Johannes Wieland, Björn von Einem, Kirsten Reess, Univ. Ulm (Germany); Christian Freymüller, Ronald Sroka, Klinikum der Univ. München Grosshadern (Germany); Daniela Nobre, Univ. de Coimbra (Portugal); Nilanjon Naskar, Univ. Ulm (Germany)

12384-10 • 1:50 PM - 2:10 PM

Quantitative analysis of label-free fluorescence lifetime images for single cell measurements of metabolism (Invited Paper)

Author(s): Alex J. Walsh, Linghao Hu, Nianchao Wang, Addison Threet, Texas A&M Univ. (United States)

12384-11 • 2:10 PM - 2:30 PM

Quantitative analysis of collagen organization from second-harmonic generation images (Invited Paper)

Author(s): Pedro Guimarães, Coimbra Institute for Biomedical Imaging and Translational Research, Univ. de Coimbra (Portugal); Maria Mateus, Univ. de Coimbra (Portugal); António Miguel Morgado, Ana Batista, Coimbra Institute for Biomedical Imaging and Translational Research, Univ. de Coimbra (Portugal)

12384-12 • 2:30 PM - 2:50 PM

SRS, MPF, and SHG integrated multimodal metabolic imaging platform for studying aging and diseases (Invited Paper)

Author(s): Lingyan Shi, Univ. of California, San Diego (United States)

Coffee Break 2:50 PM - 3:20 PM

SESSION 4: WOMEN IN MULTIPHOTON MICROSCOPY III

3:20 PM - 5:00 PM

Moscone Center, Room 303 (Level 3 South)

Session chair: Adeela Syed, Univ. of California, Irvine (United States)

12384-13 • 3:20 PM - 3:40 PM

Multiscale Imaging of tumor targeted drug delivery (Invited Paper)

Author(s): Margarida Barroso, Albany Medical College (United States)

12384-14 • 3:40 PM - 4:00 PM

LEAD microscopy performing at 100's kHz frames per second for nonlinear imaging and 3D-imaging flow cytometry (Invited Paper)

Author(s): Adela Ben-Yakar, The Univ. of Texas at Austin (United States)

12384-15 • 4:00 PM - 4:20 PM

Computational multiphoton microscopy for bi-functional fluorescence and refractive index imaging (Invited Paper)

Author(s): Yi Xue, Univ. of California, Davis (United States)

12384-16 • 4:20 PM - 4:40 PM

An energetic, tunable, ultra-broadband fiber source for multiphoton microscopy (Invited Paper)

Author(s): Sixian You, Massachusetts Institute of Technology (United States)

12384-17 • 4:40 PM - 5:00 PM

Nonlinear optical imaging of benzothiazole analogues of BODIPY dyes (Invited Paper)

Author(s): Maros Smolicek, Comenius Univ. in Bratislava (Slovakia); Dusan Chorvat, International Laser Ctr. (Slovakia); Peter Hrobarik, Comenius Univ. in Bratislava (Slovakia); Alzbeta Marček Chorvátová, International Laser Ctr. (Slovakia)

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Session chairs: Kevin W. Eliceiri, Univ. of Wisconsin-Madison (United States), Lingyan Shi, Univ. of California, San Diego (United States), Fu-Jen Kao, National Yang Ming Chiao Tung Univ. (Taiwan), Adeela Syed, Univ. of California, Irvine (United States)

Conference attendees are invited to attend the Sunday *BiOS poster Session*. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM - 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12384-49

Exploring the effect of protein synthesis on microglia peripheral processes motility

Author(s): Shengxuan Chen, Washington Univ. in St. Louis (United States); Michael Vasek, Annie Bice, Seana Bice, Joseph Dougherty, Joseph Culver, Washington Univ. School of Medicine in St. Louis (United States)

12384-50

Gentle two-photon volumetric imaging via tailored optical pulses

Author(s): Chun Hung Weng, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); Kyu Young Han, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

12384-51 • On demand | Presented live 29 January 2023

We need to talk about laser pulse energy stability

Author(s): Lukas Kontenis, Jonas Berzinš, Karolis Neimontas, Light Conversion Ltd. (Lithuania)

12384-52 • On demand | Presented live 29 January 2023

Numerical characterization of optothermal interaction in two-photon line excitation array detection microscopy

Author(s): Aditya Roy, Adela Ben-Yakar, The Univ. of Texas at Austin (United States)

12384-53 • On demand | Presented live 29 January 2023

Spectrally resolved ratiometric multiphoton fluorescence and second harmonic imaging of noninvasive vascular scaffolds in porcine arterial walls

Author(s): Tolulope Ajuwon, Tochukwu Emeakaroha, Steve J. Smith, South Dakota School of Mines and Technology (United States)

12384-54 • On demand | Presented live 29 January 2023

One pattern analysis for the quantitative determination of protein interactions in living plant cells

Author(s): Felix Koberling, PicoQuant GmbH (Germany); Jan Maika, Institute for Developmental Genetics and Cluster of Excellence on Plant Sciences, Heinrich-Heine-Univ. Düsseldorf (Germany); Benedikt Krämer, PicoQuant GmbH (Germany); Frank Wellmer, Smurfit Institute of Genetics, Trinity College Dublin (Ireland); Stefanie Weidtkamp-Peters, Ctr. for Advanced Imaging, Heinrich-Heine-Univ. Düsseldorf (Germany); Yvonne Stahl, Rüdiger Simon, Institute for Developmental Genetics and Cluster of Excellence on Plant Sciences (Germany)

12384-55

Compact multichannel two-photon fluorescence lifetime imaging microscopy using a single detector

Author(s): UnGyo Kang, Hyeong Soo Nam, Hongki Yoo, KAIST (Republic of Korea)

12384-56 • On demand | Presented live 29 January 2023

Longitudinal two-photon intravital kidney imaging of DHA crystal formation in the adenine-induced chronic kidney disease mouse model

Author(s): Jieun Choi, KAIST (Republic of Korea); Min-sun Choi, Soonchunhyang Univ. Hospital Cheonan (Republic of Korea); Jewhi Jeon, Jieun Moon, KAIST (Republic of Korea); Ji-hye Lee, Eun Young Lee, Soonchunhyang Univ. Hospital Cheonan (Republic of Korea); Pilhan Kim, KAIST (Republic of Korea)

12384-57

A quasi-phase-matching framework for predicting SHG spatial emission pattern to investigate the collagen fibril assembly in biological tissues

Author(s): Emily M. Shelton, Paul J. Campagnola, Univ. of Wisconsin-Madison (United States)

12384-59 • On demand | Presented live 29 January 2023

LPS-induced Chronic Neuroinflammation Alters Cerebral Oxygenation But Not Blood Flow in a Mouse Model of Alzheimer's Disease

Author(s): Chang Liu, Northeastern Univ. (United States); Mohammed A. Alfadhel, Northeastern Univ. (United States), Athinoula A. Martinos Cr for Biomedical Imaging, Massachusetts General Hospital, Harvard Medical School (United States); Alfredo Cárdenas-Rivera, Mohammed A. Yaseen, Northeastern Univ. (United States)

12384-60 • On demand | Presented live 29 January 2023

Whole-brain optical access and longitudinal imaging in an adult vertebrate, *Danionella dracula*, with multiphoton microscopy

Author(s): Najva Akbari, Stanford Univ. (United States); Rose L. Tatarsky, Kristine E. Kolkman, Joseph R. Fetcho, Andrew H. Bass, Chris Xu, Cornell Univ. (United States)

12384-61 • On demand | Presented live 29 January 2023

Fast fluorescence lifetime imaging microscopy using single- and multi-photon peak event detection for rapid quantification of NAD(P)H-related metabolic dynamics during apoptosis

Author(s): Janet E. Sorrells, Marina Marjanovic, Rishyashring R. Iyer, Lingxiao Yang, Eric J. Chaney, Geng Wang, Haohua Tu, Stephen A. Boppart, Univ. of Illinois (United States)

12384-62 • On demand | Presented live 29 January 2023

Enhanced Resolution Dispersion Optimized Multiphoton Microscopy with Spatial Frequency Modulation Imaging

Author(s): Daniel Scarbrough, Anna Thomas, Colorado School of Mines (United States); Jeffrey Field, Randy Bartels, Colorado State Univ. (United States); Jeff Squier, Colorado School of Mines (United States)

12384-63

Near infrared fluorescence lifetime FRET microscopy to evaluate antibody drug binding in various HER2 positive cancer cells

Author(s): Catherine Sherry, Amit Verma, Albany Medical College (United States); Jason Smith, Vikas Pandey, Rensselaer Polytechnic Institute (United States); John Williams, City of Hope (United States); Xavier Michalet, Univ. of California, Los Angeles (United States); Xavier Intes, Rensselaer Polytechnic Institute (United States); Margarida Barroso, Albany Medical College (United States)

12384-65

FRET with broadband LED Light Source - Localization of protein-protein interactions in living cells

Author(s): Kavita Aswani, Excelitas Canada Inc. (Canada)

12384-66 • On demand | Presented live 29 January 2023

Optimizing machine learning hyperparameters in two-photon FLIM image analysis

Author(s): Brian P. Mbogo, Karsten Siller, Horst Wallrabe, Shagufta Rehman Alam, Ammasi Periasamy, Jiaxin Zhang, Univ. of Virginia (United States)

12384-69 • On demand | Presented live 29 January 2023

Diffraction limited resolution over long working distances for two-photon brain imaging

Author(s): Tayebah Sahraeibelverdi, Ahmad Shirazi, Miki Lee, Samuel Kwon, Thomas Wang, Kenn Oldham, Univ. of Michigan (United States)

Conference 12384

MONDAY 30 JANUARY

SESSION 5: FLIM/FRET/ FCS I

8:20 AM - 9:20 AM

Moscone Center, Room 303 (Level 3 South)

Session chair: Yuansheng Sun, ISS, Inc. (United States)

12384-18 • 8:20 AM - 8:40 AM

Quantitative, reproducible Fluorescence Lifetime Imaging made easy (*Invited Paper*)

Author(s): Felix Koberling, PicoQuant GmbH (Germany)

12384-19 • 8:40 AM - 9:00 AM

Ultra-fast fluorescence decay in biological material (*Invited Paper*)

Author(s): Lukas Z. Braun, Julius Heitz, Becker & Hickl GmbH (Germany); Vladislav Shcheslavskiy, Becker & Hickl GmbH (Germany), Privolzhskiy Research Medical Univ. (Russian Federation); Cornelia Junghans, Becker & Hickl GmbH (Germany); Oksana Garanina, Vadim Elagin, Privolzhsky Research Medical Univ. (Russian Federation); Wolfgang Becker, Becker & Hickl GmbH (Germany)

12384-20 • 9:00 AM - 9:20 AM

Monitoring oligomerization dynamics of individual human neurotensin receptors 1 in living cells and in SMALP nanodiscs (*Invited Paper*)

Author(s): Lukas Spantzel, Iván Pérez, Thomas Heitkamp, Anika Westphal, Stefanie Reuter, Ralf Mrowka, Michael Börsch, Universitätsklinikum Jena (Germany)

JENLAB YOUNG INVESTIGATORS AWARD ORAL PRESENTATIONS

30 January 2023 • 9:20 AM - 10:00 AM

Moscone Center, Room 303 (Level 3 South)

Session chair: Ammasi Periasamy, Univ. of Virginia (United States)

This Session includes oral presentations by the JenLab award participants.

12384-59

Inflammation disrupts microvascular oxygenation and blood flow in a mouse model of Alzheimer's disease

12384-60

Whole-brain optical access and longitudinal imaging in an adult vertebrate, *Danio rerio*, with multiphoton microscopy

12384-61

Fast fluorescence lifetime imaging microscopy using single- and multi-photon peak event detection for rapid quantification of NAD(P)H-related metabolic dynamics during apoptosis

12384-62

Cascaded wavelength domain and spatial domain spatial frequency modulation imaging for multiphoton microscopy

12384-63

Near infrared fluorescence lifetime FRET microscopy to evaluate antibody drug binding in various HER2 positive cancer cells

12384-66

Optimizing Machine Learning Hyperparameters in Two-photon FLIM Image Analysis

Coffee Break 10:00 AM - 10:30 AM

SESSION 6: FLIM/FRET/ FCS II

10:30 AM - 12:05 PM

Moscone Center, Room 303 (Level 3 South)

Session chair: Michael Börsch, Universitätsklinikum Jena (Germany)

12384-21 • 10:30 AM - 10:50 AM

Characterization of a time-resolved spectral detector for spectral fluorescence lifetime imaging with the parallel 16-channel FastFLIM and the phasor analysis (*Invited Paper*)

Author(s): Yuansheng Sun, ISS, Inc. (United States); Trung Duc Nguyen, Yuan-I Chen, The Univ. of Texas at Austin (United States); Ulas C. Coskun, Shih-Chu Liao, ISS, Inc. (United States); Hsin-Chih Yeh, The Univ. of Texas at Austin (United States)

12384-22 • 10:50 AM - 11:05 AM

Mechanosensitive protein-protein interactions in nascent focal adhesions determined by three-colour FRET sensing using multiphoton fluorescence lifetime imaging microscopy

Author(s): Conor A. Treacy, Ambrish Kumar, Tam Bui, Simon P. Poland, Mark Pfuhl, Maddy Parsons, Simon M. Ameer-Beg, King's College London (United Kingdom)

12384-23 • 11:05 AM - 11:20 AM

NIR Fluorescence lifetime macroscopic imaging with a novel time-gated SPAD camera

Author(s): Xavier Michalet, Univ. of California, Los Angeles (United States); Arin C. Ulku, Michael A. Wayne, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Shimon Weiss, Univ. of California, Los Angeles (United States); Claudio Bruschini, Edoardo Charbon, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12384-24 • 11:20 AM - 11:35 AM

Small SPAD-arrays for confocal fluorescence lifetime imaging

Author(s): Max Tillmann, Felix Koberling, Tino Roehlicke, Michael Wahl, Rainer Erdmann, PicoQuant GmbH (Germany); Ivan Michel Antolović, Pi Imaging Technology SA (Switzerland)

12384-25 • 11:35 AM - 11:50 AM

3D time resolved multiphoton fluorescence lifetime imaging microscopy of nano-crystalline agricultural treatments on living plant tissue

Author(s): Xiaotong Yuan, Varun Mannam, Scott Howard, Univ. of Notre Dame (United States)

12384-26 • 11:50 AM - 12:05 PM

Repetition rate control for high-speed two-photon fluorescence lifetime imaging microscopy

Author(s): Jeonggeun Song, KAIST (Republic of Korea); Juehyung Kang, Hanyang Univ. (Republic of Korea); Hyeong Soo Nam, Ungyo Kang, KAIST (Republic of Korea); Hyun Jung Kim, Jin Won Kim, Korea Univ. College of Medicine (Republic of Korea); Hongki Yoo, KAIST (Republic of Korea)

Lunch Break 12:05 PM - 1:30 PM

SESSION 7: TECHNOLOGY AND APPLICATIONS I

1:30 PM - 2:40 PM

Moscone Center, Room 303 (Level 3 South)

Session chair: Fu-Jen Kao, National Yang Ming Chiao Tung Univ. (Taiwan)

12384-27 • 1:30 PM - 1:45 PM

Ultrafast laser sources for non-linear Imaging: review of the latest technology

Author(s): Mantas Butkus, Coherent Corp. (United States); Marco Arrigoni, Erin McCole Dlugosz, Darryl McCoy, Coherent Corp. (United States)

12384-28 • 1:45 PM - 2:00 PM

Ultrafast lasers developments elevate biological imaging

Author(s): Ian A. Read, Spectra-Physics, a division of MKS Instruments (United States)

12384-29 • 2:00 PM - 2:20 PM

CANCELED: The use of two-photon excitation and Mueller matrix microscopy towards bioimaging (*Invited Paper*)

Author(s): Alberto Diaspro, Istituto Italiano di Tecnologia (Italy), Univ. degli Studi di Genova (Italy)

12384-70 • 2:00 PM - 2:20 PM

Replacing 12384-29: Translational research on prostate cancer using metabolic Imaging-ML-FIRR microscopy

Author(s): Ammasi Periasamy, Univ. of Virginia (United States)

12384-30 • 2:20 PM - 2:40 PM

Fast multi-photon brain-wide volumetric imaging and photostimulation (*Invited Paper*)

Author(s): Lapo Turrini, Istituto Nazionale di Ottica (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); Giuseppe de Vito, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Univ. degli Studi di Firenze (Italy); Pietro Ricci, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); Michele Sorelli, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Univ. degli Studi di Firenze (Italy); Marco Marchetti, Light4Tech Firenze S.r.l. (Italy); Francesco Vanzi, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Univ. degli Studi di Firenze (Italy); Ludovico Silvestri, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Istituto Nazionale di Ottica (Italy); Francesco Saverio Pavone, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Istituto Nazionale di Ottica (Italy)

JENLAB AND POSTER AWARDS

30 January 2023 • 2:40 PM - 3:00 PM

Moscone Center, Room 303 (Level 3 South)

Session chair: Ammasi Periasamy, Univ. of Virginia (United States)

This Session will include presentations of the JenLab and Poster Awards.

Coffee Break 3:00 PM - 3:30 PM

SESSION 8: TECHNOLOGY AND APPLICATIONS II

3:30 PM - 4:55 PM

Moscone Center, Room 303 (Level 3 South)

Session chair: Kevin W. Eliceiri, Univ. of Wisconsin-Madison (United States)

12384-31 • 3:30 PM - 3:50 PM

Toward high throughput 3D connectome imaging (*Invited Paper*)

Author(s): Fu-Jen Kao, National Yang Ming Chiao Tung Univ. (Taiwan); Ann-Shyn Chiang, National Tsing Hua Univ. (Taiwan); Scottie Liu, Tiffany Kao, National Yang Ming Chiao Tung Univ. (Taiwan); Daniel Wu, Wei-Kun Chang, Henry Liu, National Tsing Hua Univ. (Taiwan); Jerry Wong, National Yang Ming Chiao Tung Univ. (Taiwan)

12384-32 • 3:50 PM - 4:10 PM

Multimodal multiphoton tomography of human teeth (*Invited Paper*)

Author(s): Karsten König, Hans Georg Breunig, JenLab GmbH (Germany)

12384-33 • 4:10 PM - 4:25 PM

Multimodal multiphoton and vibrational microscopy reveals early therapy-induced senescence in human tumors: a non-invasive tool to prevent the risk of cancer relapse

Author(s): Arianna Bresci, Francesco Manetti, Politecnico di Milano (Italy); Silvia Ghislanzoni, Fondazione IRCCS Istituto Nazioale dei Tumori (Italy); Federico Vernuccio, Salvatore Sorrentino, Chiara Ceconello, Politecnico di Milano (Italy); Renzo Vanna, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Italia Bongarzone, Fondazione IRCCS Istituto Nazioale dei Tumori (Italy); Giulio Cerullo, Dario Polli, Politecnico di Milano (Italy)

12384-34 • 4:25 PM - 4:40 PM

Coherent exciton coupling in fluorescent protein dimers probed by two-photon polarization ratio

Author(s): Mikhail Drobizhev, Montana State Univ. (United States); Henry Puhl, Kirk Hines, Steven S. Vogel, National Institutes of Health (United States)

12384-35 • 4:40 PM - 4:55 PM

Optical gearbox enabled high-speed multiphoton microscopy

Author(s): Meng Cui, Jianian Lin, Zongyue Cheng, Purdue Univ. (United States)

Conference 12384

TUESDAY 31 JANUARY

SESSION 9: SHG/THG MICROSCOPY

31 January 2023 • 9:00 AM - 9:55 AM

Moscone Center, Room 303 (Level 3 South)

Session chair: Paul J. Campagnola, Univ. of Wisconsin-Madison (United States)

12384-36 • 9:00 AM - 9:20 AM

Multiscale SHG/THG analysis of collagen architecture alterations in human idiopathic pulmonary fibrosis tissues and in vitro models (*Invited Paper*)

Author(s): Paul J. Campagnola, Darian S. James, Nathan Sandbo, Univ. of Wisconsin-Madison (United States); Mark Jones, Univ. of Southampton (United Kingdom)

12384-37 • 9:20 AM - 9:40 AM

Analysis of the different type collagen with pixel-resolution by Dual-LC PSHG microscopy (*Invited Paper*)

Author(s): Chi-Hsiang Lien, National United Univ. (Taiwan); Anupama Nair, National Yang Ming Chiao Tung Univ. (Taiwan); Shu-Chun Chuang, Yi-Shan Lin, Kaohsiung Medical Univ. (Taiwan); Chun-Yu Lin, National Yang Ming Chiao Tung Univ. (Taiwan); Chung-Hwan Chen, Kaohsiung Medical Univ. (Taiwan); Shean-Jen Chen, National Yang Ming Chiao Tung Univ. (Taiwan)

12384-39 • 9:40 AM - 9:55 AM

Role of collagen fiber morphology and matrix stiffness on ovarian cancer cell migration using multiphoton excited fabricated image-based and StyleGAN based in vitro models

Author(s): Paul J. Campagnola, Samuel Freire Alkmin, Manish Patankar, Melissa Champer, Univ. of Wisconsin-Madison (United States)

Coffee Break 9:55 AM - 10:25 AM

SESSION 10: TECHNOLOGY AND APPLICATIONS III

31 January 2023 • 10:25 AM - 11:50 AM

Moscone Center, Room 303 (Level 3 South)

Session chair: Yi Xue, Univ. of California, Davis (United States)

12384-40 • 10:25 AM - 10:45 AM

History of clinical multiphoton tomography (*Invited Paper*)

Author(s): Karsten König, JenLab GmbH (Germany)

12384-41 • 10:45 AM - 11:00 AM

Collinear ultrasonic and multiphoton focusing for advanced functional imaging and stimulation

Author(s): Justin Little, NYU Grossman School of Medicine (United States); Behnam Tayebi, Inscopix, Inc. (United States); Yi Yuan, Yanshan Univ. (China); Michal Balberg, Holon Institute of Technology (Israel); Shy Shoham, NYU Grossman School of Medicine (United States)

12384-42 • 11:00 AM - 11:15 AM

Full-wave modelling of two-photon microscopy with spatiotemporal focussing

Author(s): Philip Wijesinghe, Kishan Dholakia, Univ. of St. Andrews (United Kingdom); Peter R. T. Munro, Univ. College London (United Kingdom)

12384-43 • 11:15 AM - 11:35 AM

Multiphoton imaging in conjunction with ICG imaging by a rigid endomicroscope combined with laser ablation in the head and neck region (*Invited Paper*)

Author(s): Chenting Lai, Bernhard Messerschmidt, Karl Reichwald, Sven Flämig, Grintech GmbH (Germany); Tino Eidam, Fabian Stutzki, Active Fiber Systems GmbH (Germany); Matteo Calvarese, Leibniz-Institut für Photonische Technologien e.V. (Germany); Hyeonsoo Bae, Leibniz-Institut für Photonische Technologien e.V. (Germany); Institutes für Physikalische Chemie, Friedrich-Schiller-Univ. Jena (Germany); Tobias Meyer, Leibniz-Institut für Photonische Technologien e.V. (Germany); Michael Schmitt, Institutes für Physikalische Chemie, Friedrich-Schiller-Univ. Jena (Germany); Herbert Gross, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Franziska Hoffmann, Orlando Guntinas-Lichius, Universitätsklinikum Jena (Germany); Jürgen Popp, Leibniz-Institut für Photonische Technologien e.V. (Germany); Institutes für Physikalische Chemie, Friedrich-Schiller-Univ. Jena (Germany)

12384-44 • 11:35 AM - 11:50 AM

Label free highly multimodal nonlinear endoscope using hollow core fiber

Author(s): Hervé Rigneault, Institut Fresnel (France); Dylan Septier, Lab. de Physique des Lasers, Atomes et Molécules (France); Gaelle Brevaille, Lightcore Technologies (France); Naveen Gajendra Kumar, Institut Fresnel (France); Jeremy Saucourt, Vasyl Mytskaniuk, Lightcore Technologies (France); Rémi Habert, Damien Labat, Karen Baudelle, Alexandre Cassez, Matteo Conforti, Géraud Bouwmans, Alexandre Kudlinski, Lab. de Physique des Lasers, Atomes et Molécules (France)

Lunch/Exhibition Break 11:50 AM - 1:30 PM

SESSION 11: TECHNOLOGY AND APPLICATIONS IV

31 January 2023 • 1:30 PM - 3:10 PM

Moscone Center, Room 303 (Level 3 South)

Session chair: Karsten König, JenLab GmbH (Germany)

12384-45 • 1:30 PM - 1:45 PM

Simultaneous 2-photon and 3-photon multimodal signal acquisition for multiphoton microscopy

Author(s): Wentao Wu, Christoph Brandt, Shuo Tang, The Univ. of British Columbia (Canada)

12384-46 • 1:45 PM - 2:00 PM

Assessment of the location dependent microstructure of the articular cartilage surface in a porcine tibiofemoral joint using nonlinear optical microscopy

Author(s): Calvin Chernyatskiy, Hongming Fan, Michael Le, Zhao Zhang, Clemson Univ. (United States); Emily Ye, Medical Univ. of South Carolina (United States); Jennifer Xsu, Maria Lutas, Bruce Gao, Tong Ye, Clemson Univ. (United States)

12384-47 • 2:00 PM - 2:15 PM

Pulse-picking multimodal nonlinear optical microscopy

Author(s): Matthew G. Clark, Gil Gonzalez, Chi Zhang, Purdue Univ. (United States)

12384-64 • 2:15 PM - 2:30 PM

single-wavelength femtosecond fiber lasers enable next-generation 2P microscopy applications

Author(s): Joseph Mastron, TOPTICA Photonics, Inc. (United States)

12384-67 • 2:30 PM - 2:50 PM

Endoscopic multiphoton fluorescence lifetime imaging of NADH

Author(s): Julius Heitz, Lukas Braun, Becker & Hickl GmbH (Germany); Dennis Eggert, Universitätsklinikum Hamburg-Eppendorf (Germany); Hauke Studier, Wolfgang Becker, Becker & Hickl GmbH (Germany); Christian Betz, Universitätsklinikum Hamburg-Eppendorf (Germany)

12384-68 • 2:50 PM - 3:10 PM

Optimization of higher harmonic generation microscopy for acute tissue imaging

Author(s): Marie L. Groot, Vrije Univ. Amsterdam (Netherlands); Frank van Mourik, Flash Pathology B.V (Netherlands); Niels Meijns, Amsterdam UMC (Netherlands); Yuanyuan Ma, Vrije Univ. Amsterdam (Netherlands); Oliver Prochnow, VALO Innovations GmbH (Germany)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12384-48 • On demand | Presenting live 28 January 2023

Stimulated Raman scattering imaging for studying sterol synthesis

Author(s): Yihui Zhou, Yongqing Zhang, Delong Zhang, Hyeon Jeong Lee, Zhejiang Univ. (China)

Conference 12385

1 - 2 February 2023 | Moscone Center, Room 102 (Level 1 South Lobby)

Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XXX

Conference Chairs: **Thomas G. Brown**, Univ. of Rochester (United States); **Tony Wilson**, Univ. of Oxford (United Kingdom); **Laura Waller**, Univ. of California, Berkeley (United States)

Program Committee: **Martin Booth**, Univ. of Oxford (United Kingdom); **Charles A. DiMarzio**, Northeastern Univ. (United States); **Jonathan T.C. Liu**, Univ. of Washington (United States); **Raimund J. Ober**, Texas A&M Univ. (United States); **Chrysanthé Preza**, The Univ. of Memphis (United States); **Monika Ritsch-Marte**, Medizinische Univ. Innsbruck (Austria); **Zachary J. Smith**, Univ. of Science and Technology of China (China)

WEDNESDAY 1 FEBRUARY

SESSION 1: INSTRUMENTATION AND METHODS FOR MICROSCOPY

1 February 2023 • 8:30 AM - 10:10 AM

Moscone Center, Room 102 (Level 1 South Lobby)

Session chair: Martin J. J. Booth, Univ. of Oxford (United Kingdom)

12385-1 • 8:30 AM - 8:50 AM

Adaptive optics 3d structured illumination super resolution microscopy with fast remote focusing

Author(s): Danail Stoychev, Richard Parton, Ana Rita Faria, Matthew Wincott, Univ. of Oxford (United Kingdom); Ian M. Dobbie, Johns Hopkins Univ. (United States); Lothar Schermelleh, Ilan Davis, Martin J. J. Booth, Jingyu Wang, Univ. of Oxford (United Kingdom)

12385-2 • 8:50 AM - 9:10 AM

Rapid block-face serial sectioning tomography for automated three-dimensional histological imaging

Author(s): Wentao Yu, Yan Zhang, Lei Kang, Claudia T. K. Lo, Terence T. W. Wong, Hong Kong Univ. of Science and Technology (Hong Kong, China)

12385-3 • 9:10 AM - 9:30 AM

Synthetic dipole generated in a photonic integrated circuit

Author(s): Tyler V. Howard, Univ. of Rochester (United States); Thomas G. Brown, Univ. of Rochester (United States)

12385-4 • 9:30 AM - 9:50 AM

Compressive time-resolved multispectral fluorescence microscopy with single-pixel camera

Author(s): Alberto Ghezzi, Politecnico di Milano (Italy); Andrea Farina, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Armin J. M. Lenz, Institute of New Imaging Technologies, Univ. Jaume I (Spain); Fernando Soldevila Torres, Lab. Kastler Brossel, CNRS (France), Univ. PSL (France), Sorbonne Univ. (France); Enrique Tajahuerce, Institute of New Imaging Technologies, Univ. Jaume I (Spain); Andrea Bassi, Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy); Gianluca Valentini, Cosimo D'Andrea, Politecnico di Milano (Italy)

12385-5 • 9:50 AM - 10:10 AM

Optical sectioning microscopy with structured illumination and single-pixel detection

Author(s): Luis Ordóñez, Erick Ipus, Armin J. M. Lenz, Jesús Lancis, Enrique Tajahuerce, Univ. Jaume I (Spain)

Coffee Break 10:10 AM - 10:40 AM

SESSION 2: SINGLE-PLANE ILLUMINATION/ LIGHT-SHEET MICROSCOPY

1 February 2023 • 10:40 AM - 12:00 PM PST | Moscone Center, Room 102 (Level 1 South Lobby)

Session chair: Thomas G. Brown, The Institute of Optics, Univ. of Rochester (United States)

12385-6 • 10:40 AM - 11:00 AM

3D pathology of cleared clinical specimens using an optimized nonorthogonal dual-objective (NODO) open-top light-sheet (OTLS) microscope

Author(s): Kevin W. Bishop, Adam K. Glaser, Lindsey A. Barner, Robert B. Serafin, Jonathan T. C. Liu, Univ. of Washington (United States)

12385-7 • 11:00 AM - 11:20 AM

Single objective light sheet microscopy with multi-direction excitation and structured light

Author(s): Yang Liu, Chan Zuckerberg Biohub (United States); Ming Song, Bingxi Liu, Peter A. Kner, The Univ. of Georgia (United States)

12385-9 • 11:20 AM - 11:40 AM

High-speed light-sheet microscopy imaging and data post-processing using custom hardware and software solutions

Author(s): Giacomo Mazzamuto, National Research Council (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Univ. degli Studi di Firenze (Italy); Ludovico Silvestri, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), National Research Council (Italy), Univ. degli Studi di Firenze (Italy); Giuseppe Sancataldo, Univ. degli Studi di Palermo (Italy); Vladislav Gavryusev, Univ. degli Studi di Firenze (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); Marina Scardigli, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); Irene Costantini, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Univ. degli Studi di Firenze (Italy); Francesco S. Pavone, Univ. degli Studi di Firenze (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), National Research Council (Italy)

12385-42 • 11:40 AM - 12:00 PM

Multi-lightsheet RESOLFT for volumetric imaging beyond the diffraction limit

Author(s): Andreas Bodén, Ilaria Testa, KTH Royal Institute of Technology (Sweden)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 3: MULTIDIMENSIONAL IMAGE RECONSTRUCTION AND ANALYSIS I

1 February 2023 • 1:30 PM - 3:10 PM

Moscone Center, Room 102 (Level 1 South Lobby)

Session chair: Laura Waller, Univ. of California, Berkeley (United States)

12385-10 • 1:30 PM - 1:50 PM

Quantitative imaging of 3D orientation of polymer chains

Author(s): Young J. Lee, Shuyu Xu, National Institute of Standards and Technology (United States)

12385-11 • 1:50 PM - 2:10 PM Improving neural signal estimation in 3D+T calcium imaging via self-supervised learning

Author(s): Andrew DuPlissis, Adela Ben-Yakar, The Univ. of Texas at Austin (United States)

12385-12 • 2:10 PM - 2:30 PM

Open-source image analysis pipeline with 100+ fold speed-up and real-time compression

Author(s): Jules Scholler, Wyss Ctr. for Bio and Neuro Engineering (Switzerland); Joel Jonsson, Max-Planck-Institut für Molekulare Zellbiologie und Genetik (Germany); Tomas Jorda-Siquier, Univ. de Genève (Switzerland); Ivana Gantar, Laura Batti, Stephane Pages, Wyss Ctr. for Bio and Neuro Engineering (Switzerland); Christophe M. Lamy, Univ. de Genève (Switzerland); Ivo F. Sbalzarini, Max-Planck-Institut für Molekulare Zellbiologie und Genetik (Germany)

12385-13 • 2:30 PM - 2:50 PM

Analysis of 3D nuclear spatial architecture for prostate cancer risk stratification

Author(s): Robert B. Serafin, Vanessa Roybal, Univ. of Washington (United States); Can F. Koyuncu, Emory Univ. (United States); Weisi Xie, Jonathan T. C. Liu, Univ. of Washington (United States)

12385-14 • 2:50 PM - 3:10 PM

Full-thickness fiber orientation mapping of the human uterus

Author(s): Jingpeng Hu, Christine P. Hendon, Kristin M. Myers, Aidan M. Therien, Columbia Univ. (United States)

Coffee Break 3:10 PM - 3:40 PM

SESSION 4: INSTRUMENTATION AND METHODS FOR MICROSCOPY

1 February 2023 • 3:40 PM - 5:20 PM

Moscone Center, Room 102 (Level 1 South Lobby)

Session chair: Thomas G. Brown, The Institute of Optics, Univ. of Rochester (United States)

12385-15 • 3:40 PM - 4:00 PM

MAGNIFY: Molecule anchorable gel-enabled nanoscale in-situ fluorescence microscopy for nanoscale imaging of biomolecules

Author(s): Aleksandra Klimas, Brendan R. Gallagher, Emma DiBernardo, Zhangyu Cheng, Yongxin Zhao, Carnegie Mellon Univ. (United States)

12385-17 • 4:00 PM - 4:20 PM

Imaging and tracking nerve fibers using block-face serial MUSE microscopy

Author(s): Chaitanya Kolluru, Aniruddha Upadhye, Andrew Shoffstall, Case Western Reserve Univ. (United States); Richard M. Levenson, Farzad Fereidouni, Univ. of California, Davis (United States); Michael W. Jenkins, David L. Wilson, Case Western Reserve Univ. (United States)

12385-18 • 4:20 PM - 4:40 PM

Microscopy Innovation Centre KCL: A facility for bespoke microscopy

Author(s): Dylan Herzog, Nicholas Anthony, Susan Cox, Simon M. Ameer-Beg, Maddy Parsons, King's College London (United Kingdom)

12385-43 • 4:40 PM - 5:00 PM

Spatially varying PSF estimation and deconvolution for lightsheet microscope with electrical tunable lens using deep learning

Author(s): Ming Song, The Univ. of Georgia (United States); Yang Liu, Chan Zuckerberg Biohub (United States); Bingxi Liu, Peter A. Kner, The Univ. of Georgia (United States)

12385-40 • 5:00 PM - 5:20 PM

Utilizing fluorescent beads to mimic single fluorophores

Author(s): Sherry Yi-Ting Feng, The Institute of Optics, Univ. of Rochester (United States); Luis A. Aleman-Castaneda, Institut Fresnel, Aix-Marseille Univ., CNRS (France), Ecole Centrale de Marseille (France); Rodrigo Gutiérrez-Cuevas, Institut Langevin, Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris, Univ. PSL, CNRS (France); Isael Herrera, Aix-Marseille Univ. (France); Thomas G. Brown, The Institute of Optics, Univ. of Rochester (United States); Sophie Brasselet, Aix-Marseille Univ. (France); Miguel A. Alonso, The Institute of Optics, Univ. of Rochester (United States), Aix-Marseille Univ. (France)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster Sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12385-33

Estimation of 3D point spread function of a widefield microscope by stochastic least square minimization method

Author(s): S. S. Goutam Buddha, Tata Institute of Fundamental Research (India); Nagendra Kumar, Stanford Univ. School of Medicine (United States); Santanu Konwar, Abhayapuri College (India); Bosanta R. Boruah, Indian Institute of Technology Guwahati (India)

Conference 12385

12385-34 • On demand | Presenting live 1 February 2023

Design and implementation of plenoptic imaging system with reduced aberrations

Author(s): Chih-Hao Lin, Po-Ming Lin, Ming-Fu Chen, Taiwan Instrument Research Institute (Taiwan)

12385-35 • On demand | Presenting live 1 February 2023

Automation of detecting and tracking 3D vesicle transport using dual-focus optics

Author(s): Seohyun Lee, Hyuno Kim, Hideo Higuchi, The Univ. of Tokyo (Japan)

12385-36

Extended imaging and tracking of mitochondria with deep learning

Author(s): Katelyn Canedo, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States), Florida Institute of Technology (United States); Vahid Ebrahimi, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); Jiah Kim, Univ. of Illinois (United States); Kyu Young Han, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

12385-38 • On demand | Presenting live 1 February 2023

Quantitative analysis of illumination and detection corrections in adaptive light sheet fluorescence microscopy

Author(s): Mani Rai, Chen Li, Alon Greenbaum, North Carolina State Univ. (United States)

12385-39 • On demand | Presenting live 1 February 2023

Shadow artifact removal technology based on multi-light sheet illumination fluorescence microscopy

Author(s): Inkeon Ryu, Junyoung Shin, Daekeun Kim, Dankook Univ. (Republic of Korea)

12385-41

Spatiotemporal Visualization of Melanoma Angiotropism in Larval Zebrafish with Light Sheet Microscopy

Author(s): JY Brian Jeong, California NanoSystems Institute (United States); Claire Lugassy, Raymond L. Barnhill, Institut Curie (France); Laurent A. Bentolila, California NanoSystems Institute (United States)

THURSDAY 2 FEBRUARY

SESSION 5: QUANTITATIVE PHASE, DIC, AND HOLOGRAPHIC IMAGING

2 February 2023 • 8:40 AM - 10:10 AM

Moscone Center, Room 102 (Level 1 South Lobby)

Session chair: Thomas G. Brown, The Institute of Optics, Univ. of Rochester (United States)

12385-19 • 8:40 AM - 9:10 AM

Differential structured illumination microscopy for 3D computational phase imaging

Author(s): Alex C. Matlock, Zahid Yaqoob, Peter T. C. So, Massachusetts Institute of Technology (United States)

12385-20 • 9:10 AM - 9:30 AM

Comparing angular scattering-based organelle size estimates to tomography-based size estimates in single cells

Author(s): Kaitlin J. Dunn, The Institute of Optics, Univ. of Rochester (United States); George Funkenbusch, Duke Univ. (United States); Andrew J. Berger, The Institute of Optics, Univ. of Rochester (United States)

12385-21 • 9:30 AM - 9:50 AM

Single-shot capture bright-field and digital holographic microscopy for the analysis of living cells

Author(s): Jose Angel Picazo-Bueno, Univ. de València (Spain); Alvaro Barroso, Steffi Ketelhut, Jürgen Schenekenburger, Westfälische Wilhelms-Univ. Münster (Germany); Vicente Micó Serrano, Univ. de València (Spain); Björn Kemper, Westfälische Wilhelms-Univ. Münster (Germany)

12385-22 • 9:50 AM - 10:10 AM

Generating 3D fluorescent images via holographically informed fluorescent imaging

Author(s): Vincent M. Rossi, Washburn Univ. (United States)

Coffee Break 10:10 AM - 10:40 AM

SESSION 6: COMPUTATIONAL METHODS IN MICROSCOPY

2 February 2023 • 10:40 AM - 12:20 PM

Moscone Center, Room 102 (Level 1 South Lobby)

Session chair: Katie Dunn, Rensselaer Polytechnic Institute (United States)

12385-23 • 10:40 AM - 11:00 AM

Step-by-step transfer function reversal for single-shot 3D fiber endoscopy using a diffuser

Author(s): Tom Glosemeyer, Julian Lich, Robert Kuschmierz, Jürgen W. Czarske, TU Dresden (Germany)

12385-24 • 11:00 AM - 11:20 AM

Miniaturized fluorescence 3D microscope with deep learning reconstruction

Author(s): Feng Tian, Weijian Yang, Univ. of California, Davis (United States)

12385-25 • 11:20 AM - 11:40 AM

Simulations of imperfect refractive index matching in scanning laser optical tomography and a method for correction

Author(s): Bjoern Ole Hill, Merve Wollweber, Laser Zentrum Hannover e.V. (Germany); Roland Lachmayer, Leibniz Univ. Hannover (Germany); Tammo Ripken, Laser Zentrum Hannover e.V. (Germany)

12385-26 • 11:40 AM - 12:00 PM

Super-resolution in confocal microscopy using generative adversarial networks with paired and unpaired data

Author(s): Shashwat Patra, The Univ. of Memphis (United States); Carlos A. Trujillo, Univ. EAFIT (Colombia); Ana Doblas, The Univ. of Memphis (United States)

12385-27 • 12:00 PM - 12:20 PM

Model-based data fusion for single-pixel multispectral fluorescence lifetime microscopy

Author(s): Armin J. M. Lenz, Univ. Jaume I (Spain); Alberto Ghezzi, Politecnico di Milano (Italy); Fernando Soldevila Torres, Sorbonne Univ. (France); Andrea Farina, Cosimo D'Andrea, Politecnico di Milano (Italy); Enrique Tajahuerce, Univ. Jaume I (Spain)

Lunch/Exhibition Break 12:20 PM - 1:50 PM

SESSION 7: INNOVATIONS IN MICROSCOPE DESIGN

2 February 2023 • 1:50 PM - 3:30 PM

Moscone Center, Room 102 (Level 1 South Lobby)

Session chair: Thomas G. Brown, The Institute of Optics, Univ. of Rochester (United States)

12385-28 • 1:50 PM - 2:10 PM

Design and fabrication of a GRIN-axicon for Bessel-Gauss beam generation and applications to fast volumetric imaging

Author(s): Mireille Quémener, Univ. Laval (Canada), Ctr. de Recherche CERVO (Canada), Ctr. d'optique, photonique et laser (Canada); Pierre Girard-Collins, Alexandra Alain-Beaudoin, Univ. Laval (Canada), CRCHUM (Canada); Nicolas Grégoire, Steeve Morency, Ctr. d'optique, photonique et laser (Canada); Michèle Desjardins, Univ. Laval (Canada); Daniel C. Côté, Univ. Laval (Canada), Ctr. de Recherche CERVO (Canada), Ctr. d'optique, photonique et laser (Canada); Simon Thibault, Univ. Laval (Canada), Ctr. d'optique, photonique et laser (Canada)

12385-29 • 2:10 PM - 2:30 PM

Reflective multi-immersion microscope objectives

Author(s): Fabian F. Voigt, Univ. Zürich (Switzerland), Harvard Univ. (United States); Thomas Naert, Univ. Zürich (Switzerland); Armin Bahl, Univ. Konstanz (Germany); Soeren S. Lienkamp, Fritjof Helmchen, Univ. Zürich (Switzerland)

12385-30 • 2:30 PM - 2:50 PM

Label-free visualization of chromatin remodeling in live cell nuclei by analyzing the dynamic interference scattering signal

Author(s): Yi-Teng Hsiao, Fasih Bintang Ilhami, I-Hsin Liao, Chia-Lung Hsieh, Academia Sinica (Taiwan)

12385-31 • 2:50 PM - 3:10 PM

Deep-tissue volumetric microangiography with stereovision diffuse optical localization imaging (sDOLI) in the NIR-II window

Author(s): Quanyu Zhou, Daniil Nozdriukhin, Zhenyue Chen, Lukas Glandorf, Urs Alexander Tassilo Hofmann, Michael Reiss, Xosé Luís Deán-Ben, Daniel Razansky, Univ. Zürich (Switzerland), ETH Zurich (Switzerland)

12385-32 • 3:10 PM - 3:30 PM

CANCELED: Hyperspectral full field OCT

Author(s): James S. Napier, Hochschule Emden-Leer (Germany); Hans-Christian Ahlswede, Imke Ottersberg, Carl von Ossietzky Univ. Oldenburg (Germany); Walter Neu, Hochschule Emden-Leer (Germany), Carl von Ossietzky Univ. Oldenburg (Germany)

Conference 12386

28 - 29 January 2023 | Moscone Center, Room 201 (Level 2 South)

Single Molecule Spectroscopy and Superresolution Imaging XVI

Conference Chairs: **Ingo Gregor**, Georg-August-Univ. Göttingen (Germany); **Felix Koberling**, PicoQuant GmbH (Germany); **Rainer Erdmann**, PicoQuant GmbH Berlin (Germany)

Conference Co-Chair: **Linnea Olofsson**, PicoQuant Photonics North America, Inc. (United States)

Program Committee: **Andrea M. Armani**, The Univ. of Southern California (United States); **Michael Börsch**, Friedrich-Schiller-Univ. Jena (Germany); **Christian Eggeling**, Univ. of Oxford (United Kingdom), Friedrich-Schiller Univ. Jena (Germany); **Jörg Enderlein**, Georg-August-Univ. Göttingen (Germany); **Paul M. W. French**, Imperial College London (United Kingdom); **Ewa M. Goldys**, The Univ. of New South Wales (Australia); **Zygmunt Karol Gryczynski**, Univ. of North Texas Health Science Ctr. at Fort Worth (United States), Texas Christian Univ. at Fort Worth (United States); **Mike Heilemann**, Goethe-Univ. Frankfurt am Main (Germany); **Johan Hofkens**, KU Leuven (Belgium); **Zhen-Li Huang**, Huazhong Univ. of Science and Technology (China); **Linnea Olofsson**, PicoQuant Photonics North America, Inc. (United States); **Markus Sauer**, Univ. Bielefeld (Germany); **Shimon Weiss**, Univ. of California, Los Angeles (United States); **Andong Xia**, Institute of Chemistry (China)

SATURDAY 28 JANUARY

OPENING REMARKS

28 January 2023 • 10:15 AM - 10:20 AM

Moscone Center, Room 201 (Level 2 South)

Session chair: Rainer Erdmann, PicoQuant GmbH (Germany)

Welcome and introduction

SESSION 1: NEW TECHNOLOGIES, METHODS AND LABELS I

28 January 2023 • 10:20 AM - 12:00 PM

Moscone Center, Room 201 (Level 2 South)

Session chair: Rainer Erdmann, PicoQuant GmbH (Germany)

12386-1 • 10:20 AM - 10:40 AM

Optimizing self-interference digital holography for single-molecule localization

Author(s): Shaoheng Li, Peter A. Kner, The Univ. of Georgia (United States)

12386-2 • 10:40 AM - 11:00 AM

Measuring mass and loading of single carboxysomes in the interferometric scattering anti-brownian electrokinetic trap

Author(s): Abhijit A. Lavania, William B. Carpenter, Stanford Univ. (United States); Luke M. Oltrogge, Univ. of California, Berkeley (United States); Davis D. Perez, Stanford Univ. (United States); Julia Borden, David F. Savage, Univ. of California, Berkeley (United States); William E. Moerner, Stanford Univ. (United States)

12386-3 • 11:00 AM - 11:20 AM

Heralded spectroscopy: a new single-particle probe for nanocrystal photophysics

Author(s): Gur Lubin, Weizmann Institute of Science (Israel); Ron Tenne, Weizmann Institute of Science (Israel), Univ. Konstanz (Germany); Arin C. Ulku, Ivan M. Antolović, Samuel Burri, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Sean Karg, Venkata Jayasurya Yallapragada, Weizmann Institute of Science (Israel); Claudio E. Bruschini, Edoardo Charbon, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Dan Oron, Weizmann Institute of Science (Israel)

12386-4 • 11:20 AM - 11:40 AM

MesoTIRF: a novel axial super-resolution illuminator for membrane imaging over a 4.4 x 3.0 mm field of view

Author(s): Shannan Foylan, William Bradshaw Amos, Univ. of Strathclyde (United Kingdom); John Dempster, Strathclyde Institute for Pharmacy & Biological Sciences (United Kingdom), Univ. of Strathclyde (United Kingdom); Michael J. Shaw, National Physical Lab. (United Kingdom), Univ. College London (United Kingdom); Gail McConnell, Univ. of Strathclyde (United Kingdom); Carsten G Hansen, University of Edinburgh (United Kingdom), University of Edinburgh (United Kingdom)

12386-5 • 11:40 AM - 12:00 PM

Using COBWEBS for 3D active-feedback tracking of freely diffusing particles in tricky environments.

Author(s): Anastasia J. Niver, Kevin D. Welsher, Duke Univ. (United States)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 2: FLIM, FRET AND FCS/CORRELATION I

28 January 2023 • 1:30 PM - 3:20 PM

Moscone Center, Room 201 (Level 2 South)

Session chair: Mike Heilemann, Goethe-Univ. Frankfurt am Main (Germany)

12386-6 • 1:30 PM - 2:00 PM

20 years of happy motoring with single FoF1-ATP synthase: exploring the speed limit (Invited Paper)

Author(s): Michael Börsch, Universitätsklinikum Jena (Germany), Friedrich-Schiller-Univ. Jena (Germany); Thomas Heitkamp, Iván Pérez, Universitätsklinikum Jena (Germany)

12386-7 • 2:00 PM - 2:20 PM

Easy and reliable way to perform single molecule FRET measurements

Author(s): Felix Koberling, Marcelle König, Maria Loidolt-Krüger, Fabio Barachati, Matthias Patting, Marcus Sackrow, Kamil Bobowski, Mathias Bayer, Rainer Erdmann, PicoQuant GmbH (Germany)

12386-8 • 2:20 PM - 2:40 PM

Electro-optic fluorescence lifetime microscopy (EO-FLIM) of single molecules and neurons

Author(s): Adam J. Bowman, Mark Kasevich, Stanford Univ. (United States)

12386-9 • 2:40 PM - 3:00 PM

Light-sheet autofluorescence lifetime imaging microscopy using a SPAD array detector

Author(s): Kayvan Samimi, Danielle Desa, Morgridge Institute for Research (United States); Wei Lin, Kurt R. Weiss, Univ. of Wisconsin-Madison (United States); Joe Li, Morgridge Institute for Research (United States); Jan Huisken, Georg-August-Univ. Göttingen (Germany); Jenu V. Chacko, Andreas U. Velten, Jeremy D. Rogers, Univ. of Wisconsin-Madison (United States); Kevin W. Eliceiri, Melissa C. Skala, Morgridge Institute for Research (United States), Univ. of Wisconsin-Madison (United States)

12386-10 • 3:00 PM - 3:20 PM

Functional localization microscopy by FLIM-FRET imaging

Author(s): Ani A. Jose, Kings College London (United Kingdom)

Coffee Break 3:20 PM - 3:50 PM

SESSION 3: SUPERRESOLUTION MICROSCOPY/ NANOSCOPY I

28 January 2023 • 3:50 PM - 5:10 PM

Moscone Center, Room 201 (Level 2 South)

Session chair: Felix Koberling, PicoQuant GmbH (Germany)

12386-11 • 3:50 PM - 4:10 PM

Single-objective tilted light sheet illumination with Exchange-PAINT and deep learning for fast, accurate, and precise 3D single-molecule super-resolution imaging in mammalian cells

Author(s): Gabriella P. Gagliano, Nahima Saliba, Armando Amador, Anna-Karin Gustavsson, Rice Univ. (United States)

12386-12 • 4:10 PM - 4:30 PM

Use of single molecule techniques to investigate molecular mechanisms behind memory formation

Author(s): Sofia Vargas-Hernandez, Rice Univ. (United States), Institute of Biosciences and Bioengineering (United States), Systems, Synthetic, and Physical Biology Program (United States); Tyler Nelson, Rice Univ. (United States), Smalley-Curl Institute (United States); Yuya Nakatani, Ivana Hsyung, Rice Univ. (United States); Margareth Freire, Rice Univ. (United States), San Jacinto College (United States); M. Neal Waxham, The Univ. of Texas Health Science Ctr. at Houston (United States); Anna-Karin Gustavsson, Rice Univ. (United States), Institute of Biosciences and Bioengineering (United States), Smalley-Curl Institute (United States)

12386-13 • 4:30 PM - 4:50 PM

Large volume, high speed, single pixel localization microscopy

Author(s): Randy A. Bartels, Maxine Xiu, Jeffrey J. Field, Ali Pezeshki, Colorado State Univ. (United States)

12386-14 • 4:50 PM - 5:10 PM

Single-molecule super-resolution imaging of microfabricated 3D substrates for 3D cell culture

Author(s): Clément Cabriel, Margoth Córdova-Castro, Institut Langevin (France); Erwin Berenschot, Mesoscale Chemical Systems, MESA+ Institute (Netherlands), Univ. Twente (Netherlands); Amanda Dávila-Lezema, Mesoscale Chemical Systems (Netherlands), Univ. Autónoma de Baja California (Mexico); Kirsten Pondman, Applied Microfluidics for BioEngineering Research (Netherlands), MESA+ Institute for Nanotechnology & TechMed Ctr. (Netherlands); Séverine Le Gac, Applied Microfluidics for BioEngineering Research (Netherlands); Niels Tas, Arturo Susarrey-Arce, Mesoscale Chemical Systems (Netherlands); Ignacio Izeddin, Institut Langevin, CNRS (France), Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (France), Univ. PSL (France)

SUNDAY 29 JANUARY

SESSION 4: FLIM, FRET & FCS/CORRELATION II

29 January 2023 • 8:50 AM - 10:10 AM

Moscone Center, Room 201 (Level 2 South)

Session chair: Mike Heilemann, Goethe-Univ. Frankfurt am Main (Germany)

12386-15 • 8:50 AM - 9:10 AM

Probing the tendency to aggregation of nanoplastics in model extracellular biofilm substances with fluorescence correlation spectroscopy

Author(s): Tobias Guckeisen, Rozalia Orghici, Silke Rathgeber, Univ. Koblenz-Landau (Germany)

12386-16 • 9:10 AM - 9:30 AM

Accurate photophysical transition rates of fluorophores

Author(s): Ingo Gregor, Damir Sakhapov, Jörg Enderlein, Georg-August-Univ. Göttingen (Germany)

12386-17 • 9:30 AM - 9:50 AM

Use of FCCS in drug discovery and development and presentation of a novel dedicated instrument for industrial FCCS applications

Author(s): Frank Becker, Intana Bioscience GmbH (Germany)

12386-18 • 9:50 AM - 10:10 AM

Nanoviscosity: A physical marker in starvation-induced cancer cells

Author(s): Sakshi Sareen, Alicja Kijewska, Karina Kwapiszewska, Robert Holyst, Institute of Physical Chemistry PAS (Poland)

Coffee Break 10:10 AM - 10:40 AM

SESSION 5: NEW TECHNOLOGIES, METHODS AND LABELS II

29 January 2023 • 10:40 AM - 12:30 PM

Moscone Center, Room 201 (Level 2 South)

Session chair: Ingo Gregor, Georg-August-Univ. Göttingen (Germany)

12386-19 • 10:40 AM - 11:10 AM

Non-linear organic small molecule imaging agents (Invited Paper)

Author(s): Andrea M. Armani, Yasaman Moradi, Patrick Saris, Marko Lilic, Luciana Custer, The Univ. of Southern California (United States); Jerry Lee, Carolina Garri Garces, Ellison Institute, LLC (United States)

Conference 12386

12386-20 • 11:10 AM - 11:30 AM

Super-resolution localization microscopy with orientation and spectral discrimination

Author(s): Duncan Ryan, Peter M. Goodwin, James H. Werner, Somak Majumder, Jennifer A. Hollingsworth, Los Alamos National Lab. (United States); Megan K. Dunlap, Alan K. Van Orden, Martin P. Gelfand, Colorado State Univ. (United States)

12386-21 • 11:30 AM - 11:50 AM

A new platform for single molecule measurements using the fluoruous effect

Author(s): Marina Santana Vega, Univ. of Glasgow (United Kingdom); Carlos Bueno Alejo, Univ. of Leicester (United Kingdom); Andrea Taladriz-Sender, Univ. of Strathclyde (United Kingdom); Amanda Chaplin, Chloe Farrow, Univ. of Leicester (United Kingdom); Alexander Axer, Univ. of Strathclyde (United Kingdom); Hesna Kara, Vasileos Paschalis, Sumera Tubasum, Univ. of Leicester (United Kingdom); Glenn A. Burley, Univ. of Strathclyde (United Kingdom); Cyril Dominguez, Ian Eperon, Andrew J. Hudson, Univ. of Leicester (United Kingdom); Alasdair W. Clark, Univ. of Glasgow (United Kingdom)

12386-22 • 11:50 AM - 12:10 PM

Construction and validation of a multimodal 3D single-molecule super-resolution microscope for whole cell imaging

Author(s): Tyler Nelson, Rice Univ. (United States), Smalley-Curl Institute (United States); Sofia Vargas-Hernandez, Rice Univ. (United States), Systems, Synthetic, and Physical Biology Program (United States), Institute of Biosciences & Bioengineering (United States); Ivana Hsyung, Rice Univ. (United States); Margareth Freire, Rice Univ. (United States), San Jacinto College (United States); Anna-Karin Gustavsson, Rice Univ. (United States), Smalley-Curl Institute (United States), Institute of Biosciences and Bioengineering (United States)

12386-23 • 12:10 PM - 12:30 PM

Localization based super-resolution fluorescence imaging of amyloid- β aggregates in mouse brain

Author(s): Yuki Shimaoka, Daiki Hara, Aman Shekh, Masaya Okada, Shigeki Iwanaga, Sysmex Corp. (Japan)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

SESSION 6: SUPERRESOLUTION MICROSCOPY/ NANOSCOPY II

29 January 2023 • 2:00 PM - 3:30 PM

Moscone Center, Room 201 (Level 2 South)

Session chair: Rainer Erdmann, PicoQuant GmbH (Germany)

12386-24 • 2:00 PM - 2:30 PM

Multi-color super-resolution microscopy accelerated by a neural network (Invited Paper)

Author(s): Mike Heilemann, Johanna V. Rahm, Goethe-Univ. Frankfurt am Main (Germany)

12386-25 • 2:30 PM - 2:50 PM

Time-resolved super-resolution microscopy to image photoluminescence lifetimes and spatially resolve dual emitter semiconductor nanomaterials

Author(s): Megan K. Dunlap, Pacific Northwest National Lab. (United States); Duncan P. Ryan, Peter M. Goodwin, James H. Werner, Jennifer A. Hollingsworth, Chris J. Sheehan, Los Alamos National Lab. (United States); Martin P. Gelfand, Alan K. Van Orden, Colorado State Univ. (United States)

12386-26 • 2:50 PM - 3:10 PM

Image fusion in correlation based superresolution imaging using convolutional neural networks

Author(s): Lior M. Beck, Ariel Halfon, Uri Rossman, Weizmann Institute of Science (Israel); Assaf Shocher, Univ. of California, Berkeley (United States); Michal Irani, Dan Oron, Weizmann Institute of Science (Israel)

12386-27 • 3:10 PM - 3:30 PM

Event-based sensor for fast and dense single-molecule localization microscopy

Author(s): Clément Cabriel, Institut Langevin, CNRS (France), Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (France), Univ. PSL (France); Christian Specht, Maladies et Hormones du Système Nerveux (France), Institut National de la Santé et de la Recherche Médicale (France), Univ. Paris-Saclay (France); Ignacio Izeddin, Institut Langevin, CNRS (France), Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (France), Univ. PSL (France)

PICOQUANT YOUNG INVESTIGATOR AWARD

29 January 2023 • 3:30 PM - 3:40 PM

Moscone Center, Room 201 (Level 2 South)

Session chair: Ingo Gregor, Georg-August-Univ. Göttingen (Germany)

This Session will include the presentation of the PicoQuant Young Investigator award.

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM - 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12386-28 • On demand | Presented live 29 January 2023

Integration of a superconducting nanowire detector into a confocal microscope for TRPL-mapping: sensitivity and time resolution

Author(s): Volker Buschmann, Eugeny Ermilov, Felix Koberling, Rainer Erdmann, Christian Oelsner, Jürgen Breitlow, PicoQuant GmbH (Germany)

12386-29

Simple and flexible microfluidic design for single-objective light sheet and widefield microscopy

Author(s): Nahima Saliba, Gabriella P. Gagliano, Armando Amador, Anna-Karin Gustavsson, Rice Univ. (United States)

12386-30

A real-time 3-D drift correction method for high-throughput localization microscopy

Author(s): Maomao Chen, Hongqiang Ma, Yang Liu, Univ. of Pittsburgh (United States)

12386-31

Real-time single molecule spectroscopy of Mycobacterium smegmatis protein inside nanofluidic device

Author(s): Chinmaya KV, Moumita Ghosh, International Ctr. for Nanodevices Pvt., Ltd. (India); Siddharth Ghosh, International Ctr. for Nanodevices Pvt., Ltd. (India), Univ. of Cambridge (United Kingdom); Ingo Gregor, Georg-August-Univ. Göttingen (Germany)

12386-32 • On demand | Presented live 29 January 2023

Fast analysis with minimal user interaction in Fluorescence Lifetime Imaging

Author(s): Fabio Barachati, Marcelle König, Maria Loidolt-Krüger, Ellen Schmeyer, Matthias Patting, Marcus Sackrow, Uwe Ortmann, Felix Koberling, Rainer Erdmann, PicoQuant GmbH (Germany)

12386-33

Extending the limit of structural illumination microscopy

Author(s): Ankit Butola, Sebastian Acuña, Krishna Agarwal, UiT The Arctic Univ. of Norway (Norway)

12386-34

Fluorescence lifetime image scanning microscopy

Author(s): Ingo Gregor, Niels Rademacher, Jörg Enderlein, Georg-August-Univ. Göttingen (Germany)

12386-35 • On demand | Presented live 29 January 2023

Next generation SPAD image sensors and lasers for widefield time domain FLIM

Author(s): Max Tillmann, Johan Hummert, Felix Koberling, Rainer Erdmann, PicoQuant GmbH (Germany); Cyril Saudan, Harald Homulle, Ivan Michel Antolovic, Pi Imaging Technology SA (Switzerland)

12386-36 • On demand | Presented live 29 January 2023

Adaptation of microscopy for studying cell polarization

Author(s): Yashar Rouzbahani, Leibniz-Institut für Photonische Technologien e.V. (Germany), Institut für Angewandte Optik und Biophysik, Zentrum für Angewandte Forschung, Friedrich-Schiller-Univ. Jena (Germany); Rohan Chippalkatti, Daniel Abankwa, Univ. du Luxembourg (Luxembourg); Anindita Dasgupta, Pablo Carravilla, Christian Eggeling, Leibniz-Institut für Photonische Technologien e.V. (Germany), Institut für Angewandte Optik und Biophysik, Zentrum für Angewandte Forschung, Friedrich-Schiller-Univ. Jena (Germany)

12386-37

CANCELED: High-resolution, high-contrast imaging via deep-learning based two-step image restoration

Author(s): Vahid Ebrahimi, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); Jiah Kim, Univ. of Illinois (United States); Kyu Young Han, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

Conference 12387

30 - 31 January 2023 | Moscone Center, Room 308 (Level 3 South)

Optical Diagnostics and Sensing XXIII: Toward Point-of-Care Diagnostics

Conference Chair: **Gerard L. Côté**, Texas A&M Univ. (United States)

Program Committee: **Zane A. Arp**, U.S. Food and Drug Administration (United States); **Justin S. Baba**, Vanderbilt Univ. (United States); **Brent D. Cameron**, The Univ. of Toledo (United States); **Blaž Cugmas**, Univ. of Latvia (Latvia); **H. Michael Heise**, Fachhochschule Südwestfalen (Germany); **Kristen C. Maitland**, Texas A&M Univ. (United States); **Mike J. McShane**, Texas A&M Univ. (United States); **Kenith E. Meissner II**, Swansea Univ. (United Kingdom); **Timothy J. Muldoon**, Univ. of Arkansas (United States); **Aydogan Ozcan**, Univ. of California, Los Angeles (United States); **Jessica C. Ramella-Roman**, Florida International Univ. (United States); **Babak Shadgan**, International Collaboration On Repair Discoveries (Canada)

MONDAY 30 JANUARY

SESSION 1: OPTICAL SENSING AND SPECTROSCOPY FOR IN VIVO MONITORING

30 January 2023 • 8:20 AM - 10:00 AM
Moscone Center, Room 308 (Level 3 South)

Session chair: Mike J. McShane, Texas A&M Univ. (United States)

12387-2 • 8:20 AM - 8:40 AM

Noninvasive glucose monitoring using Raman spectroscopy

Author(s): Jeon Woong Kang, Massachusetts Institute of Technology (United States); Hyung Min Kim, Kookmin Univ. (Republic of Korea); Hong Man Yoon, National Cancer Ctr. (Republic of Korea); Luis Galindo, Peter T. C. So, Massachusetts Institute of Technology (United States)

12387-3 • 8:40 AM - 9:00 AM

Pilot study on optical hydration status measurement using short wavelength infrared spectroscopy

Author(s): June-Young Lee, Jeongyun Seo, Woochang Lee, Sung Hyun Nam, SAMSUNG Advanced Institute of Technology (Republic of Korea)

12387-4 • 9:00 AM - 9:20 AM

Preliminary study monitoring hemodynamics using dynamic vascular optical spectroscopy during a surgical intervention

Author(s): Nisha Maheshwari, Alessandro Marone, Stephen HK Kim, New York Univ. (United States); Danielle Bajakian, Columbia University Medical Center (United States); Andreas H. Hielscher, New York Univ. (United States)

12387-5 • 9:20 AM - 9:40 AM

An optical fibre catheter for the detection of esophageal pressure, bile and pH in the gastroesophageal apparatus

Author(s): Francesco Baldini, Giovanni Bartolozzi, Francesco Chiavaioli, Istituto di Fisica Applicata "Nello Carrara" (Italy); Kerstin Schroeder, Tobias Habisreuther, Leibniz-Institut für Photonische Technologien e.V. (Germany); Martin Hahn, Martin Satzke, OSCOMED GmbH (Germany); Steffen Goerlich, Johannes Gäbler, JETI Technische Instrumente GmbH (Germany); Antonio Taddei, Univ. degli Studi di Firenze (Italy); Paolo Cecchi, Cecchi s.r.l. (Italy); Dario Bovio, Biocubica S.r.l. (Italy)

12387-6 • 9:40 AM - 10:00 AM

Etched MMF optical fiber based LMR biosensor for dopamine detection

Author(s): Shikha Uniyal, Kuldeep Choudhary, DIT Univ. (India); Sanjeev Kumar Raghuwanshi, Indian Institute of Technology (Indian School of Mines), Dhanbad (India); Surbhi Sachdev, DIT Univ. (India); Santosh Kumar, Liaocheng Univ. (China)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: OPTICAL IMAGING APPROACHES FOR IN VIVO MONITORING

30 January 2023 • 10:30 AM - 11:30 AM
Moscone Center, Room 308 (Level 3 South)

Session chair: Narasimhan Rajaram, Univ. of Arkansas (United States)

12387-8 • 10:30 AM - 10:50 AM

Polarized reflectance imaging: an objective way to assess capillary refill time in children

Author(s): Frida Meyer, Jonatan Stahre, Rani Toll, Joakim Henricson, Hanna Jonasson, Daniel Wilhelms, Linköping Univ. (Sweden)

12387-9 • 10:50 AM - 11:10 AM

Maternal aRMOR: Early detection of postpartum hemorrhage with a wearable optical device

Author(s): Francescsa Bonetta-Misteli, Toi Collins, Todd Pavek, Antonina Frolova, Leonid Shmuylovich, Christine M. O'Brien, Washington Univ. in St. Louis (United States)

12387-10 • 11:10 AM - 11:30 AM

Improving driving ability using biofeedback by monitoring the mental situation by RGB camera

Author(s): Takumi Okubo, Kamui Ono, Norimichi Tsumura, Chiba Univ. (Japan)

Lunch Break 11:30 AM - 2:00 PM

SESSION 3: CHARACTERIZATION AND DEVELOPMENT OF PHOTOPLETHYSMOGRAPHY (PPG) AND MULTIMODAL SYSTEMS

30 January 2023 • 2:00 PM - 3:00 PM

Moscone Center, Room 308 (Level 3 South)

Session chair: Brent D. Cameron, The Univ. of Toledo (United States)

12387-11 • 2:00 PM - 2:20 PM

Changes in morphology of multiwavelength photoplethysmography across and down major arteries in the forearm

Author(s): Chin-To Hsiao, Justin P. McMurray, Kimberly L. Branan, Texas A&M Univ. (United States); Gerard L. Coté, Texas A&M Univ. (United States), Ctr. for Remote Health Technologies & Systems (United States), Texas A&M Engineering Experiment Station (United States)

12387-12 • 2:20 PM - 2:40 PM

Multiwavelength photoplethysmography signal analysis as a function of varied wrist contact pressure

Author(s): Justin P. McMurray, Kimberly L. Branan, Chin-To Hsiao, Samuel Idah-Oze, Gerard L. Coté, Texas A&M Univ. (United States)

12387-14 • 2:40 PM - 3:00 PM

Development of a multi-source, multi-detector, finger photoplethysmography system

Author(s): Kimberly L. Branan, Justin P. McMurray, Gerard L. Coté, Texas A&M Univ. (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 4: MODELLING AND CHARACTERIZATION OF OPTICAL IMAGING SYSTEMS

30 January 2023 • 3:30 PM - 5:10 PM

Moscone Center, Room 308 (Level 3 South)

Session chairs: Zane A. Arp, U.S. Food and Drug Administration (United States), Gerard L. Coté, Texas A&M Univ. (United States)

12387-16 • 3:30 PM - 3:50 PM

External factors affecting performance of infrared thermographs for screening elevated body temperature

Author(s): Siavash Mazdeyasna, Pejman Ghassemi, Quanzeng Wang, U.S. Food and Drug Administration (United States)

12387-17 • 3:50 PM - 4:10 PM

Verification of customized conjunctival blood flow velocity measurement system with artificial motion

Author(s): Hang Chan Jo, Inha Univ. (Republic of Korea); Hyun-Ji Lee, Safety Measurement Institute, Korea Research Institute of Standards and Science (Republic of Korea); Sang-Won Lee, Safety Measurement Institute (Republic of Korea); Dae Yu Kim, Inha Univ. (Republic of Korea)

12387-18 • 4:10 PM - 4:30 PM

Development of a novel line scanner for speckle contrast diffuse correlation tomography of microvascular blood flow

Author(s): Johannes Johansson, Rolf B. Saager, Linköping Univ. (Sweden)

12387-19 • 4:30 PM - 4:50 PM

Optimization of Multispectral Filter Arrays for Detection of Cancers in the Gastrointestinal Tract

Author(s): Michaela Taylor-Williams, Ran Tao, Univ. of Cambridge (United Kingdom); Travis W. Sawyer, The Univ. of Arizona (United States); Dale J. Waterhouse, Univ. College London (United Kingdom); Jonghee Yoon, Ajou Univ. (Republic of Korea); Sarah E. Bohndiek, Univ. of Cambridge (United Kingdom)

12387-20 • 4:50 PM - 5:10 PM

Miniaturized, high performance microscopes for point-of-care applications

Author(s): Sebastian Dochow, JENOPTIK Optical Systems GmbH (Germany)

POSTERS-MONDAY

30 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the Monday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM – 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12387-7

Optical imaging system based on adaptive optics differential interference contrast microscopy for real-time in-vivo marmoset cone photoreceptor imaging

Author(s): Subeen Park, Korea Institute of Science and Technology (Republic of Korea), Kookmin Univ. (Republic of Korea); Hyo-suk Kim, Korea Institute of Science and Technology (Republic of Korea); Hang Chan Jo, Inha Univ. (Republic of Korea); Kyoung Min Lee, Da Young Song, Seoul National Univ. Hospital (Republic of Korea); Robert J. Zawadzki, Univ. of California, Davis (United States); Dae Yu Kim, Inha Univ. (Republic of Korea); Seok Hwan Kim, Seoul National Univ. Hospital (Republic of Korea); Jae Hun Kim, Korea Institute of Science and Technology (Republic of Korea)

12387-30 • On demand | Presented live 30 January 2023

Optimisation of Raman spectral processing for classification of radiotherapeutic toxicity

Author(s): Isha Behl, Dinesh Kumar Reddy Medipally, Technological Univ. Dublin (Ireland); Chris J. Talbot, Univ. of Leicester (United Kingdom); Aidan D. Meade, Fiona M. Lyng, Technological Univ. Dublin (Ireland)

12387-31 • On demand | Presented live 30 January 2023

Quantitative and label-free hematological analysis by smartphone-based microscopy and deep Learning

Author(s): Bingxin Huang, Lei Kang, Victor T. C. Tsang, Claudia Tung Kei Lo, Terence T. W. Wong, Hong Kong Univ. of Science and Technology (Hong Kong, China)

12387-32 • On demand | Presented live 30 January 2023

Numerical modelling for micropillar-enhanced silicon ATR crystals for mid-infrared spectroscopy of biomarkers

Author(s): Ahmed M. Othman, Univ. Gustave Eiffel (France), Si-Ware Systems (Egypt); Yasser M. Sabry, Si-Ware Systems (Egypt), Ain Shams Univ. (Egypt); Daa A. M. Khalil, Ain Shams Univ. (Egypt), Si-Ware Systems (Egypt); Tarik Bourouina, Univ. Gustave Eiffel (France)

12387-33 • On demand | Presented live 30 January 2023

Photonic crystal-based biosensor chip development for TB diagnosis

Author(s): Charles P. Maphanga, Saturnin S. Ombinda-Lemboumba, CSIR National Laser Ctr. (South Africa); Yaseera Ismail, Univ. of KwaZulu-Natal (South Africa); Patience T. Mthunzi-Kufa, CSIR National Laser Ctr. (South Africa)

12387-34

In-vivo human study of the obese skin optical properties using spatial frequency domain spectroscopy (SFDS) and diffuse reflectance spectroscopy

Author(s): Andres J. Rodriguez, Michael Alzamora, Ajmal Ajmal, Tananant Boonya-Ananta, Florida International Univ. (United States); Vinh Nguyen Du Le, The Univ. of Alabama in Huntsville (United States); Cristina Palacios, Florida International Univ. (United States); Ingemar Fredriksson, Tomas Strömberg, Rolf B. Saager, Linköping Univ. (Sweden); Jessica C. Ramella-Roman, Florida International Univ. (United States)

12387-35

Monitoring burn wound healing rate using terahertz handheld scanners: towards point-of-care telemedicine imaging

Author(s): Mahmoud Ebrahim Khani, Arjun Virk, Zachery Harris, Omar Osman, Andrew Chen, Steven Sandoval, Adam Singer, M. Hassan Arbab, Stony Brook Univ. (United States)

12387-36

CANCELED: Novel Approach Combining Terahertz and Autofluorescence Imaging and using Machine Learning Algorithms for Accurate Breast Cancer Margin Assessment

Author(s): Jyotirmayee Dash, Lenin B., TeraLumen Solutions Pvt. Ltd. (India); Geethanjali Radhakrishnan, Adiuvo Diagnostics, Ltd. (India); Shyamsunder Mandayam, Bala Pesala, TeraLumen Solutions Pvt. Ltd. (India)

12387-37 • On demand | Presented live 30 January 2023

Rapid and sensitive detection of disease biomarkers using SERS assay in a simplified Raman POC device

Author(s): Jayakumar Perumal, Ran Zhi Tong Chua, Mohesh Moothanchery, Poongkulali Rajarahn, Institute of Bioengineering and Bioimaging (Singapore); Aniza Puteri Mahyuddin, Yong Loo Lin School of Medicine, National Univ. of Singapore (Singapore); Ghayathri Balasundaram, Institute of Bioengineering and Bioimaging (Singapore); Mahesh Choolani, Yong Loo Lin School of Medicine, National Univ. of Singapore (Singapore); Malini Olivo, Institute of Bioengineering and Bioimaging (Singapore)

TUESDAY 31 JANUARY

SESSION 5: USE OF FLUIDIC AND OPTICAL APPROACHES FOR DETECTION OF INFECTIOUS DISEASE AT THE POINT-OF-CARE (POC)

31 January 2023 • 8:20 AM - 10:00 AM

Moscone Center, Room 308 (Level 3 South)

Session chair: Samuel Mabbott, Texas A&M Univ. (United States)

12387-21 • 8:20 AM - 8:40 AM

Rapid, sensitive detection of intact SARS-CoV-2 using DNA nets and a smartphone-linked fluorimeter

Author(s): Han Keun Lee, Weijing Wang, Neha Chauhan, Yanyu Xiong, Univ. of Illinois (United States); Tianyi Zhang, Nicholas Magazine, Louisiana State Univ. (United States); Owen Valdescruz, Dong Yeun Kim, Tianjie Qiu, Univ. of Illinois (United States); Lu Peng, Louisiana State Univ. (United States); Lifeng Zhou, Univ. of Illinois (United States); Weishan Huang, Louisiana State Univ. (United States); Xing Wang, Brian T. Cunningham, Univ. of Illinois (United States)

12387-22 • 8:40 AM - 9:00 AM

A 3D printed microfluidic PCR device towards detecting SARS-CoV-2

Author(s): Kristi Shaka, Kent Jones, Aaron Putzke, Philip Measor, Whitworth Univ. (United States)

12387-23 • 9:00 AM - 9:20 AM

Point-of-care sensing of SARS-CoV-2 using lens free holographic microscopy and deep learning

Author(s): Colin J. Potter, Wyant College of Optical Sciences (United States); Yanmei Hu, Rutgers, The State Univ. of New Jersey (United States); Zhen Xiong, Wyant College of Optical Sciences (United States); Jun Wang, Rutgers, The State Univ. of New Jersey (United States); Euan McLeod, Wyant College of Optical Sciences (United States)

12387-24 • 9:20 AM - 9:40 AM

Smartphone clip-on instrument and microfluidic processor for rapid sample-to-answer detection of Zika virus in whole blood using spatial RT-LAMP

Author(s): Weijing Wang, Han Keun Lee, Aaron M. Jankelow, Trung-Hieu Hoang, Amanda Bacon, Fu Sun, Joseph Tibbs, Kevin Baek, Seol Chae, Victoria V. Kindratenko, Katherine Koprowski, Robert A. Stavins, Univ. of Illinois (United States); Dylann Ceriani, Zachary Engelder, Gener8, Inc. (United States); William P. King, Minh N. Do, Rashid Bashir, Enrique Andres Valera Cano, Brian T. Cunningham, Univ. of Illinois (United States)

12387-25 • 9:40 AM - 10:00 AM **Optical biosensing of mycolic acid biomarker for TB diagnosis**

Author(s): Charles P. Maphanga, CSIR National Laser Ctr. (South Africa); Sello L. Manoto, National Research Foundation (South Africa); Saturnin S. Ombinda-Lemboumba, CSIR National Laser Ctr. (South Africa); Yaseera Ismail, Univ. of KwaZulu-Natal (South Africa); Patience T. Mthunzi-Kufa, CSIR National Laser Ctr. (South Africa)

31 January 2023 PST | Moscone Center, Room 308 (Level 3 South)

Coffee Break 10:00 AM - 10:30 AM

SESSION 6: USE OF FLUIDIC AND OPTICAL APPROACHES FOR BIOMARKER DETECTION AT THE POINT-OF-CARE (POC)

31 January 2023 • 10:30 AM - 12:10 PM

Moscone Center, Room 308 (Level 3 South)

Session chair: Hatice Koydemir, Texas A&M Univ. (United States)

12387-26 • 10:30 AM - 10:50 AM

Versatile SERS-fluidic platforms for optical analysis of liquids

Author(s): Caterina Credi, Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); Caterina Dallari, European Laboratory for non-linear Spectroscopy (LENS) (Italy), University of Florence - Department of Astronomy and Physics (Italy); Sara Nocentini, National Institute of Metrology (INRiM) (Italy), European Laboratory for Non-Linear Spectroscopy (LENS) (Italy); Francesco S. Pavone, University of Florence - Department of Astronomy and Physics (Italy), European Laboratory for non-linear Spectroscopy (LENS) (Italy), National Institute of Optics, National Research Council (CNR-INO) (Italy)

12387-27 • 10:50 AM - 11:10 AM

Paper fluidic platform with dual-optical readouts to detect microRNA-20a (miR-20a) for preeclampsia

Author(s): Nandita Chaturvedi, Alyssa Kunkel, Monika Schechinger, Texas A&M Univ. (United States); Samuel Mabbott, Texas A&M Univ. (United States), Ctr. for Remote Health Technologies & Systems (United States), Texas A&M Engineering Experiment Station (United States); Mahua Choudhury, Texas A&M Univ. (United States); Gerard L. Côté, Texas A&M Univ. (United States), Ctr. for Remote Health Technologies & Systems (United States), Texas A&M Engineering Experiment Station (United States)

12387-28 • 11:10 AM - 11:30 AM

Fluorescence sensing and intravascular microdialysis for personalised medicine: The case of immunosuppressants in transplanted patients

Author(s): Francesco Baldini, Sara Tombelli, Cosimo Trono, Simone Berneschi, Ambra Giannetti, Istituto di Fisica Applicata "Nello Carrara" (Italy); Romeo Bernini, Gianluca Persichetti, Genni Testa, Istituto per il Rilevamento Elettromagnetico dell'Ambiente (Italy); Guillermo Orellana, Francesca Salis, Univ. Complutense de Madrid (Spain); Susanne Weber, Peter B. Lupp, Klinikum rechts der Isar der Technischen Univ. München (Germany); Giampiero Porro, Giovanna Quartu, Datamed S.r.L. (Italy); Markus B. Schubert, Univ. Stuttgart (Germany); Marcel Berner, Innovative Pyrotechnik GmbH (Germany); Holger Becker, Claudia Gärtner, microfluidic ChipShop GmbH (Germany); Mark T. O'Connell, Cornet Medical Ltd. (United Kingdom)

12387-29 • 11:30 AM - 11:50 AM

Integrated spectral interrogator for point-of-care biosensors

Author(s): Anne van Klinken, Ruud Jansen, Arthur L. Hendriks, Chenhui Li, Mathias Dolci, Petar Sevo, Luca Picelli, Mildred S. Cano-Velázquez, Peter Zijlstra, Andrea Fiore, Technische Univ. Eindhoven (Netherlands)

12387-1 • 11:50 AM - 12:10 PM

Optical urea sensing in sweat for kidney healthcare by sensitive and selective non-enhanced Raman spectroscopy

Author(s): Ata Golparvar, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Assim Boukhayma, Senbiosys SA (Switzerland); Mattia Petrelli, Libera Univ. di Bolzano (Italy); Christian C. Enz, Sandro Carrara, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12387-13 • On demand | Presenting live 28 January 2023

Impact of an inexperienced operator on photoplethysmogram for bovine heat detection

Author(s): Aleksandar Plavšić, Tanja Mavrič, Vets4science d.o.o. (Slovenia); Eva Štruc, Vetamplify SIA (Latvia); Blaž Cugmas, Univ. of Latvia (Latvia)

Conference 12388

29 - 30 January 2023 | Moscone Center, Room 54 (Lower Mezzanine South)

Adaptive Optics and Wavefront Control for Biological Systems IX

Conference Chairs: **Thomas G. Bifano**, Boston Univ. (United States); **Na Ji**, Univ. of California, Berkeley (United States); **Lei Tian**, Boston Univ. (United States)

Program Committee: **Jacopo Bertolotti**, Univ. of Exeter (United Kingdom); **Martin J. Booth**, Univ. of Oxford (United Kingdom); **Yaron Bromberg**, The Hebrew Univ. of Jerusalem (Israel); **Wonshik Choi**, Korea Univ. (Korea, Republic of); **Tomáš Pátek**, Univ. of Jena (Germany); **Meng Cui**, Purdue Univ. (United States); **Sylvain Gigan**, Lab. Kastler Brossel (France); **John M. Girkin**, Durham Univ. (United Kingdom); **Benjamin Judkewitz**, Charité Universitätsmedizin Berlin (Germany); **Ori Katz**, The Hebrew Univ. of Jerusalem (Israel); **Peter A. Kner**, The Univ. of Georgia (United States); **Pablo Loza-Alvarez**, ICFO - Institut de Ciències Fotòniques (Spain); **Allard P. Mosk**, Utrecht Univ. (Netherlands); **Nicolas C. Pégard**, The Univ. of North Carolina at Chapel Hill (United States); **Rafael Piestun**, Univ. of Colorado Boulder (United States); **Laura Waller**, Univ. of California, Berkeley (United States); **Monika Ritsch-Marte**, Medizinische Univ. Innsbruck (Austria); **Yi Xue**, Univ. of California, Davis (United States)

SUNDAY 29 JANUARY

SESSION 1: ADVANCES IN ADAPTIVE SCATTERING COMPENSATION I

29 January 2023 • 8:00 AM - 10:30 AM

Moscone Center, Room 54 (Lower Mezzanine South)

Session chair: Na Ji, Univ. of California, Berkeley (United States)

12388-1 • 8:00 AM - 8:20 AM

Performance metrics and active temperature control of spatial light modulators

Author(s): Connor Wolenski, Anna M. Linnenberger, Meadowlark Optics, Inc. (United States)

12388-2 • 8:20 AM - 8:40 AM

3D imaging in two photon microscopy using deformable lenses

Author(s): Tommaso Furieri, Univ. degli Studi di Padova (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy); Chang-Ling Chung, National Taiwan Univ. (Taiwan); Stefano Bonora, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Shi-Wei Chu, National Taiwan Univ. (Taiwan), Brain Research Ctr., National Tsing Hua Univ. (Taiwan)

12388-3 • 8:40 AM - 9:00 AM

Light sheet fluorescence microscopy with sensor-based adaptive optics and a confocal guide star

Author(s): Bingxi Liu, The Univ. of Georgia (United States); Yang Liu, Chan Zuckerberg Biohub (United States); Carly R. Duffy, James D. Lauderdale, Peter A. Kner, The Univ. of Georgia (United States)

12388-4 • 9:00 AM - 9:30 AM

Sample-conjugate sensorless scatter compensation in two-photon fluorescence microscopy (Invited Paper)

Author(s): Alexander Jesacher, Maximilian Sohmen, Juan Munoz-Bolanos, Monika Ritsch-Marte, Medizinische Univ. Innsbruck (Austria)

12388-5 • 9:30 AM - 9:50 AM

Large FoV correction using adaptive lenses and deconvolution

Author(s): Tommaso Furieri, Univ. degli Studi di Padova (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy); Stefano Bonora, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Andrea Bassi, Daniele Ancora, Gianmaria Calisesi, Politecnico di Milano (Italy)

12388-6 • 9:50 AM - 10:10 AM

A universal method for sensorless adaptive microscopy: a physics-embedded machine learning approach

Author(s): Qi Hu, Martin Hailstone, Jingyu Wang, Matthew Wincott, Huriye Antilgan, Richard Parton, Danail Stoychev, Jacopo Antonello, Adam M. Packer, Martin J. J. Booth, Univ. of Oxford (United Kingdom)

12388-7 • 10:10 AM - 10:30 AM

Simultaneous control of 3D volume speckle field and 3D holography through biological tissue

Author(s): Amit Kumar, Sarvesh Thakur, Samir Kumar Biswas, Indian Institute of Science Education and Research Mohali (India)

Coffee Break 10:30 AM - 11:00 AM

SESSION 2: ADVANCES IN ADAPTIVE SCATTERING COMPENSATION II

29 January 2023 • 11:00 AM - 12:30 PM

Moscone Center, Room 54 (Lower Mezzanine South)

Session chair: Thomas G. Bifano, Boston Univ. (United States)

12388-8 • 11:00 AM - 11:30 AM

CANCELED: Digital optical phase conjugation through thick scattering tissues with a wavefront sensor (Invited Paper)

Author(s): Tengfei Wu, Yixuan Zhang, Baptiste Blochet, Univ. Paris Cité (France); Pascal Berto, Institut de la Vision (France); Marc Guillon, Univ. Paris Cité (France)

12388-9 • 11:30 AM - 11:50 AM

High-resolution wavefront microscopy for the study of living cells

Author(s): Guillaume Baffou, Institut Fresnel (France)

12388-10 • 11:50 AM - 12:10 PM

Deep learning driven adaptive optics for single molecule localization microscopy

Author(s): Peiyi Zhang, Donghan Ma, Xi Cheng, Purdue Univ. (United States); Andy P. Tsai, Indiana Univ. (United States); Yu Tang, Hao-Cheng Gao, Li Fang, Bi Cheng, Purdue Univ. (United States); Gary E. Landreth, Indiana Univ. (United States); Alexander A. Chubykin, Fang Huang, Purdue Univ. (United States)

12388-36 • 12:10 PM - 12:30 PM

Frequency-multiplexed aberration measurement and correction for confocal microscopy

Author(s): Daisong Pan, Univ. of California, Berkeley (United States); Xinxin Ge, Univ. of California, San Francisco (United States); Lydia Liu, Leah Ferger, Ehud Isacoff, Na Ji, Univ. of California, Berkeley (United States)

Lunch/Exhibition Break 12:30 PM - 1:30 PM

SESSION 3: COMPUTATIONAL IMAGING IN SCATTERING MEDIA I

29 January 2023 • 1:30 PM - 3:40 PM

Moscone Center, Room 54 (Lower Mezzanine South)

Session chair: Tong Qiu, Massachusetts Institute of Technology (United States)

12388-11 • 1:30 PM - 1:50 PM

Computational focusing and imaging through scattering media with single-pixel detected two-photon fluorescence

Author(s): Shupeng Zhao, Bernhard Rauer, Lab. Kastler Brossel (France), Ecole normale supérieure - PSL (France); Ruifeng Liu, Xi'an Jiaotong Univ. (China); Hilton Barbosa de Aguiar, Sylvain Gigan, Lab. Kastler Brossel (France), Ecole normale supérieure - PSL (France)

12388-12 • 1:50 PM - 2:20 PM

Fast fluorescent wavefront-shaping using incoherent iterative time reversal (*Invited Paper*)

Author(s): Anat Levin, Technion-Israel Institute of Technology (Israel)

12388-13 • 2:20 PM - 2:40 PM

EDoF-Miniscopes: A computational miniscopes for extended depth-of-field neural imaging

Author(s): Joseph Greene, Yujia Xue, Jeffrey Alido, Boston Univ. (United States); Alex C. Matlock, Massachusetts Institute of Technology (United States); Guorong Hu, Kivildim Kilic, Ian G. Davison, Lei Tian, Boston Univ. (United States)

12388-14 • 2:40 PM - 3:00 PM

Enhancing Speckle Statistics for Imaging Inside Scattering Tissue

Author(s): Wei Yu Chen, Aswin C. Sankaranarayanan, Matthew O'Toole, Carnegie Mellon Univ. (United States); Anat Levin, Technion-Israel Institute of Technology (Israel)

12388-15 • 3:00 PM - 3:20 PM

Full-wave simulation of focusing light through scattering layers using the T-matrix method

Author(s): Jake Bewick, Peter R. T. Munro, Simon R. Arridge, Univ. College London (United Kingdom); James A. Guggenheim, Univ. of Birmingham (United Kingdom), Univ. College London (United Kingdom)

12388-37 • 3:20 PM - 3:40 PM

Guiding stable light fields through moving complex scattering media

Author(s): David B. Phillips, Chaitanya Mididoddi, Christina Sharp, Simon A. R. Horsley, Univ. of Exeter (United Kingdom)

MONDAY 30 JANUARY

SESSION 4: IMAGING THROUGH FIBERS I

30 January 2023 • 8:00 AM - 10:00 AM

Moscone Center, Room 54 (Lower Mezzanine South)

Session chair: Alexander Jesacher, Medizinische Univ. Innsbruck (Austria)

12388-26 • 8:00 AM - 8:30 AM

Light field two-photon microscopy for deep brain photostimulation and imaging (*Invited Paper*)

Author(s): Yi Xue, Univ. of California, Davis (United States)

12388-16 • 8:30 AM - 9:00 AM

Progress with coherent endoscopy through multimode fiber (*Invited Paper*)

Author(s): Martin Villiger, Wellman Ctr. for Photomedicine (United States)

12388-17 • 9:00 AM - 9:20 AM

Imaging through specialty optical fibers

Author(s): Erin S. Lamb, Tristan Kremp, Paul S. Westbrook, David J. DiGiovanni, OFS Fitel, LLC (United States)

12388-18 • 9:20 AM - 9:40 AM

Neural-network-based multimode fiber imaging and position sensing under thermal perturbations

Author(s): Tristan Kremp, OFS Fitel, LLC (United States); Nicholas Bagley, Southern Methodist Univ. (United States); Erin S. Lamb, Paul S. Westbrook, David J. DiGiovanni, OFS Fitel, LLC (United States)

12388-19 • 9:40 AM - 10:00 AM

Beam shaping with multimode fibre based on real-valued intensity transmission matrix for endoscopic applications

Author(s): Hui Ma, Tyndall National Institute (Ireland), Univ. College Cork (Ireland); Sanathana Konugolu Venkata Sekar, Rekha Gautam, Tyndall National Institute (Ireland); Stefan Andersson-Engels, Tyndall National Institute (Ireland), Univ. College Cork (Ireland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 5: IMAGING THROUGH FIBERS II

30 January 2023 • 10:30 AM - 12:00 PM

Moscone Center, Room 54 (Lower Mezzanine South)

Session chair: Martin Villiger, Wellman Ctr. for Photomedicine (United States)

12388-21 • 10:30 AM - 11:00 AM

New ways to look through multimode optical fibres (*Invited Paper*)

Author(s): David B. Phillips, Univ. of Exeter (United Kingdom); Shuhui Li, Huazhong Univ. of Science and Technology (China); Uwe G. Butaite, Hlib Kupianskyi, Univ. of Exeter (United Kingdom); Tomáš Čížmár, Leibniz-Institut für Photonische Technologien e.V. (Germany); Simon AR Horsley, Univ. of Exeter (United Kingdom)

Conference 12388

12388-22 • 11:00 AM - 11:20 AM

Flexible two-photon lensless endoscope with tapered multicore fibers

Author(s): Hervé Rigneault, Institut Fresnel (France); Fatima El Moussawi, Univ. de Lille (France), PhLAM (France); Matthias Hofer, Naveen Gajendra Kumar, Institut Fresnel (France); Damien Labat, Andy Cassez, Geraud Bouwmans, Univ. de Lille (France), PhLAM (France); Siddharth Sivankutty, Univ. de Lille (France), PhLAM (France); Rosa Cossart, Institut de Neurologie de la Méditerranée (France); Olivier Vanvincq, Esben Andresen, Univ. de Lille (France), PhLAM (France)

12388-23 • 11:20 AM - 11:40 AM

3D micro-endoscopy enabled by 2-photon polymerization and advanced fiber design

Author(s): Robert Kuschmierz, Elias Scharf, Jakob Dremel, TU Dresden (Germany), Competence Ctr. for Biomedical Computational Laser Systems (BIOLAS) (Germany); Kinga Zolnacz, Wroclaw Univ. of Science and Technology (Poland), TU Dresden (Germany); Ronja Stephan, Michael Steinke, Detlef Ristau, Leibniz Univ. Hannover (Germany); Jürgen W. Czarske, TU Dresden (Germany), Competence Ctr. for Biomedical Computational Laser Systems (BIOLAS) (Germany)

12388-24 • 11:40 AM - 12:00 PM

High-resolution brain imaging via a multimode fiber

Author(s): Benjamin Lochocki, Advanced Research Ctr. for Nanolithography (Netherlands); Max V. Verweg, Vrije Univ. Amsterdam (Netherlands); Jeroen J. M. Hoozemans, Amsterdam UMC (Netherlands); Johannes F. de Boer, Vrije Univ. Amsterdam (Netherlands); Lyubov V. Amitonova, Advanced Research Ctr. for Nanolithography (Netherlands)

Lunch/Exhibition Break 12:00 PM - 1:40 PM

SESSION 6: COMPUTATIONAL IMAGING IN SCATTERING MEDIA II

30 January 2023 • 1:40 PM - 3:30 PM
Moscone Center, Room 54 (Lower Mezzanine South)
Session chair: Lei Tian, Boston Univ. (United States)

12388-20 • 1:40 PM - 2:10 PM

Investigation of neurodegeneration in the human organoid retina with transmission matrix measurements (Invited Paper)

Author(s): Jürgen W. Czarske, Nektarios Koukourakis, Stefan Rothe, Felix Wagner, TU Dresden (Germany); Mike O. Karl, DFG-Ctr. for Regenerative Therapies Dresden (Germany)

12388-27 • 2:10 PM - 2:30 PM

Rapid fluorescent wavefront shaping using incoherent power iterations

Author(s): Dror Aizik, Technion-Israel Institute of Technology (Israel); Ioannis Gkioulekas, Carnegie Mellon Univ. (United States); Anat Levin, Technion-Israel Institute of Technology (Israel)

12388-28 • 2:30 PM - 2:50 PM

Acquiring the phase function of volumetric scattering materials using speckle correlation

Author(s): Marina Alterman, Evgeniia Saiko, Anat Levin, Technion-Israel Institute of Technology (Israel)

12388-29 • 2:50 PM - 3:10 PM

CANCELED: Non-invasive super-resolution imaging through scattering media with fluctuating objects

Author(s): Xiangwen Zhu, Nanyang Technological Univ. (Singapore); Sujit Kumar Sahoo, Indian Institute of Technology Goa (India); Giorgio Adamo, Landobasa Y. M. Tobing, Dao Hua Zhang, Cuong H. Dang, Nanyang Technological Univ. (Singapore)

12388-30 • 3:10 PM - 3:30 PM

CANCELED: Non-invasive imaging through scattering media beyond the optical memory effect region

Author(s): Heng Du, Xiangwen Zhu, Nanyang Technological Univ. (Singapore); Sujit Kumar Sahoo, Indian Institute of Technology Goa (India); Cuong H. Dang, Nanyang Technological Univ. (Singapore)

POSTERS-MONDAY

30 January 2023 • 5:30 PM - 7:00 PM
Moscone Center, Level 2 West

Conference attendees are invited to attend the Monday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM - 5:00 PM

View poster presentation guidelines and set-up instructions at:
<https://spie.org/PW/Poster-Guidelines>

12388-32

Energetic tunable broadband sources for dynamic multiphoton imaging and stimulation

Author(s): Tong Qiu, Massachusetts Institute of Technology (United States); Artem Gazizov, Technische Univ. München (Germany); Sixian You, Massachusetts Institute of Technology (United States)

12388-33

Ultrathin NeedleScope with multimode fiber illumination and CMOS image sensor for volumetric imaging in deep tissue

Author(s): Li-Yu Yu, Jaebin Choi, Fan Wang, Sixian You, Massachusetts Institute of Technology (United States)

12388-34 • On demand | Presented live 30 January 2023

Deep self-supervised learning for computational adaptive optics in widefield microscopy

Author(s): Iksung Kang, Qinrong Zhang, Na Ji, Univ. of California, Berkeley (United States)

12388-35

Correcting strong aberrations in multi-photon microscopy using optofluidic adaptive optics

Author(s): Maximilian Sohmen, Juan Munoz-Bolanos, Medizinische Univ. Innsbruck (Austria); Pouya Rajaeipour, Phaseform GmbH (Germany); Monika Ritsch-Marte, Medizinische Univ. Innsbruck (Austria); Caglar Ataman, Univ. of Freiburg (Germany); Alexander Jesacher, Medizinische Univ. Innsbruck (Austria)

Conference 12389

28 - 30 January 2023 | Moscone Center, Room 155 (Upper Mezzanine South)

Quantitative Phase Imaging IX

Conference Chairs: **Yang Liu**, Univ. of Pittsburgh (United States); **YongKeun Park**, KAIST (Korea, Republic of)

Conference Co-Chair: **Allison H. Squires**, Univ. of Chicago (United States)

Program Committee: **Tatiana Alieva**, Univ. Complutense de Madrid (Spain); **George Barbastathis**, Massachusetts Institute of Technology (United States); **Shwetadwip Chowdhury**, The Univ. of Texas at Austin (United States); **Pietro Ferraro**, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Björn Kemper**, Westfälische Wilhelms-Univ. Münster (Germany); **Myung K. Kim**, Univ. of South Florida (United States); **Jerome Mertz**, Boston Univ. (United States); **Aydogan Ozcan**, Univ. of California, Los Angeles (United States); **Demetri Psaltis**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Monika Ritsch-Marte**, Medizinische Univ. Innsbruck (Austria); **Peter T. C. So**, Massachusetts Institute of Technology (United States); **Laura Waller**, Univ. of California, Berkeley (United States); **Renjie Zhou**, The Chinese Univ. of Hong Kong (Hong Kong, China)

SATURDAY 28 JANUARY

SESSION 1: MEMORIAL SESSION FOR GABI POPESCU

28 January 2023 • 9:00 AM - 10:30 AM
Moscone Center, Room 155 (Upper Mezzanine South)
Session chair: YongKeun Park, KAIST (Republic of Korea)

12389-1 • 9:00 AM - 9:15 AM

Memories of Gabi (*Invited Paper*)

Author(s): Yang Liu, Univ. of Pittsburgh (United States)

12389-2 • 9:15 AM - 9:30 AM

Memories of Gabi (*Invited Paper*)

Author(s): Adam P. Wax, Duke Univ. (United States)

12389-3 • 9:30 AM - 9:45 AM

Soccer and QPI with Gabi (*Invited Paper*)

Author(s): Keisuke Goda, The Univ. of Tokyo (Japan)

12389-4 • 9:45 AM - 10:00 AM

Learning Gabi's QPI and Wisdom (*Invited Paper*)

Author(s): Renjie Zhou, The Chinese Univ. of Hong Kong (Hong Kong, China)

12389-72 • 10:00 AM - 10:15 AM

Toward the specificity in QPI 3D Tomographic Cell Flow Cytometry Holography: recent achievements and perspectives in biomedical sciences

Author(s): Pietro Ferraro, Consiglio Nazionale delle Ricerche, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

12389-5 • 10:15 AM - 10:30 AM

Red blood cells and quantitative phase imaging with Gabi (*Invited Paper*)

Author(s): YongKeun Park, KAIST (Republic of Korea)

Coffee Break 10:30 AM - 11:00 AM

SESSION 2: QPI ALGORITHM I

28 January 2023 • 10:50 AM - 12:20 PM
Moscone Center, Room 155 (Upper Mezzanine South)
Session chair: Peter T. C. So, Massachusetts Institute of Technology (United States)

12389-6 • 10:50 AM - 11:20 AM

Computational phase tomography (*Invited Paper*)

Author(s): Lei Tian, Boston Univ. (United States)

12389-7 • 11:20 AM - 11:40 AM

Rapid identification of individual bacterial pathogens using three-dimensional quantitative phase imaging and artificial neural network

Author(s): Geon Kim, KAIST (Republic of Korea); Daewoong Ahn, Tomocube, Inc. (Republic of Korea); Minhee Kang, SAMSUNG Medical Ctr. (Republic of Korea); Jinho Park, KAIST (Republic of Korea); DongHun Ryu, Massachusetts Institute of Technology (United States); YoungJu Jo, Stanford Univ. (United States); Jinyeop Song, Massachusetts Institute of Technology (United States); Jea Sung Ryu, KAIST (Republic of Korea); Gunho Choi, Hyun Jung Chung, Tomocube, Inc. (Republic of Korea); Kyuseok Kim, CHA Bundang Medical Ctr. (Republic of Korea); Doo Ryeon Chung, SAMSUNG Medical Ctr. (Republic of Korea); In Young Yoo, Seoul St. Mary's Hospital (Republic of Korea); Hee Jae Huh, SAMSUNG Medical Ctr. (Republic of Korea); Hyun-seok Min, Tomocube, Inc. (Republic of Korea); Nam Yong Lee, SAMSUNG Medical Ctr. (Republic of Korea); YongKeun Park, KAIST (Republic of Korea)

12389-9 • 12:00 PM - 12:20 PM

Deep learning-based neuron segmentation in quantitative phase images trained on procedurally generated data

Author(s): Eddie M. Gil, Texas A&M Univ. (United States); Zachary A. Steelman, Joel N. Bixler, Air Force Research Lab. (United States)

Lunch/Exhibition Break 12:20 PM - 1:30 PM

SESSION 3: QPI ALGORITHM II

28 January 2023 • 1:30 PM - 2:30 PM
Moscone Center, Room 155 (Upper Mezzanine South)
Session chair: Renjie Zhou, The Chinese Univ. of Hong Kong (Hong Kong, China)

12389-8 • 1:30 PM - 1:50 PM

From hours to seconds: towards 100x faster quantitative phase imaging via differentiable microscopy

Author(s): Udith Haputhanthri, Kithmini Herath, Ramith Hettiarachchi, Hasindu Kariyawasam, Harvard Univ. (United States); Azeem Ahmad, Balpreet Singh, Ahluwalia, UiT The Arctic Univ. of Norway (Norway); Chamira U. S. Edussooriya, Univ. of Moratuwa (Sri Lanka); Dushan N. Wadduwage, Harvard Univ. (United States)

12389-10 • 1:50 PM - 2:10 PM

Glomerulus quantification with deep learning based on novel multi-modal label-free quantitative phase imaging from a near-infrared

Author(s): Hyewon Cho, Nurbolat Aimakov, Inwoo Park, Myeonghoon Choi, Yerim Kim, Geosong Na, Sunghoon Lim, Woonggyu Jung, Ulsan National Institute of Science and Technology (Republic of Korea)

Conference 12389

12389-12 • 2:10 PM - 2:30 PM

Learning-based quantitative phase imaging through an ultra-thin lens-free fiber microendoscope

Author(s): Jiawei Sun, Nektarios Koukourakis, Juergen Czarske, TU Dresden (Germany)

SESSION 4: QPI ALGORITHM III

28 January 2023 • 2:30 PM - 4:50 PM

Moscone Center, Room 155 (Upper Mezzanine South)

Session chairs: YongKeun Park, KAIST (Republic of Korea), Yang Liu, Univ. of Pittsburgh (United States)

12389-13 • 2:30 PM - 3:00 PM

Pixel super-resolution phase retrieval algorithms for digital holography *(Invited Paper)*

Author(s): Liangcai Cao, Yunhui Gao, Tsinghua Univ. (China)

12389-14 • 3:00 PM - 3:20 PM

Few-shot transfer learning using a recurrent neural network for hologram reconstruction

Author(s): Luzhe Huang, Xilin Yang, Tairan Liu, Aydogan Ozcan, UCLA Samueli School of Engineering (United States)

Coffee Break 3:20 PM - 3:50 PM

12389-15 • 3:50 PM - 4:10 PM

Towards fabricating visible wavelength D2NNs through multi-level quantization for quantitative phase imaging

Author(s): Hasindu Kariyawasam, Ramith Hettiarachchi, Harvard Univ. (United States), Univ. of Moratuwa (Sri Lanka); Quansan Yang, Massachusetts Institute of Technology (United States); Udith Haputhanthri, Kithmini Herath, Harvard Univ. (United States), Univ. of Moratuwa (Sri Lanka); Chamira U. S. Edussooriya, Univ. of Moratuwa (Sri Lanka); Edward Boyden, Peter T. C. So, Massachusetts Institute of Technology (United States); Dushan N. Wadduwage, Harvard Univ. (United States)

12389-17 • 4:10 PM - 4:30 PM

Automated hologram reconstruction, including fast defocus correction, for developing time-lapse polychromatic digital holographic microscopy

Author(s): Mohamed Haouat, Céline Larivière-Loiselle, Ctr. de Recherche CERVO (Canada), Univ. Laval (Canada); Maxime Moreaud, Ctr. de Recherche CERVO (Canada), IFP Energies Nouvelles (France), MINES ParisTech (France); Erik Bélanger, Pierre P. Marquet, Ctr. de Recherche CERVO (Canada), Univ. Laval (Canada)

12389-16 • 4:30 PM - 4:50 PM

Virtual polychromatic DHM: A supervised learning approach for denoising quantitative-phase images and revealing fine subcellular structures

Author(s): Johan Chaniot, Maxime Moreaud, Céline Larivière-Loiselle, Mohamed Haouat, Marie-Eve Crochetière, Erik Bélanger, Pierre P. Marquet, Ctr. de Recherche CERVO (Canada)

SUNDAY 29 JANUARY

SESSION 5: QPI METHODOLOGIES I

29 January 2023 • 8:30 AM - 10:20 AM

Moscone Center, Room 155 (Upper Mezzanine South)

Session chair: Yang Liu, Univ. of Pittsburgh (United States)

12389-18 • 8:30 AM - 9:00 AM

Quantitative phase microscopy for life science and diagnosis *(Invited Paper)*

Author(s): Balpreet Singh Ahluwalia, Azeem Ahmad, Vishesh Kumar Dubey, Ankit Butola, UiT The Arctic Univ. of Norway (Norway)

12389-19

Acoustic-driven quantitative phase microscope for quantifying cell mechanical properties at sub-cellular level

Author(s): Yuechuan Lin, Xiang Zhang, Rebecca E. Zubajlo, Zahid Yaqoob, Brian W. Anthony, Peter T. C. So, Massachusetts Institute of Technology (United States)

29 January 2023 • 9:00 AM - 9:20 AM PST | Moscone Center, Room 155 (Upper Mezzanine South)

Show Abstract +

12389-20 • 9:20 AM - 9:40 AM

Single capture epi-mode quantitative phase imaging with tomographic sectioning

Author(s): Paloma Casteleiro Costa, Zhe Guang, Nischita Kaza, Francisco E. Robles, Georgia Institute of Technology (United States)

12389-21 • 9:40 AM - 10:00 AM

Deep refractive index tomography by partial reconstruction and wave-backpropagation

Author(s): Osamu Yasuhiko, Kozo Takeuchi, Hamamatsu Photonics K.K. (Japan)

12389-22 • 10:00 AM - 10:20 AM

Holographic tomography supported by Raman micro-spectroscopy for identifying and quantifying changes in cells treated with Chinese herbal medicine

Author(s): Maria Baczewska, Warsaw Univ. of Technology (Poland); Milena Królikowska, Univ. of Warsaw (Poland); Wojciech Krauze, Małgorzata Kujawińska, Warsaw Univ. of Technology (Poland)

Coffee Break 10:20 AM - 10:50 AM

SESSION 6: QPI METHODOLOGIES II

29 January 2023 • 10:50 AM - 12:20 PM

Moscone Center, Room 155 (Upper Mezzanine South)

Session chair: Pietro Ferraro, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

12389-23 • 10:50 AM - 11:20 AM

Fourier ptychography using display screen for programmable illumination *(Invited Paper)*

Author(s): Kyungwon Lee, Kyung Chul Lee, Jaewoo Jung, Hyesuk Chae, Seung Ah Lee, Yonsei Univ. (Republic of Korea)

12389-24 • 11:20 AM - 11:40 AM

Multiscale and multipurpose phantoms for 2D/3D quantitative phase imaging

Author(s): Michal Ziemczonok, Małgorzata Kujawinska, Warsaw Univ. of Technology (Poland)

12389-25 • 11:40 AM - 12:00 PM

Quantitative oblique back-illumination microscopy with enhanced nuclear phase contrast using acetic acid

Author(s): Zhe Guang, Georgia Institute of Technology (United States); Amunet Jacobs, Agnes Scott College (United States); Paloma Casteleiro Costa, Caroline Filan, Francisco E. Robles, Georgia Institute of Technology (United States)

12389-26 • 12:00 PM - 12:20 PM

Single-shot refractive index imaging using spectral multiplexing and optical transfer function reshaping

Author(s): ChungHa Lee, Hugonnet Herve, Mahn Jae Lee, Weisun Park, YongKeun Park, KAIST (Republic of Korea)

29 January 2023 PST | Moscone Center, Room 155 (Upper Mezzanine South)

Lunch/Exhibition Break 12:20 PM - 1:20 PM

SESSION 7: QPI ALGORITHM IV

29 January 2023 • 1:20 PM - 3:10 PM

Moscone Center, Room 155 (Upper Mezzanine South)

Session chairs: Yang Liu, Univ. of Pittsburgh (United States), YongKeun Park, KAIST (Republic of Korea)

12389-27 • 1:20 PM - 1:50 PM

3D phase imaging through multiple-scattering (*Invited Paper*)

Author(s): Shwetadwip Chowdhury, The Univ. of Texas at Austin (United States)

12389-28 • 1:50 PM - 2:10 PM

Quantitative phase imaging and all-optical phase recovery using diffractive optical networks

Author(s): Deniz Mengu, Aydogan Ozcan, UCLA Samueli School of Engineering (United States)

12389-29 • 2:10 PM - 2:30 PM

Concurrent execution of phase compensation and automatic focusing procedures for telecentric off-axis digital holographic microscopy

Author(s): Carlos Trujillo, Univ. EAFIT (Colombia); Ana Doblas, Raul Castañeda, The Univ. of Memphis (United States)

12389-30 • 2:30 PM - 2:50 PM

Overview of the automatic reconstruction method for quantitative phase imaging using a digital holographic microscope operating in non-telecentric regime

Author(s): Brian Bogue-Jimenez, The Univ. of Memphis (United States); Carlos Trujillo, Univ. EAFIT (Colombia); Ana Doblas, The Univ. of Memphis (United States)

12389-31 • 2:50 PM - 3:10 PM

To be announced

Coffee Break 3:10 PM - 3:40 PM

SESSION 8: QPI METHODOLOGIES III

29 January 2023 • 3:40 PM - 5:30 PM

Moscone Center, Room 155 (Upper Mezzanine South)

Session chair: Shwetadwip Chowdhury, The Univ. of Texas at Austin (United States)

12389-32 • 3:40 PM - 4:10 PM

Nanoscale nuclear architecture mapping of early carcinogenesis (*Invited Paper*)

Author(s): Shikhar Uttam, Univ. of Pittsburgh (United States)

12389-33 • 4:10 PM - 4:30 PM

Deep learning-based hologram reconstruction with superior external generalization

Author(s): Hanlong Chen, Luzhe Huang, Tairan Liu, Aydogan Ozcan, Univ. of California, Los Angeles (United States)

12389-34 • 4:30 PM - 4:50 PM

High-throughput quantitative phase imaging via compressive phase retrieval

Author(s): Yunhui Gao, Liangcai Cao, Tsinghua Univ. (China)

12389-35 • 4:50 PM - 5:10 PM

Multiplexed dielectric tensor tomography for cost-effective and robust dielectric tensor reconstruction

Author(s): Juheon Lee, KAIST (Republic of Korea); Seungwoo Shin, Univ. of California, Santa Barbara (United States); Herve Hugonnet, KAIST (Republic of Korea); YongKeun Park, KAIST (Republic of Korea), Tomocube, Inc. (Republic of Korea)

12389-36 • 5:10 PM - 5:30 PM

Interferometric phase and absorption microscopy (iPAM) for sickle cell disease imaging

Author(s): Alex C. Matlock, Yuhao Qiang, Ming Dao, Massachusetts Institute of Technology (United States); John Higgins, Massachusetts General Hospital (United States); Zahid Yaqoob, Peter T. C. So, Massachusetts Institute of Technology (United States)

MONDAY 30 JANUARY

SESSION 9: QPI OF CELLS AND TISSUES I

30 January 2023 • 8:30 AM - 10:30 AM

Moscone Center, Room 155 (Upper Mezzanine South)

Session chair: YongKeun Park, KAIST (Republic of Korea)

12389-37 • 8:30 AM - 9:00 AM

Quantitative phase imaging to quantify cell growth and response to therapy in space and time (*Invited Paper*)

Author(s): Thomas A. Zangle, The Univ. of Utah (United States)

12389-38 • 9:00 AM - 9:20 AM

Machine-learning-based analysis of refractive index tomograms to predict the immune status of individual human monocytes

Author(s): Mahn Jae Lee, Geon Kim, Moosung Lee, Jeongwon Shin, KAIST (Republic of Korea); Jung Ho Lee, School of Medicine, CHA Univ. (Republic of Korea); DongHun Ryu, Massachusetts Institute of Technology (United States); Young Seo Kim, Yoonjae Chung, KAIST (Republic of Korea); Kyuseok Kim, School of Medicine, CHA Univ. (Republic of Korea); YongKeun Park, KAIST (Republic of Korea)

12389-39 • 9:20 AM - 9:40 AM

Label-free perioperative monitoring of monocytes and lymphocytes utilizing quantitative phase imaging with digital holographic microscopy

Author(s): David R. Steike, Michael Hessler, Burkhard Greve, Björn Kemper, Westfälische Wilhelms-Univ. Münster (Germany)

Conference 12389

12389-73 • 9:40 AM - 10:10 AM

Holographic molecular binding assays (*Invited Paper*)

Author(s): David G. Grier, New York University (United States)

12389-40 • 10:10 AM - 10:30 AM

Digital holographic microscopy for label-free in vitro cytotoxicity testing of polymeric nanocarriers: An interlaboratory comparison

Author(s): Anne Marzi, Kai Moritz Eder, Biomedizinisches Technologiezentrum, Westfälische Wilhelms-Univ. Münster (Germany); Álvaro Barroso, Biomedizinisches Technologiezentrum (BMTZ) der Medizinischen Fakultät (Germany); Ane Marit Wågbø, Torkild Visnes, Ruth B. Schmid, Geir Klinkenberg, SINTEF Industry (Norway); Björn Kemper, Jürgen Schneckeburger, Biomedizinisches Technologiezentrum (BMTZ) der Medizinischen Fakultät (Germany)

Coffee Break 10:30 AM - 11:00 AM

SESSION 10: QPI OF CELLS AND TISSUES II

30 January 2023 • 11:00 AM - 12:00 PM

Moscone Center, Room 155 (Upper Mezzanine South)

Session chair: Yang Liu, Univ. of Pittsburgh (United States)

12389-41 • 11:00 AM - 11:20 AM

Cross-grating phase microscopy for single neural cell imaging and characterization

Author(s): Ljiljana Durdevic, Guillaume Baffou, Institut Fresnel (France)

12389-42 • 11:20 AM - 11:40 AM

Large-scale quantitative phase imaging-based single-cell morphological profiling of chemical and genetic perturbations

Author(s): Dickson Siu, Victor M.L. Wong, Sum Lau, Bei Wang, Alan S.L. Wong, Kenneth K.Y. Wong, Kevin K. Tsia, The Univ. of Hong Kong (Hong Kong, China)

12389-43 • 11:40 AM - 12:00 PM

Quantitative phase imaging of sickle cell disease effects on mouse brain vasculature using quantitative oblique back-illumination microscopy

Author(s): Caroline Filan, Hannah Song, Manu Platt, Francisco E. Robles, Georgia Institute of Technology (United States)

POSTERS-MONDAY

30 January 2023 • 5:30 PM - 7:00 PM PST | Moscone Center, Level 2 West

Conference attendees are invited to attend the Monday BIOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM - 5:00 PM

View poster presentation guidelines and set-up instructions at:

<https://spie.org/PW/Poster-Guidelines>

12389-44 • On demand | Presented live 30 January 2023

High-resolution label-free cell imaging with angular information encoded dynamic speckle illumination

Author(s): Xiantao Jiang, Nansen Zhou, Yijin Wang, Renjie Zhou, The Chinese Univ. of Hong Kong (Hong Kong, China)

12389-45 • 5:30 PM - 7:00 PM

Orthogonality of Zernike modes in phase profiles estimated using Zonal wavefront sensor and Transport of Intensity phase retrieval method

Author(s): Akanshu Chauhan, Nedup Sherpa, Indian Institute of Technology Guwahati (India); Nagendra Kumar, Byers Eye Institute, Stanford Univ. (United States); Pranjal Choudhury, Bosanta R. Boruah, Indian Institute of Technology Guwahati (India); Satya Siddharta Goutam Buddha, Tata Institute of Fundamental Research (India)

12389-46 • 5:30 PM - 7:00 PM

Ptychographic lens-less polarization microscopy

Author(s): Jeongsoo Kim, Seungri Song, Hongseong Kim, Yonsei Univ. (Republic of Korea); Daesuk Kim, Jeonbuk National Univ. (Republic of Korea); Chulmin Joo, Yonsei Univ. (Republic of Korea)

12389-47 • On demand | Presented live 30 January 2023

Faster phase retrieval using deep learning model generated by neural architecture search

Author(s): Xin Shu, Yi Zhang, Mengxuan Niu, Renjie Zhou, Hongfei Zhu, The Chinese Univ. of Hong Kong (Hong Kong, China)

12389-48 • On demand | Presented live 30 January 2023

Label-free E. coli viability assay using quantitative phase imaging and deep learning

Author(s): Yi Zhang, Yujie Nie, Xin Shu, The Chinese Univ. of Hong Kong (Hong Kong, China); Chengsong Ye, Xin Yu, Xiamen Univ. (China); Renjie Zhou, The Chinese Univ. of Hong Kong (Hong Kong, China)

12389-49

DMD and microlens-array for programmable illumination-angle coding for optical diffraction tomography

Author(s): Siqi Yang, Shwetadwip Chowdhury, The Univ. of Texas at Austin (United States)

12389-50

Interrogating nuclear dynamics of cells housed in a benchtop imaging incubator via quantitative phase imaging

Author(s): Katherine C. Davidson, Vincent M. Rossi, Washburn Univ. (United States)

12389-51 • On demand | Presented live 30 January 2023

High-throughput, single-cell drug response measurement using quantitative phase microscopy

Author(s): Fiona Xu, Dan Fu, Univ. of Washington (United States)

12389-52 • On demand | Presented live 30 January 2023

Contrast-enhanced spatial light interference microscopy for imaging of high-scattering granules in cells

Author(s): Huai-Ching Hsieh, Kung-Bin Sung, National Taiwan Univ. (Taiwan)

12389-53

Comparing vesicle tracking using quantitative phase imaging and fluorescence

Author(s): Benoit Wattellier, Asif Rakib, Charan Godavarthi, PHASICS S.A. (France); Julien Savatier, Serge Monneret, Institut Fresnel (France)

12389-54

Deciphering dynamic speckle illumination interference microscopy and its applications

Author(s): Azeem Ahmad, Vishesh Kumar Dubey, Nikhil Jayakumar, Mona Nystad, Balpreet Singh Ahluwalia, UiT The Arctic Univ. of Norway (Norway)

12389-57 • On demand | Presented live 30 January 2023

Study on pre-filtering requirements of Hilbert transform method for optical phase retrieval

Author(s): Bagath Chandraprasad T., Indian Institute of Technology Madras (India); Pramitha Vayalamkuzhi, Central Scientific Instruments Organisation (CSIO) (India); Shanti Bhattacharya, Indian Institute of Technology Madras (India)

12389-58 • On demand | Presented live 30 January 2023

Defining Phase Spatial Resolution in Quantitative Phase Imaging

Author(s): Nansen Zhou, Renjie Zhou, Hongfei Zhu, The Chinese Univ. of Hong Kong (Hong Kong, China)

12389-59

High-quality phase recovery with a physics-inspired plug-and-play denoiser in polarization differential interference contrast microscopy

Author(s): Mariia Aleksandrovych, The Graduate Ctr., The City Univ. of New York (United States), Hunter College, The City Univ. of New York (United States); Mark Strassberg, Chelsea Yu, Min Xu, Hunter College, The City Univ. of New York (United States)

12389-61

High-throughput phase-guided digital histological staining based on Fourier ptychographic microscopy

Author(s): Kyung Chul Lee, Duke Univ. (United States), Yonsei Univ. (Republic of Korea); Hyesuk Chae, Yonsei Univ. (Republic of Korea); Lucas Kreiss, Shiqi Xu, Amey Chaware, Kanghyun Kim, Duke Univ. (United States); Hyeongyu Kim, Kyoungwon Kim, Dosik Hwang, Seung Ah Lee, Yonsei Univ. (Republic of Korea); Roarke Horstmeyer, Duke Univ. (United States)

12389-62

Optical phase projection tomography for quantitative phenotype screening of zebrafish

Author(s): Yerim Kim, Ulsan National Institute of Science and Technology (Republic of Korea); Unbeom Shin, Ctr. for Genomic Integrity, Institute of Basic Sciences, Ulsan National Institute of Science and Technology (Republic of Korea); Inwoo Park, Nurbolat Aimakov, Sangjin Lee, Myeonghoon Choi, Ulsan National Institute of Science and Technology (Republic of Korea); Yoonsung Lee, College of Medicine, Kyung Hee Univ. (Republic of Korea); Woonggyu Jung, Ulsan National Institute of Science and Technology (Republic of Korea)

12389-63

Effect of partial spatial coherence of light on quantitative phase microscopy of biological samples: improved spatial phase sensitivity, space-bandwidth product, and high accuracy in phase measurement

Author(s): Dalip Singh Mehta, Shilpa Tayal, Indian Institute of Technology Delhi (India); Azeem Ahmad, UiT The Arctic Univ. of Norway (Norway); Sunil Bhatt, Indian Institute of Technology Delhi (India); Vishesh Kumar Dubey, Ankit Butola, Balpreet Singh Ahluwalia, UiT The Arctic Univ. of Norway (Norway)

12389-64

Cross-grating phase microscopy: Working principle and accuracy

Author(s): Baptiste Marthy, Guillaume Baffou, Institut Fresnel (France)

12389-65

Cross-grating phase microscopy for the study of hyperthermophilic micro-organisms under laser heating

Author(s): Maëlle Bénéfice, Institut Fresnel (France); Céline Molinaro, Institut Fresnel (France); Aurore Gorlas, Violette Da Cunha, Patrick Forterre, Institut de Biologie Integrative de la Cellule (France); Guillaume Baffou, Institut Fresnel (France)

12389-66 • On demand | Presented live 30 January 2023

Spatial resolution and QPI performance of digital lensless holographic microscopy with holographic optical elements

Author(s): Maria Josef Lopera Acosta, Carlos Trujillo, Univ. EAFIT (Colombia)

12389-67

Prolonged monitoring of individual live bacteria using quantitative phase imaging and hydrogel-based immobilization

Author(s): Jeongwon Shin, Jinho Park, KAIST (Republic of Korea); Geon Kim, Moosung Lee, KAIST (Republic of Korea), Smart Healthcare Device Research Ctr. (Republic of Korea); Yongkeun Park, KAIST (Republic of Korea), Tomocube, Inc. (Republic of Korea), Smart Healthcare Device Research Ctr. (Republic of Korea)

12389-68 • On demand | Presented live 30 January 2023

Understanding vascular and cellular activity during cerebral stroke in zebrafish model using swept-source optical coherence tomography/angiography (SSOCT/A)

Author(s): Zoya Alam, Abhishek Banerjee, Birla Institute of Technology Mesra (India); Robert J. Zawadzki, Univ. of California, Davis (United States); Raju Poddar, Birla Institute of Technology Mesra (India)

12389-69

Video-rate Fourier ptychographic microscopy using color- and state-multiplexed illumination

Author(s): Malith Ranathunga, Chulmin Joo, Seongri Song, Taegyun Moon, Yonsei Univ. (Republic of Korea)

12389-70

Quantitative phase and refractive index imaging of 3D objects via optical transfer function reshaping

Author(s): Mahn Jae Lee, Herve Hugonnet, YongKeun Park, KAIST (Republic of Korea)

12389-71

Low-coherence Holotomography for Speckle Noise-Free Live Cell Imaging

Author(s): Woonsoo Lee, Hansol Yoon, Sangchan Na, Sumin Lee, Taehong Kim, Tomocube, Inc. (Republic of Korea); Herve J. Hugonnet, KAIST (Republic of Korea); Yongkeun Park, Tomocube, Inc. (Republic of Korea), KAIST (Republic of Korea)

Conference 12390

28 - 30 January 2023 | Moscone Center, Room 302 (Level 3 South)

High-Speed Biomedical Imaging and Spectroscopy VIII

Conference Chairs: **Kevin K. Tsia**, The Univ. of Hong Kong (Hong Kong, China); **Keisuke Goda**, The Univ. of Tokyo (Japan)

Program Committee: **Steven G. Adie**, Cornell Univ. (United States); **Hongwei Chen**, Tsinghua Univ. (China); **Shi-Wei Chu**, National Taiwan Univ. (Taiwan); **Meng Cui**, Purdue Univ. (United States); **Qionghai Dai**, Tsinghua Univ. (China); **Martí Duocastella**, Univ. de Barcelona (Spain); **Mark Foster**, Johns Hopkins Univ. (United States); **Katsumasa Fujita**, Osaka Univ. (Japan); **Liang Gao**, Univ. of Illinois at Urbana-Champaign (United States); **Nobuyuki Hashimoto**, Citizen Watch Co., Ltd. (Japan); **Jessica P. Houston**, New Mexico State Univ. (United States); **Bo Huang**, Univ. of California, San Francisco (United States); **Bahram Jalali**, Univ. of California, Los Angeles (United States); **Chulhong Kim**, Pohang Univ. of Science and Technology (Korea, Republic of); **Thomas Klein**, Optores GmbH (Germany); **Edmund Y. Lam**, The Univ. of Hong Kong (Hong Kong, China); **Cheng Lei**, Wuhan Univ. (China); **Tzu-Ming Liu**, Univ. of Macau (Macao, China); **Yu-Hwa Lo**, Univ. of California, San Diego (United States); **Hideharu Mikami**, Hokkaido Univ. (Japan); **Wei Min**, Columbia Univ. (United States); **Nao Nitta**, CYBO, Inc. (Japan); **Yasushi Okada**, RIKEN Quantitative Biology Ctr. (Japan); **YongKeun Park**, KAIST (Korea, Republic of); **Adrian Podoleanu**, Univ. of Kent (United Kingdom); **Dario Polli**, Politecnico di Milano (Italy); **Eric O. Potma**, Univ. of California, Irvine (United States); **Guohai Situ**, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences (China); **Peter T. C. So**, Massachusetts Institute of Technology (United States); **Lei Tian**, Boston Univ. (United States); **Benjamin J. Vakoc**, Wellman Ctr. for Photomedicine (United States); **Laura Waller**, Univ. of California, Berkeley (United States); **Chao Wang**, Univ. of Kent (United Kingdom); **Lihong V. Wang**, Caltech (United States); **Kenneth Y. Wong**, The Univ. of Hong Kong (Hong Kong, China); **Yicong Wu**, National Institutes of Health (United States); **Takeshi Yasui**, Tokushima Univ. (Japan); **Tomokazu Yoshida**, Sysmex Corp. (Japan); **Zeev Zalevsky**, Bar-Ilan Univ. (Israel)

SATURDAY 28 JANUARY

SESSION 1: HIGH-SPEED FLUORESCENCE IMAGING

28 January 2023 • 10:30 AM - 12:00 PM
Moscone Center, Room 302 (Level 3 South)

Session chair: Kevin K. Tsia, The Univ. of Hong Kong (Hong Kong, China)

12390-1 • 10:30 AM - 11:00 AM

Multi-focal structured illumination microscopy for deeper penetration superresolution imaging
(Invited Paper)

Author(s): Junle Qu, Tymish Y. Ohulchanskyy, Shenzhen Univ. (China)

12390-2 • 11:00 AM - 11:30 AM

Multi-molecular super resolution metabolic imaging in aging and diseases (Invited Paper)

Author(s): Lingyan Shi, Univ. of California, San Diego (United States)

12390-3 • 11:30 AM - 11:45 AM

Speckle flow structured illumination microscopy for dynamic super-resolution imaging

Author(s): Ruiming Cao, Fanglin Linda Liu, Univ. of California, Berkeley (United States); Li-Hao Yeh, ASML (United States); Guanghan Meng, Univ. of California (United States); Laura Waller, Univ. of California, Berkeley (United States)

12390-4 • 11:45 AM - 12:00 PM

Differentiable microscopy for content and task aware compressive fluorescence imaging

Author(s): Udith Haputhanthri, Andrew Seeber, Dushan N. Wadduwage, Harvard Univ. (United States)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 2: AI IMAGE CONSTRUCTION AND ANALYTICS

28 January 2023 • 1:30 PM - 3:30 PM
Moscone Center, Room 302 (Level 3 South)

Session chair: Shi-Wei Chu, National Taiwan Univ. (Taiwan)

12390-5 • 1:30 PM - 2:00 PM

On-the-fly Raman microscopy guaranteeing the accuracy of diagnosis by reinforcement learning
(Invited Paper)

Author(s): Tamiki Komatsuzaki, Hokkaido Univ. (Japan)

28 January 2023 PST | Moscone Center, Room 302 (Level 3 South)

Show Abstract +

12390-6

Deep-learning enables rapid and slide-free cellular imaging with virtual histological staining: from two-dimensional to three-dimensional histopathology
(Invited Paper)

Author(s): Terence T. W. Wong, Hong Kong Univ. of Science and Technology (Hong Kong, China)

28 January 2023 • 2:00 PM - 2:30 PM PST | Moscone Center, Room 302 (Level 3 South)

Show Abstract +

12390-7

Image restoration of FACED microscopy by generative adversarial network

Author(s): Gwinky G.K. Yip, Michelle C.K. Lo, The Univ. of Hong Kong (Hong Kong, China); Kenneth K. Y. Wong, Kevin K. Tsia, The Univ. of Hong Kong (Hong Kong, China), Advanced Biomedical Instrumentation Ctr. (Hong Kong, China)

28 January 2023 • 2:30 PM - 2:45 PM PST | Moscone Center, Room 302 (Level 3 South)

Show Abstract +

12390-8

Scalable and generalizable morphological profiling of cells by unsupervised deep learning

Author(s): Rashmi Sreeramachandra Murthy, Gwinky G.K. Yip, Anderson H. C. Shum, Kenneth K. Y. Wong, Kevin K. Tsia, The Univ. of Hong Kong (Hong Kong, China)

28 January 2023 • 2:45 PM - 3:00 PM PST | Moscone Center, Room 302 (Level 3 South)

Show Abstract +

12390-9

Chemical specific orientation imaging through vibrational sum-frequency generation microscopy and machine learning

Author(s): Jackson C. Wagner, Zishan Wu, Wei Xiong, Univ. of California, San Diego (United States)

28 January 2023 • 3:00 PM - 3:15 PM PST | Moscone Center, Room 302 (Level 3 South)

Show Abstract +

12390-10 • 3:15 PM - 3:30 PM

Large-scale, batch-effect-free augmented quantitative phase imaging by generative learning

Author(s): Michelle C.K. Lo, Dickson M. D. Siu, The Univ. of Hong Kong (Hong Kong, China); Kevin K. Tsia, The Univ. of Hong Kong (Hong Kong, China), Advanced Biomedical Instrumentation Ctr. (Hong Kong, China)

Coffee Break 3:30 PM - 4:00 PM

SESSION 3: HIGH-SPEED MULTIPHOTON IMAGING

28 January 2023 • 4:00 PM - 5:30 PM

Moscone Center, Room 302 (Level 3 South)

Session chair: Kotaro Hiramatsu, The Univ. of Tokyo (Japan)

12390-11 • 4:00 PM - 4:30 PM

Advancing low flux in vivo two-photon voltage imaging (Invited Paper)

Author(s): Jerry Chen, Boston Univ. (United States)

12390-12 • 4:30 PM - 4:45 PM

Optical gearbox enabled high-speed laser scanning multiphoton microscopy

Author(s): Meng Cui, Jianian Lin, Zongyue Cheng, Purdue Univ. (United States)

12390-13 • 4:45 PM - 5:00 PM

Design and characterization of two-photon line excitation array detection (2p-LEAD) microscopy for monitoring in vivo neuronal activity

Author(s): Samuel Murphy, Nicholas Watson, Peisen Zhao, Christopher Martin, Berk Camli, Adela Ben-Yakar, The Univ. of Texas at Austin (United States)

12390-14 • 5:00 PM - 5:15 PM Kilohertz two-photon microscopy with spectro-temporal laser imaging by diffractive excitation (SLIDE) at 780nm

Author(s): Tonio Kutscher, Florian Sommer, Christian Stock, Stefan Meyer, Moritz Wiggert, Anton Gruber, Annika Hunold, Christina Leonhardt, Philipp Lamming, Jonas Jurkevicius, Sebastian 'Nino' Karpf, Univ. zu Lübeck (Germany)

12390-15 • 5:00 PM - 5:15 PM

High signal-to-noise ratio rapid third-order label-free and harmonic generation microscopy of neural dynamics through electronic heterodyne amplification

Author(s): Kayvan F. Tehrani, Alejandro De la Cadena, Stephen A. Bopp, Univ. of Illinois (United States)

SUNDAY 29 JANUARY**SESSION 4: HIGH-SPEED VOLUMETRIC IMAGING**

29 January 2023 • 8:30 AM - 10:00 AM

Moscone Center, Room 302 (Level 3 South)

Session chair: Liang Gao, UCLA Samueli School of Engineering (United States)

12390-16 • 8:30 AM - 9:00 AM

Non-destructive 3D pathology with open-top light-sheet microscopy for precision medicine (Invited Paper)

Author(s): Jonathan T. C. Liu, Univ. of Washington (United States)

12390-17 • 9:00 AM - 9:30 AM

Open access single objective light-sheet microscopy (Invited Paper)

Author(s): Manish Kumar, Indian Institute of Technology Delhi (India); Jose Ernesto Canton-Josh, Yevgenia Kozorovitskiy, Northwestern Univ. (United States)

12390-18 • 9:30 AM - 9:45 AM

High-throughput tomographic fluorescence imaging with a synchronized camera array

Author(s): Kevin C. Zhou, Clare Cook, Shiqi Xu, Roarke Horstmeyer, Duke Univ. (United States)

12390-19 • 9:45 AM - 10:00 AM

High-speed augmented light field tomography through parallel spectral encoding

Author(s): Zhaoqiang Wang, Liang Gao, Univ. of California, Los Angeles (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 5: NOVEL HIGH-SPEED IMAGING TECHNOLOGY

29 January 2023 • 10:30 AM - 12:00 PM

Moscone Center, Room 302 (Level 3 South)

Session chair: Tamiki Komatsuzaki, Hokkaido Univ. (Japan)

12390-20 • 10:30 AM - 11:00 AM

Tether-free, single-molecule microscopy of DNA interactions in out-of-equilibrium conditions (Invited Paper)

Author(s): Sabrina Leslie, The Univ. of British Columbia (Canada)

12390-21 • 11:00 AM - 11:30 AM

Label-free plasmonic imaging for quantitative analysis of transparent nanoscale objects (Invited Paper)

Author(s): Wei-Chuan Shih, Univ. of Houston (United States)

12390-22 • 11:30 AM - 11:45 AM

Spinning arrayed optofluidic imaging for large-scale single-cell image-based analysis

Author(s): Man Lai Wong, Dickson M. D. Siu, Sum Lau, Kenneth K. Y. Wong, Kevin K. . Tsia, The Univ. of Hong Kong (Hong Kong, China)

Conference 12390

12390-23 • 11:45 AM - 12:00 PM

Ultrafast phase imaging of propagating current flows in myelinated axons and electromagnetic pulses in dielectrics

Author(s): Yide Zhang, Caltech (United States); Binglin Shen, Shenzhen Univ. (China); Tong Wu, Nanjing Univ. of Aeronautics and Astronautics (China); Jerry Zhao, Joseph Jing, Peng Wang, Kanomi Sasaki-Capela, William Dunphy, David Garrett, Konstantin Maslov, Caltech (United States); Weiwei Wang, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States); Lihong Wang, Caltech (United States)

Lunch/Exhibition Break 12:00 PM - 1:00 PM

SESSION 6: HIGH-SPEED VIBRATIONAL IMAGING

29 January 2023 • 1:00 PM - 3:00 PM

Moscone Center, Room 302 (Level 3 South)

Session chair: Dario Polli, Politecnico di Milano (Italy)

12390-24 • 1:00 PM - 1:30 PM

Improving the clarity of biological imaging using quantum correlated light *(Invited Paper)*

Author(s): Warwick P. Bowen, The Univ. of Queensland (Australia)

12390-25 • 1:30 PM - 2:00 PM

Hyperspectral vibrational imaging for biological and materials systems *(Invited Paper)*

Author(s): Wei Xiong, Zishan Wu, Jackson C. Wagner, Chang Yan, Univ. of California, San Diego (United States)

12390-26 • 2:00 PM - 2:15 PM

Video-rate wide-field broadband CARS microscopy

Author(s): Chiara Ceconello, Federico Vernuccio, Arianna Bresci, Francesco Manetti, Salvatore Sorrentino, Politecnico di Milano (Italy); Renzo Vanna, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Giulio Cerullo, Dario Polli, Politecnico di Milano (Italy)

12390-27 • 2:15 PM - 2:30 PM

High-speed compressive Raman imaging

Author(s): Clement Grand, Camille Scotte, Frédéric Galland, Hervé Rigneault, Institut Fresnel (France)

12390-28 • 2:30 PM - 2:45 PM

Parallelized compressive spontaneous Raman imaging via SPAD arrays

Author(s): Clémence Gentner, Lab. Kastler Brossel, Ecole Normale Supérieure (France); Samuel Burri, Edoardo Charbon, Claudio Bruschini, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Hilton Barbosa de Aguiar, Lab. Kastler Brossel, Ecole Normale Supérieure (France)

12390-29 • 2:45 PM - 3:00 PM

Broadband label-free vibrational imaging in the fingerprint region at <1-ms pixel dwell time via deep learning

Author(s): Federico Vernuccio, Arianna Bresci, Alejandro De la Cadena, Chiara Ceconello, Francesco Manetti, Salvatore Sorrentino, Politecnico di Milano (Italy); Renzo Vanna, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Giulio Cerullo, Dario Polli, Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy)

Coffee Break 3:00 PM - 3:30 PM

SESSION 7: IMAGE CYTOMETRY

29 January 2023 • 3:30 PM - 5:30 PM

Moscone Center, Room 302 (Level 3 South)

Session chair: Keisuke Goda, The Univ. of Tokyo (Japan)

12390-30 • 3:30 PM - 4:00 PM

CANCELED: Engineering tools for whole-brain imaging of *C. elegans* *(Invited Paper)*

Author(s): Hang Lu, Georgia Institute of Technology (United States)

12390-61 • 3:30 PM - 4:00 PM

Replacing 12390-30: Deep-learning image-based biophysical cytometry *(Invited Paper)*

Author(s): Kevin K. Tsia, The Univ. of Hong Kong (Hong Kong, China)

12390-31 • 4:00 PM - 4:30 PM

Automated platform for dual-color 3D imaging of single cells at high resolution and throughput *(Invited Paper)*

Author(s): Francesca Bragheri, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Petra Paiè, CNR-Istituto di Fotonica e Nanotecnologie (Italy), Politecnico di Milano (Italy); Andrea Comi, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Alessia Candeo, Gianmaria Calisesi, Politecnico di Milano (Italy); Federico Sala, CNR-Istituto di Fotonica e Nanotecnologie (Italy), Politecnico di Milano (Italy); Francesco Ceccarelli, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Korbinian Muhlberger, Michael Fokine, KTH Royal Institute of Technology (Sweden); Mark Neil, Imperial College London (United Kingdom); Gianluca Valentini, Politecnico di Milano (Italy); Roberto Osellame, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Andrea Bassi, Politecnico di Milano (Italy)

12390-33 • 4:30 PM - 4:45 PM

Deciphering the efficacy of antiplatelet drugs under vascular stenosis by high-speed on-chip optofluidic imaging

Author(s): Yunjie Deng, The Univ. of Tokyo (Japan); Hui Min Tay, Nanyang Technological Univ. (Singapore); Yuqi Zhou, Xueer Fei, Masako Nishikawa, Ting-Hui Xiao, Yutaka Yatomi, The Univ. of Tokyo (Japan); Han Wei Hou, Nanyang Technological Univ. (Singapore); Keisuke Goda, The Univ. of Tokyo (Japan), Wuhan Univ. (China), Univ. of California, Los Angeles (United States)

29 January 2023 PST | Moscone Center, Room 302 (Level 3 South)

Show Abstract

12390-34 • 4:45 PM - 5:00 PM

Uncovering the long-term effects of mRNA COVID-19 vaccinations on platelets by high-speed optical imaging on a chip

Author(s): Yuqi Zhou, The Univ. of Tokyo (Japan); Masako Nishikawa, The Univ. of Tokyo Hospital (Japan); Hiroshi Kanno, Ruoxi Yang, Yuma Ibayashi, Ting-Hui Xiao, Walker Peterson, Maik Herbig, The Univ. of Tokyo (Japan); Nao Nitta, CYBO, Inc. (Japan); Shigeki Miyata, Central Blood Institute, Japanese Red Cross Society (Japan); Yogendra Kanthi, National Heart, Lung, and Blood Institute, National Institutes of Health (United States); Gustavo K. Rohde, Univ. of Virginia (United States); Kyoji Moriya, The Univ. of Tokyo Hospital (Japan); Yutaka Yatomi, The Univ. of Tokyo Hospital (Japan), The Univ. of Tokyo (Japan); Keisuke Goda, The Univ. of Tokyo (Japan), CYBO, Inc. (Japan), Wuhan Univ. (China)

12390-35 • 5:00 PM - 5:15 PM

Label-free identification of T-cell subpopulations and tracking their activations by large-scale quantitative phase imaging cytometry

Author(s): Chi Kai Ho, Dickson M. D. Siu, Kenneth K. Y. Wong, Kevin K. Tsia, The Univ. of Hong Kong (Hong Kong, China)

12390-36 • 5:15 PM - 5:30 PM

Imaging flow cytometry for modern particle analysis

Author(s): Julia Sophie Boeke, Thomas Henkel, Leibniz-Institut für Photonische Technologien e.V. (Germany)

MONDAY 30 JANUARY

SESSION 8: HIGH-SPEED FLUORESCENCE LIFETIME IMAGING

30 January 2023 • 9:00 AM - 10:00 AM

Moscone Center, Room 302 (Level 3 South)

Session chair: Yuqi Zhou, The Univ. of Tokyo (Japan)

12390-37 • 9:00 AM - 9:15 AM

3D image acquisition with multispectral FLIM and compressed sensing

Author(s): Anneliese L. Jarman, King's College London (United Kingdom); Hanning Mai, The Univ. of Edinburgh (United Kingdom); Conor Treacy, King's College London (United Kingdom); Ahmet Erdogan, Neil Finlayson, The Univ. of Edinburgh (United Kingdom); Claire Wells, King's College London (United Kingdom); Robert Henderson, The Univ. of Edinburgh (United Kingdom); Simon P. Poland, King's College London (United Kingdom)

12390-38 • 9:15 AM - 9:30 AM

Single-shot compressed photoluminescence lifetime imaging for fast wide-field thermometry

Author(s): Xianglei Liu, Artiom Skripka, Yingming Lai, Cheng Jiang, Jingdan Liu, Fiorenzo Vetrone, Jinyang Liang, Institut National de la Recherche Scientifique (Canada)

12390-39 • 9:30 AM - 9:45 AM

Fewer photons for fast FLIM using analog multiplexing of laser clock

Author(s): Rishyashring R. Iyer, Janet E. Sorrells, Geng Wang, Lingxiao Yang, Haohua Tu, Stephen A. Boppart, Univ. of Illinois (United States)

12390-40 • 9:45 AM - 10:00 AM

Development of a high-speed confocal line scanning FLIM microscope for live cell imaging

Author(s): Simon P. Poland, King's College London (United Kingdom); Hanning Mai, The Univ. of Edinburgh (United Kingdom); Anneliese L. Jarman, Conor Treacy, King's College London (United Kingdom); Ahmet Erdogan, Neil Finlayson, The Univ. of Edinburgh (United Kingdom); Maddy Parsons, Claire Wells, King's College London (United Kingdom); Robert Henderson, The Univ. of Edinburgh (United Kingdom)

Coffee Break 10:00 AM - 10:30 AM

SESSION 9: HIGH-SPEED OPTICAL COHERENCE TOMOGRAPHY

30 January 2023 • 10:30 AM - 11:30 AM PST | Moscone Center, Room 302 (Level 3 South)

Session chair: Terence T.W. Wong, Hong Kong Univ. of Science and Technology (Hong Kong, China)

12390-41 • 10:30 AM - 10:45 AM

High speed 4D in-vivo OCT imaging of the human brain: Creating high density datasets for machine learning toward identification of malign tissue in real time

Author(s): Wolfgang Draxinger, Paul Strenge, Univ. zu Lübeck (Germany)

12390-42 • 10:45 AM - 11:00 AM

Towards sub-5 μm axial resolution OCT from a multi-MHz swept source

Author(s): Sacha Grelet, Patrick B. Montague, NKT Photonics A/S (Denmark); Adrian Podoleanu, Univ. of Kent (United Kingdom)

30 January 2023 PST | Moscone Center, Room 302 (Level 3 South)

Show Abstract

12390-43 • 11:00 AM - 11:15 AM

High-throughput 4D OCT of mammary spheroids with temporal non-uniform compressive sampling

Author(s): Lin Yang, Pan Ji, Amy Oldenburg, The Univ. of North Carolina at Chapel Hill (United States)

12390-44 • 11:15 AM - 11:30 AM

Multifocal metasurface optics for rapid virtual biopsy of cellular-resolution optical coherence tomography

Author(s): Jing J. Zhao, Aidan Van Vleck, Yonatan Winetraub, Stanford Univ. (United States); Lin Du, Univ. of California, Berkeley (United States); Yong Han, Tsinghua Univ. (China); Adam de la Zorda, Stanford Univ. (United States)

POSTERS-MONDAY

30 January 2023 • 5:30 PM - 7:00 PM PST | Moscone Center, Level 2 West

Conference attendees are invited to attend the Monday BIOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM - 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12390-45

Wavelength-tunable picosecond burst-mode active mode-locking fiber laser for high-speed multispectral photoacoustic microscopy

Author(s): Soon-Woo Cho, Gyeong Hun Kim, Sang Min Park, Chang-Seok Kim, Pusan National Univ. (Republic of Korea)

Conference 12390

12390-47 • On demand | Presented live 30 January 2023

High-speed photoacoustic monitoring of vascular changes during acute hyperglycemia

Author(s): Joongho Ahn, Jin Woo Baik, Donggyu Kim, Seunghyun Lee, Sung-Min Park, Jin Young Kim, Chulhong Kim, Pohang Univ. of Science and Technology (Republic of Korea)

12390-49 • On demand | Presented live 30 January 2023

High-Speed Fluorescence Molecular Tomography Reconstructions through a Sparsity Constrained Neural Network

Author(s): Fay Wang, Columbia Univ. (United States); Andreas H. Hielscher, New York Univ. (United States); Stephen H. Kim, New York Univ. (United States), Columbia Univ. Irving Medical Ctr. (United States)

12390-50 • On demand | Presented live 30 January 2023

An end-to-end adaptive neural network for process-aware snapshot compressive temporal imaging

Author(s): Yingming Lai, Institut National de la Recherche Scientifique (Canada); Miguel Marquez, Univ. Industrial de Santander (Colombia); Xianglei Liu, Cheng Jiang, Institut National de la Recherche Scientifique (Canada); Shian Zhang, East China Normal Univ. (China); Henry Arguello, Univ. Industrial de Santander (Colombia); Jinyang Liang, Institut National de la Recherche Scientifique (Canada)

12390-51 • On demand | Presented live 30 January 2023

Variance lower bound on fluorescence microscopy image denoising

Author(s): Yilun Li, Purdue Univ. (United States)

12390-52

Beyond pile-up limits: A new approach to time correlated single photon counting

Author(s): Giulia Acconcia, Serena Farina, Massimo Ghioni, Ivan Rech, Politecnico di Milano (Italy)

12390-53

Quantitative phenotype analysis of zebrafish using customized quantitative phase imaging scanner

Author(s): Geoseong Na, Inwoo Park, Yerim Kim, Unbeom Shin, Ulsan National Institute of Science and Technology (Republic of Korea); Yoonsung Lee, Kyung Hee Univ. (Republic of Korea); Woonggyu Jung, Ulsan National Institute of Science and Technology (Republic of Korea)

12390-54

Virtual rapid on-site evaluation after endoscopic ultrasound-guided fine-needle aspiration

Author(s): Myeonghoon Choi, Ulsan National Institute of Science and Technology (Republic of Korea)

12390-55

Liquid optical biopsy by spectral fingerprinting of quantum defect nanosensors via machine learning processes

Author(s): Daniel A. Heller, Memorial Sloan-Kettering Cancer Ctr. (United States), Weill Cornell Medicine (United States); Mijin Kim, Memorial Sloan-Kettering Cancer Ctr. (United States)

12390-56

FPGA based CNN accelerator for high speed biomedical application

Author(s): Hemkant Nehete, Gaurav Verma, Avi Gupta, Brajesh Kumar Kaushik, Indian Institute of Technology Roorkee (India)

On demand | Presented live 30 January 2023
Show Abstract +

12390-58

High-speed imaging of cancer stages on tissue microarrays (TMAs) and detection and identification of the stages using artificial intelligence

Author(s): Rajesh Shrestha, Mousa Alrubayan, Prabhakar Pradhan, Mississippi State Univ. (United States)

12390-59

High-resolution, high-contrast imaging via deep-learning based two-step image restoration

Author(s): Vahid Ebrahimi, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); Jiah Kim, Univ. of Illinois (United States); Kyu Young Han, Univ. of Central Florida (United States)

12390-60

High-speed terahertz full-spectroscopic imaging at 4 frames per second using 2.6 kHz ECOPS time-domain trace acquisition: Towards video-rate THz clinical imaging

Author(s): Zachery B. Harris, Arjun Virk, Andrew Chen, Mahmoud Ebrahimkhani, Omar B. Osman, M. Hassan Arbab, Stony Brook Univ. (United States)

Conference 12391

28 - 31 January 2023 | Moscone Center, Room 213 (Level 2 South)

Label-free Biomedical Imaging and Sensing (LBIS) 2023

Conference Chairs: **Natan T. Shaked**, Tel Aviv Univ. (Israel); **Oliver Hayden**, Technische Univ. München (Germany)

Program Committee: **Shi-Wei Chu**, National Taiwan Univ. (Taiwan); **Pietro Ferraro**, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Jochen R. Guck**, TU Dresden (Germany); **Bahram Jalali**, Univ. of California, Los Angeles (United States); **Alexander T. Khmaladze**, Univ. at Albany (United States); **Pierre P. Marquet**, Ctr. de Recherche de l'Univ. Laval Robert-Giffard (Canada); **Jürgen Popp**, Friedrich-Schiller-Univ. Jena (Germany); **Aniruddha Ray**, The Univ. of Toledo (United States); **Francisco E. Robles**, Georgia Institute of Technology & Emory Univ. School of Medicine (United States); **Travis W. Sawyer**, Wyant College of Optical Sciences (United States); **Melissa C. Skala**, Univ. of Wisconsin-Madison (United States); **Valery V. Tuchin**, Saratov State Univ. (Russian Federation), Tomsk State Univ. (Russian Federation), Institute of Precision Mechanics and Control of the RAS (Russian Federation); **Yihui Wu**, Changchun Institute of Optics, Fine Mechanics and Physics (China); **Yizheng Zhu**, Virginia Polytechnic Institute and State Univ. (United States)

SATURDAY 28 JANUARY

SESSION 1: FLUORESCENCE I

28 January 2023 • 8:10 AM - 10:00 AM
Moscone Center, Room 213 (Level 2 South)

Session chair: Natan T. Shaked, Tel Aviv Univ. (Israel)

12391-1 • 8:10 AM - 8:30 AM

Portable device for rapid assessment of pathogens using autofluorescence lifetime characteristics

Author(s): Harish Kumar D., Mohamed Irfan, Jagdish A. Krishnaswamy, Bala Pesala, Geethanjali Radhakrishnan, Adiuvo Diagnostics, Ltd. (India)

12391-2 • 8:30 AM - 8:50 AM

Development of computational high-throughput autofluorescence microscopy by pattern illumination using a low-cost light-emitting diode assisted by deep learning

Author(s): Zhenghui Chen, Ivy Hei Man Wong, Lei Kang, Weixing Dai, Terence Tsz Wai Wong, Hong Kong Univ. of Science and Technology (Hong Kong, China)

12391-3 • 8:50 AM - 9:10 AM

Label-free multiple histochemical virtual staining enabled by multiwavelength autofluorescence microscopy and deep learning

Author(s): Ivy Hei Man Wong, Weixing Dai, Claudia Lo Tung Kei, Simon Chi Kwan Chan, Terence Tsz Wai Wong, Hong Kong Univ. of Science and Technology (Hong Kong, China)

12391-4 • 9:10 AM - 9:30 AM

Practical and cost-effective implementations of fluorescence lifetime imaging systems (*Invited Paper*)

Author(s): Michael J. Serafino, Javier A. Jo, The Univ. of Oklahoma (United States)

Autofluorescence imaging screens of hydrogels for stem cell-derived cardiomyocyte differentiation and maturation (*Invited Paper*)

Author(s): Danielle E. Desa, Morgridge Institute for Research (United States); Margot Amitrano, William L. Murphy, Univ. of Wisconsin-Madison (United States); Melissa C. Skala, Morgridge Institute for Research (United States), Univ. of Wisconsin-Madison (United States)

Coffee Break 10:00 AM - 10:30 AM

KEYNOTE

28 January 2023 • 10:30 AM - 11:15 AM

Moscone Center, Room 213 (Level 2 South)

Session chair: Natan T. Shaked, Tel Aviv Univ. (Israel)

12391-13 • 10:30 AM - 11:15 AM

Label-free AI-enhanced imaging for biomarkers of cancer using SLAM microscopy (*Keynote Presentation*)

Author(s): Stephen A. Boppart, Beckman Institute for Advanced Science and Technology (United States)

SESSION 2: FLUORESCENCE II

28 January 2023 • 11:15 AM - 12:15 PM

Moscone Center, Room 213 (Level 2 South)

Session chair: Oliver Hayden, Technische Univ. München (Germany)

12391-6 • 11:15 AM - 11:35 AM

Identifying cancer cell metabolic states in autofluorescence lifetime images with machine learning

Author(s): Linghao Hu, Alex J. Walsh, Texas A&M Univ. (United States)

12391-7 • 11:35 AM - 11:55 AM

CANCELED: Development of excitation emission matrix microscopy for label-free molecular imaging of biological tissue

Author(s): Jianrong Qiu, Elzbieta Stepula, Magnus Jensen, Mads Bergholt, King's College London (United Kingdom)

12391-8 • 11:55 AM - 12:15 PM

Label-free optophysiology of neural activity using dual-channel fast autofluorescence lifetime imaging microscopy

Author(s): Rishyashring R. Iyer, Janet E. Sorrells, Carlos A. Renteria, Lingxiao Yang, Jiho Kahng, Stephen A. Boppart, Univ. of Illinois (United States)

Lunch/Exhibition Break 12:15 PM - 1:35 PM

SESSION 3: FLUORESCENCE III

28 January 2023 • 1:35 PM - 2:35 PM

Moscone Center, Room 213 (Level 2 South)

Session chair: Alex J. Walsh, Texas A&M Univ. (United States)

Conference 12391

12391-10 • 1:35 PM - 2:05 PM

Wide-field optical redox imaging with leading-edge detection for assessment of patient-derived cancer organoids *(Invited Paper)*

Author(s): Amani A. Gillette, Morgridge Institute for Research (United States); Shirsa Udgata, McArdle Lab. for Cancer Research, Univ. of Wisconsin-Madison (United States); Lexie Schmitz, McArdle Lab. for Cancer Research, Univ. of Wisconsin-Madison (United States); Dustin Deming, McArdle Lab. for Cancer Research, Univ. of Wisconsin-Madison (United States), Univ. of Wisconsin Carbone Cancer Ctr. (United States); Melissa C. Skala, Morgridge Institute for Research (United States), Univ. of Wisconsin-Madison (United States)

12391-11 • 2:05 PM - 2:35 PM

Evaluation of the preservation of tissue metabolic function in fresh and fixed epithelium using label-free two-photon fluorescence microscopy *(Invited Paper)*

Author(s): Adriana Sánchez-Hernández, Christopher M. Polleys, Irene Georgakoudi, Tufts Univ. (United States)

Coffee Break 2:35 PM - 3:35 PM

SESSION 4: MULTIPHOTON, INFRARED, HYPERSPECTRAL

28 January 2023 • 3:35 PM - 5:55 PM

Moscone Center, Room 213 (Level 2 South)

Session chair: Oliver Hayden, Technische Univ. München (Germany)

12391-14 • 3:35 PM - 3:55 PM

Label-free hyperspectral retinal imaging system with an extended depth of field

Author(s): Ruixuan Zhao, Qi Cui, Liang Gao, UCLA Samueli School of Engineering (United States)

12391-15 • 3:55 PM - 4:15 PM

Spatial and spectral optimization of two-photon imaging data for optimal label-free texture-based tissue classification models

Author(s): Thomas G. Knapp, Suzann Duan, Juanita L. Merchant, The Univ. of Arizona (United States); Travis W. Sawyer, Wyant College of Optical Sciences, The Univ. of Arizona (United States)

12391-16 • 4:15 PM - 4:35 PM

Mid-IR imaging as a new tool to investigate waste heat production in the nematode *C. elegans*

Author(s): Ryan A. Merritt, The Univ. of North Carolina at Chapel Hill (United States); Cobey L. McGinnis, The Univ. of North Carolina at Charlotte (United States); Kacy L. Gordon, The Univ. of North Carolina at Chapel Hill (United States); Susan R. Trammell, The Univ. of North Carolina at Charlotte (United States)

12391-17 • 4:35 PM - 4:55 PM

Broadband CARS microscopy in the entire fingerprint region for biological applications

Author(s): Federico Vernuccio, Arianna Bresci, Alejandro De la Cadena, Chiara Ceconello, Francesco Manetti, Salvatore Sorrentino, Politecnico di Milano (Italy); Renzo Vanna, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Giulio Cerullo, Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy); Dario Polli, Politecnico di Milano (Italy)

12391-18 • 4:55 PM - 5:15 PM

High-speed wide-field broadband CARS microscopy via supercontinuum generation in bulk media

Author(s): Chiara Ceconello, Federico Vernuccio, Arianna Bresci, Francesco Manetti, Salvatore Sorrentino, Politecnico di Milano (Italy); Renzo Vanna, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Giulio Cerullo, Dario Polli, Politecnico di Milano (Italy)

12391-19 • 5:15 PM - 5:35 PM

An automatic whole-slide hyperspectral imaging microscope

Author(s): Minh Tran, Baowei Fei, The Univ. of Texas at Dallas (United States)

12391-20 • 5:35 PM - 5:55 PM

Denosing of depth-resolved, label-free, two-photon images using deep-learning-based algorithms

Author(s): Nilay Vora, Christopher M. Polleys, Tufts Univ. (United States); Filippou Sakellariou, Anatolia College (Greece); Hong-Thao N. Thieu, Elizabeth M. Genega, Tufts Medical Ctr. (United States); Irene Georgakoudi, Tufts Univ. (United States)

SUNDAY 29 JANUARY

SESSION 5: PHASE I

29 January 2023 • 8:00 AM - 10:00 AM

Moscone Center, Room 213 (Level 2 South)

Session chair: Natan T. Shaked, Tel Aviv Univ. (Israel)

12391-21 • 8:00 AM - 8:20 AM

Mid-infrared digital holography imaging in aqueous media

Author(s): Marine Beurrier-Bousquet, CEA-LETI (France); Irène Wang, Lab. Interdisciplinaire de Physique, CNRS (France); Laurent Frey, CEA-LETI-DOPT (France); Mathieu Dupoy, CEA-LETI (France)

12391-22 • 8:20 AM - 8:40 AM

Dynamic tracking of water influx and efflux across cellular membranes using quantitative phase imaging

Author(s): Zachary A. Steelman, Stacey Martens, Air Force Research Lab. (United States); Jennifer Tran, Univ. of Wisconsin-Madison (United States); Anna Sedelnikova, SAIC (United States); Allen Kiester, Bennett Ibey, Joel N. Bixler, Air Force Research Lab. (United States)

12391-23 • 8:40 AM - 9:00 AM

Polychromatic digital holographic microscopy for live-cell imaging

Author(s): Céline Larivière-Loiselle, Mohamed Haouat, Erik Bélanger, Pierre Marquet, Ctr. de Recherche CERVO (Canada)

12391-24 • 9:00 AM - 9:20 AM

Mode conversion of qOBM (quantitative oblique back-illumination microscopy) stain-free tissue images to emulates H&E histology via deep learning

Author(s): Tanishq Abraham, Univ. of California, Davis (United States); Paloma C. Costa, Caroline Filan, Francisco E. Robles, Georgia Institute of Technology (United States); Richard Levenson, Univ. of California, Davis (United States)

12391-25 • 9:20 AM - 9:40 AM

Characterization of a microfluidic system with hydrodynamic focusing capabilities for flexible high-throughput analysis of microscopic particles using digital holographic microscopy

Author(s): Álvaro Barroso Peña, Westfälische Wilhelms-Univ. Münster (Germany); Mark Stude, RWTH Aachen Univ. (Germany); Jian Kim, Marlene Kallass, Steffi Ketelhut, Jürgen Schnekenburger, Björn Kemper, Westfälische Wilhelms-Univ. Münster (Germany)

12391-26 • 9:40 AM - 10:00 AM

Single-shot ultra- high sensitivity imaging of nanometer-sized viruses by common path interferometric microscopy

Author(s): Samer Alhaddad, Institut Langevin (France); Martine Boccara, Institut Langevin (France), Institut de biologie de l'Ecole Normale Supérieure (France); Ignacio Izeddin, Claude Boccara, Institut Langevin (France)

Coffee Break 10:00 AM - 10:30 AM

SESSION 6: PHASE II

29 January 2023 • 10:30 AM - 12:40 PM

Moscone Center, Room 213 (Level 2 South)

Session chair: Oliver Hayden, Technische Univ. München (Germany)

12391-76 • 10:30 AM - 11:00 AM

Label-free 3D Visualization and Quantification of endogenous and exogenous intracellular particles in single cells by phase-contrast holographic flow tomography (Invited Paper)

Author(s): Daniele Pirone, Francesco Merola, Daniele Sirico, Lisa Miccio, Vittorio Bianco, Pasquale Memmolo, Pietro Ferraro, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

12391-27 • 11:00 AM - 11:20 AM

Handheld quantitative phase imaging probe for in-vivo brain tumor margin assessment

Author(s): Zhe Guang, Paloma Casteleiro Costa, Georgia Institute of Technology (United States); Amunet Jacobs, Agnes Scott College (United States); Caroline Filan, Francisco E. Robles, Georgia Institute of Technology (United States)

12391-29 • 11:20 AM - 11:40 AM

Label-free cytometry for the classification and diagnosis of bladder cancer

Author(s): Matan Dudaie, Miki Haifler, Natan T. Shaked, Itay Barnea, Tel Aviv Univ. (Israel)

12391-30 • 11:40 AM - 12:00 PM

Combining holography and Raman spectroscopy for cancer-tissue evaluation

Author(s): Omri Plotnik, Almog Taieb, Tel Aviv Univ. (Israel); Garry Berkovic, Soreq Nuclear Research Ctr. (Israel); Miki Haifler, Sheba Medical Center (Israel); Ori Chehnavsky, Natan Shaked, Tel Aviv Univ. (Israel)

12391-78 • 12:00 PM - 12:20 PM

Platelet micro-aggregate diagnostics with quantitative phase microscopy

Author(s): Oliver Hayden, Christian Klenk, Technische Univ. München (Germany); Johanna Erber, Klinikum rechts der Isar der Technischen Univ. München (Germany); David Fresacher, Stefan Röhl, Manuel Lengl, Dominik Heim, Technische Univ. München (Germany); Hedwig Irl, Martin Schlegel, Tobias Lahmer, Klinikum rechts der Isar der Technischen Univ. München (Germany); Klaus Diepold, Technische Univ. München (Germany); Sebastian Rasch, Bernhard Haller, Klinikum rechts der Isar der Technischen Univ. München (Germany)

12391-33 • 12:20 PM - 12:40 PM

UV-FPM for the label-free analysis of biological samples

Author(s): Mark Dethlefsen, Gaby Marquardt, Siemens Healthineers (Germany); Thomas Engel, Siemens AG (Germany); Mohiudeen Azhar, Siemens Healthineers India LLP (India); Joshi Abhijeet, Siemens AG (India); Peter Paulicka, Siemens Healthineers (Germany)

Lunch/Exhibition Break 12:40 PM - 1:40 PM

SESSION 7: SENSORS AND POLARIZATION

29 January 2023 • 1:40 PM - 4:20 PM

Moscone Center, Room 213 (Level 2 South)

Session chair: Travis W. Sawyer, Wyant College of Optical Sciences (United States)

12391-34 • 1:40 PM - 2:00 PM

Assessing Mueller Matrix polarization for tumor localization of human gastrinoma

Author(s): Julianne Chania Setiadi, Univ of Arizona (United States); Thomas G. Knapp, Justina Bonaventura, The Univ. of Arizona (United States); Suzann Duan, University of Arizona (United States); Juanita L. Merchant, Travis W. Sawyer, The Univ. of Arizona (United States)

12391-35 • 2:00 PM - 2:20 PM

Automated polarized hyperspectral imaging (PHSI) for ex-vivo and in-vivo tissue assessment

Author(s): Ling Ma, Akhila Srinivas, Ximing Zhou, Nimit Subhashbhai Shah, Girgis Obaid, Baowei Fei, The Univ. of Texas at Dallas (United States)

12391-36 • 2:20 PM - 2:50 PM

CANCELED: An integrated nano-plasmonic graphene-quantum dots photoelectronic biosensor (Invited Paper)

Author(s): Jiaxing Sun, Nottingham Trent Univ. (United Kingdom); Lin Zhou, Hongju Mao, Jialong Zhao, Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences (China); Xianfeng Chen, Nottingham Trent Univ. (United Kingdom)

Coffee Break 2:50 PM - 3:20 PM

12391-37 • 3:20 PM - 3:40 PM

Label-free quantification of POEGMA-144 polymerization and thermal response via PC-TIR biosensor

Author(s): Luis Trabucco, Henry Guess, Joshua Chaj-Ulloa, Maisha Ahmed, Rohini Thevi Gunthur, The Univ. of Texas at San Antonio (United States); Nikolay Akimov, SAFE Biosense LLC (United States); Gabriela Romero, Jing Yong Ye, The Univ. of Texas at San Antonio (United States)

Conference 12391

12391-38 • 3:40 PM - 4:00 PM

Metasurface enhanced infrared spectroscopy using vertical nanostructures

Author(s): Aditya Mahalanabish, Steven H. Huang, Gennady Shvets, Cornell Univ. (United States)

12391-39 • 4:00 PM - 4:20 PM

Single particle material characterization using microtoroid optical resonators

Author(s): Shuang Hao, Sartanee Suebka, Judith Su, The Univ. of Arizona (United States)

SESSION 8: FLUORESCENCE IV

29 January 2023 • 4:20 PM - 4:50 PM

Moscone Center, Room 213 (Level 2 South)

Session chair: Travis W. Sawyer, Wyant College of Optical Sciences (United States)

12391-12 • 4:20 PM - 4:50 PM

UV-excited autofluorescence responses from cells embedded in turbid media containing hemoglobin analyzed using spectral phasors *(Invited Paper)*

Author(s): Paul Urayama, Mary McNeill, Blake S. McClain, Nick Majer, Karthik Vishwanath, Miami Univ. (United States)

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM – 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12391-66 • On demand | Presented live 29 January 2023

Evaluation of lipid uptake in cells using Raman spectroscopy

Author(s): Hayata Tadamasu, Takeo Minamikawa, Akihiro Suzuki, Takeshi Yasui, Tokushima Univ. (Japan)

12391-67 • On demand | Presented live 29 January 2023

Comparative response area of cadaveric tympanic membrane using Doppler optical coherence tomography

Author(s): Euimin Lee, Daewoon Seong, Yoonseok Kim, Hayoung Kim, Sangyeob Han, Shinheon Kim, Mansik Jeon, Jeehyun Kim, Kyungpook National Univ. (Republic of Korea)

12391-68

Investigating cortical microvascular effects of focused ultrasound neuromodulation using optical coherence tomography angiography in vivo

Author(s): Yubing Shen, Jacob Hehir, New York Medical College (United States); Marcello Amaral, Chao Ren, Chao Zhou, Washington Univ. in St. Louis (United States); Jonathan A. N. Fisher, New York Medical College (United States)

12391-69 • On demand | Presented live 29 January 2023

Intelligent detection of complex biochemical compounds with multiplexed microresonator sensor

Author(s): Anton V. Saetchnikov, Andreas Ostendorf, Ruhr-Univ. Bochum (Germany)

12391-70 • On demand | Presented live 29 January 2023

Assessment of residual adhesive on the dental surface using optical coherence tomography

Author(s): Yoonseok Kim, Daewoon Seong, Hayoung Kim, Euimin Lee, Sangyeob Han, Shinheon Kim, Mansik Jeon, Jeehyun Kim, Kyungpook National Univ. (Republic of Korea)

12391-71

Label-free whole-body morphology analysis of *Camponotus atrox* using a photoacoustic microscopy

Author(s): Hyun-Mo Kim, Daewoon Seong, Sangyeob Han, Hoseong Cho, Mansik Jeon, Jeehyun Kim, Kyungpook National Univ. (Republic of Korea)

12391-73

Spontaneous Raman spectroscopy used for differentiation of brain regions

Author(s): Antoine Rousseau, Mireille Quémener, Martin Parent, Daniel Côté, Univ. Laval (Canada)

12391-74

Effect of inner cavity on the enhancement of refractive index sensitivity at localized surface plasmon resonance inflection points in single hollow gold nanospheres

Author(s): Ji Won Ha, Univ. of Ulsan (Republic of Korea)

12391-75

Fluorophore characterization in living tissues with fluorescence lifetime and spectral two-photon imaging

Author(s): Varshini Ramanathan, Yang Zhang, Maria Savvidou, Irene Georgakoudi, Tufts Univ. (United States)

MONDAY 30 JANUARY

SESSION 9: PHOTOACOUSTIC

30 January 2023 • 8:30 AM - 10:10 AM

Moscone Center, Room 213 (Level 2 South)

Session chair: Oliver Hayden, Technische Univ. München (Germany)

12391-40 • 8:30 AM - 8:50 AM

Wavelength-switchable active mode-locked Raman fiber laser in 1.7 μm band for photoacoustic generation

Author(s): Sang Min Park, Seongjin Bak, Gyeong Hun Kim, Soon-Woo Cho, Chang-Seok Kim, Pusan National Univ. (Republic of Korea)

12391-41 • 8:50 AM - 9:10 AM

Variable repetition rate of 1700 nm SRS pulsed fiber laser for PA generation

Author(s): Seongjin Bak, Sang Min Park, Gyeong Hun Kim, Soon-Woo Cho, Chang-Seok Kim, Pusan National Univ. (Republic of Korea)

12391-42 • 8:50 AM - 9:10 AM

Label-free automated whole slide imaging system for histopathological assessment of tissue with Total Absorption Photoacoustic Remote Sensing

Author(s): James Tweel, Benjamin R. Ecclestone, Marian Boktor, Kevan Bell, Parsin Haji-Reza, Univ. of Waterloo (Canada)

12391-43 • 9:30 AM - 9:50 AM

Development of a frequency-modulated photoacoustic microscope system for thermal imaging using a picosecond laser

Author(s): Sathiyamoorthy Krishnan, Michael C. Kolios, Toronto Metropolitan Univ. (Canada)

12391-44 • 9:50 AM - 10:10 AM

Prostate needle biopsy metabolic analysis and virtual H&E microscopy using photoacoustic remote sensing and autofluorescence microscopy

Author(s): Brendon S. Restall, Brendyn D. Cikaluk, Matthew M. Martell, Nathaniel J. M. Haven, Adam Kinnaird, Roger J. Zemp, Univ. of Alberta (Canada)

Coffee Break 10:10 AM - 10:40 AM**SESSION 10: BRILLOUIN, RAMAN, SRS, CONFOCAL I**

30 January 2023 • 10:40 AM - 11:50 AM

Moscone Center, Room 213 (Level 2 South)

Session chair: Oliver Hayden, Technische Univ. München (Germany)

12391-45 • 10:40 AM - 11:00 AM

Brillouin and Raman imaging for plant cell wall mechanics

Author(s): Timm Landes, Hannoversches Zentrum für Optische Technologien (Germany), Institut für Gartenbauliche Produktionssysteme, Leibniz Univ. Hannover (Germany); Inga Weisheit, Hannoversches Zentrum für Optische Technologien (Germany), Institut für Pflanzengenetik, Leibniz Univ. Hannover (Germany); Alphonse Mathew, Eren Alkanat, Hannoversches Zentrum für Optische Technologien (Germany); Miroslav Zabic, Hannoversches Zentrum für Optische Technologien (Germany), Institut für Gartenbauliche Produktionssysteme, Leibniz Univ. Hannover (Germany); Thomas Debener, Institut für Pflanzengenetik, Leibniz Univ. Hannover (Germany); Dag Heinemann, Hannoversches Zentrum für Optische Technologien (Germany), Institut für Gartenbauliche Produktionssysteme, Leibniz Univ. Hannover (Germany)

12391-47 • 11:00 AM - 11:20 AM

Identification of spectral features for selective detection of peripheral nerves by support vector machine-based Raman spectral analysis

Author(s): Koshirou Hori, Tokushima Univ. (Japan); Takeo Minamikawa, Institute of Post-LED Photonics, Tokushima Univ. (Japan); Yoshiaki Terao, Masami Shishibori, Tokushima Univ. (Japan); Takeshi Yasui, Institute of Post-LED Photonics, Tokushima Univ. (Japan)

12391-48 • 11:20 AM - 11:50 AM

Assessment of Raman hyperspectral spectra upon depletion of proteins involved in iron transport
(Invited Paper)

Author(s): Pampa Mandal, Albany Medical College (United States); Alireza Sheikhsofla, Samaneh Ghazanfarpour, Ting-Chean Khoo, Univ. at Albany (United States); Jonathan Barra, Albany Medical College (United States); Anna V. Sharikova, Alexander Khmaladze, Univ. at Albany (United States); Margarida Barroso, Albany Medical College (United States)

Lunch/Exhibition Break 11:50 AM - 1:40 PM**SESSION 11: BRILLOUIN, RAMAN, SRS, CONFOCAL II**

30 January 2023 • 1:40 PM - 5:10 PM

Moscone Center, Room 213 (Level 2 South)

Session chair: Francisco E. Robles, Wallace H. Coulter Dept. of Biomedical Engineering at Georgia Institute of Technology (United States)

12391-49 • 1:40 PM - 2:00 PM

Early diagnosis of cancer from liquid biopsies via Raman spectroscopy combined with decision algorithms

Author(s): Elisa Grassi, King Abdullah Univ. of Science and Technology (Saudi Arabia); Jean-Marc Nabholz, King Saud Univ. Medical City (Saudi Arabia); Roberto Incitti, King Abdullah Univ. of Science and Technology (Saudi Arabia); Khalid Al-Saleh, King Saud Univ. Medical City (Saudi Arabia); Mohun Bahadour, International Cancer Research Group (United Arab Emirates); Takashi Gojobori, Carlo Liberale, King Abdullah Univ. of Science and Technology (Saudi Arabia)

12391-50 • 2:00 PM - 2:20 PM

Stimulated Raman scattering microscope for leukemic cell imaging

Author(s): Cassia Corso Silva, Institute of Physical Chemistry PAS (Poland); Lukasz Zinkiewicz, Univ. of Warsaw (Poland); Mateusz Pielach, Agnieszka Jamrozik, Institute of Physical Chemistry PAS (Poland); Milena Królikowska, Joanna Purzycka, Piotr Wasylczyk, Univ. of Warsaw (Poland); Katarzyna Krupa, Yuriy Stepanenko, Institute of Physical Chemistry PAS (Poland)

12391-51 • 2:20 PM - 2:40 PM

Stimulated Raman scattering spectro-microscopy using multiple-plate continuum

Author(s): Guan-Jie Huang, National Taiwan Univ. (Taiwan); Pei-Chen Lai, Ming-Wei Shen, Jia-Xuan Su, Jhan-Yu Guo, Institute of Photonics Technologies, National Tsing Hua Univ. (Taiwan); Kuo-Chuan Guo, Brain Research Ctr., National Tsing Hua Univ. (Taiwan); Peng Lin, Ji-Xin Cheng, Boston Univ. (United States); Li-An Chu, Ann-Shyn Chiang, Brain Research Ctr., National Tsing Hua Univ. (Taiwan); Bo-Han Chen, Chih-Hsuan Lu, Institute of Photonics Technologies, National Tsing Hua Univ. (Taiwan); Shi-Wei Chu, National Taiwan Univ. (Taiwan); Shang-Da Yang, Institute of Photonics Technologies, National Tsing Hua Univ. (Taiwan)

12391-52 • 2:40 PM - 3:10 PM

Ultra-compact widely tunable dual-wavelength fiber-based sources for CARS and SRS imaging
(Invited Paper)

Author(s): Armin Hoffmann, Florian Just, Christian Gaida, Sven Breitkopf, Oliver Herrfurth, Active Fiber Systems GmbH (Germany); Tobias Meyer-Zedler, Jürgen Popp, Leibniz-Institut für Photonische Technologien e.V. (Germany); Tino Eidam, Active Fiber Systems GmbH (Germany); Jens Limpert, Active Fiber Systems GmbH (Germany), Institute of Applied Physics, Abbe Ctr. of Photonics, Friedrich-Schiller-Univ. Jena (Germany)

Coffee Break 3:10 PM - 3:30 PM

12391-53 • 3:30 PM - 3:50 PM

Hyperspectral stimulated Raman imaging with a widely tunable portable light source

Author(s): Tim Hellwig, Niklas Luepken, Sven Dobner, Maximilian Brinkmann, Refined Laser Systems GmbH (Germany)

Conference 12391

12391-54 • 3:50 PM - 4:10 PM

Label-free, in vivo virtual histology of skin using reflectance confocal microscopy and deep learning

Author(s): Jingxi Li, UCLA Samueli School of Engineering (United States); Jason Garfinkel, Dermatology and Laser Ctr. (United States); Xiaoran Zhang, Di Wu, Yijie Zhang, Kevin de Haan, Hongda Wang, Tairan Liu, Bijie Bai, Yair Rivenson, UCLA Samueli School of Engineering (United States); Gennady Rubinstein, Dermatology and Laser Ctr. (United States); Philip O. Scumpia, Univ. of California, Los Angeles (United States); Aydogan Ozcan, UCLA Samueli School of Engineering (United States)

12391-55 • 4:10 PM - 4:30 PM

high-speed interferometric scattering confocal microscopy for label-free live cell imaging

Author(s): Tsai-Ying Wu, Academia Sinica (Taiwan), National Taiwan Univ. (Taiwan); Yi-Teng Hsiao, Academia Sinica (Taiwan); Shi-Wei Chu, National Taiwan Univ. (Taiwan); Chia-Lung Hsieh, Academia Sinica (Taiwan)

12391-77 • 4:30 PM - 4:50 PM

Research on the Detection of Dithiocarbamate Pesticides by Using Surface-Enhanced Raman Spectroscopy

Author(s): Shih-Chieh Hsu, Tamkang Univ. (Taiwan)

12391-79 • 4:50 PM - 5:10 PM

Label-free intraoperative assessment of tumor margins with hyperspectral imaging and machine learning

Author(s): David Pertzborn, Hoang-Ngan Nguyen, Katharina Hüttmann, Jonas Prengel, Günther Ernst, Orlando Guntinas-Lichius, Ferdinand von Eggeling, Franziska Hoffmann, Universitätsklinikum Jena (Germany)

TUESDAY 31 JANUARY

SESSION 12: OCT I

31 January 2023 • 8:20 AM - 10:40 AM

Moscone Center, Room 213 (Level 2 South)

Session chair: Yuankai Kenny Tao, Vanderbilt Univ. (United States)

12391-64 • 8:20 AM - 8:50 AM

Optical coherence elastography on clinical samples of gastric cancer shows promise for assessing alteration of mechanical properties with onset of disease (*Invited Paper*)

Author(s): Travis W. Sawyer, The Univ. of Arizona (United States); Graham Spicer, Stephen Mead, Massimiliano di Pietro, Ashraf Sanduka, Univ. of Cambridge (United Kingdom); Makenna Aitken, Faith Rice, The Univ. of Arizona (United States); Sarah E. Bohndiek, Univ. of Cambridge (United Kingdom); Jennifer K. Barton, The Univ. of Arizona (United States)

12391-57 • 8:50 AM - 9:10 AM

Non-invasive and label-free zebrafish investigations using polarization-sensitive optical coherence tomography

Author(s): Antonia Lichtenegger, Medizinische Univ. Wien (Austria); Junya Tamaoki, Pradipta Mukherjee, Univ. of Tsukuba (Japan); Roxane Licandro, Medizinische Univ. Wien (Austria); Lida Zhu, Tomoko Mori, Rion Morishita, Lixuan Bian, Ibrahim Abd El-Sadek, Shuichi Makita, Univ. of Tsukuba (Japan); Konrad Leskova, Medizinische Univ. Wien (Austria); Satoshi Matsusaka, Univ. of Tsukuba (Japan); Martin Distel, St. Anna Kinderkrebsforschung e.V. (Austria); Makoto Kobayashi, Univ. of Tsukuba (Japan); Bernhard Baumann, Medizinische Univ. Wien (Austria); Yoshiaki Yasuno, Univ. of Tsukuba (Japan)

12391-58 • 9:10 AM - 9:40 AM

Organelle dynamics imaged label-free with Interface Self-Referencing dynamic full-field optical coherence tomography (*Invited Paper*)

Author(s): Tual Monfort, Institut de la Vision, Sorbonne Univ., INSERM, CNR (France), INSERM-DGOS CIC 1423, Ctr. Hospitalier National d'Ophthalmologie des Quinze-Vingts (France); Salvatore Azzollini, Institut de la Vision, Sorbonne Univ., INSERM, CNRS (France); Olivier Thouvenin, Institut Langevin, Sorbonne Univ. (France), Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris, CNRS (France); Kate Grieve, Institut de la Vision, Sorbonne Univ., INSERM, CNRS (France), INSERM-DGOS CIC 1423, Ctr. Hospitalier National d'Ophthalmologie des Quinze-Vingts (France)

12391-59 • 9:40 AM - 10:00 AM

Volumetric differential contrast imaging by computationally augmented optical coherence tomography microscopy

Author(s): Kiriko Tomita, Shuichi Makita, Computational Optics Group, Univ. of Tsukuba (Japan); Naoki Fukutake, Nikon Corp. (Japan); Rion Morishita, Computational Optics Group, Univ. of Tsukuba (Japan); Ibrahim Abd El-Sadek, Computational Optics Group, Univ. of Tsukuba (Japan), Damietta Univ. (Egypt); Pradipta Mukherjee, Computational Optics Group, Univ. of Tsukuba (Japan); Antonia Lichtenegger, Computational Optics Group, Univ. of Tsukuba (Japan), Center for Medical Physics and Biomedical Engineering, Medizinische Univ. Wien (Austria); Junya Tamaoki, Lixuan Bian, Makoto Kobayashi, Tomoko Mori, Satoshi Matsusaka, Yoshiaki Yasuno, Univ. of Tsukuba (Japan)

12391-60 • 10:00 AM - 10:20 AM

Dynamic OCT to visualize development of cotyledon vessels in sprouts

Author(s): Yiheng Lim, Shumpei Kojima, Pradipta Mukherjee, Univ. of Tsukuba (Japan); Ibrahim Abd El-Sadek, Univ. of Tsukuba (Japan), Damietta Univ. (Egypt); Shuichi Makita, Yoshiaki Yasuno, Univ. of Tsukuba (Japan)

12391-61 • 10:20 AM - 10:40 AM

Early detection of caries with ultrahigh-resolution optical coherence tomography

Author(s): Tai-Ang Wang, Hsiang-Chieh Lee, National Taiwan Univ. (Taiwan); Yen-Li Wang, Chang Gung Memorial Hospital (Taiwan); Meng-Tsan Tsai, Chang Gung Univ. (Taiwan)

Coffee Break 10:40 AM - 11:00 AM

SESSION 13: OCT II

31 January 2023 • 11:00 AM - 12:10 PM

Moscone Center, Room 213 (Level 2 South)

Session chairs: Natan T. Shaked, Tel Aviv Univ. (Israel), Oliver Hayden, Technische Univ. München (Germany)

12391-62 • 11:00 AM - 11:20 AM

Development of circular scanning optical coherence tomography for volumetric imaging of the long mouse spinal cord

Author(s): SangJin Lee, Eunji Lee, Kibeom Park, Woonggyu Jung, Ulsan National Institute of Science and Technology (Republic of Korea)

12391-63 • 11:20 AM - 11:50 AM

Longitudinal spatial coherence gated line-field optical coherence tomography of multilayer structures with speckle-free and reduced crosstalk *(Invited Paper)*

Author(s): Dalip Singh Mehta, Sunil Bhatt, Harpreet Kaur, Dibakar Borah, Indian Institute of Technology Delhi (India); Azeem Ahmad, UiT The Arctic Univ. of Norway (Norway); Anand Kumar, Indian Institute of Technology Delhi (India); Ankit Butola, UiT The Arctic Univ. of Norway (Norway)

12391-65 • 11:50 AM - 12:10 PM

Evaluation of cell dynamic activity using machine learning and intracellular migration observations

Author(s): Soongho Park, Thien Nguyen, Vinay Veluvolu, Jinho Park, Amir Gandjbakhche, National Institutes of Health (United States)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12391-32 • On demand | Presenting live 28 January 2023

Label-free cell imaging based on multi-wavelength lensless digital holography

Author(s): Kai Chen, Duofang Chen, Huidi Guan, Xidian Univ. (China); Feng Chen, Shanghai Electro-Mechanical Engineering Institute (China); Xueli Chen, Xidian Univ. (China)

12391-46 On demand | Presenting live 28 January 2023

Label-free characterization of oxidative stress impact on drosophila brain elasticity using combined Brillouin-Raman spectroscopy

Author(s): Vsevolod Cheburkanov, Jace A. Willis, Vladislav V. Yakovlev, Texas A&M Univ. (United States)

Conference 12392

28 - 30 January 2023 | Moscone Center, Room 157 (Upper Mezzanine South)

Advanced Chemical Microscopy for Life Science and Translational Medicine 2023

Conference Chairs: **Ji-Xin Cheng**, Boston Univ. (United States); **Wei Min**, Columbia Univ. (United States); **Garth J. Simpson**, Purdue Univ. (United States)

Program Committee: **Rohit Bhargava**, Univ. of Illinois (United States); **Stephen A. Boppart**, Univ. of Illinois (United States); **Sophie Brasselet**, Institut Fresnel (France); **Minhaeng Cho**, Korea Univ. (Korea, Republic of); **Marcus T. Cicerone**, Georgia Institute of Technology (United States); **Hilton B. de Aguiar**, Ecole Normale Supérieure (France); **Conor L. Evans**, Wellman Ctr. for Photomedicine (United States); **Hanieh Fattahi**, Max-Planck-Institut für Quantenoptik (Germany); **Dan Fu**, Univ. of Washington (United States); **Katsumasa Fujita**, Osaka Univ. (Japan); **Wei E. Huang**, Univ. of Oxford (United Kingdom); **Zhiwei Huang**, National Univ. of Singapore (Singapore); **Minbiao Ji**, Fudan Univ. (China); **Anita Mahadevan-Jansen**, Vanderbilt Univ. (United States); **Julian Moger**, Univ. of Exeter (United Kingdom); **Yasuyuki Ozeki**, The Univ. of Tokyo (Japan); **Sapun H. Parekh**, The Univ. of Texas at Austin (United States); **Ammasi Periasamy**, Univ. of Virginia (United States); **Miguel A. Pleitez**, Helmholtz Zentrum München GmbH (Germany); **Dario Polli**, Politecnico di Milano (Italy); **Jürgen Popp**, Leibniz-Institut für Photonische Technologien e.V. (Germany); **Eric O. Potma**, Univ. of California, Irvine (United States); **Rohith K. Reddy**, Univ. of Houston (United States); **Hervé Rigneault**, Institut Fresnel (France); **Lingyan Shi**, Univ. of California, San Diego (United States); **Chi-Kuang Sun**, National Taiwan Univ. (Taiwan); **Meng Wang**, Baylor College of Medicine (United States); **Warren S. Warren**, Duke Univ. (United States); **Jesse W. Wilson**, Colorado State Univ. (United States); **Xiaoliang Sunney Xie**, Peking Univ. (China); **Xiaoji G. Xu**, Lehigh Univ. (Canada); **Shuhua Yue**, Beihang Univ. (China)

SATURDAY 28 JANUARY

SESSION 1: IR PHOTOTHERMAL MICROSCOPY

28 January 2023 • 8:00 AM - 10:20 AM

Moscone Center, Room 157 (Upper Mezzanine South)

Session chairs: Ji-Xin Cheng, Boston Univ. (United States), Ji-Xin Cheng, Boston Univ. (United States)

12392-1 • 8:00 AM - 8:30 AM

Mid-infrared photothermal quantitative phase imaging with high signal-to-noise ratio *(Invited Paper)*

Author(s): Takuro Ideguchi, The Univ. of Tokyo (Japan)

12392-2 • 8:30 AM - 9:00 AM

Functional live-cell mid-infrared microscopy and spectroscopy by optoacoustic and optothermal detection *(Invited Paper)*

Author(s): Miguel A. Pleitez, Helmholtz Zentrum München GmbH (Germany), Technische Univ. München (Germany); Francesca Gasparin, Helmholtz Zentrum München GmbH (Germany)

12392-3 • 9:00 AM - 9:20 AM

Volumetric bond-selective imaging and spectroscopic analysis of cellular Tau fibrils through a fluorescence-guided computational chemical microscope

Author(s): Jian Zhao, Lulu Jiang, Yihong Xu, Boston Univ. (United States); Alex C. Matlock, Massachusetts Institute of Technology (United States); Jiabei Zhu, Lei Tian, Benjamin Wolozin, Ji-Xin Cheng, Boston Univ. (United States)

12392-4 • 9:20 AM - 9:40 AM

Video-rate mid-infrared photothermal imaging of cellular dynamics

Author(s): Jiaze Yin, Lu Lan, Meng Zhang, Fukai Chen, Zhongyue Guo, Ji-Xin Cheng, Boston Univ. (United States)

12392-5 • 9:40 AM - 10:00 AM

Single virus detection by wide-field interferometric defocus-enhanced mid-infrared photothermal microscopy

Author(s): Qing Xia, Ji-Xin Cheng, John H. Connor, Zhongyue Guo, Haonan Zong, Scott Seitz, Le Wang, Celalettin Yurdakul, Boston Univ. (United States)

12392-6 • 10:00 AM - 10:20 AM

Widefield infrared photothermal imaging and spectroscopy

Author(s): Kirill Kniazev, Evgenii Zaitsev, Zhuoming Zhang, Masaru K. Kuno, Univ. of Notre Dame (United States)

Coffee Break 10:20 AM - 10:50 AM

SESSION 2: RAMAN PROBE

28 January 2023 • 10:50 AM - 12:30 PM

Moscone Center, Room 157 (Upper Mezzanine South)

Session chair: Lu Wei, Caltech (United States)

12392-7 • 10:50 AM - 11:20 AM

Activatable Raman probes for multiplexed imaging of biological phenomena *(Invited Paper)*

Author(s): Mako Kamiya, Tokyo Institute of Technology (Japan)

12392-8 • 11:20 AM - 11:50 AM

Functional stimulated Raman imaging for complex sub-cellular analysis *(Invited Paper)*

Author(s): Lu Wei, Caltech (United States)

12392-9 • 11:50 AM - 12:10 PM

Alkyne-tagged Raman probes for local environmental sensing by hydrogen-deuterium exchange

Author(s): Xiaotian Bi, Kun Miao, Lu Wei, Caltech (United States)

12392-10 • 12:10 PM - 12:30 PM

Vibrational tags for Raman and infrared-based imaging

Author(s): Yong Li, Katherine Townsend, Robert Dorn, Jennifer Prescher, Eric O. Potma, Univ. of California, Irvine (United States)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

SESSION 3: MULTIMODAL CHEMICAL IMAGING

28 January 2023 • 2:00 PM - 3:10 PM

Moscone Center, Room 157 (Upper Mezzanine South)

Session chair: Qing Xia, Boston Univ. (United States)

12392-11 • 2:00 PM - 2:30

Super resolution multimodal metabolic imaging in aging and diseases (*Invited Paper*)

Author(s): Lingyan Shi, Yajuan Li, Hongje Jang, Zhi Li, Sahran Hussain, Univ. of California, San Diego (United States)

12392-12 • 2:30 PM - 2:50 PM

New chemical microscopies to inform the design of pharmaceutical formulations (*Invited Paper*)

Author(s): Garth J. Simpson, Purdue Univ. (United States)

12392-13 • 2:50 PM - 3:10 PM

Label-free and live-cell Raman and autofluorescence imaging of drug distribution and induced cytotoxicity

Author(s): Menglu Li, National Institute of Advanced Industrial Science and Technology, Osaka Univ (Japan); Hao-Xiang Liao, Osaka Univ. (Japan); Kazuki Bando, National Institute of Advanced Industrial Science and Technology, Osaka Univ. (Japan); Yasunori Nawa, Satoshi Fujita, National Institute of Advanced Industrial Science and Technology, Osaka Univ (Japan); Katsumasa Fujita, National Institute of Advanced Industrial Science and Technology, Osaka Univ. (Japan), Institute for Open and Transdisciplinary Research Initiatives (Japan)

Coffee Break 3:10 PM - 3:40 PM

SESSION 4: CLINICAL TRANSLATION

28 January 2023 • 3:40 PM - 5:30 PM

Moscone Center, Room 157 (Upper Mezzanine South)

Session chair: Miguel A. Pleitez, Helmholtz Zentrum München GmbH (Germany)

12392-14 • 3:40 PM - 4:10 PM

Technical innovations and clinical translation for in vivo Raman spectroscopy, multimodal imaging and Raman-based chemical imaging (*Invited Paper*)

Author(s): Iwan W. Schie, Leibniz-Institut für Photonische Technologien e.V. (Germany)

12392-15 • 4:10 PM - 4:30 PM

High-content Stimulated Raman scattering histology of breast cancer

Author(s): Hongli Ni, Chinmayee V. Prabhu Dessai, Haonan Lin, Boston Univ. (United States); Wei Wang, Hologic, Inc. (United States); Ji-Xin Cheng, Boston Univ. (United States)

12392-16 • 4:30 PM - 4:50 PM

Imaging radiobiological response of breast cancer cells in vitro using stimulated Raman scattering

Author(s): Christian Harry Allen, Robyn Skillings, Duale Ahmed, Carleton Univ. (Canada); Sarita Cuadros Sanchez, Kaitlyn Altwasser, Health Canada (Canada); Justin Gagnon, Carleton Univ. (Canada); Vinita Chauhan, Health Canada (Canada); Edana Cassol, Sangeeta Murugkar, Carleton Univ. (Canada)

12392-18 • 4:50 PM - 5:10 PM

Identifying metastatic melanoma with pump-probe microscopy of melanin

Author(s): David Grass, Georgia M. Beasley, Martin C. Fischer, M. Angelica Selim, Yue Zhou, Warren S. Warren, Duke Univ. (United States)

12392-19 • 5:10 PM - 5:30 PM

The clinical transferability of Raman micro-spectroscopic systems for cervical cytopathology

Author(s): Rubina S. Shaikh, FOCAS Research Institute, Technological Univ. Dublin (Ireland); Alison Malkin, Technological Univ. Dublin (Ireland); John J. O'Leary, Coombe Women & Infants Univ. Hospital (Ireland), Trinity College Dublin (Ireland); Cara M. Martin, Trinity College Dublin (Ireland); Fiona Lyng, Technological Univ. Dublin (Ireland)

SUNDAY 29 JANUARY

SESSION 5: NEW DEVELOPMENT OF RAMAN MICROSCOPY

29 January 2023 • 8:00 AM - 10:40 AM

Moscone Center, Room 157 (Upper Mezzanine South)

Session chair: Wei Min, Columbia Univ. (United States)

12392-20 • 8:00 AM - 8:30 AM

Chemical-specific precision control of biomolecules in live cells (*Invited Paper*)

Author(s): Matthew G. Clark, Gil A. Gonzalez, Yiyang Luo, Jesus Aldana-Mendoza, Mark Carlsen, Gregory Eakins, Mingjie Dai, Chi Zhang, Purdue Univ. (United States)

12392-21 • 8:30 AM - 9:00 AM

Random illumination wide field coherent anti-Stokes Raman scattering microscopy (RIM-CARS) (*Invited Paper*)

Author(s): Hervé Rigneault, Eric Fantuzzi, Sandro Heuke, Institut Fresnel (France); Randy A. Bartels, Colorado State Univ. (United States); Anne Sentenac, Institut Fresnel (France); Dominykas Gudavičius, Light Conversion Ltd. (Lithuania), Cardiff Univ. (United Kingdom)

12392-22 • 9:00 AM - 9:30 AM

Accelerating spontaneous Raman spectroscopy and imaging (*Invited Paper*)

Author(s): Yasuaki Kumamoto, Osaka Univ. (Japan)

12392-23 • 9:30 AM - 10:00 AM

Super-resolution stimulated Raman scattering of opaque tissues using speckle patterns (*Invited Paper*)

Author(s): Julien Guilbert, Awoke Negash, Lab. Kastler Brossel (France); Simon Labouesse, Institut Fresnel (France); Sylvain Gigan, Lab. Kastler Brossel (France); Anne Sentenac, Institut Fresnel (France); Hilton Barbosa de Aguiar, Lab. Kastler Brossel (France)

12392-24 • 10:00 AM - 10:20 AM

Stimulated Raman photothermal (SRPT) microscopy

Author(s): Yifan Zhu, Xiaowei Ge, Le Wang, Ji-Xin Cheng, Boston Univ. (United States)

12392-25 • 10:20 AM - 10:40 AM

Quantum-enhanced stimulated Raman scattering microscopy toward breaking the shot noise limit in high-power regime

Author(s): Kenichi Oguchi, Zicong Xu, Yoshitaka Taguchi, Shun Takahashi, Yuki Sano, Takaha Mizuguchi, Kazuhiro Katoh, Yasuyuki Ozeki, The Univ. of Tokyo (Japan)

Coffee Break 10:40 AM - 11:00 AM

Conference 12392

SESSION 6: DATA SCIENCE I

29 January 2023 • 11:00 AM - 12:30 PM

Moscone Center, Room 157 (Upper Mezzanine South)

Session chair: Hilton Barbosa de Aguiar, Lab. Kastler Brossel (France)

12392-26 • 11:00 AM - 11:30 AM

Machine learning augmented cell imaging and classification with stimulated Raman scattering microscopy *(Invited Paper)*

Author(s): Dan Fu, Univ. of Washington (United States)

12392-27 • 11:30 AM - 12:00 PM

Broadband coherent Raman microscopy and deep learning for high-speed imaging of biological samples *(Invited Paper)*

Author(s): Dario Polli, Federico Vernuccio, Alejandro De la Cadena, Arianna Bresci, Chiara Ceconello, Francesco Manetti, Salvatore Sorrentino, Subir Das, Politecnico di Milano (Italy); Renzo Vanna, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Giulio N. Cerullo, Politecnico di Milano (Italy)

High-speed, quantitative Raman signal extraction from CARS spectra and hyperspectral imagery

Author(s): Charles H. Camp, National Institute of Standards and Technology (United States)

Lunch/Exhibition Break 12:30 PM - 1:50 PM

SESSION 7: BIOMEDICAL APPLICATIONS OF IR PHOTOTHERMAL MICROSCOPY

29 January 2023 • 1:50 PM - 3:40 PM

Moscone Center, Room 157 (Upper Mezzanine South)

Session chair: Eric O. Potma, Univ. of California, Irvine (United States)

12392-29 • 1:50 PM - 2:20 PM

Protein-specific infrared spectroscopic imaging at sub-micrometer resolution with fluorescently guided optical photothermal infrared microscopy *(Invited Paper)*

Author(s): Craig Prater, Yeran Bei, Photothermal Spectroscopy Corp. (United States); Ferenc Borondics, Synchrotron SOLEIL (France); Oxana I. Klementieva, Lund Univ. (Sweden)

12392-30 • 2:20 PM - 2:40 PM

In situ lipid metabolism characterization in cells and brain organoids by optical photothermal infrared microscopy

Author(s): Yeran Bai, Univ. of California, Santa Barbara (United States); Photothermal Spectroscopy Corp. (United States); Stella Glasauer, Carolina M. Camargo, Xinran Tian, Andrew Longhini, Kenneth Kosik, Univ. of California, Santa Barbara (United States); Craig Prater, Photothermal Spectroscopy Corp. (United States)

12392-31 • 2:40 PM - 3:00 PM

Optical photothermal infrared spectroscopy and imaging for identification of infections and cancers

Author(s): Christoph Krafft, Jürgen Popp, Leibniz-Institut für Photonische Technologien e.V. (Germany)

12392-32 • 3:00 PM - 3:20 PM

Biomedical diagnostics and clinical applications of photothermal mid-infrared spectroscopic imaging

Author(s): Chalapathi Gajjala, Rupali Mankar, Ragib Ishrak, Xinyu Wu, Reza Reihanisaransari, Sharmin Afrose, David Mayerich, Rohith K. Reddy, Univ. of Houston (United States)

12392-33 • 3:20 PM - 3:40 PM

Mapping enzyme activity in cells and in vivo by mid-infrared photothermal imaging of nitrile chameleons

Author(s): Hongjian He, Jiaze Yin, Zian Wang, Meng Zhang, Boston Univ. (United States); Bing Xu, Brandeis Univ. (United States); Ji-Xin Cheng, Boston Univ. (United States)

Coffee Break 3:40 PM - 4:00 PM

SESSION 8: IR MICROSCOPY

29 January 2023 • 4:00 PM - 5:50 PM

Moscone Center, Room 157 (Upper Mezzanine South)

Session chair: Georg Ramer, Technische Univ. Wien (Austria)

12392-343 • 4:00 PM - 4:30 PM

Widefield mid-infrared photothermal heterodyne imaging in the cell-silent window *(Invited Paper)*

Author(s): Eduardo M. Paiva, Florian M. Schmidt, Umeå Univ. (Sweden)

12392-35 • 4:30 PM - 4:50 PM

Quantitative chemical imaging of live cells using advanced IR microscopy

Author(s): Yow-Ren Chang, Seong-Min Kim, Young Jong Lee, National Institute of Standards and Technology (United States)

12392-36 • 4:50 PM - 5:10 PM

High speed, high definition mid-infrared spectral imaging by non-degenerate two-photon absorption

Author(s): David Knez, Anabel Chen, Eric O. Potma, Dmitry A. Fishman, Univ. of California, Irvine (United States)

12392-37 • 5:10 PM - 5:30 PM

Advances in mid-infrared optoacoustic microscopy: Towards non-invasive biomolecular imaging and spectroscopy

Author(s): Nasire Uluç, Miguel A. Pleitez, Vasilis Ntziachristos, Zentralinstitut für Translationale Krebsforschung, Technische Univ. München (Germany); Institute of Biological and Medical Imaging, Helmholtz Zentrum München GmbH (Germany)

12392-38 • 5:30 PM - 5:50 PM

Label-free parts per million detection by autofluorescence photothermal mid-IR (AF-PTIR) microscopy

Author(s): Aleksandr Razumtcev, Minghe Li, Garth J. Simpson, Purdue Univ. (United States)

MONDAY 30 JANUARY

SESSION 9: RAMAN BIOMEDICAL APPLICATION

30 January 2023 • 8:00 AM - 10:30 AM

Moscone Center, Room 157 (Upper Mezzanine South)

Session chair: Valerie G. Brunton, MRC Institute of Genetics & Molecular Medicine (United Kingdom)

12392-39 • 8:00 AM - 8:30 AM

Cutaneous pharmacokinetic and pharmacodynamic imaging with coherent Raman scattering *(Invited Paper)*

Author(s): Conor L. Evans, Wellman Ctr. for Photomedicine (United States)

12392-40 • 8:30 AM - 9:00 AM

Applications of Raman microscopy in cancer biology and drug discovery *(Invited Paper)*

Author(s): Valerie G. Brunton, Martin Lee, Ander Maguregui, Craig Steven, Manasa Ravindra, Romain B. Enjalbert, Michaela Noskova, The Univ. of Edinburgh (United Kingdom); Steve Hood, GlaxoSmithKline (United Kingdom); Alison N. Hulme, Miguel O. Bernabeu, The Univ. of Edinburgh (United Kingdom)

12392-41 • 9:00 AM - 9:30 AM

High-speed FT-CARS spectroscopy for high-throughput phenotyping *(Invited Paper)*

Author(s): Kotaro Hiramatsu, The Univ. of Tokyo (Japan)

12392-42 • 9:30 AM - 9:50 AM

Changes in lipid metabolism in hypoxic cancer cells revealed by hyperspectral stimulated Raman scattering microscopy

Author(s): Gil A. Gonzalez, Matthew G. Clark, Ezinne Osuji, Chi Zhang, Purdue Univ. (United States)

12392-43 • 9:50 AM - 10:10 AM

A new SRS architecture for broadband sparse wavenumber analysis of environmental microfibers using the Hadamard transform

Author(s): Luca Genchi, Sergey P. Laptinok, Carlo Liberale, King Abdullah Univ. of Science and Technology (Saudi Arabia)

12392-44 • 10:10 AM - 10:30 AM

Characterization of lipid composition and localization at different stages of nonalcoholic fatty liver disease using stimulated Raman scattering microscopy

Author(s): Xi Xu, Univ. of Washington (United States); George Ioannou, Sum Lee, Christopher Savard, Seattle VA Medical Ctr. (United States); Dan Fu, Univ. of Washington (United States)

Coffee Break 10:30 AM - 11:00 AM

SESSION 10: DATA SCIENCE II

30 January 2023 • 11:00 AM - 12:30 PM

Moscone Center, Room 157 (Upper Mezzanine South)

Session chair: Dario Polli, Politecnico di Milano (Italy)

12392-45 • 11:00 AM - 11:30 AM

Image processing as basis for chemometrics in photothermal atomic force microscopy infrared imaging *(Invited Paper)*

Author(s): Georg Ramer, A. Catarina V. D. dos Santos, Yide Zhang, Ufuk Yilmaz, Bernhard Lendl, Technische Univ. Wien (Austria)

12392-46 • 11:30 AM - 11:50 AM

Segmentation of hyperspectral stimulated Raman images using deep learning techniques

Author(s): Adiel Felsen, Nikolas Burzynski, Soumit Saha, Yuhao Yuan, David Reitano, Zhibo Wang, Binghamton Univ. (United States); Khalid A. Sethi, United Health Services (United States); Kenneth Chiu, Fake Lu, Binghamton Univ. (United States)

12392-47 • 11:50 AM - 12:10 PM

Transfer learning for Raman spectroscopy in biological applications: A case study for bacterial classification

Author(s): Milena Królikowska, Univ. of Warsaw (Poland), Leibniz-Institut für Photonische Technologien e.V. (Germany); Thomas Bocklitz, Leibniz-Institut für Photonische Technologien e.V. (Germany), Institut für Physikalische Chemie, Abbe Ctr. of Photonics, Friedrich-Schiller-Univ. Jena (Germany)

12392-48 • 12:10 PM - 12:30 PM

Diffusion mapping by Fourier-transform fluorescence recovery after photobleaching (FT-FRAP) for phase separation in drug formulations

Author(s): Ziyi Cao, Dustin M. Harmon, Ruochen Yang, Aleksandr Razumtcev, Minghe Li, Mark S. Carlsen, Andreas C. Geiger, Alex M. Sherman, Nita Takanti, Jiayue Rong, Lynne S. Taylor, Garth J. Simpson, Purdue Univ. (United States)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

SESSION 11: VOLUMETRIC COHERENT RAMAN SCATTERING IMAGING

30 January 2023 • 2:00 PM - 3:00 PM

Moscone Center, Room 157 (Upper Mezzanine South)

Session chair: Jesse Zhang

12392-49 • 2:00 PM - 2:20 PM

Three-dimensional analysis of water dynamics in human skin by stimulated Raman scattering imaging

Author(s): Takaha Mizuguchi, The Univ. of Tokyo (Japan); Christopher T. Knight, Makiko Goto, Masato Ninomiya, Mariko Egawa, Shiseido Co., Ltd. (Japan); Yasuyuki Ozeki, The Univ. of Tokyo (Japan)

12392-50 • 2:20 PM - 2:40 PM

Scalable volumetric vibrational imaging of cells and tissues

Author(s): Li-En Lin, Kun Miao, Chenxi Qian, Lu Wei, Caltech (United States)

12392-51 • 2:40 PM - 3:00 PM

Raman projection tomography for label-free 3D molecular imaging of live tissue engineered constructs

Author(s): Elzbieta Stepula, King's College London (United Kingdom); Anders R. Walther, Univ. of Southern Denmark (Denmark); Dev R. Mehrotra, Boston Univ. (United States); Magnus Jensen, King's College London (United Kingdom); Michael B. Albro, Boston Univ. (United States); Martin A. B. Hedegaard, Univ. of Southern Denmark (Denmark); Mads S. Bergholt, King's College London (United Kingdom)

Coffee Break 3:00 PM - 3:20 PM

SESSION 12: INNOVATION AND COMMERCIALIZATION OF VIBRATIONAL MICROSCOPY

30 January 2023 • 3:20 PM - 5:30 PM

Moscone Center, Room 157 (Upper Mezzanine South)

Session chair: Garth J. Simpson, Purdue Univ. (United States)

12392-52 • 3:20 PM - 3:50 PM

Surface-enhanced coherent Raman scattering with non-metallic antennas *(Invited Paper)*

Author(s): Eric O. Potma, Shamsul Abedin, Yong Li, Abid A. Sifat, Univ. of California, Irvine (United States)

Conference 12392

12392-53 • 3:50 PM - 4:10 PM

Metasurface-enhanced infrared reflection chemical imaging on live and fixed cells with a QCL microscope

Author(s): Po-Ting Shen, Steven H. Huang, Giovanni Sartorello, Gennady B. Shvets, Cornell Univ. (United States)

12392-54 • 4:10 PM - 4:30 PM

Low frequency coherent Raman imaging with high optical scattering robustness

Author(s): David R. Smith, Colorado State Univ. (United States); Siddarth Shivkumar, Aix-Marseille Univ. (France); Jeff Field, Jesse Wilson, Colorado State Univ. (United States); Hervé Rigneault, Aix-Marseille Univ. (France); Randy A. Bartels, Colorado State Univ. (United States)

12392-55 • 4:30 PM - 4:50 PM

Broadband fluorescence-encoded vibrational imaging

Author(s): Phillip C. McCann, The Univ. of Tokyo (Japan); Kotaro Hiramatsu, Research Ctr. for Spectrochemistry, The Univ. of Tokyo (Japan), PRESTO, Japan Science and Technology Agency (Japan); Keisuke Goda, The Univ. of Tokyo (Japan), Univ. of California, Los Angeles (United States), Wuhan Univ. (China)

12392-56 • 4:50 PM - 5:10 PM

High-speed multicolor stimulated Raman imaging enabled by a compact and robust light source

Author(s): Maximilian Brinkmann, Niklas Lüpken, Sven Dobner, Tim Hellwig, Refined Laser Systems GmbH (Germany)

12392-57 • 5:10 PM - 5:30 PM

Dual frequency stimulated Raman microscopy

Author(s): Barbara Sarri, Lightcore Technologies (France); Sandro Heuke, Institut Fresnel (France); Chang Liu, Lightcore Technologies (France); Hervé Rigneault, Institut Fresnel (France); Ingo Rimke, Edlef Büttner, APE Angewandte Physik & Elektronik GmbH (Germany)

POSTERS-MONDAY

30 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the Monday BIOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM - 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12392-58 • On demand | Presented live 30 January 2023

Fast diffusion characterization by fluorescence recovery while photobleaching (FRWP)

Author(s): Minghe Li, Aleksandr Razumtcev, Dustin M. Harmon, Garth J. Simpson, Purdue Univ. (United States)

12392-61

Plug-and-play stimulated Raman microscopy system for broadband coherent vibrational imaging

Author(s): Francesco Crisafi, Benedetta Talone, Andrea Ragni, Gabriele Di Noia, Cambridge Raman Imaging S.r.l. (Italy); Mujeeb Rahman, Cambridge Raman Imaging Ltd. (United Kingdom); Jing He, Jeremiah Marcellino, Goutam P. Kar, Yarjan Samad, Boyang Mao, Univ. of Cambridge (United Kingdom); Renzo Vanna, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Franziska Hoffmann, Orlando Guntinas Lichius, Universitätsklinikum Jena (Germany); Sze Yun Set, Andrea C. Ferrari, Univ. of Cambridge (United Kingdom); Giulio N. Cerullo, Politecnico di Milano (Italy); Matteo Negro, Cambridge Raman Imaging Ltd. (United Kingdom)

12392-62 • On demand | Presented live 30 January 2023

Blind hyperspectral unmixing of pump-probe images with maximum likelihood selection of a convolutional network from an ensemble of models

Author(s): Arya C. Mugdha, Jesse W. Wilson, Colorado State Univ. (United States)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12392-59 • On demand | Presenting live 28 January 2023

Feasibility study of Raman spectroscopy in corneal stromal tissue of human myopic eye

Author(s): Ming Han, Xidian Univ. (China); Jing Li, Shaanxi Eye Hospital, Xi'an People's Hospital (China); Nan Wang, Rui Liu, Xidian Univ. (China); Yong Li, Juan Li, Shaanxi Eye Hospital, Xi'an People's Hospital (China); Qi Zeng, Xueli Chen, Xidian Univ. (China)

12392-60 • On demand | Presenting live 28 January 2023

Raman spectra-based structural classification analysis of flavone and isoflavone

Author(s): Li Li, Yangyao Peng, Jiaojiao Zhang, Xidian Univ. (China); Xiaojia Hu, Nature's Sunshine (Shanghai) Product Inc. (China); Dongjie Zhang, Qi Zeng, Xueli Chen, Xidian Univ. (China)

Conference 12393

28 January 2023 | Moscone Center, Room 205 (Level 2 South)

Biomedical Applications of Light Scattering XIII

Conference Chairs: **Adam Wax**, Duke Univ. (United States); **Vadim Backman**, Northwestern Univ. (United States)

Program Committee: **Irving J. Bigio**, Boston Univ. (United States); **Nada N. Boustany**, Rutgers, The State Univ. of New Jersey (United States); **Stephen A. Boppart**, Univ. of Illinois (United States); **Dirk J. Faber**, Academisch Medisch Ctr. (Netherlands); **Steven L. Jacques**, Tufts Univ. (United States); **Ofer Levi**, Univ. of Toronto (Canada); **Mary-Ann Mycek**, Univ. of Michigan (United States); **Lev T. Perelman**, Harvard Univ. (United States); **Brian W. Pogue**, Thayer School of Engineering at Dartmouth (United States); **Bruce J. Tromberg**, National Institute of Biomedical Imaging and Bioengineering (United States)

SATURDAY 28 JANUARY

SESSION 1: CLINICAL APPLICATIONS

28 January 2023 • 8:30 AM - 10:00 AM

Moscone Center, Room 205 (Level 2 South)

Session chair: Vadim Backman, Northwestern Univ. (United States)

12393-1 • 8:30 AM - 8:50 AM

Investigating corneal properties through temporal decorrelation in OCT images

Author(s): Brecken J. Blackburn, Matthew McPheeters, Michael Jenkins, Case Western Reserve Univ. (United States); William J. Dupps, Cleveland Clinic (United States); Andrew M. Rollins, Case Western Reserve Univ. (United States)

12393-2 • 8:50 AM - 9:10 AM

Ultra-miniaturised spatial frequency domain imaging for improved early detection of gastrointestinal cancers

Author(s): Jane Crowley, George Gordon, The Univ. of Nottingham (United Kingdom)

12393-3 • 9:10 AM - 9:30 AM

Identification of gastric conduit perfusion deficits with laparoscopic laser speckle contrast imaging

Author(s): Tim Hoffman, Wido T. Heeman, Univ. of Groningen (Netherlands); Jean-Pierre E. N. Pierie, Christiaan Boerma, Medical Ctr. Leeuwarden (Netherlands)

12393-4 • 9:30 AM - 10:00 AM

Real-time evaluation of light scattering and absorption properties of liver tissues using visible diffuse reflectance spectroscopy (*Invited Paper*)

Author(s): Bing Yu, Marquette Univ. (United States), Medical College of Wisconsin (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: TISSUE PROPERTIES

28 January 2023 • 10:30 AM - 12:20 PM

Moscone Center, Room 205 (Level 2 South)

Session chair: Vadim Backman, Northwestern Univ. (United States)

12393-5 • 10:30 AM - 10:50 AM

Characterisation and quantification of the limbal architecture and biomechanical properties using optical coherence tomography or elastography

Author(s): Ryan Dimmock, Keele Univ. (United Kingdom); Yilong Zhang, Univ. of Dundee (United Kingdom); Gibran Butt, Univ. of Birmingham (United Kingdom); Zhihong Huang, Univ. of Dundee (United Kingdom); Saeeda Rauz, Univ. of Birmingham (United Kingdom); Ying Yang, Keele Univ. (United Kingdom)

12393-6 • 10:50 AM - 11:10 AM

Enhanced laser speckle perfusion imaging for skin cancer detection at 980 nm with a black silicon camera

Author(s): Giulia Mansutti, Martin Villiger, Wellman Ctr. for Photomedicine (United States); Brett E. Bouma, Wellman Ctr. for Photomedicine (United States); Institute for Medical Engineering and Science, Massachusetts Institute of Technology (United States); Néstor Uribe-Patarroyo, Wellman Ctr. for Photomedicine (United States)

12393-7 • 11:10 AM - 11:40 AM

Water monitoring in tissues with high-resolution optoacoustic technique (*Invited Paper*)

Author(s): Rinat O. Esenaliev, The Univ. of Texas Medical Branch (United States)

12393-8 • 11:40 AM - 12:00 PM

CANCELED: Classification of cancer cells at sub-cellular level by Phonon Microscopy and Deep Learning : towards phonon-based diagnostics

Author(s): Fernando Perez-Cota, Giovanna Martinez-Arellano, Alan McIntyre, Matt Clark, The Univ. of Nottingham (United Kingdom)

12393-9 • 12:00 PM - 12:20 PM

3D phononic endo-microscopy of biological matter

Author(s): Salvatore La Cavera, Fernando Perez-Cota, Veeren Chauhan, William Hardiman, Mengting Yao, Rafael Fuentes-Dominguez, Kerry Setchfield, Richard J. Smith, Matt Clark, The Univ. of Nottingham (United Kingdom)

Lunch/Exhibition Break 12:20 PM - 1:50 PM

SESSION 3: NOVEL APPROACHES

28 January 2023 • 1:50 PM - 3:45 PM

Moscone Center, Room 205 (Level 2 South)

Session chair: Adam P. Wax, Duke Univ. (United States)

12393-10 • 1:50 PM - 2:35 PM

Encoding light for high-through 3D tissue imaging (*Keynote Presentation*)

Author(s): Peter T. C. So, Massachusetts Institute of Technology (United States); Dushan N. Wadduwage, Ctr. for Advanced Imaging, Harvard Univ. (United States)

12393-11 • 2:35 PM - 2:55 PM

Characterizing extracellular network pore size and microstructural dynamics with Laser Speckle Microrheology (LSM)

Author(s): Nichaluk Leartprapun, Brandon C. Matthews, Seemantini K. Nadkarni, Massachusetts General Hospital (United States)

Conference 12393

12393-12 • 2:55 PM - 3:15 PM

SRDRS in the SWIR range for glucose measurement

Author(s): Martin Lejosne, Luc André, Mélina Bardet, Anne Koenig, Giacomo Badano, CEA-LETI (France)

12393-13 • 3:15 PM - 3:45 PM

Using time-energy entangled photons to probe biological samples *(Invited Paper)*

Author(s): Charles H. Camp, Daniel J. Lum, Michael D. Mazurek, National Institute of Standards and Technology (United States); Alexander Mikhaylov, Kristen M. Parzuchowski, Ryan N. Wilson, Ralph Jimenez, JILA, Univ. of Colorado Boulder (United States); Thomas Gerrits, Martin J. Stevens, National Institute of Standards and Technology (United States); Marcus T. Cicerone, Georgia Institute of Technology (United States)

Coffee Break 3:45 PM - 4:15 PM

SESSION 4: THEORETICAL MODELING

28 January 2023 • 4:15 PM - 5:55 PM

Moscone Center, Room 205 (Level 2 South)

Session chair: Adam P. Wax, Duke Univ. (United States)

12393-15 • 4:15 PM - 4:45 PM

Simulation analysis of the nanoscale arrangement of constituent collagen fibrils that may account for the transparency of cornea *(Invited Paper)*

Author(s): Snow H. Tseng, Chih-Yao Yang, Jia-Hao Li, Hong-Yi Zhang, Yu-Yun Lu, Chin-Jung Chiu, National Taiwan Univ. (Taiwan); Yung-Ming Jeng, National Taiwan Univ. Hospital (Taiwan); Janaka C. Ranasinghesagara, Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (United States); Vasan Venugopalan, Beckman Laser Institute and Medical Clinic (United States)

12393-16 • 4:45 PM - 5:05 PM

Improving brain sensitivity of diffuse correlation spectroscopy blood flow measurements with a three-layer model

Author(s): Hongting Zhao, Erin Buckley, Georgia Institute of Technology (United States)

12393-17 • 5:05 PM - 5:25 PM

Two Monte Carlo approaches for simulating polarized light transport in tissues: Black-box comparison and evaluation

Author(s): Alexander Doronin, Victoria Univ. of Wellington (New Zealand); Hee Ryung Lee, Tatiana Novikova, Ecole Polytechnique (France)

12393-14 • 5:25 PM - 5:55 PM

CANCELED: Multiplexed spatially-focused localisation of light in adipose biological tissues *(Invited Paper)*

Author(s): Alexander Bykov, Univ. of Oulu (Finland); Valery Tuchin, Saratov State Univ. (Russian Federation); Igor V. Meglinski, Aston Univ. (United Kingdom), Univ. of Oulu (Finland)

SUNDAY 29 JANUARY

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM – 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12393-18

Research on terahertz systems for nondestructive testing

Author(s): Siwen Bi, Institute of Remote Sensing and Digital Earth (China)

12393-20 • On demand | Presented live 29 January 2023

All-fiber real time ultrafast ranging Lidar for motion management of patients during stereotactic radiotherapy

Author(s): Behzad Boroomandisorkhabi, Mina Esmaeelpour, Missouri Univ. of Science and Technology (United States)

12393-21

Assessing Raman spectra of concentrated carbohydrate solutions

Author(s): Hacene Boukari, Yahira Lopez, Mohamed Salih, Fatima Boukari, Delaware State Univ. (United States); Cleon M. Barnett, Alabama State Univ. (United States)

12393-22

Surface-enhanced Raman scattering of methylene blue and crystal violet on the novel sensor

Author(s): Szu Han Chao, Shih-Chieh Hsu, Tamkang Univ. (Taiwan)

Conference 12394

30 January 2023 | Moscone Center, Room 101 (Level 1 South Lobby)

Nanoscale Imaging, Sensing, and Actuation for Biomedical Applications XX

Conference Chairs: **Dror Fixler**, Bar-Ilan Univ. (Israel); **Ewa M. Goldys**, The Univ. of New South Wales (Australia); **Sebastian Wachsmann-Hogiu**, McGill Univ. (Canada)

Program Committee: **Vasily N. Astratov**, The Univ. of North Carolina at Charlotte (United States); **Lorena Betancor**, Univ. ORT Uruguay (Uruguay); **Henry Hess**, Columbia Univ. (United States); **Malgorzata J?drzejewska-Szczerska**, Gdansk Univ. of Technology (Poland); **Sinyoung Jeong**, Massachusetts General Hospital (United States); **Sung Jin Kim**, Univ. of Miami (United States); **Brian D. MacCraith**, Dublin City Univ. (Ireland); **Alzbeta Marcek Chorvatova**, International Laser Ctr. (Slovakia); **Paras N. Prasad**, Univ. at Buffalo (United States)

MONDAY 30 JANUARY

SESSION 1: NANOSCALE IMAGING I

30 January 2023 • 8:50 AM - 11:20 AM
Moscone Center, Room 101 (Level 1 South Lobby)
Session chair: Dror Fixler, Bar-Ilan Univ. (Israel)

12394-1 • 8:50 AM - 9:20 AM

Endoscope-integrated wavelength multiplexing super-resolved imaging based upon encoding patterns projection (*Invited Paper*)

Author(s): Omer Wagner, Zsquare Medical (Israel); Asaf Shahmoon, ZSquare Medical (Israel); Zeev Zalevsky, Bar-Ilan Univ. (Israel)

12394-2 • 9:20 AM - 9:50 AM

Recent progresses on understanding light interaction with turbid medium towards sensing (*Invited Paper*)

Author(s): Daqing Piao, Oklahoma State Univ. (United States)

12394-4 • 9:50 AM - 10:10 AM

Wide-field nanoscale imaging via near-field speckle illumination by nanoisland substrates

Author(s): Hajun Yoo, Hongki Lee, Yonsei Univ. (Republic of Korea); Woo Joong Rhee, Yonsei Univ. College of Medicine (Republic of Korea); Gwiyeong Moon, Changhun Lee, Yonsei Univ. (Republic of Korea); Jeon-Soo Shin, Yonsei Univ. College of Medicine (Republic of Korea); Donghyun Kim, Yonsei Univ. (Republic of Korea)

Coffee Break 10:10 AM - 10:40 AM

12394-5 • 10:40 AM - 11:00 AM

Sensing the penetration of nanodiamond along different skin layers according to their optical properties

Author(s): Channa Shapira, Hamootal Duadi, Dror Fixler, Bar-Ilan Univ. (Israel)

12394-6 • 11:00 AM - 11:20 AM

Lateral and axial sub-diffraction imaging using photonic crystal in MID-IR

Author(s): Norhan A. Salama, National Institute of Laser Enhanced Sciences, Cairo Univ. (Egypt); Mohamed A. Swillam, The American Univ. in Cairo (Egypt); Shaimaa M. Alexeree, National Institute of Laser Enhanced Sciences, Cairo Univ. (Egypt); Mohamed F. O. Hameed, Mansoura Univ. (Egypt), Ctr. for Photonics and Smart Materials, Zewail City of Science and Technology (Egypt); Salah S. A. Obayya, Ctr. for Photonics and Smart Materials, Zewail City of Science and Technology (Egypt), Mansoura Univ. (Egypt)

SESSION 2: NANOSTRUCTURES FOR BIOMEDICAL SENSORS

30 January 2023 • 11:20 AM - 12:00 PM
Moscone Center, Room 101 (Level 1 South Lobby)
Session chair: Sung Jin Kim, Univ. of Miami (United States)

12394-9 • 11:20 AM - 11:40 AM

Dielectric nano-interfaces for biosensing and cell mechanobiology studies

Author(s): Hao Wang, Taerin Chung, Haogang Cai, New York Univ. (United States)

12394-10 • 11:40 AM - 12:00 PM

Electrochemiluminescence detection of uric acid at point-of-need by using a lab-on-a-CMOS platform

Author(s): Reza Abbasi, Juanjuan Liu, McGill Univ. (Canada); Sorina Maria Suarasan, Babes-Bolyai Univ. (Romania); Sebastian Wachsmann-Hogiu, McGill Univ. (Canada)

Lunch Break 12:00 PM - 1:50 PM

SESSION 3: NANOSCALE IMAGING II

30 January 2023 • 1:50 PM - 4:00 PM
Moscone Center, Room 101 (Level 1 South Lobby)
Session chair: Sebastian Wachsmann-Hogiu, McGill Univ. (Canada)

12394-11 • 1:50 PM - 2:20 PM

Nanoscale integrated photonic sensors for real-time ultrasound sensing (*Invited Paper*)

Author(s): Ofer Levi, Univ. of Toronto (Canada)

12394-12 • 2:20 PM - 2:40 PM

A proposal of spectral magneto-thermo-acoustics imaging of magnetic nanoparticles by using a static bias magnetic field on top of a continuous-wave alternating magnetic field

Author(s): Daqing Piao, Oklahoma State Univ. (United States)

12394-13 • 2:40 PM - 3:00 PM

Reduced Graphene-Oxide/Au nanoparticles SERS biosensor for DNA detection prepared by femtosecond laser irradiation process

Author(s): Ilya Belyakov, Liena Zaidan, Univ. of Waterloo (Canada); Mehrdad Irannejad, OZ Optics Ltd. (Canada); Reza Karimi, Joseph Sanderson, Mustafa Yavuz, Bersu Bastug Azer, Univ. of Waterloo (Canada)

Coffee Break 3:00 PM - 3:20 PM

Conference 12394

12394-14 • 3:20 PM - 3:40 PM

Raman and SERS spectroscopy for EV characterization: detection of amyloid beta and bulk chemical analysis

Author(s): Meruyert Imanbekova, McGill Univ. (Canada); Tatu Rojalin, Silvia Hilt, Randy P. Carney, John C. Voss, Univ. of California, Davis (United States); Ayse Mine Saridag, Mehmet Kahraman, Gaziantep Univ. (Turkey); Humeyra Caglayan, Tampere Univ. (Finland)

12394-15 • 3:40 PM - 4:00 PM

Sensing the interaction of living organisms with microplastics by microscopy methods

Author(s): Alzbeta Marček Chorvátová, International Laser Ctr. (Slovakia), Univ. of SS. Cyril and Methodius (Slovakia); Martin Uherek, Anton Mateasik, International Laser Ctr. (Slovakia); Dmitrij Bondarev, Polymer Institute SAS (Slovakia); Freek Arieze, Vrije Univ. Amsterdam (Netherlands); Dusan Chorvat, International Laser Ctr. (Slovakia)

AWARD CEREMONY

30 January 2023 • 4:00 PM - 4:15 PM

Moscone Center, Room 101 (Level 1 South Lobby)

The Session will include the presentation of the best paper award.

POSTERS-MONDAY

30 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the Monday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM - 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12394-3 • On demand | Presented live 30 January 2023

pH sensing, bioimaging, and fluorescence lifetime imaging microscopy using polyethyleneimine coated carbon dots and gold nanoparticles

Author(s): Shweta V. Pawar, Hamootal Duadi, Dror Fixler, Bar-Ilan Univ. (Israel)

12394-16 • On demand | Presented live 30 January 2023

Imaging the rotational mobility by frequency domain time-resolved fluorescence anisotropy

Author(s): Gilad Yahav, Shweta V. Pawar, Yitzchak Weber, Bar Atuar, Hamootal Duadi, Dror Fixler, Bar-Ilan Univ. (Israel)

12394-17 • On demand | Presented live 30 January 2023

Surface defective TiO₂ nanoparticles by femtosecond laser modification with enhanced electron transfer rate for biosensing applications

Author(s): Bersu Bastug Azer, Ahmet Gulsaran, Reza Karimi, Univ. of Waterloo (Canada); Aydin Ashrafi Belgabad, Univ. of Waterloo (Canada), Amirkabir Univ. of Technology (Iran, Islamic Republic of); Joseph Sanderson, Michal Bajcsy, Michael A. Pope, Mustafa Yavuz, Univ. of Waterloo (Canada)

12394-18

Resonant MEMS deformable mirror for fast and wide-field-of-view focus scanning

Author(s): Samed Kocer, Lyazzat Mukhangaliyeva, Ahmet Gulsaran, Alaa Elhady, Bersu Bastug Azer, Resul Saritas, Sasan Rahmanian, Yasser Shama, Kevan Bell, Parsin Hajireza, Mustafa Yavuz, Eihab Abdel-Rahman, Univ. of Waterloo (Canada)

Conference 12395

28 - 30 January 2023 | Moscone Center, Room 305 (Level 3 South)

Colloidal Nanoparticles for Biomedical Applications XVIII

Conference Chairs: **Marek Osiński**, The Univ. of New Mexico (United States); **Antonios G. Kanaras**, Univ. of Southampton (United Kingdom)

Program Committee: **James B. Delehanty**, U.S. Naval Research Lab. (United States); **Allison M. Dennis**, Boston Univ. (United States); **Swarnapali De Silva Indrasekara**, The Univ. of North Carolina at Charlotte (United States); **Erik Dujardin**, Ctr. d'Elaboration de Matériaux et d'Etudes Structurales (France); **Laura Fabris**, Rutgers, The State Univ. of New Jersey (United States); **Jesse V. Jokerst**, Univ. of California, San Diego (United States); **Hedi Mattoussi**, Florida State Univ. (United States); **Igor Medintz**, U.S. Naval Research Lab. (United States); **Jay L. Nadeau**, Portland State Univ. (United States); **Kelly L. Nash**, The Univ. of Texas at San Antonio (United States); **Wolfgang J. Parak**, Univ. Hamburg (Germany); **Ute Resch-Genger**, Bundesanstalt für Materialforschung und -prüfung (Germany); **Emmanuel Stratakis**, Foundation for Research and Technology-Hellas (Greece); **Claudia Tortiglione**, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Chih-Chung Yang**, National Taiwan Univ. (Taiwan); **Junjie Zhu**, Nanjing Univ. (China)

SATURDAY 28 JANUARY

WELCOME REMARKS

28 January 2023 • 8:30 AM - 8:35 AM

Moscone Center, Room 305 (Level 3 South)

Session chairs: Marek Osiński, The Univ. of New Mexico (United States), Antonios G. Kanaras, Univ. of Southampton (United Kingdom)

SESSION 1: NP APPLICATIONS IN BIOSENSING AND BIOIMAGING I

28 January 2023 • 8:35 AM - 10:25 AM

Moscone Center, Room 305 (Level 3 South)

Session chairs: Marek Osiński, The Univ. of New Mexico (United States), Antonios G. Kanaras, Univ. of Southampton (United Kingdom)

12395-1 • 8:35 AM - 9:05 AM

Plasmonic sensing and imaging of disease (Invited Paper)

Author(s): Jesse V. Jokerst, Univ. of California, San Diego (United States)

12395-2 • 9:05 AM - 9:35 AM

Luminescent Gold nanoclusters for biosensing and bioimaging of extracellular vesicles (Invited Paper)

Author(s): Valerie Marchi, Régina Cheichio, Solène Ducarre, Institut des Sciences Chimiques de Rennes, CNRS (France); Celia Ravel, CHU Rennes (France); Maria Jose Lo Faro, Univ. degli Studi di Catania (Italy); Pascale Even-Hernandez, Institut des Sciences Chimiques de Rennes, CNRS (France)

12395-3 • 9:35 AM - 10:05 AM

CANCELED: Quantum dot polymer composite probe for biosensing (Invited Paper)

Author(s): Sungjee Kim, Pohang Univ. of Science and Technology (Republic of Korea)

12395-4 • 10:05 AM - 10:25 AM

Silica nanoparticles coating in silicon nitride photonic label-free biosensing of S100 calcium-binding protein A6

Author(s): Suruk Udomsom, Phornsawat Baipaywad, Pathinan Paengnakorn, Ukrit Mankong, Nipon Theera-Umpon, Chiang Mai Univ. (Thailand); Toshimasa Umezawa, Atsushi Matsumoto, Atsushi Kanno, Naokatsu Yamamoto, Kouichi Akahane, National Institute of Information and Communications Technology (Japan); Manuel Mendez-Astudillo, Ansys Japan K.K. (Japan); Nithi Atthi, Wittawat Yamwong, Nipapan Klunngien, Rattanawan Meananeatra, Thai Microelectronic Ctr. (Thailand), National Electronics and Computer Technology Ctr. (Thailand); Kittit Intuyod, Somchai Pinlaor, Khon Kaen Univ. (Thailand); Tetsuya Kawanishi, Waseda Univ. (Japan); Kazuo Imai, Imai Engineering (Japan)

Coffee Break 10:25 AM - 10:55 AM

SESSION 2: NPS IN PHOTOTHERMAL AND PHOTODYNAMIC STUDIES

28 January 2023 • 10:55 AM - 12:15 PM

Moscone Center, Room 305 (Level 3 South)

Session chair: Eunkeu Oh, U.S. Naval Research Lab. (United States)

12395-5 • 10:55 AM - 11:25 AM

Plasmonic nanostructures for photothermal conversion (Invited Paper)

Author(s): Yadong Yin, Univ. of California, Riverside (United States)

12395-6 • 11:25 AM - 11:55 AM

Extracellular vesicle-coated prussian blue nanoparticles as targeted phototheranostics for glioblastoma treatment (Invited Paper)

Author(s): Taeho Kim, Meghan Hill, Michigan State Univ. (United States)

12395-7 • 11:55 AM - 12:15 PM

Plasmonic nanostars: Synthesis, characterization, surface modification, and applications in sensing, imaging, and photothermal therapy

Author(s): Aidan Canning, Supriya Atta, Ren A. Odion, Tuan Vo-Dinh, Duke Univ. (United States)

Lunch/Exhibition Break 12:15 PM - 1:45 PM

SESSION 3: NP APPLICATIONS IN BIOSENSING AND BIOIMAGING II

28 January 2023 • 1:45 PM - 5:15 PM

Moscone Center, Room 305 (Level 3 South)

Session chair: Yadong Yin, Univ. of California, Riverside (United States)

12395-8 • 1:45 PM - 2:15 PM

Photoactivatable fluorophores for bioimaging applications *(Invited Paper)*

Author(s): Yang Zhang, North Carolina State University (United States); Yeting Zheng, Andrea Tomassini, Colin E. Hayter, Francisco M. Raymo, Univ. of Miami (United States)

12395-9 • 2:15 PM - 2:45 PM

Quantum dot-based pseudoviral nanoprobe for adaptive antigen tracking, antibody sensing, and drug screening *(Invited Paper)*

Author(s): Eunkeu Oh, U.S. Naval Research Lab. (United States); Bruce Nguyen Tran, National Institutes of Health (United States); Kimihiro Susumu, Okhil K. Nag, Kwahun Lee, James B. Delehanty, U.S. Naval Research Lab. (United States); Catherine Chen, National Institutes of Health (United States)

12395-10 • 2:45 PM - 3:05 PM

Detection of viral oligonucleotides using nanoparticles

Author(s): Maria Elena Kyriazis, The American Univ. of the Middle East (Kuwait); Konstantina Alexaki, Joshua Greening, Otto L. Muskens, Antonios G. Kanaras, Univ. of Southampton (United Kingdom)

Coffee Break 3:05 PM - 3:35 PM

12395-11 • 3:35 PM - 4:05 PM

Experimental demonstration of nonlinear chiroptical scattering after its prediction 40 years ago *(Invited Paper)*

Author(s): Ventsislav K. Valev, Univ. of Bath (United Kingdom)

12395-12 • 4:05 PM - 4:35 PM

Colloidal quantum dot-based reporters for quantitative detection of nucleic acids with CRISPR/Cas nucleases *(Invited Paper)*

Author(s): Christopher M. Green, Joseph R. Spangler, David A. Stenger, Igor L. Medintz, Sebastián A. Díaz, U.S. Naval Research Lab. (United States)

12395-13 • 4:35 PM - 4:55 PM

Quantitation of an expanded SERS nanoparticle library for highly multiplexed imaging assays

Author(s): Alexander Czaja, Samer Awad, Olga Eremina, Cristina L. Zavaleta, The Univ. of Southern California (United States)

12395-14 • 4:55 PM - 5:15 PM

PbS/CdS QDs enabled SWIR imaging for lymphatic mapping and multiplexed lymph node imaging

Author(s): Xingjian Zhong, Amish Patel, The Boston Univ. Photonics Ctr. (United States); Allison M. Dennis, Northeastern Univ. (United States)

SUNDAY 29 JANUARY

SESSION 4: NANOMATERIALS FOR BIOMEDICAL APPLICATIONS I

29 January 2023 • 8:40 AM - 10:20 AM

Moscone Center, Room 305 (Level 3 South)

Session chair: Céline Fiorini-Debuisschert, CEA (France)

12395-15 • 8:40 AM - 9:10 AM

Silver-chalcogenide nanoparticles as multi-modal theranostic agents for breast cancer *(Invited Paper)*

Author(s): David Cormode, Penn Medicine (United States)

12395-16 • 9:10 AM - 9:40 AM

CANCELED: Versatile coating platform for metal oxide nanoparticles: Applications to materials and biological science *(Invited Paper)*

Author(s): Jean-François Berret, Lab. Matière et Systèmes Complexes (France)

12395-17 • 9:40 AM - 10:00 AM

Hollow porous platinum-based nanocomposite for combined tumor therapy

Author(s): Jingyu Sun, Shang Wang, Hongjun Wang, Stevens Institute of Technology (United States)

12395-18 • 10:00 AM - 10:20 AM

Water-assisted facile synthesis of bright inorganic perovskite nanocrystals

Author(s): Peuli Nath, Aniruddha Ray, The Univ. of Toledo (United States)

Coffee Break 10:20 AM - 10:50 AM

SESSION 5: NP APPLICATIONS IN BIOSENSING AND BIOIMAGING III

29 January 2023 • 10:50 AM - 12:00 PM

Moscone Center, Room 305 (Level 3 South)

Session chair: Jesse V. Jokerst, Univ. of California, San Diego (United States)

12395-20 • 10:50 AM - 11:20 AM

Playing on resonant and non-resonant optical processes for the development of nanoparticles for 2-photon labeling *(Invited Paper)*

Author(s): Céline Fiorini-Debuisschert, CEA-Paris-Saclay (France)

12395-21 • 11:20 AM - 11:40 AM

Evaluating the catalytic efficiency of the membrane-type 1 matrix metalloproteinase (MMP-14) using AuNP-peptide assemblies *(Invited Paper)*

Author(s): Hedi Mattoussi, Narjes Dridi, Florida State Univ. (United States); Valle Palomo, Philip E. Dawson, The Scripps Research Institute (United States); Qing-Xiang Sang, Zhicheng Jin, Florida State Univ. (United States)

12395-22 • 11:40 AM - 12:00 PM

A multifunctional contrast agent for 19F-based magnetic resonance imaging

Author(s): Heidi Mattoussi, Neda Arabzadeh Nosratabad, Florida State Univ. (United States); Shannon Helsper, National High Magnetic Field Lab., Florida State Univ. (United States); Liang Du, Debra A. Fadool, Florida State Univ. (United States); Catherine Amiens, Univ. de Toulouse (France), Lab. de Chimie de Coordination, CNRS (France)

Lunch/Exhibition Break 12:00 PM - 2:00 PM

SESSION 6: NP APPLICATIONS IN BIOSENSING AND BIOIMAGING IV

29 January 2023 • 2:00 PM - 3:20 PM

Moscone Center, Room 305 (Level 3 South)

Session chair: Hedi Mattoussi, Florida State Univ. (United States)

12395-23 • 2:00 PM - 2:30 PM

Hydrophilic quantum dot coatings: Trends, challenges, and recent advances *(Invited Paper)*

Author(s): Andrew M. Smith, Univ. of Illinois (United States)

12395-24 • 2:30 PM - 3:00 PM

Ellipsometry monitoring of sensor processes based on gold nanoparticle bonded proteins

Author(s): Zoltan Labadi, Ctr. for Energy Research (Hungary); Csaba Bakos, Mate Szucs, Budapest Univ. of Technology and Economic (Hungary); Attila Bonyar, Budapest Univ. of Technology and Economics (Hungary); Deshabrato Mukherjee, Ctr. for Energy Research (Hungary), Óbuda Univ. (Hungary); Hajnalka Jankovics, Ferenc Vonderviszt, Univ. of Pannonia (Hungary); Peter Petrik, Ctr. for Energy Research (Hungary), The Univ. of Debrecen (Hungary)

12395-25 • 3:00 PM - 3:20 PM

Colloidal Er-doped LiYF₄ nanoparticles for NIR bioimaging

Author(s): Mia I. Baca, Shruti I. Gharde, Adreanna G. Rael, Gennady A. Smolyakov, The Univ. of New Mexico (United States); Winson C. H. Kuo, Los Alamos National Laboratory (United States); John D. Watt, Sergei A. Ivanov, Los Alamos National Lab. (United States); Dale L. Huber, Sandia National Labs. (United States); Marek Osinski, The Univ. of New Mexico (United States)

Coffee Break 3:20 PM - 3:30 PM

MONDAY 30 JANUARY

SESSION 7: NANOMATERIALS FOR BIOMEDICAL APPLICATIONS II

30 January 2023 • 8:40 AM - 10:20 AM

Moscone Center, Room 305 (Level 3 South)

Session chair: Swadeshmukul Santra, UCF NanoScience Technology Ctr. (United States)

12395-26 • 8:40 AM - 9:10 AM

Engineered inorganic nanomaterials for biomedical and biosensing applications *(Invited Paper)*

Author(s): Mélanie Romain, Amira Mahmoud, Julien Boudon, Univ. Bourgogne Franche-Comté (France), Ctr. National de la Recherche Scientifique (France); Rafik Ben Chaabane, Univ. de Monastir (Tunisia); Wilfrid Boireau, Ctr. National de la Recherche Scientifique (France); Nadine Millot, Univ. Bourgogne Franche-Comté (France), Ctr. National de la Recherche Scientifique (France)

12395-27 • 9:10 AM - 9:40 AM

Biosilica from diatoms microalgae for biomedical applications *(Invited Paper)*

Author(s): Gianluca M. Farinola, Danilo Vona, Univ. degli Studi di Bari Aldo Moro (Italy); Stefania R. Cicco, Istituto di Chimica dei Composti OrganoMetallici (Italy); Roberta Ragni, Cesar Vicente Garcia, Univ. degli Studi di Bari Aldo Moro (Italy)

12395-28 • 9:40 AM - 10:00 AM

Superparamagnetic nanoparticles for the treatment of periodontal disease

Author(s): Leisha M. Armijo, MNT SmartSolutions (United States); Shayden Fritz, Texas A&M Univ. Corpus Christi (United States); Marek Osinski, The Univ. of New Mexico (United States); Nihal Bandara, Univ. of Bristol (United Kingdom); Hugh D. C. Smyth, The Univ. of Texas at Austin (United States); Wei Xu, Texas A&M Univ. Corpus Christi (United States)

12395-34 • 10:00 AM - 10:20 AM

Fabrication of nano/microparticles patterns for 3D cell cultures

Author(s): Young Hun Jeong, Gyu Man Kim, Cheol-Woo Park, Jang Hoon Seo, Jeong Hwa Kim, Kyungpook National Univ. (Republic of Korea)

Coffee Break 10:20 AM - 10:50 AM

Conference 12395

SESSION 8: ADVANCED NANOMATERIALS

30 January 2023 • 10:50 AM - 12:00 PM

Moscone Center, Room 305 (Level 3 South)

Session chair: Roberta Ragni, Univ. degli Studi di Bari Aldo Moro (Italy)

12395-30 • 10:50 AM - 11:20 AM

Advanced copper and Cu alternatives for crop protection (*Invited Paper*)

Author(s): Swadesh Santra, Univ. of Central Florida (United States)

12395-31 • 11:20 AM - 11:40 AM

Multilayered nanoparticles as optical sensors for amyloid β -peptide (1-42) targeting in liquid samples

Author(s): Caterina Dallari, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); Elena Lenci, Andrea Trabocchi, Univ. degli Studi di Firenze (Italy); Caterina Credi, Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); Francesco S. Pavone, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy)

12395-32 • 11:40 AM - 12:00 PM

Tailoring of band gap to tune the optical properties of co-doped TiO₂ nanoparticles

Author(s): Nadeem Sabir, Government College Univ. Faisalabad (Pakistan)

OCEAN OPTICS YOUNG INVESTIGATOR AWARD CEREMONY

30 January 2023 • 12:00 PM - 12:15 PM

Moscone Center, Room 305 (Level 3 South)

Session chairs: Marek Osinski, The Univ. of New Mexico (United States), Antonios G. Kanaras, Univ. of Southampton (United Kingdom)

Join us to honor the Ocean Optics Young Investigator winner.

CONCLUDING REMARKS

30 January 2023 • 12:15 PM - 12:20 PM

Moscone Center, Room 305 (Level 3 South)

Session chairs: Marek Osinski, The Univ. of New Mexico (United States), Antonios G. Kanaras, Univ. of Southampton (United Kingdom)

CONFERENCE CONCLUSION AND SUMMARY

Conference 12396

29 - 30 January 2023 | Moscone Center, Room 102 (Level 1 South Lobby)

Plasmonics in Biology and Medicine XX

Conference Chairs: **Tuan Vo-Dinh**, Duke Univ. (United States); **Ho-Pui A. Ho**, The Chinese Univ. of Hong Kong (Hong Kong, China); **Krishanu Ray**, Univ. of Maryland School of Medicine (United States)

Program Committee: **Hatice Altug**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **A. Claude Boccard**, Ecole Supérieure de Physique et de Chimie Industrielles (France); **Michael T. Canva**, Lab. Charles Fabry (France); **Andrew M. Fales**, U.S. Food and Drug Administration (United States); **Dror Fixler**, Bar-Ilan Univ. (Israel); **Christopher D. Geddes**, Univ. of Maryland, Baltimore (United States); **Zygmunt Karol Gryczynski**, Univ. of North Texas Health Science Ctr. at Fort Worth (United States); **Naomi J. Halas**, Rice Univ. (United States); **Jiri Homola**, Institute of Photonics and Electronics of the ASCR, v.v.i. (Czech Republic); **Joseph R. Lakowicz**, Univ. of Maryland School of Medicine (United States); **Laura Maria Lechuga**, Institut Català de Nanociència i Nanotecnologia (ICN2) (Spain); **Martin Maiwald**, Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik (Germany); **Shuming Nie**, Emory Univ. (United States); **Sang-Hyun Oh**, Univ. of Minnesota, Twin Cities (United States); **Jürgen Popp**, Leibniz-Institut für Photonische Technologien e.V. (Germany); **Wei-Chuan Shih**, Univ. of Houston (United States); **P. James Schuck**, Columbia Univ. (United States); **Bernd Sumpf**, Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik (Germany)

SUNDAY 29 JANUARY

SESSION 1: PLASMONICS NANOSTRUCTURES AND SERS SENSING

29 January 2023 • 10:30 AM - 11:50 AM

Moscone Center, Room 102 (Level 1 South Lobby)

Session chair: Tuan Vo-Dinh, Duke Univ. (United States)

12396-1 • 10:30 AM - 10:50 AM

Pilot investigations on solids, liquids and gases using a portable shifted excitation Raman difference spectroscopy sensor system

Author(s): Martin Maiwald, Kay Sowoidnich, Bernd Sumpf, Ferdinand-Braun-Institut (Germany)

12396-2 • 10:50 AM - 11:10 AM

Stand-off system for remote Raman detection of miRNA biomarkers using shifted excitation Raman difference spectroscopy

Author(s): Ren A. Odion, Vanessa Cupil-Garcia, Hsin-Neng Wang, Aidan Canning, Jianhong Hu, Duke Univ. (United States); Martin Maiwald, Bernd Sumpf, Ferdinand-Braun-Institut (Germany); Tai-Ping Sun, Tuan Vo-Dinh, Duke Univ. (United States)

12396-3 • 11:10 AM - 11:30 AM

Dual-surface substrate for in situ wearable surface-enhanced Raman spectroscopy

Author(s): Yasutaka Kitahama, The Univ. of Tokyo (Japan), LucasLand Co. Ltd. (Japan); Pablo Martinez Pancorbo, The Univ. of Tokyo (Japan); Ting-Hui Xiao, The Univ. of Tokyo (Japan), National Institutes for Quantum and Radiological Science and Technology (Japan); Machiko Marumi, Kotaro Hiramatsu, The Univ. of Tokyo (Japan); Keisuke Goda, The Univ. of Tokyo (Japan), LucasLand Co. Ltd. (Japan), National Institutes for Quantum and Radiological Science and Technology (Japan); William Yang, BaySpec, Inc. (United States); Hiroki Segawa, National Research Institute of Police Science (Japan)

12396-4 • 11:30 AM - 11:50 AM

Multiplexed detection of cancer biomarkers using inverse molecular sentinel integrated on plasmonic bimetallic nanostar substrate

Author(s): Aidan Canning, Xinrong Chen, Tuan Vo-Dinh, Hsin-Neng Wang, Duke Univ. (United States)

Lunch/Exhibition Break 11:50 AM - 1:20 PM

SESSION 2: NANOPLASMONICS, IMAGING AND SENSING

29 January 2023 • 1:20 PM - 3:20 PM

Moscone Center, Room 102 (Level 1 South Lobby)

Session chair: Krishanu Ray, Univ. of Maryland School of Medicine (United States)

12396-5 • 1:20 PM - 1:40 PM

Soft multimaterial photonic devices for plasmonic super-resolution imaging

Author(s): Guangjie Cui, Xintao Zhao, Di Zu, Somin Eunice Lee, Univ. of Michigan (United States)

12396-6 • 1:40 PM - 2:00 PM

Distortion imaging and correction of emitter distortion near plasmonic nanostructure

Author(s): Gwiyeong Moon, Taehwang Son, Hajun Yoo, Changhun Lee, Hyunwoong Lee, Seongmin Im, Donghyun Kim, Yonsei Univ. (Republic of Korea)

12396-7 • 2:00 PM - 2:20 PM

Controlling fluorescence of photochromic molecules via plasmonic silver nanowire

Author(s): Martyna Jankowska, Karolina Sulowska, Maciej Cwierzona, Nicolaus Copernicus Univ. (Poland); Saioa Cobo, Univ. Grenoble Alpes (France); Dawid Piatkowski, Sebastian Maćkowski, Nicolaus Copernicus Univ. (Poland)

12396-8 • 2:20 PM - 2:40 PM

Surface plasmon enhanced upconversion luminescence for biosensing applications

Author(s): Duc H. Le, Marjut Kreivi, Sanna M. Aikio, Jarno Petäjä, Sanna Uusitalo, VTT Technical Research Ctr. of Finland Ltd. (Finland); Tianlong Guo, Matthieu Roussey, Univ. of Eastern Finland (Finland); Jussi A. Hiltunen, VTT Technical Research Ctr. of Finland Ltd. (Finland)

12396-9 • 2:40 PM - 3:00 PM

Near-field scanning measurement of opto-thermal response of a single nanostructure

Author(s): Seongmin Im, Hongke Lee, Changhun Lee, Hyunwoong Lee, Yonsei Univ. (Republic of Korea); HO-PUI HO, The Chinese University of Hong Kong (Hong Kong, China); Donghyun Kim, Yonsei Univ. (Republic of Korea)

12396-30 • 3:00 PM - 3:20 PM

The ORCHID system for 3D hyperspectral imaging of plasmonic nanosystems

Author(s): Ren A. Odion, Tuan Vo-Dinh, Duke Univ. (United States)

Conference 12396

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM
Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM – 5:00 PM

View poster presentation guidelines and set-up instructions at:
<https://spie.org/PW/Poster-Guidelines>

12396-26

Quantitative plasmonic analysis of neuroblastoma cell activity

Author(s): Pramith Senaratne, Zhijia Zhang, Xintao Zhao, Guangjie Cui, Somin Eunice Lee, Univ. of Michigan (United States)

12396-27

Wavelength interrogation SPR imaging sensor based on a spectrometer for large dynamic detection range

Author(s): Socheol Kim, Jin Hwa Ryu, Hoesung Yang, Kyuwon Han, Kwangsoo Cho, Hyunseok Kim, Soyoung Park, Jeong-Kyun Kim, Sun-Hwa Lim, Sang-Gi Hong, Kang Bok Lee, Electronics and Telecommunications Research Institute (Republic of Korea)

12396-28

Life at high temperature observed in vitro upon laser heating of gold nanoparticless

Author(s): Maëlle Bénéfice, Céline Molinaro, Institut Fresnel (France); Aurore Gorlas, Violette Da Cunha, Institut de Biologie Integrative de la Cellule (France); Patrick Forterre, Institut Pasteur (France); Guillaume Baffou, Institut Fresnel (France)

12396-29 • On demand | Presented live 29 January 2023

Rapid identification of antimicrobial drug resistance strains of E-coli using SERS nanowire chip

Author(s): Sathi Das, Indian Institute of Technology Delhi (India); Kanchan Saxena, Amity Univ. (India); Abdolrahman Khezri, Inland Norway Univ. of Applied Sciences (Norway); Vishesh Dubey, Azeem Ahmad, Jean-Claude Tinguely, UiT The Arctic Univ. of Norway (Norway); Rafi Ahmad, Inland Norway Univ. of Applied Sciences (Norway); Dalip Singh Mehta, Indian Institute of Technology Delhi (India); Balpreet Singh Ahluwalia, UiT The Arctic Univ. of Norway (Norway)

MONDAY 30 JANUARY

SESSION 3: PLASMONICS AND BIOSENSING SYSTEMS I

30 January 2023 • 9:00 AM - 11:50 AM

Moscone Center, Room 102 (Level 1 South Lobby)

Session chair: Ho-Pui Ho, The Chinese Univ. of Hong Kong (Hong Kong, China)

12396-10 • 9:00 AM - 9:20 AM

Plasmonic biosensors based on singular phase-enhanced lateral position shift for real-time detection of RGD-binding Integrins

Author(s): Shaodi Zhu, Rodolphe Jaffiol, Ctr. National de la Recherche Scientifique (France); Aurelian Crunteanu, XLIM (France) (France); Cyrille Vézy, Univ. de Technologie Troyes (France); Ho-Pui Ho, The Chinese Univ. of Hong Kong (Hong Kong, China); Shuwen Zeng, Ctr. National de la Recherche Scientifique (France)

12396-11 • 9:20 AM - 9:40 AM

Detection of cancer-derived extracellular vesicles using surface plasmon resonance biosensors

Author(s): Jesus M. Lopez Baltazar, Qiuming Yu, Wenchao Gu, Marketa Bockova, Cornell Univ. (United States)

12396-12 • 9:40 AM - 10:00 AM

FDTD simulation and chemical synthesis of surface-enhanced Raman supraparticles for translatable in vivo Raman imaging

Author(s): Jung Ho Yu, Stanford Univ. School of Medicine (United States); Emma O. Cruz, Stanford Univ. (United States); Sanjiv S. Gambhir, Stanford Univ. School of Medicine (United States)

Coffee Break 10:00 AM - 10:30 AM

12396-13 • 10:30 AM - 10:50 AM

Profiling the nanoscale thermal penetration and transport in laser-induced thermal therapies with ultrafast vibrational spectroscopy

Author(s): Sara Makarem, Ramya Mohan, Patrick Hopkins, Univ. of Virginia (United States)

12396-14 • 10:50 AM - 11:10 AM

Significant Reduction in the Duration of Transient Voltage Responses of a Plasmonic Nanopore Sensor by Use of a Chebyshev Filter

Author(s): Homayoun Asadzadeh, Scott Renkes, The Univ. of Texas at Arlington (United States); Min Jun Kim, Southern Methodist Univ. (United States); George Alexandrakos, The Univ. of Texas at Arlington (United States)

12396-15 • 11:10 AM - 11:30 AM

CANCELED: Photoacoustic computed tomography augmented gold nanostar photothermal therapy for the ablation of solid tumors

Author(s): Aidan Canning, Tri Vu, Xinrong Chen, Junjie Yao, Tuan Vo-Dinh, Duke Univ. (United States)

12396-16 • 11:30 AM - 11:50 AM

Scattering field enhanced biosensing based on sub-wavelength split-ring plasmonic cavity with high Q-factor

Author(s): Xiao Jin, Lu Xue, Jichuan Xiong, Nanjing Univ. of Science and Technology (China); Shengwei Ye, Weiqing Cheng, Lianping Hou, John H. Marsh, Univ. of Glasgow (United Kingdom); Bin Ni, Bin Xu, Xuefeng Liu, Nanjing Univ. of Science and Technology (China)

Lunch Break 11:50 AM - 1:20 PM

SESSION 4: PLASMONICS AND BIOSENSING SYSTEMS II

30 January 2023 • 1:20 PM - 3:00 PM

Moscone Center, Room 102 (Level 1 South Lobby)

Session chair: Martin Maiwald, Ferdinand-Braun-Institut (Germany)

12396-17 • 1:20 PM - 1:40 PM

Plasmonic label-free imaging of electrical activity in pancreatic cell

Author(s): Sidahmed Abayzeed, The Univ. of Nottingham (United Kingdom); Paul A. Smith, Univ. of Birmingham (United Kingdom); Finlay Nelson, Oscar G. Barajas-González, Kerry Setchfield, Michael G. Somekh, Rafael Fuentes-Dominguez, The Univ. of Nottingham (United Kingdom)

12396-18 • 1:40 PM - 2:00 PM

Optimising cross-reactive plasmonic arrays for biosensing applications

Author(s): Iain Christie, William J. Peveler, Alasdair W. Clark, Univ. of Glasgow (United Kingdom)

12396-19 • 2:00 PM - 2:20 PM

Plasmon assisted photon avalanche

Author(s): Marcin Szalkowski, Nicolaus Copernicus Univ. (Poland), Institute of Low Temperature and Structure Research PAN (Poland); Maciej Cwierzona, Nicolaus Copernicus Univ. (Poland); Magdalena Dudek, Malgorzata Misiak, Zuzanna Korczak, Institute of Low Temperature and Structure Research PAN (Poland); Karolina Sulowska, Szymon Skrzyński, Dawid Piatkowski, Nicolaus Copernicus Univ. (Poland); Artur Bednarkiewicz, Institute of Low Temperature and Structure Research PAN (Poland); Sebastian Maćkowski, Nicolaus Copernicus Univ. (Poland)

12396-20 • 2:20 PM - 2:40 PM

Design and analysis of prism-based surface plasmon resonance optical sensor for detection of ammonia gas

Author(s): Vikash Kumar, Sanjeev Kumar Raghuwanshi, Indian Institute of Technology (Indian School of Mines), Dhanbad (India); Santosh Kumar, Liaocheng Univ. (China)

12396-21 • 2:40 PM - 3:00 PM

Application of spectrophotometry to detect the urea in milk sample

Author(s): Md Tauseef Iqbal Ansari, Sanjeev Kumar Raghuwanshi, Purnendu Shekhar Pandey, Indian Institute of Technology (Indian School of Mines), Dhanbad (India); Santosh Kumar, Liaocheng Univ. (China)

Coffee Break 3:00 PM - 3:30 PM

SESSION 5: PLASMONICS AND BIOSENSING SYSTEMS III

30 January 2023 • 3:30 PM - 4:50 PM

Moscone Center, Room 102 (Level 1 South Lobby)

Session chair: Somin Eunice Lee, Univ. of Michigan (United States)

12396-22 • 3:30 PM - 3:50 PM

Patterning silver nanostructures for plasmonic biosensing

Author(s): Karolina Sulowska, Martyna Jankowska, Nicolaus Copernicus Univ. (Poland); Ewa Rozniecka, Joanna Niedziółka-Jönsson, Institute of Physical Chemistry PAS (Poland); Sebastian Maćkowski, Marcin Szalkowski, Nicolaus Copernicus Univ. (Poland)

12396-23 • 3:50 PM - 4:10 PM

Optical biosensing of human immunodeficiency virus on a gold coated surface

Author(s): Masixole Y. Lugongolo, Saturnin S. Ombinda-Lemboumba, CSIR National Laser Ctr. (South Africa); Patience Mthunzi-Kufa, CSIR National Laser Ctr. (South Africa), Univ. of KwaZulu-Natal (South Africa); Charles P. Maphanga, CSIR National Laser Ctr. (South Africa)

12396-24 • 4:10 PM - 4:30 PM

Colorimetric detection of microRNA biomarkers using plasmonic nanoplatforms on a smartphone

Author(s): Tushar Krishnan, Ren A. Odion, Hsin-Neng Wang, Tuan Vo-Dinh, Duke Univ. (United States)

12396-25 • 4:30 PM - 4:50 PM

Plasmonic needle sensor for circulating tumor cell detection in a mimicked venous blood flow

Author(s): Shaodi Zhu, Zhenming Xie, The Chinese Univ. of Hong Kong (Hong Kong, China); Yuzhi Chen, Shenzhen Univ. (China); Shiyue Liu, Yiu-Wa Kwan, The Chinese Univ. of Hong Kong (Hong Kong, China); Shuwen Zeng, Ctr. National de la Recherche Scientifique (France); Wu Yuan, Ho-Pui Ho, The Chinese Univ. of Hong Kong (Hong Kong, China)

Conference 12397

29 January 2023 | Moscone Center, Room 50 (Lower Mezzanine South)

Frontiers in Biological Detection: From Nanosensors to Systems XV

Conference Chairs: **Amos Danielli**, Bar-Ilan Univ. (Israel); **Benjamin L. Miller**, Univ. of Rochester Medical Ctr. (United States); **Sharon M. Weiss**, Vanderbilt Univ. (United States)

Program Committee: **Andrea M. Armani**, The Univ. of Southern California (United States); **Nathaniel C. Cady**, SUNY Polytechnic Institute (United States); **M. Imran Cheema**, Lahore Univ. of Management Sciences (Pakistan); **Xudong Fan**, Univ. of Michigan (United States); **Jason A. Guicheteau**, U.S. Army Edgewood Chemical Biological Ctr. (United States); **Laura Maria Lechuga**, Institut Català de Nanociència i Nanotecnologia (ICN2) (Spain); **Francesco Michelotti**, Sapienza Univ. di Roma (Italy); **Michael J. Sailor**, Univ. of California, San Diego (United States); **Christopher C. Striemer**, Adarza BioSystems, Inc. (United States); **Yuze Alice Sun**, The Univ. of Texas at Arlington (United States)

SUNDAY 29 JANUARY

SESSION 1: PHOTONICS AND FIBERS

29 January 2023 • 8:30 AM - 10:00 AM

Moscone Center, Room 50 (Lower Mezzanine South)

Session chair: Benjamin L. Miller, Univ. of Rochester Medical Ctr. (United States)

12397-1 • 8:30 AM - 8:50 AM

On-chip integration of optical microbottles for biosensing

Author(s): Vanessa Zamora, Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration IZM (Germany), Technische Univ. Berlin (Germany); Paul Preussler, Jonas Herter, Sebastian Marx, Henning Schroeder, Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration IZM (Germany); Martin Schneider-Ramelow, Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration IZM (Germany), Technische Univ. Berlin (Germany)

12397-2 • 8:50 AM - 9:10 AM

Real-time monitoring of tissue chips via integrated photonic sensors

Author(s): Benjamin L. Miller, John S. Cognetti, Maya Moen, Univ. of Rochester Medical Ctr. (United States)

12397-3 • 9:10 AM - 9:30 AM

Improved molecular detection sensitivity through photonic crystal unit cell design

Author(s): Yanrong Zhang, Rabeb Layouni, Sami I. Halimi, Sharon M. Weiss, Vanderbilt Univ. (United States)

12397-4 • 9:30 AM - 10:00 AM

Mid-infrared integrated photonics for non-invasive and real-time breath biomarker detection (*Invited Paper*)

Author(s): Pao T. Lin, Texas A&M Univ. (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: NEURONS AND PROTEINS

29 January 2023 • 10:30 AM - 11:40 AM

Moscone Center, Room 50 (Lower Mezzanine South)

Session chair: Amos Danielli, Bar-Ilan Univ. (Israel)

12397-5 • 10:30 AM - 11:00 AM

Infrared spectroscopy for neurochemical monitoring of alcohol and its metabolites (*Invited Paper*)

Author(s): Tse-Ang Lee, Jessie Peng, Jina Kowal, Rueben Gonzales, Tanya Hutter, The Univ. of Texas at Austin (United States)

12397-6 • 11:00 AM - 11:20 AM

Eavesdropping on neuronal chemical chatter using single wall carbon nanotube optical sensors

Author(s): Abraham G. Beyene, Chandima Bulumulla, Andrew T. Krasley, Howard Hughes Medical Institute (United States)

12397-7 • 11:20 AM - 11:40 AM

Improving the sensitivity of fluorescence-based immunoassays by time-resolved and spatial-resolved measurements

Author(s): Ran Kremer, Shira Roth, Avital Bross, Yair Noam, Amos Danielli, Bar-Ilan Univ. (Israel)

Lunch/Exhibition Break 11:40 AM - 1:10 PM

SESSION 3: VIRUSES

29 January 2023 • 1:10 PM - 2:50 PM

Moscone Center, Room 50 (Lower Mezzanine South)

Session chair: Andrea K. Locke, Vanderbilt Univ. (United States)

12397-8 • 1:10 PM - 1:40 PM

A simple, pipette-free, and power-free device for virus nucleic acid detection (*Invited Paper*)

Author(s): Ke Du, Univ. of California, Riverside (United States)

12397-10 • 1:40 PM - 2:10 PM

Recent advances in rapid and highly sensitive detection of proteins and specific DNA sequences using a magnetic modulation biosensing system (*Invited Paper*)

Author(s): Shira Roth, Michael Margulis, Amos Danielli, Bar-Ilan Univ. (Israel)

12397-9 • 2:10 PM - 2:30 PM

High throughput optical modulation biosensing for highly sensitive and mass scale rapid detection of Covid-19

Author(s): Shmuel Burg, Shira Roth, Meir Cohen, Shira Avivi-Mintz, Michael Margulis, Hanan Rohana, Bar-Ilan Univ. (Israel); Avi Peretz, The Baruch Padeh Medical Ctr., Poriya (Israel); Amos Danielli, Bar-Ilan Univ. (Israel)

12397-11 • 2:30 PM - 2:50 PM

2D materials-based biosensor for detecting COVID-19 virus

Author(s): Parvin Fathi-Hafshejani, Nurul Azam, Suman Jaiswal, Lu Wang, Marcelo Kuroda, Michael C. Hamilton, Auburn Univ. (United States); Sahar Hasim, Mercer Univ. (United States); Masoud Mahjouri-Samani, Auburn Univ. (United States)

Coffee Break 2:50 PM - 3:20 PM

SESSION 4: BACTERIA

29 January 2023 • 3:20 PM - 4:10 PM
Moscone Center, Room 50 (Lower Mezzanine South)
Session chair: Benjamin L. Miller, Univ. of Rochester Medical Ctr. (United States)

12397-13 • 3:20 PM - 3:50 PM

Near infrared imaging and detection of pathogens with multiplexed nanosensors *(Invited Paper)*

Author(s): Sebastian Kruss, Ruhr-Univ. Bochum (Germany)

12397-19 • 3:50 PM - 4:10 PM

Monitoring anti-viral antibody production throughout vaccination and breakthrough Covid-19 infection via arrayed imaging reflectometry

Author(s): Gabrielle Kosoy, Univ. of Rochester (United States); Alanna Klose, Benjamin L. Miller, Univ. of Rochester Medical Ctr. (United States)

SESSION 5: PAPER-BASED METHODS

29 January 2023 • 4:10 PM - 5:30 PM
Moscone Center, Room 50 (Lower Mezzanine South)
Session chair: Sharon M. Weiss, Vanderbilt Univ. (United States)

12397-14 • 4:10 PM - 4:40 PM

Optimization of in situ growth nanoparticles on filter paper for saliva characterization via surface-enhanced Raman spectroscopy *(Invited Paper)*

Author(s): Amelia Taylor, Vanderbilt Univ. (United States); Braden Carroll, Univ. of Colorado Boulder (United States); Andrea K. Locke, Vanderbilt Univ. (United States)

12397-15 • 4:40 PM - 5:00 PM

Paper-based diagnostics incorporating porous silicon

Author(s): Rabeb Layouni, Juliana Yang, Simon J. Ward, Paul E. Laibinis, Sharon M. Weiss, Vanderbilt Univ. (United States)

12397-16 • 5:00 PM - 5:30 PM

Solid-state optical chemosensor array devices for real-sample analysis *(Invited Paper)*

Author(s): Tsuyoshi Minami, The Univ. of Tokyo (Japan)

POSTERS-SUNDAY

29 January 2023 • 5:30 PM - 7:00 PM
Moscone Center, Level 2 West

Conference attendees are invited to attend the Sunday BIOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Sunday 10:00 AM - 5:00 PM

View poster presentation guidelines and set-up instructions at: <https://spie.org/PW/Poster-Guidelines>

12397-17 • On demand | Presented live 29 January 2023

Lossy mode resonance based single mode fiber structure for detection of ascorbic acid

Author(s): Vivek Kumar Gupta, Kuldeep Choudhary, DIT Univ. (India); Sanjeev Kumar Raghuwanshi, Indian Institute of Technology (Indian School of Mines) Dhanbad (India); Santosh Kumar, Liaocheng Univ. (China)

12397-18

The study of gold nanoparticle loaded aerosolized droplets using a contactless photoacoustic technique and the finite-difference time-domain method

Author(s): Sathiyamoorthy Krishnan, Eric Strohm, Michael C. Kolios, Toronto Metropolitan Univ. (Canada)

Conference 12398

Tuesday - Wednesday 31-1 February 2023 • Proceedings of SPIE Vol. 12398

Reporters, Markers, Dyes, Nanoparticles, and Molecular Probes for Biomedical Applications XIV

Conference Chairs: **Mikhail Y. Berezin**, Washington Univ. School of Medicine in St. Louis (United States); **Ramesh Raghavachari**, U.S. Food and Drug Administration (United States)

Program Committee: **Daniel A. Heller**, Memorial Sloan-Kettering Cancer Ctr. (United States); **Lingyan Shi**, Univ. of California, San Diego (United States); **Allison Dennis**, Northeastern Univ. (United States); **Andrew M. Smith**, Univ. of Illinois (United States); **Hisataka Kobayashi**, National Cancer Institute (United States); **Igor Luzhansky**, Washington Univ. in St. Louis (United States); **Ashok Kumar Mishra**, Indian Institute of Technology Madras (India); **Gabor Patonay**, Georgia State Univ. (United States); **Baowei Fei**, The Univ. of Texas at Dallas (United States)

TUESDAY 31 JANUARY

SESSION 1: IMAGING IN NIR AND BEYOND

31 January 2023 • 8:30 AM - 10:10 AM

Moscone Center, Room 101 (Level 1 South Lobby)

Session chair: Ramesh Raghavachari, U.S. Food and Drug Administration (United States)

12398-1 • 8:30 AM - 9:10 AM

NIR I cyanine dyes complexed with engineered albumin fragments for NIR II fluorescence imaging
(Keynote Presentation)

Author(s): Xiaoyuan Chen, National Univ. of Singapore (Singapore)

12398-2 • 9:10 AM - 9:30 AM

Deuterium probed brain lipid metabolic activities during aging processes

Author(s): Lingyan Shi, Yajuan Li, Hongje Jang, Phyllis Chang, Sahran Hussain, Univ. of California, San Diego (United States)

12398-3 • 9:30 AM - 9:50 AM

Hyperspectral imaging in SWIR: Applications of geospatial approaches to biological imaging

Author(s): Hriday Biswas, Helena Hurbon, Deependra K. Mishra, John Wang, Mikhail Y. Berezin, Washington Univ. in St. Louis (United States)

12398-4 • 9:50 AM - 10:10 AM

Shortwave infrared preclinical tumor screening and resection via pHLIP ICG

Author(s): Ben Mc Larney, Mijin Kim, Sheryl Roberts, Magdalena Skubal, Hsiao-Ting Tsu, Anuja Ogirala, Nagavarakishore Pillarsetty, Daniel A. Heller, Jason S. Lewis, Jan Grimm, Memorial Sloan-Kettering Cancer Ctr. (United States)

Coffee Break 10:10 AM - 10:30 AM

NANO/BIPHOTONICS PLENARY

31 January 2023 • 10:30 AM - 11:30 AM

Moscone Center, Room 207 (Level 2 South)

Lunch/Exhibition Break 11:30 AM - 12:30 PM

SESSION 2: NANO PROBES I

31 January 2023 • 12:30 PM - 2:50 PM

Moscone Center, Room 101 (Level 1 South Lobby)

Session chair: Mikhail Y. Berezin, Washington Univ. School of Medicine in St. Louis (United States)

12398-5 • 12:30 PM - 1:00 PM

Nanosensors for the interrogation of autophagy in vivo
(Invited Paper)

Author(s): Daniel A. Heller, Memorial Sloan-Kettering Cancer Ctr. (United States), Weill Cornell Medicine (United States); Mijin Kim, Chen Chen, Memorial Sloan-Kettering Cancer Ctr. (United States)

12398-6 • 1:00 PM - 1:30 PM

Design, synthesis and characterization of copolymerized silica nanoparticle optical probes
(Invited Paper)

Author(s): Gabor Patonay, Maged Henary, Georgia State Univ. (United States)

12398-7 • 1:30 PM - 1:50 PM

Self-assembled porous polymer films for improved oxygen sensing

Author(s): Nikolaos Salaris, Univ. College London (United Kingdom); Paul A. Haigh, Newcastle Univ. (United Kingdom); Ioannis Papakonstantinou, Manish K. Tiwari, Univ. College London (United Kingdom)

12398-8 • 1:50 PM - 2:10 PM

Self-assembled peptide-dye nanoparticles for targeted photoacoustic tumor imaging

Author(s): Raina Borum, Matthew N. Creyer, Yu-Ci Chang, Jesse V. Jokerst, Univ. of California, San Diego (United States)

12398-9 • 2:10 PM - 2:30 PM

Multifunctional biocompatible nanoplatforms for near infrared cancer theranostics

Author(s): Tymish Y. Ohulchanskyy, Shenzhen Univ. (China), Univ. at Buffalo (United States)

12398-10 • 2:30 PM - 2:50 PM

Development of model nanoparticles for nanoplastics toxicology and biodistribution studies

Author(s): Leisha M. Armijo, MNT SmartSolutions (United States); Shayden Fritz, Kayla Simpson, Wei Xu, Texas A&M Univ. Corpus Christi (United States)

Coffee 2:50 PM - 3:10 PM

SESSION 3: NANO PROBES II

31 January 2023 • 3:10 PM - 4:50 PM

Moscone Center, Room 101 (Level 1 South Lobby)

Session chair: Daniel A. Heller, Memorial Sloan-Kettering Cancer Ctr. (United States)

12398-11 • 3:10 PM - 3:40 PM

Studies on phase-change nanodroplets for biomedical imaging (*Invited Paper*)

Author(s): Konstantin V. Sokolov, Dmitry Nevozhay, Pavel Tsitovich, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States)

12398-12 • 3:40 PM - 4:10 PM

Imaging of cell to cell communication with near infrared fluorescent nanosensors (*Invited Paper*)

Author(s): Sebastian Kruss, Ruhr-Univ. Bochum (Germany)

12398-13 • 4:10 PM - 4:30 PM

Targeted fluorescent gold nanocluster for NIR imaging

Author(s): Hengbo Huang, Julie Prior, Katie Duncan, Rui Tang, Washington Univ. in St. Louis (United States); Samuel Achilefu, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States)

12398-14 • 4:30 PM - 4:50 PM

Multiplexed spatial profiling of cancer enabled by Raman imaging

Author(s): Olga Eremina, Alexander Czaja, Augusta Fernando, Cristina L. Zavaleta, The Univ. of Southern California (United States)

SESSION 4: NOVEL NIR PROBES

31 January 2023 • 4:50 PM - 6:10 PM

Moscone Center, Room 101 (Level 1 South Lobby)

Session chair: Lingyan Shi, Univ. of California, San Diego (United States)

12398-15 • 4:50 PM - 5:20 PM

In vivo imaging of CRISPRi-attenuated receptor expression by using a miniaturized near-infrared anti-EGFR probe (*Invited Paper*)

Author(s): Alexei A. Bogdanov, Suresh Gupta, UMass Chan Medical School (United States); Anand T. N. Kumar, Rahul Pal, Athinoula A. Martinos Ctr. for Biomedical Imaging (United States); Eric Schmidt, UMass Chan Medical School (United States)

12398-16 • 5:20 PM - 5:50 PM

Using dye chemistry to investigate the role of payloads and linkers on antibody conjugate targeting (*Invited Paper*)

Author(s): Martin Schnermann, National Cancer Institute (United States)

12398-17 • 5:50 PM - 6:10 PM CANCELED: Multiplexed near-infrared surface-enhanced Raman imaging of cancer in living subjects

Author(s): Jung Ho Yu, Sanjiv Sam Gambhir, Stanford Univ. (United States)

WEDNESDAY 1 FEBRUARY

SESSION 5: DESIGN AND APPLICATIONS OF OPTICAL PROBES

1 February 2023 • 8:50 AM - 10:10 AM

Moscone Center, Room 101 (Level 1 South Lobby)

Session chair: Allison M. Dennis, Boston Univ. (United States)

12398-18 • 8:50 AM - 9:10 AM

Optical microscopy for quantifying oxygenation and blood flow during healthy and diseased conditions in mouse: brain and beyond

Author(s): Ikbil Sencan-Egilmez, Washington Univ. in St. Louis (United States)

12398-19 • 9:10 AM - 9:30 AM

Clinical results from a pilot multi-center study using a novel fluorescent tracer agent for renal function measurement

Author(s): Richard B. Dorshow, Jeng-Jong Shieh, Martin P. Debreczeny, MediBeacon Inc. (United States)

12398-20 • 9:30 AM - 9:50 AM

Quantitative fluorescence imaging of tyrosine kinase inhibitors in live cells and tissues

Author(s): Lei G. Wang, Antonio R. Montaño, Allison Solanki, Nathan P. McMahon, Oregon Health & Science Univ. (United States); Kimberley S. Samkoe, Dartmouth College (United States); Kenneth M. Tichauer, Illinois Institute of Technology (United States); Summer L. Gibbs, Oregon Health & Science Univ. (United States)

12398-21 • 9:50 AM - 10:10 AM

Near infrared fluorophore specific for annexin A2 identifies peripheral nerve injury in a rodent crush model

Author(s): David Brogan, Tony Lee, Jason Wever, Christopher Dy, Washington Univ. in St. Louis (United States); Samuel Achilefu, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States)

Coffee Break 10:10 AM - 10:40 AM

SESSION 6: FLUORESCENCE LIFETIME APPLICATIONS

1 February 2023 • 10:40 AM - 12:10 PM

Moscone Center, Room 101 (Level 1 South Lobby)

Session chairs: Ramesh Raghavachari, U.S. Food and Drug Administration (United States), Mikhail Y. Berezin, Washington Univ. School of Medicine in St. Louis (United States)

12398-23 • 10:40 AM - 11:10 AM

Monitoring target engagement in vivo via lifetime FRET (*Invited Paper*)

Author(s): Xavier R. Intes, Rensselaer Polytechnic Institute (United States)

12398-24 • 11:10 AM - 11:30 AM

Monitoring neuromodulator levels across time and animals with fluorescence-lifetime sensitive optical biosensors

Author(s): Pingchuan Ma, Peter Chen, Elizabeth I. Tilden, Yao Chen, Washington Univ. in St. Louis (United States)

Conference 12398

12398-25 • 11:30 AM - 11:50 AM

Feasibility of imaging intracellular tension probes in multicellular aggregates

Author(s): Luni Hu, Julian Ong, Rutgers, The State Univ. of New Jersey (United States); Margarida M. Barroso, Albany Medical College (United States); Nada N. Boustany, Rutgers, The State Univ. of New Jersey (United States)

12398-26 • 11:50 AM - 12:10 PM

The bright future of fluorescence lifetime analysis

Author(s): Alessandro Rossetta, FLIM LABS S.r.l. (Italy)

POSTERS-MONDAY

30 January 2023 • 5:30 PM - 7:00 PM

Moscone Center, Level 2 West

Conference attendees are invited to attend the Monday BiOS poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM – 5:00 PM

View poster presentation guidelines and set-up instructions at:
<https://spie.org/PW/Poster-Guidelines>

12398-22

Digitization of print-based absorption and fluorescence spectra – extracting clarity from clutter

Author(s): Masahiko Taniguchi, Zhiyuan Wu, Caitlin Sterling, Jonathan S. Lindsey, North Carolina State Univ. (United States)

LASE

Contents

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Solid State Lasers XXXII: Technology and Devices	
Chair(s): W. Andrew Clarkson; Ramesh K. Shori	
Conference 12400	00
Fiber Lasers XX: Technology and Systems	
Chair(s): V. R. Supradeepa; Clémence Jollivet	
Conference 12401	00
High Power Lasers for Fusion Research VII	
Chair(s): Abdul A. S. Awwal; Constantin L. Haefner	
Conference 12402	00
Components and Packaging for Laser Systems IX	
Chair(s): Alexei L. Glebov; Paul O. Leisher	
Conference 12403	00
High-Power Diode Laser Technology XXI	
Chair(s): Mark S. Zediker; Erik P. Zucker	
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Vertical External Cavity Surface Emitting Lasers (VECSELs) XII	
Chair(s): Robert G. Bedford	
Conference 12405	00
Nonlinear Frequency Generation and Conversion: Materials and Devices XXII	
Chair(s): Peter G. Schunemann	
Conference 12406	00
Real-time Measurements, Rogue Phenomena, and Single-Shot Applications VIII	
Chair(s): Daniel R. Solli; Georg Herink; Serge Bielawski	
Conference 12407	00
Laser Resonators, Microresonators, and Beam Control XXV	
Chair(s): Vladimir S. Ilchenko; Andrea M. Armani; Julia V. Sheldakova; Alexis V. Kudryashov	
Conference 12408	00
Laser Applications in Microelectronic and Optoelectronic Manufacturing (LAMOM) XXVIII	
Chair(s): Aiko Narazaki; Laura Gemini; Jan Kleinert	
Conference 12409	00
Laser-based Micro- and Nanoprocessing XVII	
Chair(s): Rainer Kling; Akira Watanabe; Wilhelm Pfleging	
Conference 12410	00
Nanoscale and Quantum Materials: From Synthesis and Laser Processing to Applications 2023	
Chair(s): Andrei V. Kabashin; Maria Farsari; Masoud Mahjouri-Samani	
Conference 12411	00
Frontiers in Ultrafast Optics: Biomedical, Scientific, and Industrial Applications XXIII	
Chair(s): Peter R. Herman; Roberto Osellame; Adela Ben-Yakar	
Conference 12412	00
Laser 3D Manufacturing X	
Chair(s): Bo Gu; Hongqiang Chen; Henry Helvajian	
Conference 12413	00
Free-Space Laser Communications XXXV	
Chair(s): Hamid Hemmati; Bryan S. Robinson	
Conference 12414	00
High-Power Laser Materials Processing: Applications, Diagnostics, and Systems XII	
Chair(s): Stefan Kaierle; Klaus R. Kleine	

Solid State Lasers XXXII: Technology and Devices

31 January - 1 February 2023 | Moscone Center, Room 202 (Level 2 South)

Conference Chairs: **W. Andrew Clarkson**, Optoelectronics Research Ctr. (United Kingdom); **Ramesh K. Shori**, Naval Undersea Warfare Ctr. Keyport (United States)

Program Committee: **Gary Cook**, Air Force Research Lab. (United States); **Scott J. Hamlin**, MegaWatt Lasers, Inc. (United States); **Dennis G. Harris**, Dennis Harris Associates (United States); **Helena Jelínková**, Czech Technical Univ. in Prague (Czech Republic); **Christian Kränkel**, Leibniz-Institut für Kristallzüchtung (Germany); **Jacob I. Mackenzie**, Univ. of Southampton (United Kingdom); **Markus Pollnau**, Univ. of Surrey (United Kingdom); **Narasimha S. Prasad**, NASA Langley Research Ctr. (United States); **Bojan Resan**, Fachhochschule NordWestschweiz (Switzerland); **Nikolay E. Ter-Gabrielyan**, DEVCOM Army Research Lab. (United States)

TUESDAY 31 JANUARY

SESSION 1: CRYSTALLINE FIBER LASERS

31 January 2023 • 8:30 AM - 9:50 AM | Moscone Center, Room 202 (Level 2 South)

Session Chair: Ramesh K. Shori, Naval Undersea Warfare Ctr. Keyport (United States)

12399-1 • 8:30 AM - 8:50 AM

Claddings for YAG single crystal high power fiber lasers

Author(s): Randall Hay, Hyunjun Kim, Andrew Schlup, John Drazin, Kathryn Doyle, Benjamin Gray, Kent Averett, Cynthia Bowers, Air Force Research Lab. (United States)

12399-2 • 8:50 AM - 9:10 AM

Calcium gallium germanium garnet as a cladding material for single-crystal yttrium aluminum garnet fiber lasers

Author(s): Andrew Schlup, UES, Inc. (United States)

12399-3 • 9:10 AM - 9:30 AM

In-fiber crystal growth

Author(s): John M. Ballato, Thomasina Zaengle, Thomas W. Hawkins, Clemson Univ. (United States)

31 January 2023 | Moscone Center, Room 202 (Level 2 South)

Show Abstract +

12399-4 • 9:30 AM - 9:50 AM

Crystal fibers for laser sources

Author(s): Daniel J. Gibson, Brandon Shaw, Shyam Bayya, Jas Sanghera, U.S. Naval Research Lab. (United States); Robert Nicol, Jacobs Engineering Group Inc. (United States); Tony Zhou, Univ. Research Foundation (United States); Adam Floyd, Jason Myers, U.S. Naval Research Lab. (United States); Robel Bekele, Univ. Research Foundation (United States)

Coffee Break 9:50 AM - 10:20 AM

SESSION 2: ULTRAFAST LASERS

31 January 2023 • 10:20 AM - 11:40 AM | Moscone Center, Room 202 (Level 2 South)

Session Chair: Narasimha S. Prasad, NASA Langley Research Ctr. (United States)

12399-5 • 10:20 AM - 10:40 AM

Spatially-multiplexed dual-comb lasers: from 80 MHz to 1 GHz

Author(s): Justinas Pupeikis, Christopher Phillips, Benjamin Willenberg, Alexander Nussbaum-Lapping, Carolin P. Bauer, Sandro Camenzind, Ursula Keller, ETH Zurich (Switzerland)

12399-6 • 10:40 AM - 11:00 AM

Machine learning enhanced beam pointing stabilization for the pump-probe laser at the FLASH FEL Facility

Author(s): Henrik Tünnermann, Federico Pressacco, Hamed Tavakol, Ingmar Hartl, Deutsches Elektronen-Synchrotron (Germany)

12399-8 • 11:00 AM - 11:20 AM

Versatile ultrashort pulse laser tunable up to nanosecond range

Author(s): Tadas Bartulevicius, Mykolas Lipnickas, Karolis Madeikis, Raimundas Burokas, Andrejus Michailovas, EKSPLA (Lithuania)

12399-9 • 11:20 AM - 11:40 AM

Femtosecond extended-cavity Yb:CALGO laser operating at sub-10 MHz repetition rate

Author(s): Md. Anisur Rahman Reza, Arkady Major, Univ. of Manitoba (Canada)

Lunch/Exhibition Break 11:40 AM - 2:00 PM

SESSION 3: DONUT MODE AND VORTEX BEAM LASERS

31 January 2023 • 2:00 PM - 3:20 PM | Moscone Center, Room 202 (Level 2 South)

Session Chair: W. Andrew Clarkson, Optoelectronics Research Ctr. (United Kingdom)

12399-10 • 2:00 PM - 2:20 PM

Yb fiber vortex laser using an interferometric mode converting output coupler

Author(s): Jan W. T. Geberbauer, Robert T. Murray, Timothy H. Runcorn, William R. Kerridge-Johns, Imperial College London (United Kingdom)

12399-11 • 2:20 PM - 2:40 PM

Double-pass amplification of a radially polarized beam up to 33.7 W using a Ho:YAG thin-slab architecture

Author(s): Matthew J. Barber, Peter C. Shallow, Callum R. Smith, W. A. Clarkson, Optoelectronics Research Ctr. (United Kingdom)

12399-12 • 2:40 PM - 3:00 PM

Generation of actively Q-switched pulses with radial polarization using a laser-written S-waveplate in a Ho:YAG laser

Author(s): Matthew J. Barber, Peter C. Shallow, Yuhao Lei, Peter G. Kazansky, W. A. Clarkson, Optoelectronics Research Ctr. (United Kingdom)

12399-13 • 3:00 PM - 3:20 PM

Generation and detection of OAM-carrying beamlets for underwater optical systems using a HOBBIT system

Author(s): Jaxon Wiley, Evan Robertson, Kunjian Dai, Justin Free, Keith Miller, Eric G. Johnson, Clemson Univ. (United States)

Coffee Break 3:20 PM - 3:50 PM

SESSION 4: EYE-SAFE AND MID-IR LASERS

31 January 2023 • 3:50 PM - 5:50 PM | Moscone Center, Room 202 (Level 2 South)

Session Chair: Ramesh K. Shori, Naval Undersea Warfare Ctr. Keyport (United States)

12399-14 • 3:50 PM - 4:10 PM

A multi-wavelength hybrid waveguide-fiber cavity 2.1 μm laser

Author(s): David G. Lancaster, Dale E. Otten, Yongsop Hwang, Univ. of South Australia (Australia); Dmitrii Stepanov, Defence Science and Technology Group (Australia)

12399-15 • 4:10 PM - 4:30 PM

Q-switched, high energy, high repetition rate, mini-laser transmitters at 1.54 μm

Author(s): Baoping Guo, L3Harris Technologies Inc., Kigre (United States); Josh Foster, L3Harris Technology (United States); Susanne Lee, L3Harris Technologies, Inc. (United States); Jared Hudock, Joshua Roller, L3Harris Technologies (United States); Edward Miesak, L3Harris Technologies, Inc. (United States)

12399-16 • 4:30 PM - 4:50 PM

Er,Yb:Glass transmitter designed for high volume manufacturing

Author(s): Jon M. McGuire, LUMIBIRD (United States)

12399-18 • 4:50 PM - 5:10 PM

Q-switched Ho³⁺:YAG Porro resonators with improved alignment stability

Author(s): Katharina Goth, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany), Karlsruher Institut für Technologie (Germany); Michael Griesbeck, Madeleine Eitner, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany); Marc Eichhorn, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany), Karlsruher Institut für Technologie (Germany); Christelle Kieleck, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany)

12399-19 • 5:10 PM - 5:30 PM

Challenges in designing and building a high energy, pulsed diode-pumped MWIR Fe:ZnSe laser

Author(s): Binh T. Do, Laryssa Skolnik, Jay Skolnik, Thong T. Nguyen, 3 Micron Laser Technology, LLC (United States)

12399-57 • 5:30 PM - 5:50 PM

Electro-optically Q-switched 2.8 μm Cr:Er:YSGG laser with output energy up to 300 mJ

Author(s): Dmitri V. Martyshkin, Vladimir V. Fedorov, The Univ. of Alabama at Birmingham (United States); Scott J. Hamlin, MegaWatt Lasers Corp. (United States); Sergey B. Mirov, The Univ. of Alabama at Birmingham (United States)

POSTERS-TUESDAY

31 January 2023 • 6:00 PM - 8:00 PM |

Moscone Center, Level 2 West

Conference attendees are invited to attend the LASE poster Session on Tuesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12399-37

Diode pumped cryogenically cooled Tm:LuVO₄ laser

Author(s): Karel Veselsky, Jan Šulc, Helena Jelínková, Czech Technical Univ. in Prague (Czech Republic)

12399-38

High spectral resolution LIDAR source at 1 kHz amplifying spectrally single mode ns-pulses with active ASE suppression

Author(s): Andrea Nagel, Bastian Kaiser, Bernhard Henrich, Photonik-Zentrum Kaiserslautern e.V. (Germany), Landesforschungszentrum OPTIMAS, Technische Univ. Kaiserslautern (Germany); Peter Koch, Martin Nittmann, Jürgen Bartschke, Xiton Photonics GmbH (Germany); Johannes A. L'huillier, Photonik-Zentrum Kaiserslautern e.V. (Germany), Landesforschungszentrum OPTIMAS, Technische Univ. Kaiserslautern (Germany)

12399-39

Gain-switched Ti:Sapphire microchip laser investigation within 78-300 K temperature range

Author(s): Martin Fibrich, Czech Technical Univ. in Prague (Czech Republic), ELI Beamlines (Czech Republic); Jan Šulc, Michal Nemec, Helena Jelínková, Czech Technical Univ. in Prague (Czech Republic)

12399-40

Benchmark evaluation of a single frequency continuous wave OPO seeded pulsed dye amplifier for high-resolution laser spectroscopy

Author(s): M. Urquiza-González, HÜBNER GmbH & Co. KG (Germany); M. Au, CERN (Switzerland), Johannes Gutenberg Univ. Mainz (Germany); C. Bernerd, Institute for Nuclear and Radiation Physics, KU Leuven (Belgium); M. L. Bissell, The Univ. of Manchester (United Kingdom); B. van den Borne, Institute for Nuclear and Radiation Physics, KU Leuven (Belgium); K. Chrysalidis, CERN (Switzerland); Thomas E. Cocolios, Institute for Nuclear and Radiation Physics, KU Leuven (Belgium); V. Fedosseev, CERN (Switzerland); K. T. Flanagan, Photon Science Institute, The Univ. of Manchester (United Kingdom); R. F. Garcia Ruiz, Massachusetts Institute of Technology (United States); Sarina Geldhof, Grand Accélérateur National d'Ions Lourds (France); R. P. de Groote, Institute for Nuclear and Radiation Physics, KU Leuven (Belgium), Univ. of Jyväskylä (Finland); Á. Koszorus, Institute for Nuclear and Radiation Physics, KU Leuven (Belgium); D. Hanstorp, Göteborgs Univ. (Sweden); M. Heines, Institute for Nuclear and Radiation Physics, KU Leuven (Belgium); R. Heinke, CERN (Switzerland); K. Hens, HÜBNER GmbH & Co. KG (Germany); O. S. Khwairakpam, Lab. Nazionali di Legnaro, Istituto Nazionale di Fisica Nucleare (Italy), Univ. degli Studi di Siena (Italy); S. Kujanpää, Univ. of Jyväskylä (Finland); L. Lalanne, Institute for Nuclear and Radiation Physics,

Conference 12399

KU Leuven (Belgium); B. A. Marsh, CERN (Switzerland); G. Neyens, Institute for Nuclear and Radiation Physics, KU Leuven (Belgium), CERN (Switzerland); M. Nichols, Göteborgs Univ. (Sweden); H. A. Perrett, D. Pitman-Weymouth, J. R. Reilly, The Univ. of Manchester (United Kingdom); V. Sonnenschein, HÜBNER GmbH & Co. KG (Germany); K. Wendt, Institut für Physik, Johannes Gutenberg Univ. Mainz (Germany); J. Wessolek, The Univ. of Manchester (United Kingdom), M Squared Lasers Ltd. (United Kingdom); S. G. Wilkins, Massachusetts Institute of Technology (United States); X. F. Yang, Institute for Nuclear and Radiation Physics, KU Leuven (Belgium), Peking Univ. (China)

12399-41

Temperature dependence of spectroscopy and laser parameters of Er:Y2O3 ceramic from 80 to 300 K

Author(s): Richard Švejkar, Jan Sulc, Helena Jelinkova, Czech Technical Univ. in Prague (Czech Republic)

12399-42

Delivery of Er:YAG laser radiation with repetition rate up to 150 Hz by a hollow glass waveguide

Author(s): Michal Nemec, Helena Jelinkova, Jan Šulc, Czech Technical Univ. in Prague (Czech Republic); Katsumasa Iwai, Hiroyuki Takaku, National Institute of Technology, Sendai College (Japan); Mitsunobu Miyagi, Tohoku Institute of Technology (Japan)

12399-43

Investigation of optical and lasing properties of a Yb-doped silica rod

Author(s): Jongseon Park, Korea Institute of Industrial Technology (Republic of Korea); Yejin Oh, Jinphil Kim, Ji Won Kim, Hanyang Univ. (Republic of Korea); Gaye Park, Jaesun Kim, Taihan Fiber Optics Co., Ltd. (Republic of Korea); Hoon Jeong, Korea Institute of Industrial Technology (Republic of Korea)

12399-44

Cylindrical vector vortex beam generation in a Nd:YVO4 laser

Author(s): Ji Won Kim, Yejin Oh, Jongseon Park, Eunji Park, Hanyang Univ. (Republic of Korea); Hoon Jeong, Korea Institute of Industrial Technology (Republic of Korea)

12399-45

Novels temporal pulse shaping methods for nanosecond MOPA fiber laser systems

Author(s): Maryam Sadeghi, PicoQuant GmbH (Germany); Raphaël Humblot, Lab. pour l'Utilisation des Lasers Intenses (France); Paul Fey, PicoQuant GmbH (Germany); Loïc Meignien, Lab. pour l'Utilisation des Lasers Intenses (France); Thomas Schönau, PicoQuant GmbH (Germany)

12399-47

Nd:YAG/Cr:YAG microchip-based system for laser-induced damage threshold measurement

Author(s): Jan Šulc, Michal Nemec, David Vyhřídál, Helena Jelinková, Czech Technical Univ. in Prague (Czech Republic); Karel Nejezchleb, Štěpán Uxa, CRYTUR spol s.r.o. (Czech Republic)

12399-48

The influence of Cr²⁺ to Fe²⁺ ions concentration ratio on the Cr,Fe:Zn(1-x)Mn(x)Se (x ≈ 0.15) laser properties excited via Cr²⁺ → Fe²⁺ energy transfer

Author(s): Adam Riha, Helena Jelinkova, Czech Technical Univ. in Prague (Czech Republic); Maxim E. Doroshenko, A. M. Prokhorov General Physics Institute (Russian Federation); Michal Jelinek, Michal Nemec, Jan Sulc, David Vyhřídál, Czech Technical Univ. in Prague (Czech Republic); Nazar O. Kovalenko, Institute for Single Crystals, National Academy of Sciences of Ukraine (Ukraine)

On demand | Presented live 31 January 2023
Show Abstract +

12399-49

20km high accuracy, low false alarm probability laser rangefinder

Author(s): Xuan Duc Cao, Bao Dong To, Tuan Anh Nguyen, Van Tuan Vu, Viettel High-Tech Industrial Corp. (Vietnam)

12399-51

Passively Q-switched sub-100 ps Yb³⁺:YAG/Cr⁴⁺:YAG microchip laser: experimental results and numerical analysis

Author(s): Andreas Giese, Technische Hochschule Nürnberg Georg Simon Ohm (Germany); Michael Körber, Technische Hochschule Nürnberg Georg Simon Ohm (Germany), Paracelsus Medizinische Privatuniversität (Germany); Konstantina Kostourou, NANO Precision IBS Coatings GmbH (Germany); Daniel Kopf, MONTFORT Laser GmbH (Austria); Manfred Kottcke, Jan Lohbreier, Technische Hochschule Nürnberg Georg Simon Ohm (Germany); Josef M. Schmidbauer, Klinikum Nürnberg (Germany), Paracelsus Medizinische Privatuniversität (Germany); Bernd Braun, Technische Hochschule Nürnberg Georg Simon Ohm (Germany)

12399-52

10 mJ, 100 W, 1 ps hybrid laser system based on amplification in Yb:YAG

Author(s): Aivaras Kazakevicius, Raimundas Burokas, EKSPALA (Lithuania), Ctr. for Physical Sciences and Technology (Lithuania); Rokas Danilevicius, EKSPALA (Lithuania); Andrejus Michailovas, EKSPALA (Lithuania), Ctr. for Physical Sciences and Technology (Lithuania)

12399-53

Tm, Ho:GGAG 2.1 μm laser diode-pumped at 1.7 μm

Author(s): Jan Kratochvíl, Czech Technical Univ. in Prague (Czech Republic); Pavel Boháček, Institute of Physics of the CAS, v.v.i. (Czech Republic); Jan Šulc, Michal Nemec, Martin Fibrich, Helena Jelinková, Czech Technical Univ. in Prague (Czech Republic); Bohumil Trunda, Lubomír Havlák, Karel Jurek, Martin Nikl, Institute of Physics of the CAS, v.v.i. (Czech Republic)

12399-54

Continuous-wave Yb:YAG laser pumped by a compact Nd:YAG laser operating at 946 nm

Author(s): Rubel C. Talukder, Arkady Major, Univ. of Manitoba (Canada)

12399-55

Optical, electrical, and EPR studies of polycrystalline Al:Cr:ZnSe gain elements

Author(s): Rick Watkins, Vladimir V. Fedorov, Mary E. Zvanut, Suman Bhandari, The Univ. of Alabama at Birmingham (United States); Yury Barnakov, IPG Photonics Corp. (United States); Sergey B. Mirov, The Univ. of Alabama at Birmingham (United States)

12399-56

High power operation of a diode-pumped continuous-wave Yb:YLF laser at room temperature

Author(s): Reza Akbari, Arkady Major, Univ. of Manitoba (Canada)

12399-58

Flashlamp-pumped CTH:YAG MOPA

Author(s): Scott J. Hamlin, MegaWatt Lasers, Inc. (United States); Ramesh K. Shori, Naval Undersea Warfare Ctr. Keyport (United States); Alex Likins, MegaWatt Lasers Inc. (United States); Ashley Hamlin, MegaWatt Lasers, Inc. (United States); J. Keith Miller, Eric G. Johnson, Clemson Univ. (United States)

WEDNESDAY 1 FEBRUARY**SESSION 5: PULSED LASERS**

1 February 2023 • 8:20 AM - 10:00 AM | Moscone Center, Room 202 (Level 2 South)

Session Chair: Jacob McKenzie

12399-20 • 8:20 AM - 8:50 AM

Advanced pulsed laser architectures with high output powers and high pulse energies (*Invited Paper*)

Author(s): Klaus Albers, Christian Stolzenburg, Dominik Bauer, Aleksander Budnicki, Dirk Sutter, Alexander Killi, TRUMPF Laser GmbH (Germany); Tom Metzger, Sandro Klingebiel, TRUMPF Scientific Lasers GmbH + Co., KG (Germany); Claus Schnitzler, Jan Dolkemeyer, AMPHOS GmbH (Germany)

12399-21 • 8:50 AM - 9:10 AM

Numerical modelling of Cr:YAG Q-switched Yb:YAG micro-lasers and comparison with experimental results

Author(s): Pierre Bourdon, Christophe Planchat, Didier Goular, Laurent Lombard, Francois Gustave, Julien Le Gouet, ONERA (France)

12399-23 • 9:10 AM - 9:30 AM

>70 MW peak power air-cooled Nd:YAG/Cr4+:YAG unstable cavity microchip laser at 100 Hz

Author(s): Hwan Hong Lim, Institute for Molecular Science (Japan); Takunori Taira, RIKEN SPring-8 Ctr. (Japan); Institute for Molecular Science (Japan)

12399-24 • 9:30 AM - 10:00 AM

Design and development of a 10 J, 100 Hz DiPOLE diode-pumped solid state laser (*Invited Paper*)

Author(s): Mariastefania De Vido, Gary Quinn, Jacob Spear, STFC Rutherford Appleton Lab. (United Kingdom); Klaus Ertel, TRUMPF Laser GmbH (Germany); Danielle Clarke, Paul Mason, STFC Rutherford Appleton Lab. (United Kingdom); Martin Divoky, Jan Pilar, Magdalena Sawicka-Chyla, Ondrej Slezak, Ondrej Denk, Jan Cvrcek, Petr Navrátil, HiLASE Ctr. (Czech Republic); Jodie Smith, Jonathan Phillips, Saumyabrata Banerjee, Agnieszka Wojtusiak, Thomas Butcher, STFC Rutherford Appleton Lab. (United Kingdom); Martin Smrz, Tomas Mocek, HiLASE Ctr. (Czech Republic); John Collier, STFC Rutherford Appleton Lab. (United Kingdom)

Coffee Break 10:00 AM - 10:30 AM**SESSION 6: CHALLENGES AND ISSUES IN FIELD, FLIGHT, AND SPACE QUALIFIED LASER COMPONENTS AND SYSTEMS**

1 February 2023 • 10:30 AM - 12:10 PM | Moscone Center, Room 202 (Level 2 South)

Session Chair: Jacob McKenzie

12399-25 • 10:30 AM - 10:50 AM

Environmental testing of high-quality Alexandrite crystals and coatings for space applications

Author(s): Stefanie Unland, Roland Kalms, Peter Weßels, Tammo Böntgen, Heinrich Mädebach, Michael Hunnekuhl, Dietmar Kracht, Laser Zentrum Hannover e.V. (Germany); Mirco Lorrai, Pier Giorgio Lorrai, Mahmoud Hmidat, Filar Opto Materials S.r.l. (Italy); Justinas Butkus, Laurynas Lukoševicius, Altechna Coatings, JSC (Lithuania); Jörg Neumann, Laser Zentrum Hannover e.V. (Germany)

12399-26 • 10:50 AM - 11:10 AM

Conductively cooled, high average power, pulsed Nd:YAG solid state laser, with fully integrated electronics with military-grade reliability for industrial applications

Author(s): Jon M. McGuire, LUMIBIRD (United States)

12399-27 • 11:10 AM - 11:30 AM

Laser and optical transport line for laser-based ion beam diagnostics and control in the SNS linear accelerator

Author(s): Yun Liu, Sydney Murray, Anthony Webster, Oak Ridge National Lab. (United States)

12399-28 • 11:30 AM - 11:50 AM

Technology development of a solid state 266 nm laser for NASA's Dragonfly mission

Author(s): Matthew W. Mullin, Barry Coyle, Paul R. Stysley, Melissa G. Trainer, Michael J. Hersh, Bryan L. James, NASA Goddard Space Flight Ctr. (United States); Erich A. Frese, Science Systems and Applications, Inc. (United States); Guru Ramu, AMU Engineering, Inc. (United States); Kristen A. Washington, Joe Thomes, NASA Goddard Space Flight Ctr. (United States); Eric I. Lyness, Microtel LLC (United States); Juan Landers, Fibertek, Inc. (United States); Akif Ersahin, MAE Aerospace LLC (United States); Peter D. Mule, Daniel G. Bae, Peter W. Barfknecht, NASA Goddard Space Flight Ctr. (United States); Kevin A. Smith, Genesis Engineering Solutions Inc (United States); Marc J. Matysek, Science Systems and Applications, Inc. (United States); Timothy A. Petry, Amandeep Kaur, William J. Halaburda, NASA Goddard Space Flight Ctr. (United States); Jackie I Bartel, Genesis Engineering Solutions Inc (United States); Keith A. Kienzie, Science Systems and Applications (United States); Alejandro Rodriguez Perez, Jean-Marie Lauenstein, NASA Goddard Space Flight Ctr. (United States)

12399-29 • 11:50 AM - 12:10 PM

Optical characteristics of radiated multifunctional optical materials

Author(s): Narasimha S. Prasad, NASA Langley Research Ctr. (United States); Bradley Arnold, Fow-Sen Choa, Eric Bowman, Meghan Brandt, Carla Golubev, Narsingh B. Singh, Univ. of Maryland, Baltimore County (United States)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

Conference 12399

SESSION 7: LASER MATERIALS AND CHARACTERIZATION

1 February 2023 • 1:40 PM - 3:40 PM | Moscone Center, Room 202 (Level 2 South)

Session Chair: Narasimha S. Prasad, NASA Langley Research Ctr. (United States)

12399-30 • 1:40 PM - 2:00 PM

Highly-compact and power-scalable transition-metal-doped single-frequency lasers

Author(s): Alexander A. Lagatsky, Gerald M. Bonner, Peter J. Schlosser, David J. M. Stothard, Loyd J. McKnight, Fraunhofer Ctr. for Applied Photonics (United Kingdom)

12399-31 • 2:00 PM - 2:20 PM

An overview of polarisation control in high-energy, diode-pumped, solid-state lasers

Author(s): Danielle Clarke, Science and Technology Facilities Council (United Kingdom), Heriot-Watt Univ. (United Kingdom); Lydia Dixon, Science and Technology Facilities Council (United Kingdom), Univ. of Surrey (United Kingdom); Ryan McGuigan, Helmut Kessler, Chris Bridle, Manx Precision Optics Ltd. (Isle of Man); Mariastefania De Vido, Science and Technology Facilities Council (United Kingdom); Daniel Esser, Heriot-Watt Univ. (United Kingdom)

12399-32 • 2:20 PM - 2:40 PM

Modelling the effect of astigmatism on the beam quality factor of Laguerre-Gaussian optical beams.

Author(s): Chemist M. Mabena, Teboho Lebohang Bell, Darryl Naidoo, Council for Scientific and Industrial Research (South Africa)

12399-33 • 2:40 PM - 3:00 PM

Continuous-wave narrow-line lasing of polycrystalline Cr:ZnS/Se gain media in non-selective twisted mode cavities

Author(s): Rem Danilin, Sergey Mirov, Vladimir Fedorov, Dmitry Martyshkin, The Univ. of Alabama at Birmingham (United States)

12399-35 • 3:00 PM - 3:20 PM

Enhanced photoluminescence via energy transfer from plasmon Ag to Eu³⁺ ions in ZABS glasses for solid-state device applications

Author(s): Monisha Murthi, Sudha D. Kamath, Manipal Institute of Technology (India)

12399-36 • 3:20 PM - 3:40 PM

Simulations of amplified spontaneous emissions and parasitic oscillations in high-power solid-state laser amplifiers

Author(s): Holger Schmitz, Paul Mason, Yunxin Tang, Saumyabrata Banerjee, Science and Technology Facilities Council (United Kingdom)

1 February 2023 | Moscone Center, Room 202 (Level 2 South)

Show Abstract +

DIGITAL POSTER

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12399-50 • On demand | Presenting live 28 January 2023

Comparison analysis of Freetrig mode and universal trigger mode

Author(s): Tienan Wang, Yongshun Xu, Xiaohua Chen, BWT Beijing Ltd. (China)

Conference 12400

Fiber Lasers XX: Technology and Systems

30 January - 2 February 2023 | Moscone Center, Room 203 (Level 2 South)

Conference Chair: **V. R. Supradeepa**, Ctr. for Nano Science and Engineering (CeNSE) (India)

Conference Co-Chair: **Clémence Jollivet**, Coherent | Nufern (United States)

Program Committee: **Adrian L. Carter**, Coherent | Nufern (Australia); **Fabio Di Teodoro**, Raytheon Co. (United States); **Mark Dubinskii**, DEVCOM Army Research Lab. (United States); **Heike Ebendorff-Heidepriem**, The Univ. of Adelaide (Australia); **Angel Flores**, Air Force Research Lab. (United States); **Gregory D. Goodno**, Northrop Grumman Space Systems (United States); **Ingmar Hartl**, Deutsches Elektronen-Synchrotron (Germany); **Thomas W. Hawkins**, Clemson Univ. (United States); **Clifford Headley III**, Leonardo Electronics US Inc. (United States); **Stuart D. Jackson**, Macquarie Univ. (Australia); **César Jáuregui-Misas**, Friedrich-Schiller-Univ. Jena (Germany); **Manoj Kanskar**, nLIGHT, Inc. (United States); **Martin Dybendal Maack**, NKT Photonics A/S (Denmark); **Peter F. Moulton**, MIT Lincoln Lab. (United States); **Martin H. Muendel**, Lumentum (United States); **Philippe Roy**, XLIM (France); **Jeffrey W. Nicholson**, OFS Fitel, LLC (United States); **Bryce N. Samson**, IPG Photonics Corp. (United States); **Matthias Savage-Leuchs**, Lockheed Martin Aculight Corp. (United States); **Thomas Schreiber**, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); **Lawrence Shah**, Luminar Technologies, Inc. (United States); **L. Brandon Shaw**, U.S. Naval Research Lab. (United States); **Wei Shi**, Tianjin Univ. (China); **Paul Steinvurzel**, The Aerospace Corp. (United States); **Pu Wang**, Beijing Univ. of Technology (China); **Michalis N. Zervas**, Optoelectronics Research Ctr. (United Kingdom); **Pu Zhou**, National Univ. of Defense Technology (China); **Benedikt Schuhbauer**, Laser Zentrum Hannover e.V. (Germany)

INFORMATION

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MONDAY 30 JANUARY

SESSION 1: POWER SCALING OF FIBER LASERS AND AMPLIFIERS

30 January 2023 • 10:20 AM - 12:40 PM
Moscone Center, Room 203 (Level 2 South)

Session Chair: Gregory D. Goodno, Northrop Grumman Corp. (United States)

12400-1 • 10:20 AM - 10:50 AM

5 kW single-mode output power from Yb-doped fibers with increased higher-order mode loss *(Invited Paper)*

Author(s): Jeffrey W. Nicholson, Jose Pincha, Ishu Kansal, Robert Windeler, Eric Monberg, Vasilii Lukonin, Anand Hariharan, Greg Williams, Andrea Rosales-Garcia, Lalitkumar Bansal, David DiGiovanni, OFS Fitel, LLC (United States)

12400-2 • 10:50 AM - 11:10 AM

Performance of 915 nm pumped LMA Yb fiber designs for long-term reliable multi-kilowatt operation

Author(s): Andrea Rosales-Garcia, OFS Fitel, LLC (United States); Rasmus Jensen, Kasper Ingerslev, Bent Edvold, Poul Kristensen, Simona Ovtar, Sigrid S. Adersen, OFS Fitel Denmark ApS (Denmark); Jeffrey W. Nicholson, Robert S. Windeler, David J. DiGiovanni, OFS Fitel, LLC (United States); Bera Páldóttir, OFS Fitel Denmark ApS (Denmark)

12400-3 • 11:10 AM - 11:30 AM

Arbitrary MHz output modulation of continuous-wave Ytterbium-doped monolithic PM fiber amplifiers by polarization-switching

Author(s): Maximilian Strecker, Till Walbaum, Thomas Schreiber, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

12400-6 • 11:30 AM - 12:00 PM

Recent progress of high-power single-frequency all-fiber oscillators and amplifiers *(Invited Paper)*

Author(s): Wei Shi, Shijie Fu, Tianjin Univ. (China); Jinhui Li, Southeast University Chengxian College (China); Quan Sheng, Chaodu Shi, Lu Zhang, Kai Xue, Junxiang Zhang, Yang Xu, Jianquan Yao, Tianjin Univ. (China)

12400-5 • 12:00 PM - 12:20 PM 700W single-frequency all-fiber amplifier

Author(s): Chaodu Shi, Xun Deng, Shijie Fu, Quan Sheng, Peiheng Jiang, Zheng Shi, Yanyan Li, Wei Shi, Jianquan Yao, Tianjin Univ. (China)

12400-4 • 12:20 PM - 12:40 PM

Triple-clad ytterbium-doped fiber for 10 kW fiber laser

Author(s): Yue Meng, Yu Li, Xudong Shi, Zhangru Chen, Tianying Liu, Zuying Xu, Yangtze Optical Fibre and Cable Joint Stock Ltd. Co. (China); Imtiaz Majid, Everfoton Technologies (China)

Lunch Break 12:40 PM - 2:00 PM

SESSION 2: THULIUM AND HOLMIUM DOPED FIBER LASERS AND AMPLIFIERS I

30 January 2023 • 2:00 PM - 3:20 PM | Moscone Center, Room 203 (Level 2 South)

Session Chair: Benedikt Schuhbauer, Laser Zentrum Hannover e.V. (Germany)

12400-7 • 2:00 PM - 2:20 PM

High efficiency of a holmium doped fibre laser in clad-pump configuration

Author(s): Bastien Beaumont, iXblue SAS (France); Pierre Bourdon, ONERA (France); Alexandre Barnini, Louanne Kervella, Thierry Robin, iXblue (France); Julien Le Gouët, ONERA (France)

12400-8 • 2:20 PM - 2:40 PM

Short-wavelength-band tunable high-power Tm-doped fiber laser

Author(s): Xinyang Liu, Regina Gumenyuk, Tampere Univ. (Finland)

Conference 12400

12400-9 • 2:40 PM - 3:00 PM

The effect of temperature dependence of thulium cross sections on thulium-doped fiber laser operation

Author(s): Ondrej Schreiber, Bara Jirickova, Institute of Photonics and Electronics of the CAS, v.v.i. (Czech Republic), Czech Technical Univ. in Prague (Czech Republic); Jan Aubrecht, Institute of Photonics and Electronics of the CAS, v.v.i. (Czech Republic); Martin Grábner, Institute of Photonics and Electronics of the CAS (Czech Republic); César Jáuregui-Misas, Friedrich-Schiller-Univ. Jena (Germany); Pavel Honzátko, Pavel Peterka, Institute of Photonics and Electronics of the CAS, v.v.i. (Czech Republic)

12400-10 • 3:00 PM - 3:20 PM

Novel 2039 nm DFB FBG Tm-doped fiber laser source with high optical-optical pump efficiency

Author(s): Wiktor T. Walasik, Shivaraman Asoda, Jean-Marc Delavaux, Cybel, LLC (United States); Emmanuel Pinsard, iXblue Photonics (France)

Coffee Break 3:20 PM - 3:45 PM

LASE PLENARY AND HOT TOPICS

30 January 2023 • 3:45 PM - 6:05 PM | Moscone Center, Room 207/215 (Level 2 South)

3:45 PM - 3:50 PM: **Welcome and Opening Remarks**

Stefan Kaierle, Laser Zentrum Hannover e.V. (Germany) and John Ballato, Clemson Univ. (United States)

3:50 PM - 3:55 PM: **Announcement of the 3D Printing, Fabrication, and Manufacturing Best Paper Awards**

Henry Helvajian, The Aerospace Corp. (United States)

****Announcement of the LASE AI/ML Best Paper Award moved to 6:00 PM****

12408-500 • 4:00 PM - 4:30 PM

Status and potential of fully integrated photonic systems (Plenary Presentation)

Author(s): Arnan Mitchell, RMIT Univ. (Australia)

12412-601 • 4:30 PM - 4:45 PM

How laser AM can mitigate insecurities with supply chain issues and carbon footprint (Plenary Presentation)

Author(s): Eliana Fu, TRUMPF Inc. (United States)

12412-602 • 4:45 PM - 5:00 PM

Innovations in lidar driving the next generation of autonomy and safety (Hot Topic) (Plenary Presentation)

Author(s): Jason M. Eichenholz, Luminar Technologies, Inc. (United States)

12407-603 • 5:00 PM - 5:15 PM

Quantum computing with lasers (Hot Topic) (Plenary Presentation)

Author(s): Jürgen Stuhler, TOPTICA Photonics AG (Germany)

12401-501 • 5:15 PM - 5:45 PM

First demonstration of fusion ignition by inertial confinement fusion (ICF) at the National Ignition Facility (NIF) at LLNL (Plenary Presentation)

Author(s): Jean-Michel G. Di Nicola, Lawrence Livermore National Lab. (United States)

TUESDAY 31 JANUARY

SESSION 3: POWER COMBINING OF FIBER LASERS I

31 January 2023 • 8:30 AM - 10:00 AM | Moscone Center, Room 203 (Level 2 South)

Session Chair: Scott Christensen, IPG Photonics Corp. (United States)

12400-11 • 8:30 AM - 8:50 AM

Deep-learning applied to coherent combining of fiber lasers: from numerical modelling to experimental demonstration

Author(s): Pierre Bourdon, Nathanael Hulard, François Gustave, Anasthase Limery, Didier Goular, Christophe Planchat, Laurent Lombard, ONERA (France)

12400-12 • 8:50 AM - 9:10 AM

55-fs pulses from a spectrally combined fiber laser system via coherent spectral synthesis of two pulse shapers

Author(s): Siyun Chen, Qiang Du, Dan Wang, Antonio Gilardi, Lauren Cooper, Mahek Logantha, Jeroen van Tilborg, Carl Schroeder, Eric Esarey, Derun Li, Cameron Geddes, Russell Wilcox, Tong Zhou, Lawrence Berkeley National Lab. (United States)

12400-13 • 9:10 AM - 9:30 AM

188 W average power coherently combined Tm-doped fiber laser system delivering ultrashort pulses with 1.86 mJ energy

Author(s): Tobias Heuermann, Friedrich-Schiller-Univ. Jena (Germany), Helmholtz Institute Jena (Germany), GSI Helmholtzzentrum für Schwerionenforschung GmbH (Germany); Ziyao Wang, Mathias Lenski, Martin Gebhardt, Friedrich-Schiller-Univ. Jena (Germany); Christian Gaida, Friedrich-Schiller-Univ. Jena (Germany), Active Fiber Systems GmbH (Germany); Mahmoud Abdelaal, Joachim Buldt, Friedrich-Schiller-Univ. Jena (Germany); Michael Müller, Friedrich-Schiller-Univ. Jena (Germany), Univ. de Neuchâtel (Switzerland); Arno Klenke, Helmholtz Institute Jena (Germany), GSI Helmholtzzentrum für Schwerionenforschung GmbH (Germany); Jens Limpert, Friedrich-Schiller-Univ. Jena (Germany), Helmholtz Institute Jena (Germany), GSI Helmholtzzentrum für Schwerionenforschung GmbH (Germany)

12400-14 • 9:30 AM - 10:00 AM

Layered laser defense overview (Invited Paper)

Author(s): Robert S. Afzal, Lockheed Martin Aculight Corp. (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 4: POWER COMBINING OF FIBER LASERS II

31 January 2023 • 10:30 AM - 11:40 AM | Moscone Center, Room 203 (Level 2 South)

Session Chair: Matthias Savage-Leuchs, Lockheed Martin Aculight Corp. (United States)

12400-15 • 10:30 AM - 11:00 AM

Optimisation of coherent beam combination using deep learning (Invited Paper)

Author(s): Ben Mills, James A. Grant-Jacob, Michalis N. Zervas, Univ. of Southampton (United Kingdom)

12400-16 • 11:00 AM - 11:20 AM

4kW single-mode narrow-linewidth Ytterbium fiber amplifier in all-fiber format and modular package

Author(s): Nikolai Platonov, Roman Yagodkin, Joel De La Cruz, Valentin Gapontsev, IPG Photonics Corp. (United States)

12400-17 • 11:20 AM - 11:40 AM

All-fiber integrated 85um core chirally-coupled core fiber high energy amplifiers for compact coherently combined laser arrays

Author(s): Mingshu Chen, Alexander Rainville, Univ. of Michigan (United States); Manoj Kanskar, Jim Zhang, nLIGHT Inc. (United States); Ossi Kimmelma, Arto Nieminen, nLight Oy (Finland); Donald Sipes, Brian Schulz, Carson Shollenbarger, Optical Engines Inc. (United States); Tong Zhou, Russell Wilcox, Lawrence Berkeley National Laboratory (United States); Almantas Galvanauskas, Univ. of Michigan (United States)

Dedicated Exhibition Time 11:40 AM - 4:00 PM

SESSION 5: THULIUM AND HOLMIUM DOPED FIBER LASERS AND AMPLIFIERS II

31 January 2023 • 4:00 PM - 5:50 PM | Moscone Center, Room 203 (Level 2 South)

Session Chair: Mark Dubinskii, DEVCOM Army Research Lab. (United States)

12400-18 • 4:00 PM - 4:20 PM

Thulium- and holmium-doped high stability fiber amplifiers at 2 μm for next generation gravitational wave detectors

Author(s): Patrick Baer, Adelind Elshani, Melina Reiter, Pelin Cebeci, Martin Giesberts, Johannes Ebert, Marco Höfer, Dieter Hoffmann, Fraunhofer-Institut für Lasertechnik ILT (Germany)

12400-19 • 4:20 PM - 4:40 PM

High-power CW thulium:silica fiber MOPA emitting at 2036 nm

Author(s): Clément Romano, Dieter Panitzek, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany); Dominik Lorenz, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany); Karlsruhe Institute of Technology (Germany); Patrick Forster, Marc Eichhorn, Christelle Kieleck, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany); Karlsruhe Institut für Technologie (Germany)

12400-20 • 4:40 PM - 5:10 PM

High concentration large-mode-area Tm-doped double-clad fiber for high efficiency operation (*Invited Paper*)

Author(s): Stefan Gausmann, Benoît Faugas, Joshua Bradford, Mark Goldsmith, Adrian Carter, Kanishka Tankala, Clemence Jollivet, Coherent | Nufern (United States)

12400-21 • 5:10 PM - 5:30 PM

215 mW single-frequency Tm-doped fiber ring laser at 2050 nm

Author(s): Lu Zhang, Quan Sheng, Junxiang Zhang, Shijie Fu, Wei Shi, Jianquan Yao, Tianjin Univ. (China)

12400-22 • 5:30 PM - 5:50 PM

Highly efficient, in-band pumped thulium-doped fibers for high-power ultrafast 2 μm wavelength laser systems

Author(s): Mathias Lenski, Friedrich-Schiller-Univ. Jena (Germany); Tobias Heuermann, Martin Gebhardt, Friedrich-Schiller-Univ. Jena (Germany); Helmholtz Institute Jena (Germany); GSI Helmholtzzentrum für Schwerionenforschung GmbH (Germany); Ziyao Wang, Friedrich-Schiller-Univ. Jena (Germany); Christian Gaida, Active Fiber Systems GmbH (Germany); César Jáuregui, Friedrich-Schiller-Univ. Jena (Germany); Jens Limpert, Friedrich-Schiller-Univ. Jena (Germany); Helmholtz Institute Jena (Germany); GSI Helmholtzzentrum für Schwerionenforschung GmbH (Germany)

POSTERS-TUESDAY

31 January 2023 • 6:00 PM - 8:00 PM |

Moscone Center, Level 2 West

Conference attendees are invited to attend the LASE poster Session on Tuesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12400-54

6.5 nJ, 20 MHz compact SESAM-free all-PM ultra-short pulse fiber seed laser pumped by a single butterfly laser-diode

Author(s): Masanori Nishiura, Saitama Univ. (Japan); Ryo Kageyama, SevenSix, Inc. (Japan); Ryosuke Nakamura, Tatsutoshi Shioda, Saitama Univ. (Japan)

12400-55

Experimental study of a F8L using an automated adjustment system based in polarization control plates

Author(s): Maximino R. Tapia-García, Stephanie G. Hernández-García, Juan C. Hernández-García, Daniel A. Razo-Medina, Julián M. Estudillo-Ayala, Univ. de Guanajuato (Mexico); Olivier Pottiez, Centro de Investigaciones en Óptica, A.C. (Mexico); José D. Filoteo-Razo, Univ. Autónoma de Tamaulipas (Mexico); Jesus Pablo Lauterio-Cruz, Universidad de Sonora (Mexico); Fidel A. Gomez-Rodriguez, Roberto Rojas-Laguna, Univ. de Guanajuato (Mexico)

12400-56

1.5-kW narrow-linewidth FBG-based MOPA configuration fiber laser emitting at 1105 nm

Author(s): Yang Xu, Quan Sheng, Tianjin Univ. (China); Peng Wang, Xuelong Cui, Yizhu Zhao, Haixin Xu, Xiangdong Ding, Qiang Fang, HFB Photonics, Inc. (China); Wei Shi, Jianquan Yao, Tianjin Univ. (China)

12400-57

Robust 2070 nm ns pulsed PM laser module with 250 W peak output power and 12μJ pulse energy

Author(s): Wiktor T. Walasik, Shivaraman Asoda, Gustavo Rivas, Robert E. Tench, Jean-Marc Delavaux, Cybel, LLC (United States)

Conference 12400

12400-58

All-polarization-maintaining Yb-doped fiber oscillator with a hybrid ring-linear cavity of net anomalous dispersion

Author(s): Mateusz Pielach, Agnieszka Jamrozik, Katarzyna Krupa, Yuriy Stepanenko, Institute of Physical Chemistry (Poland)

12400-59

Low ASE Er-Yb laser with single amplification stage

Author(s): Ece Ilkay Sungur, Middle East Technical Univ. (Turkey), Havelsan Technology Radar Inc. (Turkey); Ihor Pavlov, Middle East Technical Univ. (Turkey), ODTÜ-GÜNAM Ctr. for Solar Energy Research and Applications (Turkey)

12400-60

Study on the spectral gain distribution and pulse self-compression in thulium-doped fiber Mamyshev oscillators

Author(s): Benedikt Schuhbauer, Veronika Adolfs, Frithjof Haxsen, Laser Zentrum Hannover e.V. (Germany); Uwe Morgner, Institut für Quantenoptik, Leibniz Univ. Hannover (Germany); Jörg Neumann, Dietmar Kracht, Laser Zentrum Hannover e.V. (Germany)

12400-61

Multi-pass cell contrast improvement with enhanced frequency chirping

Author(s): Maximilian Benner, Maximilian Karst, Institute of Applied Physics, Friedrich-Schiller-Univ. Jena (Germany); Christina Amaya Mendez, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Henning Stark, Jens Limpert, Institute of Applied Physics, Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

12400-62

Polarization-maintaining large-mode-area solid-core anti-resonant fiber at 1064 nm

Author(s): Hao Tian, Shijie Fu, Quan Sheng, Wei Shi, Guizhong Zhang, Jianquan Yao, Tianjin Univ. (China)

12400-63

Reliable high-power erbium ytterbium codoped fiber amplifier for earth-satellite communications

Author(s): Khmaies Guesmi, Sylvain Bordaïs, Quentin Coulaud, Axel Mérad, Guillaume Canat, Keopsys by LUMIBIRD (France)

12400-64

Limitations of the power threshold for fiber amplifiers with both the Brillouin and transverse mode instabilities

Author(s): Josh Young, Baylor Univ. (United States); Curtis R. Menyuk, Univ. of Maryland, Baltimore County (United States); Jonathan Hu, Baylor Univ. (United States)

12400-65

Modeling and simulation of crystalline fiber amplifiers

Author(s): Benjamin Smith, Jay Del Barga, Chris Brownsberger, Benjamin Olikier, Hoang-Nam Nguyen, Ball Aerospace (United States); Brian Anderson, Shadi A. Naderi, Air Force Research Lab. (United States)

12400-66

New developments on industrial fiber laser technology in China

Author(s): Imtiaz Majid, Jason Zhou, Jerry Ji, Meng Yue, Song Li, Ray Xu, Joe Xu, Mohammed Naeem, Chih-Hao Wang, Everfoton Technologies (China)

12400-67

Low-cost, high performance LIDAR systems enabled by vertical integration of critical fiber laser supply chains

Author(s): Jon M. McGuire, LUMIBIRD (United States)

12400-69

Ultrafast full PM Er-doped fiber laser seeder for Alexandrite amplifiers

Author(s): Valerian Freysz, Michaël Berisset, Adrian Grande, Sébastien Vidal, Johan Boullet, Marc Castaing, ALPhANOV (France)

WEDNESDAY 1 FEBRUARY

SESSION 6: MODAL INSTABILITY I

1 February 2023 • 9:00 AM - 10:20 AM | Moscone Center, Room 203 (Level 2 South)

Session Chair: César Jáuregui-Misas, Friedrich-Schiller-Univ. Jena (Germany)

12400-23 • 9:00 AM - 9:20 AM

Fitting of a transverse mode instability model to experimental data

Author(s): Liang Dong, Clemson Univ. (United States)

12400-24 • 9:20 AM - 9:40 AM

Transverse Mode Instability suppression using wavefront shaping in multimode fiber amplifiers

Author(s): Kabish Wisal, Chun-Wei Chen, Hui Cao, A. Douglas Stone, Yale Univ. (United States)

12400-25 • 9:40 AM - 10:00 AM

STRS and TMI effects in high power fiber amplifiers

Author(s): Michalis N. Zervas, Optoelectronics Research Ctr. (United Kingdom)

12400-26 • 10:00 AM - 10:20 AM

Transverse modal instability in two-mode fiber amplifiers: effect of input mode

Author(s): Michalis N. Zervas, Optoelectronics Research Ctr. (United Kingdom)

Coffee Break 10:20 AM - 10:50 AM

SESSION 7: MODAL INSTABILITY II

1 February 2023 • 10:50 AM - 12:30 PM | Moscone Center, Room 203 (Level 2 South)

Session Chair: Michalis N. Zervas, Optoelectronics Research Ctr. (United Kingdom)

12400-27 • 10:50 AM - 11:10 AM

Characterizing the transverse modes of optical fibers by singular value decomposition

Author(s): Yiming Tu, Christian Pfléghar, Cesar Jauregui, Jens Limpert, Friedrich-Schiller-Univ. Jena (Germany)

12400-28 • 11:10 AM - 11:30 AM

High-speed mode-resolved polarization measurements in TMI-limited Yb-doped fiber amplifiers

Author(s): Friedrich Möller, Florian Grimm, Gonzalo Palma-Vega, Denny Häßner, Victor Distler, Till Walbaum, Thomas Schreiber, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

12400-29 • 11:30 AM - 11:50 AM

Mitigation of transverse mode instability in large mode area polarization maintaining fibers

Author(s): Gonzalo Palma-Vega, Denny Häßner, Stefan Kuhn, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); César Jáuregui, Institute of Applied Physics, Friedrich-Schiller-Univ. Jena (Germany); Nicoletta Haarlammer, Thomas Schreiber, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

12400-30 • 11:50 AM - 12:10 PM

Photonic lantern based real-time modal instability diagnostic tool for high power lasers

Author(s): Matthew A. Cooper, Stephanos Yerolastitis, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); Alejandro Lopez-Zelaya, Daniel Cruz-Delgado, CREOL (United States); Joseph Wahlen, Daniel Parra, Jose Antonio-Lopez, Axel Schülzgen, Rodrigo Amezcua-Correa, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

12400-31 • 12:10 PM - 12:30 PM

The impact of core size scaling on the transverse mode instability threshold in fiber laser amplifiers

Author(s): Sobhy E. Kholaf, Mehran Bahri, Friedrich-Schiller-Univ. Jena (Germany); Arno Klenke, Friedrich-Schiller-Univ. Jena (Germany), Helmholtz Institute Jena (Germany), GSI Helmholtzzentrum für Schwerionenforschung GmbH (Germany); Cesar Jáuregui, Friedrich-Schiller-Univ. Jena (Germany); Johannes Nold, Nicoletta Haarlammer, Stefan Kuhn, Thomas Schreiber, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Jens Limpert, Friedrich-Schiller-Univ. Jena (Germany)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

SESSION 8: NOVEL FIBER DESIGN AND MATERIALS I

1 February 2023 • 2:00 PM - 3:10 PM | Moscone Center, Room 203 (Level 2 South)

Session Chair: L. Brandon Shaw, U.S. Naval Research Lab. (United States)

12400-32 • 2:00 PM - 2:20 PM

All-solid antiresonant fiber design with hybrid light guidance mechanism

Author(s): Charu Goel, Seongwoo Yoo, Wonkeun Chang, Nanyang Technological Univ. (Singapore)

12400-33 • 2:20 PM - 2:50 PM

49-core rod-type ytterbium-doped multicore fiber for high power operation (*Invited Paper*)

Author(s): Arno Klenke, Helmholtz Institute Jena (Germany), GSI Helmholtzzentrum für Schwerionenforschung GmbH (Germany), Friedrich-Schiller-Univ. Jena (Germany); Mehran Bahri, Albrecht Steinkopff, Christopher Aleshire, Cesar Jauregui, Friedrich-Schiller-Univ. Jena (Germany); Johannes Nold, Nicoletta Haarlammer, Thomas Schreiber, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Jens Limpert, Friedrich-Schiller-Univ. Jena (Germany), Helmholtz Institute Jena (Germany), GSI Helmholtzzentrum für Schwerionenforschung GmbH (Germany)

12400-34 • 2:50 PM - 3:10 PM

Optical core-to-core crosstalk in rod-type multicore fibers

Author(s): Albrecht Steinkopff, Christopher Aleshire, Friedrich-Schiller-Univ. Jena (Germany); Arno Klenke, Friedrich-Schiller-Univ. Jena (Germany), Helmholtz Institute Jena (Germany), GSI Helmholtzzentrum für Schwerionenforschung GmbH (Germany); Cesar Jauregui, Friedrich-Schiller-Univ. Jena (Germany); Johannes Nold, Stefan Kuhn, Nicoletta Haarlammer, Thomas Schreiber, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Jens Limpert, Friedrich-Schiller-Univ. Jena (Germany), Helmholtz Institute Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

Coffee Break 3:10 PM - 3:40 PM

SESSION 9: NOVEL FIBER DESIGN AND MATERIALS II

1 February 2023 • 3:40 PM - 5:30 PM | Moscone Center, Room 203 (Level 2 South)

Session Chair: Adrian L. Carter, Coherent | Nufern (Australia)

12400-48 • 3:40 PM - 4:10 PM

Gas-filled hollow-core fiber lasers for gas spectroscopy and imaging (*Invited Paper*)

Author(s): Yazhou Wang, Cuiling Zhang, Technical Univ. of Denmark (Denmark); Jose Enrique Antonio-Lopez, Rodrigo Amezcua Correa, University of Central Florida (United States); Christos Markos, Technical Univ. of Denmark (Denmark)

12400-35 • 4:10 PM - 4:30 PM

The impact of structural birefringence in multicore fibers

Author(s): César Jáuregui-Misas, Friedrich-Schiller-Univ. Jena (Germany); Arno Klenke, Helmholtz Institute Jena (Germany); Albrecht Steinkopff, Christopher E. Aleshire, Jens Limpert, Friedrich-Schiller-Univ. Jena (Germany)

12400-36 • 4:30 PM - 4:50 PM

Crystal-derived double-clad fibers for high gain and high efficiency Tm fiber lasers

Author(s): Martin Leich, Robert Müller, Sonja Unger, Anka Schwuchow, Jan Dellith, Jens Kobelke, Adrian Lorenz, Matthias Jäger, Leibniz-Institut für Photonische Technologien e.V. (Germany)

12400-37 • 4:50 PM - 5:10 PM

Analysis and fabrication of tapered multicore gain fibers for high power lasers

Author(s): Christopher Aleshire, Albrecht Steinkopff, Friedrich-Schiller-Univ. Jena (Germany); Arno Klenke, Friedrich-Schiller-Univ. Jena (Germany), Helmholtz Institute Jena (Germany), GSI Helmholtzzentrum für Schwerionenforschung GmbH (Germany); Cesar Jáuregui, Friedrich-Schiller-Univ. Jena (Germany); Steffen Böhme, Tobias Koch, Stefan Kuhn, Johannes Nold, Nicoletta Haarlammer, Thomas Schreiber, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Jens Limpert, Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany), Helmholtz Institute Jena (Germany)

12400-38

Novel 30/400 ytterbium-doped LMA polarization-maintaining fiber with very efficient higher-order modes filtering capabilities

Author(s): Louis Desbiens, Vincent Roy, Mathieu Boivin, Antoine Proulx, Marc Deladurantaye, Yves Taillon, INO (Canada)

Conference 12400

THURSDAY 2 FEBRUARY

SESSION 10: HIGH PEAK POWER AND ULTRAFAST FIBER LASERS I

2 February 2023 • 8:30 AM - 10:00 AM | Moscone Center, Room 203 (Level 2 South)

Session Chair: Peter F. Moulton, MIT Lincoln Lab. (United States)

12400-39 • 8:30 AM - 8:50 AM

Industrial-grade high-harmonic generation

Author(s): Christian Grebing, Maxim Tschernajew, Evgeny Shestaev, Christian Gaida, Sven Bretkopf, Oliver Herrfurth, Tino Eidam, Jens Limpert, Active Fiber Systems GmbH (Germany)

12400-40 • 8:50 AM - 9:20 AM

132 W, 1.3 mJ, sub-two-cycle pulses at 1.8 μm wavelength (*Invited Paper*)

Author(s): Ziyao Wang, Institute of Applied Physics, Abbe Ctr. of Photonics, Friedrich-Schiller-Univ. Jena (Germany); Tobias Heuermann, Martin Gebhardt, Institute of Applied Physics, Abbe Ctr. of Photonics, Friedrich-Schiller-Univ. Jena (Germany), Helmholtz Institute Jena (Germany), GSI Helmholtzzentrum für Schwerionenforschung GmbH (Germany); Mathias Lenski, Institute of Applied Physics, Abbe Ctr. of Photonics, Friedrich-Schiller-Univ. Jena (Germany); Philipp Gierschke, Institute of Applied Physics, Abbe Ctr. of Photonics, Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Robert Klas, Institute of Applied Physics, Abbe Ctr. of Photonics, Friedrich-Schiller-Univ. Jena (Germany), Helmholtz Institute Jena (Germany), GSI Helmholtzzentrum für Schwerionenforschung GmbH (Germany); Cesar Jauregui, Institute of Applied Physics, Abbe Ctr. of Photonics, Friedrich-Schiller-Univ. Jena (Germany); Jens Limpert, Institute of Applied Physics, Abbe Ctr. of Photonics, Friedrich-Schiller-Univ. Jena (Germany), Helmholtz Institute Jena (Germany), GSI Helmholtzzentrum für Schwerionenforschung GmbH (Germany)

12400-41 • 9:20 AM - 9:40 AM

High-energy solitonic source of high harmonics

Author(s): Yann Leventoux, Melek Jedidi, Lamine Ferhat, XLIM (France); Cristian Jimenez, Idris Tiliouine, XLIM (France); Geoffroy Granger, Jean-Christophe Orlianges, Aurelian Crunteanu, XLIM (France); Laure Lavoute, Dmitry Gaponov, NOVAE (France); Johan Boulet, ALPhANOV (France); Marie Froidevaux, Willem Boutu, Hamed Merdji, LIDYL (France); Vincent Couderc, Sebastien Fevrier, XLIM (France)

12400-42 • 9:40 AM - 10:00 AM

35/250 ytterbium-doped LMA polarization-maintaining fiber for high average and high peak power amplifiers

Author(s): Vincent Roy, Louis Desbiens, Mathieu Boivin, Paul Grenier, Sébastien Deshaies, Quentin Martineau, Marc Deladurantaye, Antoine Proulx, Yves Taillon, INO (Canada)

Coffee Break 10:00 AM - 10:30 AM

SESSION 11: HIGH PEAK POWER AND ULTRAFAST FIBER LASERS II

2 February 2023 • 10:30 AM - 12:20 PM | Moscone Center, Room 203 (Level 2 South)

Session Chair: Jeffrey W. Nicholson, OFS Fitel, LLC (United States)

12400-43 • 10:30 AM - 11:00 AM

Spectral peak generation using ultrashort pulse fiber lasers (*Invited Paper*)

Author(s): Norihiko Nishizawa, Shotaro Kitajima, Nagoya Univ. (Japan); Youichi Sakakibara, AIST (Japan); Hideki Tomita, Nagoya Univ. (Japan); Hisashi Abe, AIST (Japan)

12400-44 • 11:00 AM - 11:20 AM

0.6 mJ single-frequency pulsed fiber amplifier based on hybrid active fiber

Author(s): Xun Deng, Chaodu Shi, Hao Tian, Shijie Fu, Quan Sheng, Zheng Shi, Peiheng Jiang, Wei Shi, Jianquan Yao, Tianjin Univ. (China)

12400-45 • 11:20 AM - 11:40 AM

MW-class femtosecond Er-doped tapered fiber amplifier

Author(s): Geoffroy Granger, Romain Dauliat, Benoît Debord, Yann Leventoux, XLIM (France); Idris Tiliouine, XLIM (France); Baptiste Leconte, XLIM (France); Anka Schwuchow, Katrin Wondraczek, Leibniz-Institut für Photonische Technologien e.V. (Germany); Fetah Benabid, Frédéric Gérôme, Raphael Jamier, Philippe Roy, Sebastien Fevrier, XLIM (France)

12400-46 • 11:40 AM - 12:00 PM

Radially polarized picosecond MOPA system based on double-clad ytterbium-doped spun tapered fiber with ring-shaped active core

Author(s): Iuliia Zaleskaia, Tampere Univ. (Finland); Evgenii Motorin, Vasilii Ustimchik, Ampliconix Oy (Finland); Florian Lindner, Volker Reichel, Katrin Wondraczek, Leibniz-Institut für Photonische Technologien e.V. (Germany); Yuhao Lei, Optoelectronics Research Ctr., Univ. of Southampton (United Kingdom); Peter G. Kazansky, Optoelectronics Research Ctr. (United Kingdom); Regina Gumenyuk, Tampere Univ. (Finland), Ampliconix Oy (Finland); Valery Filippov, Ampliconix Oy (Finland)

12400-47 • 12:00 PM - 12:20 PM

Polarization-multiplexed thulium-doped fiber laser for free-running dual-comb generation

Author(s): Moritz Bartnick, Gayathri Bharathan, Camille-Sophie Brès, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Lunch/Exhibition Break 12:20 PM - 2:00 PM

SESSION 12: NOVEL FIBER LASERS AND AMPLIFIERS I

2 February 2023 • 2:00 PM - 2:40 PM | Moscone Center, Room 203 (Level 2 South)

Session Chair: Philippe Roy, XLIM (France)

12400-49 • 2:00 PM - 2:20 PM

Long term, stable, 115W output from an Erbium fiber amplifier pumped by a Raman fiber laser

Author(s): Andrew T. Grimes, Venkatapuram Sudarshanam, Anand Hariharan, Jeffrey W. Nicholson, OFS Fitel, LLC (United States)

12400-50 • 2:20 PM - 2:40 PM

SBS suppression with high beam quality by selective multimode excitation in fiber

Author(s): Chun-Wei Chen, Kabish Wisal, Yale Univ. (United States); Stephen Warren-Smith, Univ. of South Australia (Australia); Peyman Ahmadi, Coherent (United States); A. Douglas Stone, Hui Cao, Yale Univ. (United States)

Coffee Break 2:40 PM - 3:10 PM

SESSION 13: NOVEL FIBER LASERS AND AMPLIFIERS II

2 February 2023 • 3:10 PM - 4:10 PM | Moscone Center, Room 203 (Level 2 South)

Session Chair: Thomas Schreiber, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

12400-51 • 3:10 PM - 3:30 PM

Spectral mitosis of the Stokes tone generated by two-tone pumped stimulated Brillouin scattering using a completely spectrally resolved model

Author(s): Micheal Rodriguez, John Marciante, Univ. of Rochester (United States)

12400-52 • 3:30 PM - 3:50 PM

Highly stable fiber amplifier development and environmental component-testing for the space-based gravitational wave detector LISA

Author(s): Pelin Cebeci, Martin Giesberts, Patrick Baer, Jonas Esser, Joel Guetzlaff, Hans-Dieter Hoffmann, Fraunhofer-Institut für Lasertechnik ILT (Germany); Katrin Dahl, SpaceTech GmbH (Germany)

12400-53 • 3:50 PM - 4:10 PM

900 nm swept source FDML laser with kW peak power

Author(s): Philipp Lamminger, Hubertus Hakert, Simon Lotz, Univ. zu Lübeck (Germany); Jan Philip Kolb, Medizinisches Laserzentrum Lübeck GmbH (Germany); Tonio Kutscher, Sebastian Karpf, Robert Huber, Univ. zu Lübeck (Germany)

FIBER LASERS BEST STUDENT PAPER AWARDS CEREMONY

2 February 2023 • 4:10 PM - 4:30 PM | Moscone Center, Room 203 (Level 2 South)

Conference 12401

High Power Lasers for Fusion Research VII

1 February 2023 | Moscone Center, Room 213 (Level 2 South)

Conference Chairs: **Abdul A. S. Awwal**, Lawrence Livermore National Lab. (United States); **Constantin L. Haefner**, Fraunhofer-Institut für Lasertechnik ILT (Germany)

Program Committee: **Philippe Balcou**, Ctr. Lasers Intenses et Applications (France); **Nathalie Blanchot**, CEA-Cesta (France); **Mark Bowers**, Lawrence Livermore National Lab. (United States); **Jean-Christophe Francis Chanteloup**, Ecole Polytechnique (France); **John L. Collier**, STFC Rutherford Appleton Lab. (United Kingdom); **Jean-Michel G. Di Nicola**, Lawrence Livermore National Lab. (United States); **John E. Heebner**, Lawrence Livermore National Lab. (United States); **Nicholas W. Hopps**, AWE plc (United Kingdom); **Efim A. Khazanov**, Institute of Applied Physics of the RAS (Russian Federation); **Ryosuke Kodama**, Osaka Univ. (Japan); **Brian E. Kruschwitz**, Lab. for Laser Energetics (United States); **Richard R. Leach Jr.**, Lawrence Livermore National Lab. (United States); **Catherine Le Blanc**, Lab. pour l'Utilisation des Lasers Intenses (France); **Ruxin Li**, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences (China); **Takayoshi Norimatsu**, Osaka Univ. (Japan); **Christophe Simon-Boisson**, Thales LAS France SAS (France); **Kazuo A. Tanaka**, Osaka Univ. (Japan); **Sébastien Vermersch**, CEA-Cesta (France); **Changhe Zhou**, Jinan Univ. (China); **Hagen Zimer**, TRUMPF Photonics, Inc. (United States)

MONDAY 30 JANUARY

LASE PLENARY AND HOT TOPICS

30 January 2023 • 3:45 PM - 6:05 PM | Moscone Center, Room 207/215 (Level 2 South)

3:45 PM - 3:50 PM: **Welcome and Opening Remarks**

Stefan Kaierle, Laser Zentrum Hannover e.V. (Germany) and John Ballato, Clemson Univ. (United States)

3:50 PM - 3:55 PM: **Announcement of the 3D Printing, Fabrication, and Manufacturing Best Paper Awards**

Henry Helvajian, The Aerospace Corp. (United States)

****Announcement of the LASE AI/ML Best Paper Award moved to 6:00 PM****

12408-500 • 4:00 PM - 4:30 PM

Status and potential of fully integrated photonic systems (*Plenary Presentation*)

Author(s): Arnan Mitchell, RMIT Univ. (Australia)

12412-601 • 4:30 PM - 4:45 PM

How laser AM can mitigate insecurities with supply chain issues and carbon footprint (*Plenary Presentation*)

Author(s): Eliana Fu, TRUMPF Inc. (United States)

12412-602 • 4:45 PM - 5:00 PM

Innovations in lidar driving the next generation of autonomy and safety (Hot Topic) (*Plenary Presentation*)

Author(s): Jason M. Eichenholz, Luminar Technologies, Inc. (United States)

12407-603 • 5:00 PM - 5:15 PM

Quantum computing with lasers (Hot Topic) (*Plenary Presentation*)

Author(s): Jürgen Stuhler, TOPTICA Photonics AG (Germany)

12401-501 • 5:15 PM - 5:45 PM

First demonstration of fusion ignition by inertial confinement fusion (ICF) at the National Ignition Facility (NIF) at LLNL (*Plenary Presentation*)

Author(s): Jean-Michel G. Di Nicola, Lawrence Livermore National Lab. (United States)

TUESDAY 1 FEBRUARY

SESSION 1: STATUS OF BIG LASERS

1 February 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 213 (Level 2 South)

Session Chair: Constantin L. Häfner, Fraunhofer-Institut für Lasertechnik ILT (Germany)

12401-1 • 8:00 AM - 8:30 AM

LMJ 2023 facility status (*Invited Paper*)

Author(s): Vincent Denis, Jérôme Néauport, Nathalie Blanchot, Chloé Lacombe, CEA (France)

12401-2 • 8:30 AM - 9:00 AM

Development of the Fourth-Generation Laser for Ultrabroadband eXperiments (FLUX) (*Invited Paper*)

Author(s): Christophe Dorrer, Univ. of Rochester (United States)

12401-3 • 9:00 AM - 9:30 AM

Recent laser performance improvements and latest results at the National Ignition Facility (*Invited Paper*)

Author(s): Jean-Michel G. Di Nicola, Tayyab Suratwala, Lawrence Pelz, John Heebner, David Alessi, Anumeha Bhasker, Tiziana Bond, Mark Bowers, Gordon Brunton, Brandon Buckley, Alicia Calonico Soto, Wren Carr, Leyen Chang, Jason Chou, Simon Cohen, David Cross, Rich Deveno, Peter Devore, Michael Erickson, Catalin Filip, Nathan Gottesman, Apurva Gowda, Dan Kalantar, Abe Handler, Vincent Hernandez, Sandrine Herriot, Christopher Kinsella, Tom Lanier, Doug Larson, Brian MacGowan, Samuel McLaren, Ken Manes, Kathleen McCandless, Christopher Miller, Marcus Monticelli, Ryan Muir, Mario Ordonez, Alan Pao, Jordan Penner, Travis Petersen, Shahida Rana, Brett Raymond, River Aden, Nathan Ruiz, Sam Schrauth, Stanley Sommer, Mary Spaeth, Christopher Stolz, Diana VanBlarcom, Bruno Van Wonterghem, Alexander Wargo, Lei Wang, Paul Wegner, Brian Welday, Pam Whitman, Nan Wong, Lawrence Livermore National Lab. (United States)

12401-4 • 9:30 AM - 10:00 AM

Experimental operations at the National Ignition Facility (*Invited Paper*)

Author(s): Steven Weaver, Chris Choate, Bob Ehrlich, Tom Kohut, Adam Langro, Bruno Van Wonterghem, Lawrence Livermore National Lab. (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: OPTO-ELECTRONIC, POLARIZATION MANIPULATING DEVICES, AND APPLICATIONS

1 February 2023 • 10:30 AM - 12:10 PM | Moscone Center, Room 213 (Level 2 South)

Session Chair: Jean-Michel G. Di Nicola, Lawrence Livermore National Lab. (United States)

12401-5 • 10:30 AM - 10:50 AM

An all-electronic fail-safe for stimulated Brillouin scattering suppression

Author(s): Michael Spilatro, Wade A. Bittle, Michael Bock, Zachary Carofanello, Christophe Dorrier, Elizabeth M. Hill, Nathan Landis, Jonathan D. Zuegel, Univ. of Rochester (United States)

12401-6 • 10:50 AM - 11:10 AM

A mid-scale plasma-electrode Pockels cell for the FLUX laser

Author(s): Brian E. Kruschwitz, Samuel Agnello, Kyle Gibney, David Nelson, Troy W. Walker, Wade A. Bittle, Noah Carrier, Jeffrey Hettrick, Gary L. Mitchell, John Szczepanski, Gary Wagner, Univ. of Rochester (United States)

12401-7 • 11:10 AM - 11:30 AM

Metamaterial quarter-wave plate UV transmission grating for high-energy laser beams

Author(s): Jérôme Néauport, CEA-Cesta (France); Jerome Daurios, CEA (France); Pierre Briancau, CEA-LETI (France); Nicolas Bonod, Institut Fresnel (France)

12401-8 • 11:30 AM - 11:50 AM

Freeform crystal optics for arbitrary space-variant polarization control in large aperture, high energy lasers

Author(s): Anthony Vella, Gary Tham, Tayyab Suratwala, Joseph Menapace, Jean-Michel G. Di Nicola, Lawrence Livermore National Lab. (United States)

12401-9 • 11:50 AM - 12:10 PM

fabrication of polarization-smoothing optics for direct drive inertial confinement fusion based on novel liquid crystal devices and surface-figured potassium dihydrogen phosphate

Author(s): Nathaniel D. Urban, Kenneth L. Marshall, Amy Rigatti, John A. Marozas, Kyle R. P. Kafka, Gary L. Mitchell, Marcela Ramirez Mireles, Univ. of Rochester (United States); Jason U. Wallace, D'Youville College (United States); Ji-Mi Jang, Stavros G. Demos, Univ. of Rochester (United States)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

SESSION 3: SYSTEM PERFORMANCE, OPERATIONS, AND MODELING

1 February 2023 • 1:40 PM - 3:20 PM | Moscone Center, Room 213 (Level 2 South)

Session Chair: Constantin L. Häfner, Fraunhofer-Institut für Lasertechnik ILT (Germany)

12401-10 • 1:40 PM - 2:00 PM

Characterization of the OMEGA laser system on-shot, focal-spot uniformity and wavefront

Author(s): Leon J. Waxer, Siddharth Sampat, Matthew Heimbueger, Katelynn Bauer, Seung-Whan Bahk, David Weiner, Alexander Shvydky, Joseph Kwiatkowski, Univ. of Rochester (United States)

12401-11 • 2:00 PM - 2:20 PM

Modeling and optimization of on-target power balance on OMEGA

Author(s): Siddharth Sampat, Brian Ehrich, Joseph Kwiatkowski, Brian Kruschwitz, Leon Waxer, Univ. of Rochester (United States)

12401-12 • 2:20 PM - 2:40 PM

Beam-line parameter image processing optimization and maintenance for beam alignment in the National Ignition Facility

Author(s): Abdul A. S. Awwal, Richard Leach, Roger R. Lowe-Webb, Victoria Miller-Kamm, Lawrence Livermore National Lab. (United States)

12401-13 • 2:40 PM - 3:00 PM

Four-dimensional multi-level stimulated rotational Raman scattering dynamics in air

Author(s): Samuel A. McLaren, Kathleen McCandless, Jordan Penner, River Aden, Sam Schrauth, Eyal Feigenbaum, Jean-Michel Di Nicola, Lawrence Livermore National Lab. (United States)

12401-14 • 3:00 PM - 3:20 PM

Material dynamics measurements in conditions relevant to laser-direct-drive fusion

Author(s): Kyle R. P. Kafka, Adrien Pineau, Tanya Z. Kosc, Valeri N. Goncharov, Suxing X. Hu, Univ. of Rochester (United States); Guillaume Duchateau, CEA-Cesta (France); Stavros G. Demos, Univ. of Rochester (United States)

Coffee Break 3:20 PM - 3:50 PM

SESSION 4: FUTURE SYSTEMS AND EDUCATION

1 February 2023 • 3:50 PM - 5:10 PM | Moscone Center, Room 213 (Level 2 South)

Session Chair: Abdul A. S. Awwal, Lawrence Livermore National Lab. (United States)

12401-16 • 3:50 PM - 4:10 PM

High energy operation of a diode-pumped Tm:YLF laser

Author(s): Issa Tamer, Brendan A. Reagan, Frantisek Batysta, Leily Kiani, Zbynek Hubka, Thomas Galvin, Emily Sistrunk, Drew Willard, Andrew Church, Hansel Neurath, Justin Galbraith, Glenn Huete, Thomas Spinka, Lawrence Livermore National Lab. (United States)

12401-17 • 4:10 PM - 4:30 PM

High repetition rate, high energy petawatt laser for the matter in extreme conditions upgrade

Author(s): Brendan A. Reagan, MariAnn Albrecht, David Alessi, Mark Ammons, Frantisek Batysta, Brandon Buckley, Alex Chemali, Erin Clark, Edwin Davila, Robert J. Deri, Kevin Eseltine, Barry Fishler, Justin Galbraith, Thomas Galvin, Anthony Gonzales, Vinod Gopalan, Sandrine Herriot, Jessica Jimenez, Leily Kiani, Ed Koh, Rotem Kupfer, Zhi Liao, Jeremy Lusk, Hoang Nguyen, John Peterson, Robert Plummer, Kathleen Schaffers, Emily Sistrunk, Thomas M. Spinka, Issa Tamer, Vincent Tang, Kenneth Terzi, Pamela Utley, Katherine M. Velas, Anthony Vella, Lawrence Livermore National Lab. (United States)

12401-18 • 4:30 PM - 4:50 PM

Industry and academia: Pursuing a PhD at Fraunhofer - the best of both worlds

Author(s): Sarah Klein, Martin Adams, Tim Biermann, Hans-Dieter Hoffmann, Constantin L. Häfner, Fraunhofer-Institut für Lasertechnik ILT (Germany)

12401-19 • 4:50 PM - 5:10 PM

LLE and the Institute of Optics: advancing high-power lasers education at the University of Rochester

Author(s): Leon J. Waxer, Andrew Berger, Jake Bromage, Julie Bentley, Thomas Brown, Steve Craxton, Terrance Kessler, Jennifer Kruschwitz, Brian Kruschwitz, Gary Wicks, Jonathan Zuegel, Univ. of Rochester (United States)

Conference 12402

Components and Packaging for Laser Systems IX

30 - 31 January 2023 | Moscone Center, Room 205 (Level 2 South)

Conference Chairs: **Alexei L. Glebov**, OptiGrate Corp. (United States); **Paul O. Leisher**, Freedom Photonics, LLC (United States)

Program Committee: **Jens Biesenbach**, BWT Laser Europe GmbH (Germany); **Gunnar Böttger**, Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration IZM (Germany); **Johan Bouillet**, ALPhANOV (France); **Jenna Campbell**, Freedom Photonics, LLC (United States); **Joseph L. Dallas**, Avo Photonics, Inc. (United States); **Martin Forrer**, FISBA AG (Switzerland); **Manoj Kanskar**, nLIGHT, Inc. (United States); **Alexander V. Laskin**, AdlOptica Optical Systems GmbH (Germany); **Xingsheng Liu**, Focuslight Technologies, Inc. (China); **Christian V. Poulsen**, NKT Photonics A/S (Denmark); **Nicholas W. Sawruk**, Fibertek, Inc. (United States); **Mark A. Stephen**, NASA Goddard Space Flight Ctr. (United States); **Takunori Taira**, Institute for Molecular Science (Japan); **François Trépanier**, TeraXion Inc. (Canada); **Torsten Vahrenkamp**, ficonTEC Service GmbH (Germany); **Alexander Yusim**, Analog Photonics LLC (United States); **Chung-En Zah**, Focuslight Technologies, Inc. (China)

MONDAY 30 JANUARY

SESSION 1: FIBER COMPONENTS FOR HIGH POWER/ENERGY LASERS

30 January 2023 • 1:30 PM - 3:10 PM | Moscone Center, Room 205 (Level 2 South)

Session Chairs: Nicholas W. Sawruk, Fibertek, Inc. (United States), François Trépanier, TeraXion Inc. (Canada)

12402-1 • 1:30 PM - 1:50 PM

High non-linearities effects on pulse quality in a CPA system and mitigation strategies

Author(s): Martin Maurel, Evelyne Brown-Dussault, Mathieu Gagnon, Sylvain Boudreau, Alain Mailloux, Samuel Gouin, Pascal Deladurantaye, François Trépanier, TeraXion Inc. (Canada)

12402-2 • 1:50 PM - 2:10 PM

Performance comparison between nested and non-nested anti-resonant hollow core fibers for high power beam delivery

Author(s): Matthew A. Cooper, Stephanos Yerolatsitis, Joseph Wahlen, Daniel Parra, Jose Antonio-Lopez, Ivan Divliansky, Axel Schülzgen, Rodrigo Amezcua Correa, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

12402-3 • 2:10 PM - 2:30 PM

Compact packaged Tm-doped and Ho-doped broadband PM ASE sources in the 2000 nm band

Author(s): Wiktor Walasik, Alexandre Amavigan, Gustavo Rivas, Robert E. Tench, Jean-Marc Delavaux, Cybel, LLC (United States)

12402-4 • 2:30 PM - 2:50 PM

Birefringence of femtosecond written fiber Bragg gratings for linear polarized fiber lasers

Author(s): Georg R. Schwartz, Ria G. Krämer, Thorsten A. Goebel, Malte P. Siems, Daniel Richter, Institute of Applied Physics, Abbe Ctr. of Photonics, Friedrich-Schiller-Univ. Jena (Germany); Stefan Nolte, Institute of Applied Physics, Abbe Ctr. of Photonics, Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

12402-5 • 2:50 PM - 3:10 PM

Ultrashort pulse inscribed fiber Bragg gratings with controlled apodisation profiles

Author(s): Ria G. Krämer, Institute of Applied Physics, Friedrich-Schiller-Univ. Jena (Germany); Christian P. Schmittner, Institute of Applied Physics, Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Malte P. Siems, Tobias Ullsperger, Institute of Applied Physics, Friedrich-Schiller-Univ. Jena (Germany); Thorsten A. Goebel, Institute of Applied Physics, Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Daniel Richter, Institute of Applied Physics, Friedrich-Schiller-Univ. Jena (Germany); Stefan Nolte, Institute of Applied Physics, Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

Coffee Break 3:10 PM - 3:45 PM

LASE PLENARY AND HOT TOPICS

30 January 2023 • 3:45 PM - 6:05 PM | Moscone Center, Room 207/215 (Level 2 South)

3:45 PM - 3:50 PM: **Welcome and Opening Remarks**

Stefan Kaierle, Laser Zentrum Hannover e.V. (Germany) and John Ballato, Clemson Univ. (United States)

3:50 PM - 3:55 PM: **Announcement of the 3D Printing, Fabrication, and Manufacturing Best Paper Awards**

Henry Helvajian, The Aerospace Corp. (United States)

****Announcement of the LASE AI/ML Best Paper Award moved to 6:00 PM****

12408-500 • 4:00 PM - 4:30 PM

Status and potential of fully integrated photonic systems (Plenary Presentation)

Author(s): Arnan Mitchell, RMIT Univ. (Australia)

12412-601 • 4:30 PM - 4:45 PM

How laser AM can mitigate insecurities with supply chain issues and carbon footprint (Plenary Presentation)

Author(s): Eliana Fu, TRUMPF Inc. (United States)

12412-602 • 4:45 PM - 5:00 PM

Innovations in lidar driving the next generation of autonomy and safety (Hot Topic) (Plenary Presentation)

Author(s): Jason M. Eichenholz, Luminar Technologies, Inc. (United States)

12407-603 • 5:00 PM - 5:15 PM

Quantum computing with lasers (Hot Topic) (Plenary Presentation)

Author(s): Jürgen Stuhler, TOPTICA Photonics AG (Germany)

12401-501 • 5:15 PM - 5:45 PM

First demonstration of fusion ignition by inertial confinement fusion (ICF) at the National Ignition Facility (NIF) at LLNL (Plenary Presentation)

Author(s): Jean-Michel G. Di Nicola, Lawrence Livermore National Lab. (United States)

SESSION 2: LASER DIODE PACKAGING

31 January 2023 • 10:00 AM - 11:40 AM | Moscone Center, Room 205 (Level 2 South)

Session Chairs: Jens Biesenbach, BWT Laser Europe GmbH (Germany), Kai Zhou, Focuslight Technologies, Inc. (China)

12402-6 • 10:00 AM - 10:20 AM

Low SWaP miniaturized fiber coupled external cavity diode laser (ECDL) with high optical isolation as plug and play solution

Author(s): Daniel Brauda, Hendrick Thiem, Markus Schütz, TOPTICA eagleyard (Germany); Manfred Hager, TOPTICA Photonics AG (Germany)

12402-7 • 10:20 AM - 10:40 AM

Single mode 660 nm DBR tapered laser with 1 W optical output power

Author(s): Gunnar Blume, Oliver Matalla, Hans Wenzel, Andre Maassdorf, David Feise, Jörg Fricke, Peter Ressel, Sabrina Kreutzmann, Arnim Ginolas, Alexander Sahn, Andrea Knigge, Katrin Paschke, Ferdinand-Braun-Institut (Germany)

12402-8 • 10:40 AM - 11:00 AM

200-W tunable ultra-narrow band laser diode systems for spin-exchange optical pumping

Author(s): Aleksandr I. Rysanyanskiy, Oleksiy Mokhun, Vadim Smirnov, Alexei Glebov, OptiGrate Corp. (United States)

12402-10 • 11:00 AM - 11:20 AM

Ultra-robust watt-class single spatial mode 885 nm diode lasers

Author(s): Michelle Labrecque, Jenna Campbell, Kevin McClune, Matthew Larkins, Elliot Burke, Daniel Renner, Milan Mashanovitch, Paul Leisher, Freedom Photonics, LLC (United States)

12402-11 • 11:20 AM - 11:40 AM

Compact metallic mirrors for laser diodes that are manufactured by ultra-high precision stamping

Author(s): Robert R. Vallance, Yang Chen, Peter Gordon, King-Fu Hii, Jeremy Burke, Tiger Ninomiya, Bernard Lee, SENKO Advanced Components, Inc. (United States)

Lunch/Exhibition Break 11:40 AM - 2:00 PM

TUESDAY 31 JANUARY

SESSION 3: OPTICAL COMPONENTS FOR LASER SYSTEMS

31 January 2023 • 2:00 PM - 3:30 PM | Moscone Center, Room 205 (Level 2 South)

Session Chairs: Jenna Campbell, Freedom Photonics, LLC (United States), Thomas L. Haslett, Avo Photonics, Inc. (United States)

12402-15 • 2:00 PM - 2:30 PM

Volume Bragg gratings for quantum optics (*Invited Paper*)

Author(s): Vadim Smirnov, Alexei Glebov, Oleksiy Mokhun, Ruslan Vasilev, OptiGrate Corp. (United States)

12402-16 • 2:30 PM - 2:50 PM

Realization and characterization of the first ultrashort pulse written chirped volume Bragg gratings in fused silica

Author(s): Malte P. Siems, Daniel Richter, Institute of Applied Physics, Friedrich-Schiller-Univ. Jena (Germany); Thorsten A. Goebel, Institute of Applied Physics, Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Ria G. Krämer, Institute of Applied Physics, Friedrich-Schiller-Univ. Jena (Germany); Stefan Nolte, Institute of Applied Physics, Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

12402-17 • 2:50 PM - 3:10 PM

Phase-shifted, chirped volume Bragg grating as a spectrally tunable notch filter

Author(s): Lam H. Mach, David Guacaneme, Oussama Mhibik, Leonid Glebov, Ivan Divliansky, Univ. of Central Florida (United States)

12402-18 • 3:10 PM - 3:30 PM

Blue-laser solarization of optical glass

Author(s): Ralf Jedamzik, Antoine Carre, Uwe Petzold, SCHOTT AG (Germany)

Coffee Break 3:30 PM - 4:00 PM

SESSION 4: HIGH POWER/ENERGY LASER COMPONENTS

31 January 2023 • 4:00 PM - 5:40 PM | Moscone Center, Room 205 (Level 2 South)

Session Chair: Paul O. Leisher, Freedom Photonics, LLC (United States)

12402-19 • 4:00 PM - 4:20 PM

6 kW power handling in a 7+1 to 1 pump-signal combiner

Author(s): Lalitkumar Bansal, Jose Pincha, Robert Sienkowski, Christopher Neale, Joel Mann, Jeffrey W. Nicholson, OFS Fitel, LLC (United States)

12402-20 • 4:20 PM - 4:40 PM

Modeling of dispersion compensation for spectral beam combining by volume Bragg gratings

Author(s): Elena Shirshneva Vashchenko, Leonid Glebov, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

12402-21 • 4:40 PM - 5:00 PM

Surface and bulk damage resistance of calcium fluoride optics assessed by X-ray induced color centers

Author(s): Jue Wang, François Piché, Eileen M. Fanning, Corning Incorporated (United States)

12402-22 • 5:00 PM - 5:20 PM

Optimization of ultrashort pulse written volume Bragg gratings in fused silica for UV applications

Author(s): Daniel Richter, Malte P. Siems, Thorsten A. Goebel, Ria G. Krämer, Friedrich-Schiller-Univ. Jena (Germany); Stefan Nolte, Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

Conference 12402

12402-23 • 5:20 PM - 5:40 PM

Flat optics for compact integration and high performances

Author(s): Ludovic Marigo, NIL Technology Switzerland GmbH (Switzerland); Ulrich Quaade, NIL Technology ApS (Denmark); Moritz Schmidlin, NIL Technology Switzerland GmbH (Switzerland)

POSTERS-TUESDAY

31 January 2023 • 6:00 PM - 8:00 PM |
Moscone Center, Level 2 West

Conference attendees are invited to attend the LASE poster Session on Tuesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12402-25

Modeling of laser beam shaping by volume holographic phase masks

Author(s): Elena Shirshneva Vashchenko, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); Nafiseh Mohammadian, Google (United States); Ivan Divliansky, Leonid Glebov, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12402-9

High-brightness high-power lightweight diode laser

Author(s): Xiaohua Chen, Dan Xu, Jianqiang Zhang, Zhenkun Yu, Yuankai Wu, Zedong Xue, BWT Beijing Ltd. (China)

12402-13

650W dual-wavelength locked high brightness diode laser pump source

Author(s): Xiaohua Chen, Juan Li, Min Shi, Xiaopei Dong, Fuying Li, Fangjunyue Guo, Yancong Zhang, Weirong Weirong, Baohua Wang, Shengran Li, Chao Lang, BWT Beijing Ltd. (China)

12402-14

Investigation on the performance of high power long pulse laser diode arrays for hair removal and illumination

Author(s): Xiaohua Chen, Wei Ma, Linwei Yang, Jieru Li, Xiaoying Luo, Zhenkun Yu, BWT Beijing Ltd. (China); Michael Stoiber, Jens Biesenbach, BWT Laser Europe GmbH (Germany)

Conference 12403

High-Power Diode Laser Technology XXI

29 - 30 January 2023 | Moscone Center, Room 205 (Level 2 South)

Conference Chairs: **Mark S. Zediker**, NUBURU, Inc. (United States); **Erik P. Zucker**, Erik Zucker Consulting (United States)

Program Committee: **Friedrich G. Bachmann**, FriBa LaserNet Consulting (Germany); **Jenna Campbell**, Freedom Photonics, LLC (United States); **Paul A. Crump**, Ferdinand-Braun-Institut (Germany); **Stefan W. Heinemann**, Aurora Innovation, Inc. (United States); **Harald Koenig**, ams-OSRAM International GmbH (Germany); **Volker Krause**, Laserline GmbH (Germany); **Robert Martinsen**, nLIGHT, Inc. (United States); **Stewart D. McDougall**, TRUMPF Photonics, Inc. (United States); **René Todt**, II-VI Incorporated (Switzerland); **Yuji Yamagata**, Fujikura Ltd. (Japan)

SUNDAY 29 JANUARY

SESSION 1: LASER DIODES FOR LIDAR I

29 January 2023 • 8:30 AM - 10:00 AM | Moscone Center, Room 205 (Level 2 South)

Session Chairs: Stefan W. Heinemann, Aurora Innovation, Inc. (United States), Mark S. Zediker, NUBURU, Inc. (United States)

12403-1 • 8:30 AM - 9:00 AM

2 kW pulse power from internal wavelength stabilized diode laser bar for LiDAR applications *(Invited Paper)*

Author(s): Heike C. P. Christopher, Nor Ammouri, Jörg Fricke, Arnim Ginolas, Johannes Glaab, Armin Liero, Andre Maassdorf, Hans Wenzel, Andrea Knigge, Ferdinand-Braun-Institut (Germany)

12403-3 • 9:00 AM - 9:20 AM

Multi-junction lasers for LiDAR applications

Author(s): Philipp Staudinger, Wolfgang Pallmann, Sujoy Paul, Ludovic Marigo, Stephanie Fritze, Julien Boucart, Lukas Mutter, Jürgen Müller, II-VI Laser Enterprise GmbH (Switzerland)

12403-4 • 9:20 AM - 9:40 AM

30 dBm single mode fiber-coupled semiconductor optical amplifier at 1550 nm

Author(s): Jenna Campbell, Michelle Labrecque, Kevin McClune, Elliot Burke, Thomas Liu, Henry Garrett, Matthew Larkins, Daniel Renner, Milan Mashanovitch, Leif Johansson, Paul O. Leisher, Freedom Photonics, LLC (United States)

12403-5 • 9:40 AM - 10:00 AM

High performance semiconductor optical amplifier and array for FMCW LiDAR in high-speed autonomous vehicles

Author(s): Sidi Aboujja, Daniel Chu, SemiNex Corp. (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: LASER DIODES FOR LIDAR II

29 January 2023 • 10:30 AM - 12:00 PM | Moscone Center, Room 205 (Level 2 South)

Session Chairs: Harald Koenig, ams-OSRAM International GmbH (Germany), Erik P. Zucker, Erik Zucker Consulting (United States)

12403-6 • 10:30 AM - 11:00 AM

Advances in 9xx nm edge-emitting high-power pulse laser diodes for LiDAR applications *(Invited Paper)*

Author(s): Christian Lauer, Nils Kaufmann, Andreas Fröhlich, Dean Schoke, Agnieszka Gocalinska, Tomasz Swietlik, Lorenz Fuchs, Sebastian Pyka, Michael Furitsch, Michael Roth, Sebastian Hein, Simon Baumann, Fabian Eigenmann, Peter Fuchs, Jens Ebbecke, Nils Steinbrück, Josip Maric, Bruno Jentzsch, Hubert Halbritter, Alvaro Gomez-Iglesias, Markus Lermer, Harald König, Martin Behringer, ams-OSRAM International GmbH (Germany)

12403-7 • 11:00 AM - 11:20 AM

905nm 140W pulse laser diode with 4Stack epitaxy structure for autonomous lidar

Author(s): An Sik Choi, Jongkeun Park, Jaebong Lee, Younghwan Kim, Taekyung Kim, Quantum Semiconductor International Inc. (Republic of Korea)

12403-8 • 11:20 AM - 11:40 AM

High reliability of 1550nm triple junction laser diode for long-range automotive LiDAR

Author(s): Sidi Aboujja, Seth Pappas, Daniel Chu, SemiNex Corp. (United States)

12403-9 • 11:40 AM - 12:00 PM

High power semiconductor laser chips for fiber laser based lidar pump applications

Author(s): Xiaohang Liu, Yihan Xiong, Ching-long Jiang, Prasanta Modak, Ayesha Jamil, Xi Liu, Stewart McDougall, TRUMPF Photonics, Inc. (United States)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 3: LASER DIODE RELIABILITY AND QUALITY

29 January 2023 • 1:30 PM - 3:20 PM | Moscone Center, Room 205 (Level 2 South)

Session Chairs: Paul A. Crump, Ferdinand-Braun-Institut (Germany), Stewart D. McDougall, TRUMPF Photonics, Inc. (United States)

12403-10 • 1:30 PM - 2:00 PM

Highly reliable diode laser pump sources for the space qualified MERLIN laser platform and future wind LiDAR missions *(Invited Paper)*

Author(s): Martin Traub, Stephan Wissenberg, Thomas Westphalen, Sarah Klein, Jana Ammersbach, Marie Livrozet, Bastian Gronloh, Hans-Dieter Hoffmann, Fraunhofer-Institut für Lasertechnik ILT (Germany)

12403-11 • 2:00 PM - 2:20 PM

Evaluation of design concepts for feedback-resistant 9xx-nm high-power laser diodes

Author(s): Martin Adams, Fraunhofer-Institut für Lasertechnik ILT (Germany); Carlo Holly, RWTH Aachen Univ. (Germany); Simon Rauch, TRUMPF Photonic Components GmbH (Germany); Martin Traub, Hans-Dieter Hoffmann, Fraunhofer-Institut für Lasertechnik ILT (Germany)

12403-12 • 2:20 PM - 2:40 PM

Degradation in high-power broad-area lasers with quantum well and quantum dot active regions: a comparative study

Author(s): Yongkun Sin, In-Tae Bae, Zachary Lingley, The Aerospace Corp. (United States)

Conference 12403

12403-13 • 2:40 PM - 3:00 PM

COMD-free continuous-wave high-power laser diodes by using a multi-section waveguide method

Author(s): Abdullah Demir, Kaveh Ebadi, Bilkent Univ. (Turkey); Yuxian Liu, Univ. of Chinese Academy of Sciences (China); Ali Kaan Sünnetçioğlu, Sinan Gündoğdu, Serdar Sengül, Bilkent Univ. (Turkey); Yuliang Zhao, Yu Lan, Univ. of Chinese Academy of Sciences (China); Guowen Yang, Dogain Laser Technology (Suzhou) Co., Ltd. (China)

12403-14 • 3:00 PM - 3:20 PM

AI-based visual inspection of facets and p-sides for efficient quality control of diode lasers

Author(s): Christof Zink, Michael Ekterai, Dominik Martin, Ferdinand-Braun-Institut (Germany); Angela Maennel, William Clemens, Konrad Munding, dida Datenschmiede GmbH (Germany); Paul Crump, Andrea Knigge, Ferdinand-Braun-Institut (Germany)

Coffee Break 3:20 PM - 3:50 PM

SESSION 4: PROGRESS IN HIGH POWER LASER DIODE DEVICES

29 January 2023 • 3:50 PM - 5:30 PM | Moscone Center, Room 205 (Level 2 South)

Session Chairs: Jenna Campbell, Freedom Photonics, LLC (United States), Robert Martinsen, nLIGHT, Inc. (United States)

12403-15 • 3:50 PM - 4:10 PM

760nm laser bars for aesthetic applications

Author(s): Agnieszka Pietrzak, Martin Zorn, Ralf Huelsewede, Jens Meusel, Sebastian Seidel, JENOPTIK Optical Systems GmbH (Germany)

12403-16 • 4:10 PM - 4:30 PM

9 W tapered laser diodes with high beam quality at 760 nm

Author(s): Christos Mourikis, David Feise, Hans Wenzel, Pietro Della Casa, Katrin Paschke, Günther Tränkle, Ferdinand-Braun-Institut (Germany)

12403-17 • 4:30 PM - 4:50 PM

Development of high-efficiency 915 nm single emitter laser diodes with a continuous-wave output power of 48 W

Author(s): Guowen Yang, Dogain Laser Technology (Suzhou) Co., Ltd. (China); Yuxian Liu, Univ. of Chinese Academy of Sciences (China); Yongming Zhao, Song Tang, Dogain Laser Technology (Suzhou) Co., Ltd. (China); Yuliang Zhao, Yu Lan, Univ. of Chinese Academy of Sciences (China); Longgang Bai, Ling Yi, Ximin Wang, Dogain Laser Technology (Suzhou) Co., Ltd. (China); Abdullah Demir, Bilkent Univ. (Turkey)

12403-18 • 4:50 PM - 5:10 PM

Tailored in-plane thermal profiles for narrower lateral far-field in kilowatt-class 9xx nm diode laser bars

Author(s): Md. Jarez Miah, Matthias M. Karow, Mohamed Elattar, Dominik Martin, Pietro Della Casa, Ferdinand-Braun-Institut (Germany); Stefan Grützner, Stephan Strohmaier, TRUMPF Laser GmbH (Germany); Andrea Knigge, Paul A. Crump, Günther Tränkle, Ferdinand-Braun-Institut (Germany)

12403-19 • 5:10 PM - 5:30 PM

Buried-regrown-implant-structure diode lasers with ultra-thick epitaxy for resistance to mounting stress without loss in efficiency

Author(s): Ben King, Seval Arslan, Anisuzzaman Boni, Pietro Della Casa, Dominik Martin, Andreas Thies, Andrea Knigge, Paul A. Crump, Ferdinand-Braun-Institut (Germany)

MONDAY 30 JANUARY

SESSION 5: PACKAGED LASER DIODES

30 January 2023 • 9:00 AM - 11:40 AM | Moscone Center, Room 205 (Level 2 South)

Session Chairs: Friedrich G. Bachmann, FriBa LaserNet Consulting (Germany), Volker Krause, Laserline GmbH (Germany)

12403-21 • 9:00 AM - 9:30 AM

CANCELED: State of art diode lasers for industrial and LiDAR fiber laser pumping application (Invited Paper)

Author(s): Liang Ding, Peng Liu, Liangjie Huanag, Shaofeng Zhou, Jixiang Lin, Xinghan Laser Technology Co., Ltd. (China)

12403-24 • 9:30 AM - 9:50 AM

High-power multi-emitter modules with fiber Bragg grating stabilization

Author(s): Alessandro Mirigaldi, Valentina Serafini, Politecnico di Torino (Italy); Gabriella Motta, Alitec S.r.l. (Italy); Guido Perrone, Politecnico di Torino (Italy)

12403-25 • 9:50 AM - 10:10 AM

100 W multi-emitter laser with integrated electronic controller for a high brightness low-SWaP highly-manufacturable blue laser source

Author(s): Giulia Pippione, Simone Codato, Claudio Coriasco, Fulvio Gaziano, Paola Gotta, Alberto Maina, Valentina Massetti, Pier De Melchiorre, Giancarlo Meneghini, Michele Mercaldi, Giuliana Morello, Ezio Riva, Martina Riva, Marzia Rosso, Luca Di Stefano, Vito Volpe, Roberto Paoletti, Paolo Sanna, Convergent Photonics, Prima Electro S.p.A. (Italy)

Coffee Break 10:10 AM - 10:40 AM

12403-26 • 10:40 AM - 11:00 AM

Innovative fused end fiber bundle technology for high-brightness, irregular beam profiles

Author(s): Kalvis Alps, LightGuideOptics International Ltd. (Latvia)

12403-27 • 11:00 AM - 11:20 AM

Stamped reflective optics in high-power optical assemblies

Author(s): Peter Gordon, Yang Chen, Robert R. Vallance, King-Fu Hii, Jeremy Burke, Tiger Ninomoya, Bernard Lee, SENKO Advanced Components, Inc. (United States)

12403-29 • 11:20 AM - 11:40 AM

Advances in high-power/high-brightness diode lasers operating at 445nm for material processing applications

Author(s): Christopher Halle, Bien Chann, Francisco Villarreal, Bryan Lochman, Wang Zhou, Matthew Sauter, Abraham Wong, TeraDiode, Inc. (United States); Futoshi Tsutsumi, Takaoshi Okamoto, Panasonic Connect Co., Ltd. (Japan)

Conference Break 11:40 AM - 3:45 PM

LASE PLENARY AND HOT TOPICS

30 January 2023 • 3:45 PM - 6:05 PM | Moscone Center, Room 207/215 (Level 2 South)

3:45 PM - 3:50 PM: **Welcome and Opening Remarks**

Stefan Kaierle, Laser Zentrum Hannover e.V. (Germany) and John Ballato, Clemson Univ. (United States)

3:50 PM - 3:55 PM: **Announcement of the 3D Printing, Fabrication, and Manufacturing Best Paper Awards**

Henry Helvajian, The Aerospace Corp. (United States)

****Announcement of the LASE AI/ML Best Paper Award moved to 6:00 PM****

12408-500 • 4:00 PM - 4:30 PM

Status and potential of fully integrated photonic systems (*Plenary Presentation*)

Author(s): Arnan Mitchell, RMIT Univ. (Australia)

12412-601 • 4:30 PM - 4:45 PM

How laser AM can mitigate insecurities with supply chain issues and carbon footprint (*Plenary Presentation*)

Author(s): Eliana Fu, TRUMPF Inc. (United States)

12412-602 • 4:45 PM - 5:00 PM

Innovations in lidar driving the next generation of autonomy and safety (Hot Topic) (*Plenary Presentation*)

Author(s): Jason M. Eichenholz, Luminar Technologies, Inc. (United States)

12407-603 • 5:00 PM - 5:15 PM

Quantum computing with lasers (Hot Topic) (*Plenary Presentation*)

Author(s): Jürgen Stuhler, TOPTICA Photonics AG (Germany)

12401-501 • 5:15 PM - 5:45 PM

First demonstration of fusion ignition by inertial confinement fusion (ICF) at the National Ignition Facility (NIF) at LLNL (*Plenary Presentation*)

Author(s): Jean-Michel G. Di Nicola, Lawrence Livermore National Lab. (United States)

Vertical External Cavity Surface Emitting Lasers (VECSELs) XII

31 January 2023 | Moscone Center, Room 54 (Lower Mezzanine South)

Conference Chair: **Robert G. Bedford**, Air Force Research Lab. (United States)

Program Committee: **Alexander R. Albrecht**, The Univ. of New Mexico (United States); **Vasilis Apostolopoulos**, Univ. of Southampton (United Kingdom); **Juan L. Chilla**, Coherent, Inc. (United States); **Mircea Guina**, Tampere Univ. (Finland); **Michael Jetter**, Univ. Stuttgart (Germany); **Elyahou Kapon**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Ursula Keller**, ETH Zurich (Switzerland); **Walter Lubeigt**, M Squared Lasers Ltd. (United Kingdom); **Marcel Rattunde**, Fraunhofer-Institut für Angewandte Festkörperphysik IAF (Germany)

TUESDAY 31 JANUARY

SESSION 1: MECSELS

31 January 2023 • 8:45 AM - 9:55 AM | Moscone Center, Room 54 (Lower Mezzanine South)

Session Chair: Mircea Guina, Tampere Univ. (Finland)

12404-1 • 8:45 AM - 9:15 AM

Latest developments on membrane external-cavity surface-emitting lasers (MECSELS) (Invited Paper)

Author(s): Hermann Kahle, Univ. Kassel (Germany)

12404-2 • 9:15 AM - 9:35 AM

Membrane external-cavity surface-emitting laser emitting in bi-frequency operation through micromachining of cavity mirror

Author(s): Jake Daykin, Univ. of Southampton (United Kingdom); Jonathan R. C. Woods, Aquark Technologies Ltd. (United Kingdom); Daniel Heath, Univ. of Southampton (United Kingdom); Roman Bek, Twenty-One Semiconductors GmbH (Germany); James S. Wilkinson, Ben Mills, Univ. of Southampton (United Kingdom); Michael Jetter, Peter Michler, Univ. Stuttgart (Germany); Vasilis Apostolopoulos, Univ. of Southampton (United Kingdom)

12404-4 • 9:35 AM - 9:55 AM

Semiconductor quantum well membranes for tunable coherent waveguide laser arrays

Author(s): Jake Daykin, Nicholas T. Klokou, Stephen C. Richardson, Univ. of Southampton (United Kingdom); Jonathan R. C. Woods, Aquark Technologies Ltd. (United Kingdom); Roman Bek, Twenty-One Semiconductors GmbH (Germany); Jon Gorecki, James S. Wilkinson, Univ. of Southampton (United Kingdom); Michael Jetter, Peter Michler, Univ. Stuttgart (Germany); Vasilis Apostolopoulos, Univ. of Southampton (United Kingdom)

Coffee Break 9:55 AM - 10:25 AM

SESSION 2: POWER SCALING

31 January 2023 • 10:25 AM - 11:55 AM | Moscone Center, Room 54 (Lower Mezzanine South)

Session Chair: Juan L. Chilla, Coherent Corp. (United States)

12404-5 • 10:25 AM - 11:15 AM

History of optically pumped semiconductor lasers: VECSELs (Keynote Presentation)

Author(s): Mark E. Kuznetsov, Excelitas Technologies Corp. (United States)

12404-6 • 11:15 AM - 11:35 AM

3-W output power at 2 μ m from a flip-chip processed InGaSb VECSEL based on a hybrid metal-semiconductor Bragg reflector

Author(s): Nicolas Huwyler, Marco Gaulke, Jonas Heidrich, Matthias Golling, Ajanta Barh, Ursula Keller, ETH Zurich (Switzerland)

12404-15 • 11:35 AM - 11:55 AM

Hybrid SESAMs for high-repetition rate mode-locked VECSELs

Author(s): Ricky D. Gibson, Air Force Research Lab. (United States); Simon P. Tsaoussis, Univ. of Arizona (United States); Joshua Rollag, KBR, Inc. (United States); Air Force Research Lab. (United States); Catherine Nguyen, David Follman, Garrett D. Cole, Thorlabs Crystalline Solutions (United States); Sathvikas J. Addamane, Sandia National Labs. (United States); Jerome V. Moloney, R. Jason Jones, Wyant College of Optical Sciences (United States)

Lunch/Exhibition Break 11:55 AM - 2:00 PM

SESSION 3: SPECTRAL TAILORING

31 January 2023 • 2:00 PM - 3:30 PM | Moscone Center, Room 54 (Lower Mezzanine South)

Session Chair: Alexander R. Albrecht, The Univ. of New Mexico (United States)

12404-7 • 2:00 PM - 2:30 PM

Progress of turnkey VECSEL systems for quantum technology (Invited Paper)

Author(s): Jussi-Pekka Penttinen, Emmi Kantola, Sanna Ranta, Topi Uusitalo, Arttu Hietalahti, Roope Vuohenkunas, Mircea Guina, Vexlum Ltd. (Finland)

12404-8 • 2:30 PM - 2:50 PM

Effects of output coupler on THz quantum-cascade VECSELs tunable between 2.5-3.0 THz

Author(s): Anthony D. Kim, Yu Wu, Univ. of California, Los Angeles (United States); Sathvikas J. Addamane, Sandia National Labs. (United States); Benjamin S. Williams, Univ. of California, Los Angeles (United States)

12404-9 • 2:50 PM - 3:10 PM

A single-mode high-power in-well pumped hybrid-MECSEL at 589 nm

Author(s): Mingyang Zhang, Alexander R. Albrecht, The Univ. of New Mexico (United States); Gar-Wing Truong, Garrett D. Cole, Thorlabs Crystalline Solutions (United States); Mansoor Sheik-Bahae, The Univ. of New Mexico (United States)

12404-10 • 3:10 PM - 3:30 PM

Single-frequency 2.1 μm VECSELs for quantum-frequency-converter pumping

Author(s): Marcel Rattunde, Steffen Adler, Peter Holl, Elke Diwo-Emmer, Rolf Aidam, Fraunhofer-Institut für Angewandte Festkörperphysik IAF (Germany)

Coffee Break 3:30 PM - 4:00 PM

SESSION 4: NOVEL ARCHITECTURES

31 January 2023 • 4:00 PM - 5:30 PM | Moscone Center, Room 54 (Lower Mezzanine South)

Session Chair: Robert G. Bedford, Air Force Research Lab. (United States)

12404-12 • 4:00 PM - 4:20 PM

Coupled mode-locked VECSEL cavities with a shared gain medium

Author(s): Simon P. Tsoussis, Wyant College of Optical Sciences, The Univ. of Arizona (United States); Sathvikas J. Addamane, Sandia National Labs. (United States); Ronald J. Jones, Jerome V. Moloney, Wyant College of Optical Sciences, The Univ. of Arizona (United States)

12404-11 • 4:20 PM - 4:50 PM

Coupled cavity vertical external cavity surface emitting lasers (*Invited Paper*)

Author(s): Chris Hessenius, DeUve Photonics (United States)

12404-13 • 4:50 PM - 5:10 PM

THz quantum-cascade VECSELs based upon disordered metasurfaces

Author(s): Eilam Morag, Sandra Li, Anthony D. Kim, Univ. of California, Los Angeles (United States); Sathvikas J. Addamane, Sandia National Labs. (United States); Benjamin S. Williams, Univ. of California, Los Angeles (United States)

12404-14 • 5:10 PM - 5:30 PM

Femtosecond pulses from a backside-cooled 2- μm , GDD balanced InGaSb VECSEL

Author(s): Marco Gaulke, Jonas Heidrich, Nicolas Huwyler, Matthias Golling, Ajanta Barh, Ursula Keller, ETH Zurich (Switzerland)

POSTERS-TUESDAY

31 January 2023 • 6:00 PM - 8:00 PM |

Moscone Center, Level 2 West

Conference attendees are invited to attend the LASE poster Session on Tuesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12404-3

Investigation of a red-emitting MECSEL for OCT applications

Author(s): Philipp Tatar-Mathes, Tampere Univ. (Finland)

Nonlinear Frequency Generation and Conversion: Materials and Devices XXII

30 January - 1 February 2023 | Moscone Center, Room 212 (Level 2 South)

Conference Chair: **Peter G. Schunemann**, BAE Systems (United States)

Program Committee: **Carlota Canalias**, Tailored Photons AB (Sweden); **Shekhar Guha**, Air Force Research Lab. (United States); **Christelle Kieleck**, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany); **Kentaro Miyata**, RIKEN (Japan); **Rita D. Peterson**, Air Force Research Lab. (United States); **Valentin Petrov**, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); **Christopher R. Phillips**, ETH Zurich (Switzerland); **Kenneth L. Schepler**, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Chaitanya Kumar Suddapalli**, Tata Institute of Fundamental Research (India); **Konstantin L. Vodopyanov**, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Vladislav V. Yakovlev**, Texas A&M Univ. (United States); **Haohai Yu**, Shandong Univ. (China)

MONDAY 30 JANUARY

SESSION 1: FREQUENCY COMBS AND SPECTROSCOPY

30 January 2023 • 8:15 AM - 10:15 AM | Moscone Center, Room 212 (Level 2 South)

Session Chair: Peter G. Schunemann, BAE Systems (United States)

12405-1 • 8:15 AM - 8:45 AM

Precision mid-IR -THz frequency combs produced by frequency division and optical rectification (*Invited Paper*)

Author(s): Konstantin L. Vodopyanov, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

12405-2 • 8:45 AM - 9:15 AM

Real-time high resolution dual-comb spectroscopy in the 6-12 μm spectral range based on a few-cycle Cr:ZnS laser platform (*Invited Paper*)

Author(s): Sergey Vasilyev, IPG Photonics Corp. (United States); Andrey Muraviev, Dmitrii Konnov, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); Mike Mirov, IPG Photonics Corp. (United States); Sergey Mirov, The Univ. of Alabama at Birmingham (United States); Konstantin L. Vodopyanov, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

12405-3 • 9:15 AM - 9:45 AM

Towards high sensitivity spectroscopy with single-cavity dual-comb lasers and OPOs (*Invited Paper*)

Author(s): Christopher R. Phillips, Carolin P. Bauer, Justinas Pupeikis, Benjamin Willenberg, Sandro L. Camenzind, Ursula Keller, ETH Zurich (Switzerland)

12405-4 • 9:45 AM - 10:15 AM

Breath detection of SARS-CoV-2 infection via an optical frequency comb (*Invited Paper*)

Author(s): Qizhong Liang, Ya-Chu Chan, Jutta Toscano, JILA (United States); Kristen Bjorkman, Leslie Leinwand, Roy Parker, BioFrontiers Institute (United States); Eva Nozik, Univ. of Colorado Denver School of Medicine (United States); David J. Nesbitt, Jun Ye, JILA (United States)

Coffee Break 10:15 AM - 10:45 AM

SESSION 2: VISIBLE AND UV GENERATION

30 January 2023 • 10:45 AM - 12:15 PM | Moscone Center, Room 212 (Level 2 South)

Session Chair: Christopher R. Phillips, ETH Zurich (Switzerland)

12405-5 • 10:45 AM - 11:15 AM

High-harmonic generation in solids with a megawatt-level, few-cycle Er:fiber frequency comb (*Invited Paper*)

Author(s): Kristina Chang, Daniel Lesko, National Institute of Standards and Technology (United States); Scott Diddams, Univ. of Colorado Boulder (United States)

12405-6 • 11:15 AM - 11:35 AM

Spectral design of UV supercontinuum using pump modulation

Author(s): Asbjørn Moltke, Callum R. Smith, Technical Univ. of Denmark (Denmark); Rasmus D. Engelsholm, Erik N. Christensen, Mattia Michieletto, NKT Photonics A/S (Denmark); Jonas S. Madsen, Jürgen Appel, Anders Brusch, Poul Erik Hansen, DFM A/S (Denmark); Christian R. Petersen, Christos Markos, Technical Univ. of Denmark (Denmark); Patrick B. Montague, NKT Photonics A/S (Denmark); Ole Bang, Technical Univ. of Denmark (Denmark), NKT Photonics A/S (Denmark)

12405-7 • 11:35 AM - 11:55 AM

Dispersion controlled pulse synthesis in non-collinear sum frequency generation

Author(s): Randy Lemons, Joseph Duris, Nicole Neveu, Agostino Marinelli, SLAC National Accelerator Lab. (United States); Charles Durfee, Colorado School of Mines (United States); Sergio Carbajo, SLAC National Accelerator Lab. (United States)

12405-8 • 11:55 AM - 12:15 PM

Investigation of high harmonic generation through multiplexed broadband ptychography

Author(s): David D. Schmidt, David Goldberger, Colorado School of Mines (United States); Alba de las Heras, Carlos Hernández-García, Univ. de Salamanca (Spain); Yuhao Lei, Peter Kazansky, Univ. of Southampton (United Kingdom); Dan Adams, Charles Durfee, Colorado School of Mines (United States)

Lunch Break 12:15 PM - 1:45 PM

SESSION 3: SUPERCONTINUUM GENERATION

30 January 2023 • 1:45 PM - 3:15 PM | Moscone Center, Room 212 (Level 2 South)

Session Chair: Konstantin L. Vodopyanov, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

12405-9 • 1:45 PM - 2:05 PM

Applications of pump modulated UV supercontinuum

Author(s): Asbjørn Moltke, Technical Univ. of Denmark (Denmark); Jonas S. Madsen, DFM A/S (Denmark); Callum R. Smith, Technical Univ. of Denmark (Denmark); Rasmus D. Engelholm, Erik N. Christensen, Mattia Michieletto, NKT Photonics A/S (Denmark); Jürgen Appel, Anders Brusch, DFM A/S (Denmark); Christian R. Petersen, Technical Univ. of Denmark (Denmark); Poul Erik Hansen, DFM A/S (Denmark); Christos Markos, Technical Univ. of Denmark (Denmark); Patrick B. Montague, NKT Photonics A/S (Denmark); Ole Bang, Technical Univ. of Denmark (Denmark), NKT Photonics A/S (Denmark)

12405-10 • 2:05 PM - 2:35 PM

Mid-IR supercontinuum in gallium arsenide waveguide (Invited Paper)

Author(s): Geoffroy Granger, XLIM (France); Myriam Bailly, Thales Research & Technology (France); Hugo Delahaye, XLIM (France); Cristian Jimenez, XLIM (France); Idris Tiliouine, XLIM (France); Yann Leventoux, Jean-Christophe Orlianges, Vincent Couderc, XLIM (France); Bruno Gérard, III-V Lab. (France); Rezki Becheker, Said Idlahcen, Thomas Godin, Ammar Hideur, Complexe de Recherche Interprofessionnel en Aérothermochimie (France); Arnaud Grisard, Eric Lallier, Thales Research & Technology (France); Sebastien Fevrier, XLIM (France)

12405-11 • 2:35 PM - 2:55 PM

The existence of multi-octave spanning conical emission from ultrafast LWIR pulse filamentation

Author(s): Michael G. Hastings, Paris Panagiotopoulos, Miroslav Kolesik, Jerome V. Moloney, Wyant College of Optical Sciences (United States)

12405-12 • 2:55 PM - 3:15 PM

Relative intensity noise characterization of supercontinuum generation in graded index and step index multimode fibers

Author(s): Arun Surendran, Tuuli Nissinen, Zahra Eslami, Goëry Genty, Tampere Univ. (Finland)

Coffee Break 3:15 PM - 3:45 PM

LASE PLENARY AND HOT TOPICS

30 January 2023 • 3:45 PM - 6:05 PM | Moscone Center, Room 207/215 (Level 2 South)

3:45 PM - 3:50 PM: Welcome and Opening Remarks

Stefan Kaierle, Laser Zentrum Hannover e.V. (Germany) and John Ballato, Clemson Univ. (United States)

3:50 PM - 3:55 PM: Announcement of the 3D Printing, Fabrication, and Manufacturing Best Paper Awards

Henry Helvajian, The Aerospace Corp. (United States)

Announcement of the LASE AI/ML Best Paper Award moved to 6:00 PM

12408-500 • 4:00 PM - 4:30 PM

Status and potential of fully integrated photonic systems (Plenary Presentation)

Author(s): Arnan Mitchell, RMIT Univ. (Australia)

12412-601 • 4:30 PM - 4:45 PM

How laser AM can mitigate insecurities with supply chain issues and carbon footprint (Plenary Presentation)

Author(s): Eliana Fu, TRUMPF Inc. (United States)

12412-602 • 4:45 PM - 5:00 PM

Innovations in lidar driving the next generation of autonomy and safety (Hot Topic) (Plenary Presentation)

Author(s): Jason M. Eichenholz, Luminar Technologies, Inc. (United States)

12407-603 • 5:00 PM - 5:15 PM

Quantum computing with lasers (Hot Topic) (Plenary Presentation)

Author(s): Jürgen Stuhler, TOPTICA Photonics AG (Germany)

12401-501 • 5:15 PM - 5:45 PM

First demonstration of fusion ignition by inertial confinement fusion (ICF) at the National Ignition Facility (NIF) at LLNL (Plenary Presentation)

Author(s): Jean-Michel G. Di Nicola, Lawrence Livermore National Lab. (United States)

TUESDAY 31 JANUARY

SESSION 4: OPTICAL PARAMETRIC DEVICES AND APPLICATIONS

31 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 212 (Level 2 South)

Session Chair: Valentin Petrov, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

12405-13 • 8:00 AM - 8:30 AM

Efficient generation of femtosecond multi-mJ pulses at 3 μm (Invited Paper)

Author(s): Fangjie Zhou, Yi Wu, Alphonse Marra, Univ. of Central Florida (United States); Seung-Whan Bahk, University of Rochester (United States); Zenghu Chang, Univ. of Central Florida (United States)

Conference 12405

12405-14 • 8:30 AM - 9:00 AM

Intense and coherent 7-octave light source (*Invited Paper*)

Author(s): Jens Biegert, Ugaitz Elu, Lenard Vamos, ICFO - Institut de Ciències Fotòniques (Spain)

12405-15 • 9:00 AM - 9:20 AM

Compact, CEP-stable, few-cycle OPCPA for attosecond pulse generation

Author(s): Bastian Manschwetus, Filippo Campi, Thomas Braatz, Sebastian Starosielec, Jan Heye Buss, Michael Schulz, Robert Riedel, Class 5 Photonics GmbH (Germany)

12405-16 • 9:20 AM - 9:40 AM

CANCELED: Parametric wavelength conversion seeded by four-wave mixing in photonic crystal fibers: parameter optimisation and performance limits

Author(s): Ronan A. Battle, Timothy H. Runcorn, Imperial College London (United Kingdom); Arnaud Mussot, Lab. de Physique des Lasers, Atomes et Molécules, Univ. Lille, CNRS (France); Alexandre Kudlinski, Lab. de Physique des Lasers, Atomes et Molécules, Univ. de Lille, CNRS (France); Robert T. Murray, J. Roy Taylor, Imperial College London (United Kingdom)

12405-17 • 9:40 AM - 10:00 AM

Upconversion active imaging system at 2 μm with a double pulsed fiber laser

Author(s): Romain Demur, Arnaud Grisard, Luc Leviandier, Eric Lallier, Thales Research & Technology (France)

Coffee Break 10:00 AM - 10:30 AM

SESSION 5: CHARACTERIZATION OF NLO MATERIALS

31 January 2023 • 10:30 AM - 12:00 PM | Moscone Center, Room 212 (Level 2 South)

Session Chair: Valentin Petrov, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

12405-18 • 10:30 AM - 11:00 AM

Measurement refractive index and absorption coefficients of nonlinear optical crystals (*Invited Paper*)

Author(s): Shekhar Guha, Jean Wei, Joel Murray, Air Force Research Lab. (United States)

12405-19 • 11:00 AM - 11:20 AM

Minimizing 1-micron absorption losses in CdSiP₂

Author(s): Kevin T. Zawilski, Peter G. Schunemann, BAE Systems (United States); Timothy D. Gustafson, Larry Halliburton, Nancy Giles, Air Force Institute of Technology (United States); Kent Averett, Jonathan Slagle, Shekhar Guha, Air Force Research Lab. (United States); Robert Murray, Imperial College London (United Kingdom)

12405-20 • 11:20 AM - 11:40 AM

Effect of 1064 nm light on acceptors in CdSiP₂ crystals

Author(s): Timothy D. Gustafson, Nancy C. Giles, Air Force Institute of Technology (United States); Kevin T. Zawilski, Peter G. Schunemann, BAE Systems (United States); Kent L. Averett, Jonathan E. Slagle, Air Force Research Lab. (United States); Larry E. Halliburton, West Virginia Univ. (United States)

12405-21 • 11:40 AM - 12:00 PM

Laser damage threshold study of ZGP, CSP, GaAs, and GaP

Author(s): Peter G. Schunemann, Kevin T. Zawilski, Thomas Lobay, Bryan Porth, BAE Systems (United States); Michael D. Thomas, Spica Technologies, Inc. (United States)

Lunch/Exhibition Break 12:00 PM - 1:50 PM

SESSION 6: INFRARED AND THZ GENERATION

31 January 2023 • 1:50 PM - 3:30 PM | Moscone Center, Room 212 (Level 2 South)

Session Chair: Shekhar Guha, Air Force Research Lab. (United States)

12405-22 • 1:50 PM - 2:10 PM

Noncritically phase-matched self-difference frequency generation using transition-metal doped chalcogenides

Author(s): Kentaro Miyata, Masaki Yumoto, Yasushi Kawata, Satoshi Wada, RIKEN (Japan); Shinichi Imai, RIKEN (Japan), Oxide Corp. (Japan)

12405-23 • 2:10 PM - 2:30 PM

Narrowband seeding of a PPLN nonresonant optical parametric oscillator

Author(s): Robert T. Murray, Imperial College London (United Kingdom); Li Wang, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); Weidong Chen, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); Fujian Institute of Research on the Structure of Matter (China); Ronan Battle, Imperial College London (United Kingdom); Andre Schirmacher, Canlas Laser Processing GmbH (Germany); Edlef Büttner, APE Angewandte Physik & Elektronik GmbH (Germany); Valentin Petrov, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

12405-24 • 2:30 PM - 2:50 PM

High-power Q-switched Tm-doped fiber laser for nonlinear frequency conversion into the mid-IR

Author(s): Julian Schneider, Patrick Forster, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany), Institut für Regelungstechnik, Karlsruher Institut für Technologie (Germany); Dieter Panitzek, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany); Dominik Lorenz, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany), Institut für Regelungstechnik, Karlsruher Institut für Technologie (Germany); Clément Romano, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany); Marc Eichhorn, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany), Institut für Regelungstechnik, Karlsruher Institut für Technologie (Germany); Christelle Kieleck, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany)

12405-26 • 2:50 PM - 3:10 PM

Broadband high resolution sum frequency generation spectrometer for molecular vibrational spectroscopy at interfaces

Author(s): Robertas Kananavičius, Rokas Danilevicius, Regimantas Januskevicius, Karolis Madeikis, Julius Lukosiusnas, EKSPLA (Lithuania)

12405-27 • 3:10 PM - 3:30 PM

Portable, broadband, and sensitive terahertz time-domain spectrometer

Author(s): Nicolas Couture, Univ. of Ottawa (Canada); Mamoun Wahbeh, Akif Ahmed, Garland Best, OZ Optics Ltd. (Canada); Angela Gamouras, Jean-Michel Ménard, Univ. of Ottawa (Canada)

Coffee Break 3:30 PM - 4:00 PM

SESSION 7: NEW NONLINEAR MATERIALS I

31 January 2023 • 4:00 PM - 5:30 PM | Moscone Center, Room 212 (Level 2 South)

Session Chair: Peter G. Schunemann, BAE Systems (United States)

12405-28 • 4:00 PM - 4:30 PM

Diamond Raman laser with suppression of parasitic nonlinear effects at high average power *(Invited Paper)*

Author(s): Matthias Heinzig, Thomas Schreiber, Gonzalo Palma Vega, Till Walbaum, Andreas Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

12405-29 • 4:30 PM - 4:50 PM

Sum-frequency generation in silicon nitride through coherent photogalvanic effect

Author(s): Ozan Yakar, Edgars Nitiss, Jianqi Hu, Camille Brès, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12405-30 • 4:50 PM - 5:10 PM

Nonlinear optical analysis of superconductor metal nitride and oxides for advanced photonic sensor applications

Author(s): James N. Pan, Northrop Grumman Corp. (United States)

12405-31 • 5:10 PM - 5:30 PM

Microscopic analysis of linear and nonlinear electro-optical properties of tellurium

Author(s): Jörg Hader, Wyant College of Optical Sciences (United States); Sven C. Liebscher, Philipps-Univ. Marburg (Germany); Jerome V. Moloney, Wyant College of Optical Sciences (United States); Stephan W. Koch, Philipps-Univ. Marburg (Germany)

POSTERS-TUESDAY

31 January 2023 • 6:00 PM - 8:00 PM |

Moscone Center, Level 2 West

Conference attendees are invited to attend the LASE poster Session on Tuesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12405-51

Wavelength-tunable IR OPA system

Author(s): Brittany Lu, Univ. of California, Los Angeles (United States)

WEDNESDAY 1 FEBRUARY

SESSION 8: NEW NONLINEAR MATERIALS II

1 February 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 212 (Level 2 South)

Session Chair: Valentin Petrov, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

12405-32 • 8:00 AM - 8:20 AM

New ternary chalcopyrite semiconductors for mid-IR NLO frequency conversion

Author(s): Peter G. Schunemann, Kevin T. Zawilski, BAE Systems (United States)

12405-33 • 8:20 AM - 8:40 AM

Layered metal thiophosphate with large non-resonant second harmonic generation, high laser-induced damage threshold and phase-matchability

Author(s): Jingyang He, Seng Huat Lee, The Pennsylvania State Univ. (United States); Francesco Naccarato, Guillaume Brunin, Univ. Catholique de Louvain (Belgium); Rui Zu, The Pennsylvania State Univ. (United States); Yuanxi Wang, The Pennsylvania State Univ. (United States); Univ. of North Texas (United States); Leixin Miao, Huaiyu Wang, Nasim Alem, The Pennsylvania State Univ. (United States); Geoffroy Hautier, Univ. Catholique de Louvain (Belgium), Dartmouth College (United States); Gian-Marco Rignanes, Univ. Catholique de Louvain (Belgium); Zhiqiang Mao, Venkatraman Gopalan, The Pennsylvania State Univ. (United States)

12405-34 • 8:40 AM - 9:00 AM

Crystal growth and anisotropic thermal expansion of BaGa4S7

Author(s): Peter G. Schunemann, BAE Systems (United States); Michael A. Susner, Air Force Research Lab. (United States); Kevin T. Zawilski, BAE Systems (United States)

12405-35 • 9:00 AM - 9:20 AM

Sellmeier and thermo-optic dispersion formulas for BaGa2GeS6

Author(s): Kiyoshi Kato, Chitose Institute of Science and Technology (Japan); Okamoto Optics, Inc. (Japan); Nobuhiro Umemura, Chitose Institute of Science and Technology (Japan); Valeriy V. Badikov, Dmitry Badikov, Kuban State Technological Univ. (Russian Federation); Takayuki Okamoto, Okamoto Optics (Japan); Kentaro Miyata, RIKEN Ctr. for Advanced Photonics (Japan); Valentin Petrov, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

12405-36 • 9:20 AM - 9:40 AM

Orientation patterned GaAsP for nonlinear optical applications

Author(s): Shivashankar R. Vangala, Air Force Research Lab. (United States); Duane Brinegar, KBRWyle (United States); Vladimir Tassev, Air Force Research Lab. (United States); Valentin Petrov, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

Conference 12405

12405-37 • 9:40 AM - 10:00 AM

Measurements of two-photon absorption coefficient of HVPE grown GaAsP wafers

Author(s): Shekhar Guha, Joel Murray, Shivashankar Vangala, Vladimir Tassev, Air Force Research Lab. (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 9: NEW CONCEPTS IN NONLINEAR OPTICS I

1 February 2023 • 10:30 AM - 12:00 PM | Moscone Center, Room 212 (Level 2 South)

Session Chair: Kenneth L. Schepler, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

12405-38 • 10:30 AM - 11:00 AM

Dispersion cancellation using space-time wave packets (*Invited Paper*)

Author(s): Ayman F. Abouraddy, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

12405-40 • 11:00 AM - 11:20 AM

Nonlocal and cascaded effects in nonlinear graphene nanoplasmonics

Author(s): Theis Pilegaard Rasmussen, Univ. of Southern Denmark (Denmark); Álvaro Rodríguez Echarri, Javier García de Abajo, ICFO - Institut de Ciències Fotòniques (Spain); Joel Cox, Univ. of Southern Denmark (Denmark)

12405-41 • 11:20 AM - 11:40 AM

Photonic upconversion maximization for nonlinear meta-material enabled by deep learning

Author(s): Lakshmi Raju, Zhaocheng Liu, Dayu Zhu, Andrew Kim, Georgia Institute of Technology (United States); Ekaterina Poutrina, UES inc (United States), AFRL (United States); Augustine Urbas, AFRL (United States); Wenshan Cai, Georgia Institute of Technology (United States)

12405-44 • 11:40 AM - 12:00 PM

Spatially tunable non-critical phase matching of second harmonic generation in a doped LiNbO₃ crystal

Author(s): Gilad Robert Barir, Georgiy Shoulga, Alon Bahabad, Tel Aviv Univ. (Israel)

Lunch/Exhibition Break 12:00 PM - 1:50 PM

SESSION 10: NEW CONCEPTS IN NONLINEAR OPTICS II

1 February 2023 • 1:50 PM - 3:30 PM | Moscone Center, Room 212 (Level 2 South)

Session Chair: Konstantin L. Vodopyanov, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

12405-42 • 1:50 PM - 2:10 PM

Experimental demonstration of efficient parametric amplification by hybridized nonlinear optics

Author(s): Noah Flemens, Dylan Heberle, Jiaoyang Zheng, Connor Davis, Devin J. Dean, Cornell Univ. (United States); Kevin T. Zawilski, Peter G. Schunemann, BAE Systems (United States); Jeffrey Moses, Cornell Univ. (United States)

12405-43 • 2:10 PM - 2:30 PM

Cascaded third-harmonic generation approaching full efficiency through an unconventional pathway

Author(s): Nuno V. Castanheira, The Univ. of Texas at Dallas (United States); Noah Flemens, Jeffrey Moses, Cornell Univ. (United States)

12405-45 • 2:30 PM - 2:50 PM

Highly efficient frequency doubling of 1700 nm ultrashort pulsed fiber laser in PPLN bulk crystal

Author(s): Aleksand Koviarov, Dmitrii Stoliarov, Diana Galiakhmetova, Edik Rafailov, Aston Univ. (United Kingdom)

12405-47 • 2:50 PM - 3:10 PM

Computation using shaped supercontinuum generation within a neural network

Author(s): Kevin F. Lee, Martin Fermann, IMRA America, Inc. (United States)

12405-46 • 3:10 PM - 3:30 PM

Characterization of a temporal-mode sorter using multiple-delay crossed-beam spectral interferometry

Author(s): Mostafa E. El Demery, Jack Lichtman, Markus Algaier, Oregon Ctr. for OMQ Sciences, Univ. of Oregon (United States); Brian J. Smith, Michael G. Raymer, Oregon Ctr. for OMQ Sciences, Univ. of Oregon (United States)

Coffee Break 3:30 PM - 4:00 PM

SESSION 11: NEW CONCEPTS IN NONLINEAR OPTICS III

1 February 2023 • 4:00 PM - 5:20 PM | Moscone Center, Room 212 (Level 2 South)

Session Chair: Kenneth L. Schepler, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

12405-53 • 4:00 PM - 4:20 PM

Free space quasi-phase matching in multipass cells

Author(s): Nazar Kovalenko, Victor Hariton, Kilian Fritsch, Oleg Pronin, Helmut-Schmidt Univ. (Germany)

12405-48 • 4:20 PM - 4:40 PM

Enhanced second-order nonlinear susceptibility in asymmetric type-II quantum well

Author(s): Zheng Ju, Stephen Schaefer, Arizona State Univ. (United States); Jacob Khurgin, Johns Hopkins Univ. (United States); Yong-Hang Zhang, Arizona State Univ. (United States)

12405-49 • 4:40 PM - 5:00 PM

#SHAARP: an open-source package for analytical and numerical modeling of optical second harmonic generation in anisotropic crystals

Author(s): Rui Zu, Bo Wang, Jingyang He, Jianjun Wang, Lincoln Weber, Long-Qing Chen, Venkatraman Gopalan, The Pennsylvania State Univ. (United States)

12405-52 • 5:00 PM - 5:20 PM

Examining viscoelastic properties of petroleum products using impulsive stimulated Brillouin scattering

Author(s): Dominik A. Doktor, Sean P. O'Connor, Vladislav V. Yakovlev, Texas A&M Univ. (United States)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12405-39

Giant second-harmonic generation in photonic crystal slabs possessing double-resonance bound states in the continuum

Author(s): Ji Tong Wang, Univ. College London (United Kingdom); Feng Xia Li, Xidian Univ. (China); Nicolae C. Panoiu, Univ. College London (United Kingdom)

12405-50

Raman lasing in multimode diode-pumped graded-index fiber with fs-inscribed 3D random FBG array

Author(s): Alexey G. Kuznetsov, Alexey A. Wolf, Institute of Automation and Electrometry (Russian Federation); Zhibzema Munkueva, Institute of Automation and Electrometry of the SB RAS (Russian Federation); Sergey A. Babin, Institute of Automation and Electrometry (Russian Federation)

Conference 12406

Real-time Measurements, Rogue Phenomena, and Single-Shot Applications VIII

1 February 2023 | Moscone Center, Room 205 (Level 2 South)

Conference Chairs: **Daniel R. Solli**, UCLA Samueli School of Engineering (United States); **Georg Herink**, Univ. Bayreuth (Germany); **Serge Bielawski**, Lab. de Physique des Lasers, Atomes et Molécules (France)

Program Committee: **Nail N. Akhmediev**, The Australian National Univ. (Australia); **John M. Dudley**, FEMTO-ST (France); **Moti Fridman**, Bar-Ilan Univ. (Israel); **Hideaki Furukawa**, National Institute of Information and Communications Technology (Japan); **Goëry Genty**, Tampere Univ. (Finland); **Takuro Ideguchi**, The Univ. of Tokyo (Japan); **Bahram Jalali**, UCLA Samueli School of Engineering (United States); **Dario Polli**, Politecnico di Milano (Italy); **William Renninger**, The Institute of Optics, Univ. of Rochester (United States); **Claus Ropers**, Georg-August-Univ. Göttingen (Germany); **Günter Steinmeyer**, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); **Pierre Suret**, Lab. de Physique des Lasers, Atomes et Molécules (France); **Masayuki Suzuki**, Doshisha Univ. (Japan); **Abdelmajid Taki**, Lab. de Physique des Lasers, Atomes et Molécules (France); **Giovanna Tissoni**, Institut de Physique de Nice (France)

TUESDAY 31 JANUARY

POSTERS-TUESDAY

31 January 2023 • 6:00 PM - 8:00 PM |
Moscone Center, Level 2 West

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12406-22

Analysis of gun muzzle flash using a thermal and a high-speed camera

Author(s): Przemyslaw Badurowicz, Dawid Pacek, Military Institute of Armament Technology (Poland); Marcin Jasinski, Warsaw Univ. of Technology (Poland)

SESSION 1: NONLINEAR DYNAMICS, SOLITONS, AND ROGUE WAVES

1 February 2023 • 9:00 AM - 10:25 AM | Moscone Center, Room 205 (Level 2 South)

Session Chair: Daniel R. Solli, UCLA Samueli School of Engineering (United States)

12406-1 • 9:00 AM - 9:20 AM

Complex dynamics in a spatio-temporal regime in a chain of plasmonic nanoparticles (*Invited Paper*)

Author(s): Abdelmajid Taki, Zohair Ziani, Gaetan Leveque, Saliya Coulibaly, Abdellatif Akjouj, Lab. de Physique des Lasers, Atomes et Molécules (France)

12406-2 • 9:20 AM - 9:40 AM

Quantum temporal optics (*Invited Paper*)

Author(s): Moti Fridman, Bar-Ilan Univ. (Israel)

12406-3 • 9:40 AM - 9:55 AM

Quantum interferometer based on time-lenses

Author(s): Sara Meir, Eliahu Cohen, Moti Fridman, Bar-Ilan Univ. (Israel)

12406-4 • 9:55 AM - 10:10 AM

Realtime computing with femtosecond laser pulses

Author(s): Tingyi Zhou, Bahram Jalali, UCLA Samueli School of Engineering (United States)

12406-5 • 10:10 AM - 10:25 AM

Dynamics of modal self-cleaning

Author(s): Yuval Tamir, Moti Fridman, Bar-Ilan Univ. (Israel)

Coffee Break 10:25 AM - 10:55 AM

WEDNESDAY 1 FEBRUARY

SESSION 2: NONLINEAR DYNAMICS IN LASERS AND MICRORESONATORS

1 February 2023 • 10:55 AM - 11:50 AM | Moscone Center, Room 205 (Level 2 South)

Session Chair: Georg Herink, Univ. Bayreuth (Germany)

12406-6 • 10:55 AM - 11:15 AM

Nonlinear microresonators: from frequency combs to interaction of counterpropagating light (*Invited Paper*)

Author(s): Pascal Del'hayé, Max-Planck-Institut für die Physik des Lichts (Germany)

12406-7 • 11:15 AM - 11:35 AM

Temporal properties of THz frequency combs quantum cascade lasers in ridge and ring resonators (*Invited Paper*)

Author(s): Giacomo Scalari, Paolo Micheletti, Urban Senica, Andres Forrer, ETH Zurich (Switzerland); Sara Cibella, Guido Torrioli, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Mattias Beck, Jerome Faist, ETH Zurich (Switzerland)

12406-9 • 11:35 AM - 11:50 AM

Spatiotemporal light bullets, breathers, and collapse in coherently driven passive nonlinear cavities with parabolic potentials

Author(s): Yifan Sun, Pedro Parra-Rivas, Sapienza Univ. di Roma (Italy); Carles Milian, Univ. de València (Spain); Yaroslav V. Kartashov, Institute of Spectroscopy, Russian Academy of Sciences (Russian Federation); Mario Ferraro, Fabio Mangini, Mario Zitelli, Raphael Jauberteau, Francesco Rinaldo Talenti, Stefan Wabnitz, Sapienza Univ. di Roma (Italy)

Lunch/Exhibition Break 11:50 AM - 1:20 PM

SESSION 3: REAL-TIME, ULTRAFAST AND SINGLE-SHOT METHODS I

1 February 2023 • 1:20 PM - 3:10 PM | Moscone Center, Room 205 (Level 2 South)

Session Chair: Serge Bielawski, Lab. de Physique des Lasers, Atomes et Molécules (France)

12406-10 • 1:20 PM - 1:40 PM

High-speed vibrational microscopy and deep-learning algorithms to image cells and tissues *(Invited Paper)*

Author(s): Dario Polli, Federico Vernuccio, Alejandro De la Cadena, Arianna Bresci, Chiara Ceconello, Francesco Manetti, Salvatore Sorrentino, Subir Das, Renzo Vanna, Giulio Cerullo, Politecnico di Milano (Italy)

12406-11 • 1:40 PM - 2:00 PM

High speed low frequency Raman spectroscopy and microscopy *(Invited Paper)*

Author(s): Randy A. Bartels, David Smith, Colorado State Univ. (United States); Siddarth Shivkumar, Institut Fresnel (France); Jeffrey Field, Colorado State Univ. (United States); Hervé Rigneault, Institut Fresnel (France)

12406-12 • 2:00 PM - 2:15 PM

Stimulated time-domain raman spectroscopy inside a femtosecond laser cavity

Author(s): Georg Herink, Alexandra Völkel, Timo Wirth, Univ. Bayreuth (Germany)

12406-13 • 2:15 PM - 2:35 PM

Singleshot and high-sensitivity detection of terahertz waveforms using phase-offset electro-optic sampling and an echelon mirror *(Invited Paper)*

Author(s): Ikufumi Katayama, Yokohama National Univ. (Japan); Ryo Tamaki, Kanagawa Institute of Industrial Science and Technology (Japan), Yokohama National Univ. (Japan)

12406-14 • 2:35 PM - 2:50 PM

Single-shot recording of complex THz pulses with high bandwidth, using time-stretch and Diversity Electro-Optic Sampling

Author(s): Christelle Hanoun, Christophe Szawaj, Eléonore Roussel, Serge Bielawski, Lab. de Physique des Lasers, Atomes et Molécules (France); Pavel Evtushenko, Helmholtz-Zentrum Dresden-Rossendorf e. V. (Germany); Christof Schneider, Anton Ryzhov, Michael Kunzsch, Sergey Kovalev, ELBE (Germany)

12406-15 • 2:50 PM - 3:10 PM

Experimental demonstration of time lens photon Doppler velocimetry (TL-PDV) *(Invited Paper)*

Author(s): Velat Kilic, Johns Hopkins Univ. (United States); Christopher S. DiMarco, Jacob Diamond, Hopkins Extreme Materials Institute, Johns Hopkins Univ. (United States); Pighan Chu, Los Alamos National Lab. (United States); K. T. Ramesh, Hopkins Extreme Materials Institute, Johns Hopkins Univ. (United States); Zhehui Wang, Los Alamos National Lab. (United States); Mark A. Foster, Johns Hopkins Univ. (United States)

Coffee Break 3:10 PM - 3:40 PM

SESSION 4: REAL-TIME, ULTRAFAST AND SINGLE-SHOT METHODS II

1 February 2023 • 3:40 PM - 5:05 PM | Moscone Center, Room 205 (Level 2 South)

Session Chair: Moti Fridman, Bar-Ilan Univ. (Israel)

12406-17 • 3:40 PM - 4:00 PM

Advanced diagnostic detectors for rogue phenomena, single-shot applications *(Invited Paper)*

Author(s): Michele Caselle, Karlsruher Institut für Technologie (Germany); Serge Bielawski, Lab. de Physique des Lasers, Atomes et Molécules (France); Suren Chilingaryan, Karlsruher Institut für Technologie (Germany); Marie Kristin Czwilina, Deutsches Elektronen-Synchrotron (Germany); Timo Dritschler, Andreas Kopmann, Karlsruher Institut für Technologie (Germany); Ekaterina Kunakovskaya, Karlsruhe Institute of Technology (Germany); Olena Manzhura, Karlsruher Institut für Technologie (Germany); Stefan Funkner, Gudrun Niehues, Karlsruhe Institute of Technology (Germany); Meghana Patil, Karlsruher Institut für Technologie (Germany); Eleonore Roussel, Lab. de Physique des Lasers, Atomes et Molécules (France); Andrea Santamaria Garcia, Karlsruhe Institute of Technology (Germany); Luca Scomparin, Karlsruher Institut für Technologie (Germany); Bernd Steffen, Deutsches Elektronen-Synchrotron (Germany); Johannes Steinmann, Karlsruhe Institute of Technology (Germany); Christophe Szawaj, Lab. de Physique des Lasers, Atomes et Molécules (France); Erik Bründermann, Anke-Susanne Müller, Karlsruher Institut für Technologie (Germany); Ahmet Cagri Ulusoy, Karlsruhe Institute of Technology (Germany); Marc Weber, Karlsruher Institut für Technologie (Germany); Frank Simon, Karlsruhe Institute of Technology (Germany)

12406-18 • 4:00 PM - 4:15 PM

Progress towards multi-pass transmission electron microscopy

Author(s): Joshua L. Reynolds, Yonatan Israel, Adam J. Bowman, Brannon B. Klopfer, Mark A. Kasevich, Stanford Univ. (United States)

12406-19 • 4:15 PM - 4:35 PM

Flexible acousto-optically driven single-shot imaging *(Invited Paper)*

Author(s): Mohamed Touil, Saïd Idlahcen, Rezki Becheker, Denis Lebrun, Claude Rozé, Ammar Hideur, Thomas Godin, Univ. de Rouen Normandie (France)

12406-20 • 4:35 PM - 4:50 PM

single-shot, full-field, reference-free spatio-spectral characterization of ultrafast pulse-beams

Author(s): David Goldberger, Jonathan Barolak, Bojana Ivanic, Charles G. Durfee, Daniel E. Adams, Colorado School of Mines (United States)

12406-21 • 4:50 PM - 5:05 PM

High frame rate, phase and amplitude resolved imaging of single events using beam-sampling single-shot ptychography

Author(s): Jonathan Barolak, David Goldberger, Claudia Schrama, Charles Durfee, Daniel Adams, Colorado School of Mines (United States)

Laser Resonators, Microresonators, and Beam Control XXV

31 January - 1 February 2023 | Moscone Center, Room 204 (Level 2 South)

Conference Chairs: **Vladimir S. Ilchenko**, Jet Propulsion Lab. (United States); **Andrea M. Armani**, The Univ. of Southern California (United States); **Julia V. Sheldakova**, AKA Optics SAS (France)

Conference Co-Chair: **Alexis V. Kudryashov**, Institute of Geosphere Dynamics (Russian Federation)

Program Committee: **Lutz Aschke**, Mahr GmbH (Germany); **Paul E. Barclay**, Univ. of Calgary (Canada); **Victor Brasch**, CSEM SA (Switzerland); **David Burghoff**, Univ. of Notre Dame (United States); **Hui Cao**, Yale Univ. (United States); **Yanne K. Chembo**, Univ. of Maryland, College Park (United States); **Francesco Dell'Olio**, Politecnico di Bari (Italy); **Jean-Claude M. Diels**, The Univ. of New Mexico (United States); **Hans Joachim Eichler**, Technische Univ. Berlin (Germany); **Andrew Forbes**, Univ. of the Witwatersrand, Johannesburg (South Africa); **Pierre Galarneau**, INO (Canada); **Thomas Graf**, Univ. Stuttgart (Germany); **Qing Gu**, North Carolina State Univ. (United States); **Stefan Hambücker**, INGENERIC GmbH (Germany); **Tobias J. Kippenberg**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **James R. Leger**, Univ. of Minnesota, Twin Cities (United States); **Andrey B. Matsko**, Jet Propulsion Lab. (United States); **Gualtiero Nunzi Conti**, Istituto di Fisica Applicata "Nello Carrara" (Italy); **Michael J. Scaggs**, Haas Laser Technologies, Inc. (United States); **Harald G. L. Schwefel**, Univ. of Otago (New Zealand); **Haiyin Sun**, ChemImage Corp. (United States); **Hossein Taheri**, Univ. of California, Riverside (United States); **Lei Xu**, Fudan Univ. (China); **Jonathan M. Ward**, Okinawa Institute of Science and Technology Graduate Univ. (Japan)

MONDAY 30 JANUARY

LASE PLENARY AND HOT TOPICS

30 January 2023 • 3:45 PM - 6:05 PM | Moscone Center, Room 207/215 (Level 2 South)

3:45 PM - 3:50 PM: **Welcome and Opening Remarks**

Stefan Kaierle, Laser Zentrum Hannover e.V. (Germany) and John Ballato, Clemson Univ. (United States)

3:50 PM - 3:55 PM: **Announcement of the 3D Printing, Fabrication, and Manufacturing Best Paper Awards**

Henry Helvajian, The Aerospace Corp. (United States)

****Announcement of the LASE AI/ML Best Paper Award moved to 6:00 PM****

12408-500 • 4:00 PM - 4:30 PM

Status and potential of fully integrated photonic systems (*Plenary Presentation*)

Author(s): Arnan Mitchell, RMIT Univ. (Australia)

12412-601 • 4:30 PM - 4:45 PM

How laser AM can mitigate insecurities with supply chain issues and carbon footprint (*Plenary Presentation*)

Author(s): Eliana Fu, TRUMPF Inc. (United States)

12412-602 • 4:45 PM - 5:00 PM

Innovations in lidar driving the next generation of autonomy and safety (Hot Topic) (*Plenary Presentation*)

Author(s): Jason M. Eichenholz, Luminar Technologies, Inc. (United States)

12407-603 • 5:00 PM - 5:15 PM

Quantum computing with lasers (Hot Topic) (*Plenary Presentation*)

Author(s): Jürgen Stuhler, TOPTICA Photonics AG (Germany)

12401-501 • 5:15 PM - 5:45 PM

First demonstration of fusion ignition by inertial confinement fusion (ICF) at the National Ignition Facility (NIF) at LLNL (*Plenary Presentation*)

Author(s): Jean-Michel G. Di Nicola, Lawrence Livermore National Lab. (United States)

TUESDAY 31 JANUARY

SESSION 1: NONLINEAR EFFECTS IN MICRORESONATORS

31 January 2023 • 8:00 AM - 10:10 AM | Moscone Center, Room 204 (Level 2 South)

Session Chair: Vladimir S. Ilchenko, Jet Propulsion Lab. (United States)

12407-2 • 8:00 AM - 8:30 AM

Novel phenomena via strong-coupling with unconventional cavities (*Invited Paper*)

Author(s): Chulwon Lee, Long Zhang, Nathan Lydick, Kai Sun, Hui Deng, Univ. of Michigan (United States)

12407-3 • 8:30 AM - 9:00 AM

Anomalous resonance shifts, distance calibration, and lasing in WGM resonators (*Invited Paper*)

Author(s): Farhan Azeem, Josh Christensen, Luke S. Trainor, Nicholas Lambert, Dmitry Strekalov, Harald G. L. Schwefel, Univ. of Otago (New Zealand)

12407-4 • 9:00 AM - 9:20 AM

Enhancing and tailoring light-matter interaction in the near-infrared by all-dielectric metasurfaces supporting silicon-slot quasi-bound state in the continuum modes

Author(s): José F. Algorri, Univ. de Cantabria (Spain); Dimitrios C. Zografopoulos, Istituto per la Microelettronica e Microsistemi, CNR (Italy); Yunhong Ding, SiPhotonics ApS (Denmark); Victor Dmitriev, Univ. Federal do Pará (Brazil); José M. López-Higuera, Univ. de Cantabria (Spain); José M. Sánchez-Pena, Univ. Carlos III de Madrid (Spain); Lucio C. Andreani, Matteo Galli, Univ. degli Studi di Pavia (Italy); Francesco Dell'Olio, Politecnico di Bari (Italy)

12407-8 • 9:20 AM - 9:40 AM

Combining bulk resonators and integrated silicon photonics based on metamaterial engineering

Author(s): Daniele Farnesi, Stefano Pelli, Silvia Soria, Gualtiero Nunzi Conti, Istituto di Fisica Applicata "Nello Carrara" (Italy); Xavier Le Roux, Miguel Montesinos Ballester, Laurent Vivien, Ctr. de Nanosciences et de Nanotechnologies (France); Pavel Cheben, National Research Council Canada (Canada); Carlos Alonso Ramos, Ctr. de Nanosciences et de Nanotechnologies (France)

12407-1 • 9:40 AM - 10:10 AM

Sub-megahertz optical features using a resonator-free twisted Brillouin gain medium *(Invited Paper)*

Author(s): Neel Choksi, Yi Liu, Rojina Ghasemi, Li Qian, Univ. of Toronto (Canada)

Coffee Break 10:10 AM - 10:40 AM

SESSION 2: MICRORESONATORS: NOVEL FABRICATION METHODS

31 January 2023 • 10:40 AM - 11:50 AM | Moscone Center, Room 204 (Level 2 South)

Session Chair: Andrey B. Matsko, Jet Propulsion Lab. (United States)

12407-5 • 10:40 AM - 11:10 AM

High-precision single-mode microdisk laser particle arrays by controlled photoelectrochemical tuning over wide spectral range *(Invited Paper)*

Author(s): Debarghya Sarkar, Nicola Martino, Kwon-Hyeon Kim, Seok-Hyun Yun, Massachusetts General Hospital, Harvard Univ. (United States)

12407-6 • 11:10 AM - 11:30 AM

Ultra-high-Q-factor racetrack resonators on thick SOI platform through sidewall roughness improvement by hydrogen annealing

Author(s): Yisbel Marin, Arijit Bera, Matteo Cherchi, Timo Aalto, VTT Technical Research Ctr. of Finland Ltd. (Finland)

12407-7 • 11:30 AM - 11:50 AM

Subtractive processing of thick silicon nitride waveguide resonators: a comparison of soft and hard etch templates

Author(s): Gabriel Colacion, Lala Rukh, Tara E. Drake, The Univ. of New Mexico (United States)

Lunch/Exhibition Break 11:50 AM - 2:00 PM

SESSION 3: SENSING WITH MICROCAVITIES

31 January 2023 • 2:00 PM - 3:30 PM | Moscone Center, Room 204 (Level 2 South)

Session Chair: Sajjad Abdollahramezani, Stanford Univ. (United States)

12407-9 • 2:00 PM - 2:30 PM

Towards picometer precise fabrication of microresonators and resonant photonic circuits: the potential of the SNAP platform *(Invited Paper)*

Author(s): Misha Sumetsky, Aston Univ. (United Kingdom)

12407-10 • 2:30 PM - 2:50 PM

Metallic nanostructure arrays based high-Q optical cavity sensor for biomedical applications

Author(s): Seunghun Lee, Hyerin Song, Heesang Ahn, Kyujung Kim, Pusan National Univ. (Republic of Korea)

12407-11 • 2:50 PM - 3:10 PM

Sensing with WGM microlasers and high sensitivity 2D dispersion spectrometer

Author(s): Xuwen Zhou, Giuliano Scarcelli, Univ. of Maryland, College Park (United States)

12407-12 • 3:10 PM - 3:30 PM

Translation and reconfiguration of SNAP microresonators using optofluidics

Author(s): Gabriella I. Gardosi, Misha Sumetsky, Aston Univ. (United Kingdom)

Coffee Break 3:30 PM - 4:00 PM

SESSION 4: MICROCOMBS AND MICROCAVITY SOLITONS I

31 January 2023 • 4:00 PM - 5:10 PM | Moscone Center, Room 204 (Level 2 South)

Session Chair: Andrea M. Armani, The Univ. of Southern California (United States)

12407-13 • 4:00 PM - 4:30 PM

Two-dimensional frequency comb from cascaded nonlinear mixing of a multi-color soliton in an integrated microresonator *(Invited Paper)*

Author(s): Gregory Moille, Univ. of Maryland, College Park (United States); Pradyoth Shandilya, Univ. of Maryland (United States); Curtis R. Menyuk, Univ. of Maryland, Baltimore County (United States); Avik Dutt, Yanne K. Chembo, Univ. of Maryland, College Park (United States); Kartik Srinivasan, National Institute of Standards and Technology (United States)

12407-15 • 4:30 PM - 4:50 PM

Interwoven multi-color solitons from their elastic collision in an integrated microring resonator

Author(s): Gregory Moille, Univ. of Maryland, College Park (United States); Curtis R. Menyuk, Univ. of Maryland, Baltimore County (United States); Kartik Srinivasan, National Institute of Standards and Technology (United States)

12407-17 • 4:50 PM - 5:10 PM

Low-noise hybrid integrated frequency-agile laser and soliton microcomb for FMCW LiDAR

Author(s): Andrey S. Voloshin, Institute of Physics, Ecole Polytechnique Fédérale de Lausanne (Switzerland), DEEPLIGHT SA (Switzerland); Grigory Lihachev, Andrea Bancora, Institute of Physics, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Johann Riemensberger, Institute of Physics, Ecole Polytechnique Fédérale de Lausanne (Switzerland), DEEPLIGHT SA (Switzerland); Vladimir Shadymov, Institute of Physics, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Hao Tian, Purdue Univ. (United States); Rui Ning Wang, Institute of Physics, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Sunil Bhave, Purdue Univ. (United States); Tobias Kippenberg, Institute of Physics (Switzerland)

POSTERS-TUESDAY

31 January 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the LASE poster Session on Tuesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

Conference 12407

12407-28

Active control of focus position of laser beams using thermally induced lensing

Author(s): Lebohang T. Bell, Chemist Mabena, Darryl Naidoo, CSIR National Laser Ctr. (South Africa)

WEDNESDAY 1 FEBRUARY

SESSION 5: MICROCOMBS AND MICROCAVITY SOLITONS II

1 February 2023 • 8:30 AM - 9:40 AM | Moscone Center, Room 204 (Level 2 South)

Session Chair: Daniele Farnesi, Istituto di Fisica Applicata "Nello Carrara" (Italy)

12407-18 • 8:30 AM - 9:00 AM

Bistable solitons in third-harmonic generation frequency combs (*Invited Paper*)

Author(s): Tobias Hansson, Linköping Univ. (Sweden), Sapienza Univ. di Roma (Italy); Pedro Parra-Rivas, Stefan Wabnitz, Sapienza Univ. di Roma (Italy)

12407-19 • 9:00 AM - 9:20 AM

Synchronization of microresonator frequency combs in chaotic regime

Author(s): David Moreno Gallego de la Sacristana, Keio Univ. (Japan), Univ. Politècnica de València (Spain); Shun Fujii, Keio Univ. (Japan), RIKEN Ctr. for Advanced Photonics (Japan); Ayata Nakashima, Keio Univ. (Japan); Atsushi Uchida, Saitama Univ. (Japan); Pablo Sanchis, Ctr. de Tecnología Nanofotónica de Valencia, Univ. Politècnica de València (Spain); Takasumi Tanabe, Keio Univ. (Japan)

12407-20 • 9:20 AM - 9:40 AM

Parametrically excited frequency combs in a bottle microresonator: the effect of spatial distribution of modulation

Author(s): Manuel Crespo-Ballesteros, Aston Univ. (United Kingdom); Andrey B. Matsko, Jet Propulsion Lab. (United States); Misha Sumetsky, Aston Univ. (United Kingdom)

12407-21 • 9:40 AM - 10:10 AM

CANCELED: Disordered and ordered microlasers (*Invited Paper*)

Author(s): Neda Ghofraniha, Consiglio Nazionale delle Ricerche (Italy)

DISCUSSION ON HOW TO BECOME INVOLVED IN SPIE CONFERENCES

1 February 2023 • 9:40 AM - 10:15 AM | Moscone Center, Room 204 (Level 2 South)

In this discussion, conference chairs Vladimir Itchenko and Andrea Armani will review different ways that early career researchers can be involved in SPIE conferences, from technical Session chairing to joining program committees. They will also discuss career development opportunities unique to SPIE and the role of SPIE in their own careers.

Coffee Break 10:15 AM - 10:40 AM

SESSION 6: MICROCOMBS, CAVITIES, AND LASERS

1 February 2023 • 10:40 AM - 11:50 AM | Moscone Center, Room 204 (Level 2 South)

12407-22 • 10:40 AM - 11:10 AM

Stable Kerr frequency combs excited in the vicinity of strong modal dispersion disruptions (*Invited Paper*)

Author(s): Hossein Taheri, Univ. of California, Riverside (United States); Anatoliy Savchenkov, Univ. of California, Riverside (United States), Jet Propulsion Lab. (United States); Andrey B. Matsko, Jet Propulsion Lab. (United States), Caltech (United States)

12407-23 • 11:10 AM - 11:30 AM

On the phase noise of microwaves generated with Kerr optical frequency combs

Author(s): Fengyu Liu, Yanne K. Chembo, Institute for Research in Electronics & Applied Physics (United States)

12407-24 • 11:30 AM - 11:50 AM

Compact optical cavity for Yb ion clock

Author(s): Wei Zhang, Thanh Le, Thai Hoang, Mehdi Langlois, Nan Yu, Andrey Matsko, Jet Propulsion Lab. (United States)

Lunch/Exhibition Break 11:50 AM - 1:30 PM

SESSION 7: BEAM SHAPING AND BEAM CONTROL I

1 February 2023 • 1:30 PM - 2:40 PM | Moscone Center, Room 204 (Level 2 South)

Session Chair: Michael J. Scaggs, Haas Laser Technologies, Inc. (United States)

12407-25 • 1:30 PM - 2:00 PM

Novel metrics for vector beams (*Invited Paper*)

Author(s): Valeria Rodríguez-Fajardo, Colgate Univ. (United States); Andrea Aiello, Max-Planck-Institut für die Physik des Lichts (Germany); Benjamin Perez-Garcia, Tecnológico de Monterrey (Mexico); Geminiano Martínez-Ponce, Centro de Investigaciones en Óptica, A.C. (Mexico); Andrew Forbes, Univ. of the Witwatersrand, Johannesburg (South Africa); Carmelo Rosales-Guzmán, Centro de Investigaciones en Óptica, A.C. (Mexico)

12407-26 • 2:00 PM - 2:20 PM

Comparison of wavefront sensorless optimization system for high power lasers

Author(s): Tommaso Furi, Univ. degli Studi di Padova (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy); Stefano Bonora, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Ondra Denk, HiLASE Ctr., Institute of Physics of the CAS, v.v.i. (Czech Republic), Czech Technical Univ. in Prague (Czech Republic); Jan Pilar, HiLASE Ctr., Institute of Physics of the CAS, v.v.i. (Czech Republic)

12407-29 • 2:20 PM - 2:40 PM

Phase mirror for resonant mode shaping

Author(s): Oussama Mhibik, Lam Mach, Leonid Glebov, Ivan Divliansky, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

Coffee Break 2:40 PM - 3:10 PM

SESSION 8: BEAM SHAPING AND BEAM CONTROL II

1 February 2023 • 3:10 PM - 4:40 PM | Moscone Center, Room 204 (Level 2 South)

Session Chair: Hossein Taheri, Univ. of California, Riverside (United States)

12407-30 • 3:10 PM - 3:40 PM

Robust transport of light through noisy channels without adaptive control *(Invited Paper)*

Author(s): Andrew Forbes, Isaac M. Nape, Univ. of the Witwatersrand, Johannesburg (South Africa)

12407-31 • 3:40 PM - 4:00 PM

Novel full beam caustic M-squared measurement system with more efficient use of sensor area

Author(s): Michael J. Scaggs, Gilbert Haas, Haas Laser Technologies, Inc. (United States)

12407-32 • 4:00 PM - 4:20 PM

Beam shaping system for laser-induced crystal growth

Author(s): Florian Rackerseder, Martin Traub, Fraunhofer-Institut für Lasertechnik ILT (Germany); Toshimitsu Ito, National Institute of Advanced Industrial Science and Technology (Japan); Thomas Westphalen, Hans-Dieter Hoffmann, Fraunhofer-Institut für Lasertechnik ILT (Germany)

12407-33 • 4:20 PM - 4:40 PM

Spatial beam self-cleaning in multimode fibers: the role of light polarization

Author(s): Mario Ferraro, Fabio Mangini, Raphael Jauberteau, Mario Zitelli, Yifan Sun, Pedro Parra-Rivas, Sapienza Univ. di Roma (Italy); Katarzyna Krupa, Polish Academy of Sciences (Poland); Alessandro Tonello, Vincent Couderc, Univ. de Limoges (France); Stefan Wabnitz, Sapienza Univ. di Roma (Italy)

Laser Applications in Microelectronic and Optoelectronic Manufacturing (LAMOM) XXVIII

30 January - 1 February 2023 | Moscone Center, Room 210 (Level 2 South)

Conference Chairs: **Aiko Narazaki**, National Institute of Advanced Industrial Science and Technology (Japan); **Laura Gemini**, ALPhANOV (France); **Jan Kleinert**, ESI, Inc. (United States)

Program Committee: **Craig B. Arnold**, Princeton Univ. (United States); **Martynas Beresna**, Univ. of Southampton (United Kingdom); **Costas P. Grigoropoulos**, Univ. of California, Berkeley (United States); **Bo Gu**, Bos Photonics (United States); **Guido Hennig**, Daetwyler Graphics AG (Switzerland); **Hiroshi Ikenoue**, Kyushu Univ. (Japan); **Yusuke Ito**, The Univ. of Tokyo (Japan); **Tetsuya Makimura**, Univ. of Tsukuba (Japan); **Inka B. Manek-Hönniger**, Ctr. Lasers Intenses et Applications (France); **Carlos Molpeceres**, Univ. Politécnica de Madrid (Spain); **Miguel Morales**, Univ. Politécnica de Madrid (Spain); **Yoshiki Nakata**, Osaka Univ. (Japan); **Beat Neuenschwander**, Berner Fachhochschule Technik und Informatik (Switzerland); **Alberto Piqué**, U.S. Naval Research Lab. (United States); **Jie Qiao**, Rochester Institute of Technology (United States); **Gediminas Raciukaitis**, Ctr. for Physical Sciences and Technology (Lithuania); **Stephan Roth**, BLZ Bayerisches Laserzentrum GmbH (Germany); **Koji Sugioka**, RIKEN Ctr. for Advanced Photonics (Japan); **Mitsuhiro Terakawa**, Keio Univ. (Japan); **Onur Tokel**, Bilkent Univ. (Turkey); **Xianfan Xu**, Purdue Univ. (United States)

MONDAY 30 JANUARY

SESSION 1: AI FOR LASER PROCESSING

30 January 2023 • 8:30 AM - 10:10 AM | Moscone Center, Room 210 (Level 2 South)

Session Chair: Aiko Narazaki, National Institute of Advanced Industrial Science and Technology (Japan)

12408-1 • 8:30 AM - 9:00 AM

Deep-learning-based simulator for femtosecond laser micro-machining (*Invited Paper*)

Author(s): Shuntaro Tani, Yohei Kobayashi, The Institute for Solid State Physics (Japan)

12408-2 • 9:00 AM - 9:20 AM

Advanced USP laser process with deep learning and triangular beam shaping for micro Fresnel lenses fabrication

Author(s): Alexandre Miazek, Julien Dupuy, Multitel A.S.B.L. (Belgium); Ivan Gusachenko, Gwenn Pallier, CAILabs (France); Yves Hernandez, Multitel A.S.B.L. (Belgium)

12408-3 • 9:20 AM - 9:40 AM

Optimization of laser spacing in dual-laser powder bed fusion using machine learning

Author(s): Yang Du, Craig Arnold, Princeton Univ. (United States)

12408-4 • 9:40 AM - 10:10 AM

Advanced laser processing and its optimization with machine learning (*Invited Paper*)

Author(s): Andreas Michalowski, Institut für Strahlwerkzeuge, Univ. Stuttgart (Germany); Alexander Ilin, Alexander Kroschel, Stephanie Karg, Peter Stritt, Adina Dais, Sebastian Becker, Gerhard Kunz, Steffen Sonntag, Robert Bosch GmbH (Germany); Martin Lustfeld, Bosch (China) Investment Ltd. (China); Petru Tighineanu, Robert Bosch GmbH (Germany); Volkher Onuseit, Michael Haas, Institut für Strahlwerkzeuge (Germany); Thomas Graf, Univ. Stuttgart (Germany); Heiko Ridderbusch, Scintilla AG (Switzerland)

Coffee Break 10:10 AM - 10:40 AM

SESSION 2: MODELING AND OBSERVATION OF LASER-MATERIAL INTERACTION

30 January 2023 • 10:40 AM - 11:50 AM | Moscone Center, Room 210 (Level 2 South)

Session Chair: Mitsuhiro Terakawa, Keio Univ. (Japan)

12408-5 • 10:40 AM - 11:10 AM

Propagation and energy transfer of intense and ultrashort laser pulse in solids: first-principles computational approach (*Invited Paper*)

Author(s): Kazuhiro Yabana, Univ. of Tsukuba (Japan)

12408-7 • 11:10 AM - 11:30 AM

Picosecond laser shock micro-forming of stainless steel

Author(s): Miguel Morales, José Manuel López, David Munoz-Martin, Juan José Moreno-Labela, Miguel Panizo-Laiz, Univ. Politécnica de Madrid (Spain); Gilberto Gomez-Rosas, Univ. de Guadalajara (Mexico); Carlos Molpeceres, Univ. Politécnica de Madrid (Spain)

12408-8 • 11:30 AM - 11:50 AM

Observation of melt pool dynamics in pure copper welding with blue-IR hybrid laser

Author(s): Shumpei Fujio, Mao Sudo, Keisuke Takenaka, Yuji Sato, Masahiro Tsukamoto, Osaka Univ. (Japan)

Lunch Break 11:50 AM - 1:30 PM

SESSION 3: LASER DIRECT WRITING

30 January 2023 • 1:30 PM - 3:00 PM | Moscone Center, Room 210 (Level 2 South)

Session Chair: Laura Gemini, ALPhANOV (France)

12408-9 • 1:30 PM - 2:00 PM

Laser direct writing in diamond for quantum technology (*Invited Paper*)

Author(s): Patrick S. Salter, Univ. of Oxford (United Kingdom)

12408-10 • 2:00 PM - 2:20 PM

Fabrication of biodegradable triboelectric nanogenerator by laser-induced graphitization of lignin/PLLA composite sheets

Author(s): Rei Funayama, Shuichiro Hayashi, Mitsuhiro Terakawa, Keio Univ. (Japan)

12408-11 • 2:20 PM - 2:40 PM

Low-cost fiber Bragg grating interrogation with a femtosecond laser written scattering chip

Author(s): Przemyslaw L. Falak, Qi Sun, Univ. of Southampton (United Kingdom); Tom Vettenburg, University of Dundee (United Kingdom); Timothy Lee, Univ. of Southampton (United Kingdom); David B. Phillips, University of Exeter (United Kingdom); Gilberto Brambilla, Martynas Beresna, Univ. of Southampton (United Kingdom)

12408-12 • 2:40 PM - 3:00 PM

Mid-IR waveguides and beamsplitters inside IG2 by ultrafast laser inscription for astrophotonics

Author(s): Wendwesen Gebremichael, Derek Oliwa, Rochester Institute of Technology (United States); Wei Hu, Christophe Dorrer, Aktiwave LLC (United States); Jie Qiao, Rochester Institute of Technology (United States), Aktiwave LLC (United States)

Coffee Break 3:00 PM - 3:45 PM**LASE PLENARY AND HOT TOPICS**

30 January 2023 • 3:45 PM - 6:05 PM | Moscone Center, Room 207/215 (Level 2 South)

3:45 PM - 3:50 PM: Welcome and Opening Remarks

Stefan Kaierle, Laser Zentrum Hannover e.V. (Germany) and John Ballato, Clemson Univ. (United States)

3:50 PM - 3:55 PM: Announcement of the 3D Printing, Fabrication, and Manufacturing Best Paper Awards

Henry Helvajian, The Aerospace Corp. (United States)

****Announcement of the LASE AI/ML Best Paper Award moved to 6:00 PM****

12408-500 • 4:00 PM - 4:30 PM

Status and potential of fully integrated photonic systems (Plenary Presentation)

Author(s): Arnan Mitchell, RMIT Univ. (Australia)

12412-601 • 4:30 PM - 4:45 PM

How laser AM can mitigate insecurities with supply chain issues and carbon footprint (Plenary Presentation)

Author(s): Eliana Fu, TRUMPF Inc. (United States)

12412-602 • 4:45 PM - 5:00 PM

Innovations in lidar driving the next generation of autonomy and safety (Hot Topic) (Plenary Presentation)

Author(s): Jason M. Eichenholz, Luminar Technologies, Inc. (United States)

12407-603 • 5:00 PM - 5:15 PM

Quantum computing with lasers (Hot Topic) (Plenary Presentation)

Author(s): Jürgen Stuhler, TOPTICA Photonics AG (Germany)

12401-501 • 5:15 PM - 5:45 PM

First demonstration of fusion ignition by inertial confinement fusion (ICF) at the National Ignition Facility (NIF) at LLNL (Plenary Presentation)

Author(s): Jean-Michel G. Di Nicola, Lawrence Livermore National Lab. (United States)

TUESDAY 31 JANUARY**SESSION 4: ADVANCED SYSTEMS
FOR MATERIALS PROCESSING**

31 January 2023 • 8:10 AM - 10:00 AM | Moscone Center, Room 210 (Level 2 South)

Session Chair: Jan Kleinert, ESI, Inc. (United States)

12408-13 • 8:10 AM - 8:40 AM

Multi-dimensional optical data writing techniques for cloud-scale archival storage (Invited Paper)

Author(s): Patrick Anderson, Erika Aranas, Richard Black, Stefano Bucciarelli, Marco Caballero, Pashmina Cameron, Burcu Canakci, Andromachi Chatzieleftheriou, James Clegg, Daniel Cletheroe, Bridgette Cooper, Tim Deegan, Austin Donnelly, Rokas Drevinskas, Christos Gkantsidis, Ariel Gomez Diaz, Istvan Haller, Philip Heard, Teodora Ilieva, Russell Joyce, Sergey Legtchenko, Bruno Magalhaes, Aaron Ogus, Ant Rowstron, Masaaki Sakakura, Nina Schreiner, Adam Smith, Ioan Stefanovici, David Sweeney, Microsoft Research Ltd. (United Kingdom); Phil Wainman, Microsoft Research Ltd. (United Kingdom); Charles Whittaker, Hugh Williams, Thomas Winkler, Stefan Winzeck, Microsoft Research Ltd. (United Kingdom)

12408-14 • 8:40 AM - 9:00 AM

Laser-fabrication of length-controlled sub-micrometer periodic structures in the bulk of fused silica

Author(s): Srijoyee Datta, Raphaël Clady, Olivier Utéza, Nicolas Sanner, Aix-Marseille Univ. (France)

12408-15 • 9:00 AM - 9:20 AM

Laser micro-drilling of glass materials with high-speed laser modulation and real-time monitoring toward data-driven laser processing

Author(s): Aiko Narazaki, Dai Yashitomi, Hideyuki Takada, National Institute of Advanced Industrial Science and Technology (Japan)

12408-16 • 9:20 AM - 9:40 AM

Femtosecond GHz-burst laser processing for percussion drilling applications

Author(s): Inka B. Manek-Hönniger, Pierre Balage, John Lopez, Ctr. Lasers Intenses et Applications (France); Guillaume Bonamis, Clemens Hönniger, Amplitude (France)

12408-17 • 9:40 AM - 10:00 AM

Advanced high-resolution cylinder structuring with parallel Bessel beams under use of UV femtosecond laser radiation

Author(s): Martin Osbild, Fraunhofer-Institut für Lasertechnik ILT (Germany); Stephan Brüning, Schepers GmbH & Co., KG (Germany); Elisabeth-Annemarie Gerhorst, RWTH Aachen University (Germany); Saltuk Savran, Aiken van Waveren, Fraunhofer-Institut für Lasertechnik ILT (Germany)

Coffee Break 10:00 AM - 10:30 AM

Conference 12408

TUESDAY 31 JANUARY

SESSION 5: LASER NANOSTRUCTURING

31 January 2023 • 10:30 AM - 12:00 PM | Moscone Center, Room 210 (Level 2 South)

Session Chair: Miguel Morales, Univ. Politécnica de Madrid (Spain)

12408-18 • 10:30 AM - 11:00 AM

Ultrafast nanostructuring utilizing interference techniques and plasmonic effects (*Invited Paper*)

Author(s): Jürgen Ihlemann, Jens Oltmanns, Frederick Kleinwort, Jan-Hendrik Klein-Wiele, Peter Simon, Institut für Nanophotonik Göttingen e.V. (Germany)

12408-19 • 11:00 AM - 11:20 AM

Surface functionalisation of transparent materials: high-throughputs meet high resolutions

Author(s): Laura Gemini, Aurelien Sikora, Laura Loi, Girolamo Mincuzzi, Marc Faucon, Rainer Kling, ALPhANOV (France)

12408-20 • 11:20 AM - 11:40 AM

Novel surface nanostructuring by femtosecond laser with GHz burst mode

Author(s): Shota Kawabata, RIKEN Ctr. for Advanced Photonics (Japan), Tokyo Univ. of Agriculture and Technology (Japan); Kotaro Obata, RIKEN Ctr. for Advanced Photonics (Japan); Godai Miyaji, Tokyo Univ. of Agriculture and Technology (Japan); Koji Sugioka, RIKEN Ctr. for Advanced Photonics (Japan)

12408-21 • 11:40 AM - 12:00 PM

Refractive index and birefringence studies of laser-written structures buried inside silicon

Author(s): Alperen Saltik, Rana Asgari Sabet, Onur Tokel, National Nanotechnology Research Ctr., Bilkent Univ. (Turkey)

Lunch/Exhibition Break 12:00 PM - 2:00 PM

SESSION 6: INDUSTRIAL LASER GLASS PROCESSING

31 January 2023 • 2:00 PM - 3:50 PM | Moscone Center, Room 210 (Level 2 South)

Session Chair: Beat Neuenschwander, Berner Fachhochschule Technik und Informatik (Switzerland)

12408-22 • 2:00 PM - 2:30 PM

Analysis and mitigation of stress induced by rapid formation of through glass vias in thin substrates (*Invited Paper*)

Author(s): Hisashi Matsumoto, Zhibin Lin, Joel N. Schrauben, Jan Kleinert, MKS Instruments, Inc. (United States)

12408-23 • 2:30 PM - 2:50 PM

Cutting high index of refraction glass with picosecond lasers for AR eyewear

Author(s): Terence Hollister, James M. Bovatsek, Spectra-Physics, a division of MKS Instruments (United States)

12408-24 • 2:50 PM - 3:10 PM

Laser dicing of glass wafer products into sub-millimeter sized dies

Author(s): Jason R. Grenier, Corning Research & Development Corporation (United States); Elisabeth Rosier, Corning Laser Technologies GmbH (Germany); Andreas Gaab, Corning Incorporated (United States); Nicolai Hänel, Corning Laser Technologies GmbH (Germany)

12408-25 • 3:10 PM - 3:30 PM

Stress control during ultrashort pulses laser for glass machining

Author(s): Hyungsik Kim, Konstantin Mishchik, SAMSUNG Display Co., Ltd. (Republic of Korea); Woohyun Jung, Alexander Voronov, Jeongho Kim, Junghwa You, Seunghoon Jang, Sunggyu Park, Kyunghan Yoo, JEKIL RYU, SeongHo Jeong, CHEOLLAE ROH, SAMSUNG Display Co. (Republic of Korea)

12408-26 • 3:30 PM - 3:50 PM

Tailored-edge laser glass cleaving supported by thermal separation

Author(s): Myriam Kaiser, Max Kahmann, Jonas Kleiner, Daniel Flamm, TRUMPF Laser- und Systemtechnik GmbH (Germany)

Coffee Break 3:50 PM - 4:20 PM

SESSION 7: LASER ADDITIVE MANUFACTURING AND LIFT

31 January 2023 • 4:20 PM - 5:50 PM | Moscone Center, Room 210 (Level 2 South)

Session Chair: Godai Miyaji, Tokyo Univ. of Agriculture and Technology (Japan)

12408-27 • 4:20 PM - 4:50 PM

Rapid, continuous projection multi-photon 3D printing enabled by spatiotemporal focusing of femtosecond pulses (*Invited Paper*)

Author(s): Xianfan Xu, Purdue Univ. (United States)

12408-28 • 4:50 PM - 5:10 PM

Metallic microdots patterning with laser-induced forward transfer

Author(s): Haruki Kawaguchi, Kanta Takahashi, Rong Wei, Chiba Univ. (Japan); Keisaku Yamane, Ryuji Morita, Hokkaido Univ. (Japan); Ken-ichi Yuyama, Osaka Metropolitan Univ. (Japan); Satoyuki Kawano, Osaka Univ. (Japan); Katsuhiko Miyamoto, Nobuyuki Aoki, Takashige Omatsu, Chiba Univ. (Japan)

12408-29 • 5:10 PM - 5:30 PM

Pulse energy dependence of free-form pure proteinaceous line fabrication by femtosecond laser direct write

Author(s): Daniela Serien, National Institute of Advanced Industrial Science and Technology (Japan); Koji Sugioka, RIKEN Ctr. for Advanced Photonics (Japan); Aiko Narazaki, National Institute of Advanced Industrial Science and Technology (Japan)

12408-30 • 5:30 PM - 5:50 PM

2D and 3D microfabrication of thermoset polymer PDMS using laser-induced bubble (microFLIB)

Author(s): Yoichi Toba, Yasutaka Hanada, Hiroaki Univ. (Japan)

POSTERS-TUESDAY

31 January 2023 • 6:00 PM - 8:00 PM |
Moscone Center, Level 2 West

Conference attendees are invited to attend the LASE poster Session on Tuesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12408-44

Nanosecond time-resolved two-dimensional temperature estimation of nanosecond laser-irradiated silicon

Author(s): Reiji Koike, Toshifumi Kikuchi, Keita Katayama, Yoshiaki Kakimoto, Daisuke Nakamura, Hiroshi Ikenoue, Kyushu Univ. (Japan)

12408-45

Effect of polarization angle on laser-induced periodic surface structures by a two-color double-pulse femtosecond beam irradiation

Author(s): Kosei Yamamoto, Osaka Univ. (Japan); Keisuke Takenaka, Yuji Sato, Joining and Welding Research Institute, Osaka Univ. (Japan); Masaki Hashida, Research Institute of Science and Technology, Tokai Univ. (Japan), Institute for Chemical Research, Kyoto Univ. (Japan); Hitoshi Sakagami, National Institute for Fusion Science (Japan); Satoru Iwamori, Research Institute of Science and Technology, Tokai Univ. (Japan); Masahiro Tsukamoto, Joining and Welding Research Institute, Osaka Univ. (Japan)

12408-46

Observation of welding behavior for elucidation of spatter suppression mechanism in laser welding using a 16 kW disk laser

Author(s): Yoshiaki Kurita, Osaka Univ. (Japan); Tomoki Arita, Kindai Univ. (Japan); Masami Mizutani, Yuji Sato, Joining and Welding Research Institute, Osaka Univ. (Japan); Hitoshi Nakano, Kindai Univ. (Japan); Masahiro Tsukamoto, Joining and Welding Research Institute, Osaka Univ. (Japan)

12408-47

Excimer laser doping for the fabrication of 4H-SiC power devices

Author(s): Yoshiaki Kakimoto, Keita Katayama, Takuma Yasunami, Kyushu Univ. (Japan); Tetsuya Goto, Tohoku Univ. (Japan); Daisuke Nakamura, Hiroshi Ikenoue, Kyushu Univ. (Japan)

12408-48

Fundamental characteristics of microFLIB (microFabrication using Laser-Induced Bubble) to the thermoset polymer PDMS and its biochip applications

Author(s): Yoichi Toba, Hirosaki Univ. (Japan)

12408-49

Parameter study of laser-induced dot transfer technique using interference pattern

Author(s): Shohei Ueda, Hiroyuki Shiraga, Noriaki Miyana, Yoshiaki Nakata, Osaka Univ. (Japan); Hendrik Jäckel, Georg-August-Univ. Göttingen (Germany)

12408-50

In-process monitoring of femtosecond laser-induced periodic nanostructures on glass by using anti-reflective property

Author(s): Daisuke Nagai, Tokyo Univ. of Agriculture and Technology (Japan); Hideyuki Takada, Aiko Narazaki, National Institute of Advanced Industrial Science and Technology (Japan); Godai Miyaji, Tokyo Univ. of Agriculture and Technology (Japan)

12408-51

EUV ablation of polydimethylsiloxane elastomer

Author(s): Kotaro Oguchi, Yuhao Wang, Tetsuya Makimura, Univ. of Tsukuba (Japan)

12408-52

Laser rework for mini-LED chips on flexible PCB for mini-LED backlighting LCD display

Author(s): Nam Seong Kim, Jae Joon Choi, Jong Jae Yoo, Young in Lee, Laserss Corp. (Republic of Korea); Kwan-Young Han, Byung-Chul Lee, Hyeon-Song Bang, Dankook Univ. (Republic of Korea); Woo Young Jung, Jong Soo Kang, Korea Automotive Technology Institute (Republic of Korea)

WEDNESDAY 1 FEBRUARY**SESSION 8: FRONTIERS IN LASER BEAM TECHNOLOGIES I**

1 February 2023 • 8:20 AM - 10:10 AM | Moscone Center, Room 210 (Level 2 South)

Session Chair: Yoshiki Nakata, Osaka Univ. (Japan)

12408-31 • 8:20 AM - 8:50 AM

Optical vortex laser materials processing technologies (Invited Paper)

Author(s): Takashige Omatsu, Chiba Univ. (Japan)

12408-32 • 8:50 AM - 9:10 AM

Creating efficient nano-gratings buried in silicon through laser nano-lithography

Author(s): Rana Asgari Sabet, Alperen Saltik, Onur Tokel, National Nanotechnology Research Ctr., Bilkent Univ. (Turkey)

12408-33 • 9:10 AM - 9:30 AM

Tribological properties improvement of stainless steel and nickel samples at large scale thanks to beam splitting with a femtosecond laser

Author(s): Mahmoud Ziat, CAILabs (France); Yoan Di Maio, Pauline Jullian, Julien Granier, Gregory Egaud, GIE Manutech-USD (France); Dmitry Nuzhdin, Ivan Gusachenko, Gwenn Pallier, CAILabs (France); Nicolas Compère, GIE Manutech-USD (France); Guillaume Labroille, CAILabs (France)

12408-34 • 9:30 AM - 9:50 AM

Ultrafast laser platform providing dynamic peak power and energy deposition control: from laser source to industrial applications

Author(s): Marc Sailer, Florian Jansen, Steffen Ruebling, Aleksander Budnicki, Axel Fehrenbacher, TRUMPF Laser GmbH (Germany)

12408-35 • 9:50 AM - 10:10 AM

Microstructuring in metals using a UV laser microspot scanning system

Author(s): Rose Mary, Stefan Remund, Berner Fachhochschule (Switzerland); Josef Zuercher, Bern University of Applied Sciences (Switzerland); Beat Neuenschwander, Berner Fachhochschule (Switzerland)

Conference 12408

Coffee Break 10:10 AM - 10:40 AM

SESSION 9: LASER SURFACE STRUCTURING

1 February 2023 • 10:40 AM - 12:00 PM | Moscone Center, Room 210 (Level 2 South)

Session Chair: Koji Sugioka, RIKEN Ctr. for Advanced Photonics (Japan)

12408-36 • 10:40 AM - 11:00 AM

Control on wavelength of surface plasmon polaritons on Si excited with an intense femtosecond laser pulse through SiO₂ film

Author(s): Yuto Iida, Raito Muto, Godai Miyaji, Tokyo Univ. of Agriculture and Technology (Japan)

12408-37 • 11:00 AM - 11:20 AM

Surface functionalisation of transparent materials by selective laser etching

Author(s): Quentin Broudisou, Laura Gemini, Marc Faucon, Rainer Kling, ALPhANOV (France)

12408-38 • 11:20 AM - 11:40 AM

Precision Figuring and Finishing of Glass Using Femtosecond Lasers

Author(s): Gong Chen, Jie Qiao, Rochester Institute of Technology (United States)

12408-39 • 11:40 AM - 12:00 PM

Fabrication of periodic microcapsule structures on silicone rubber by 193 nm ArF excimer laser

Author(s): Kaede Iwasaki, Tsuyoshi Yoshida, Masayuki Okoshi, National Defense Academy (Japan)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 10: THIN FILM, WAFER, AND PHOTOVOLTAIC, BATTERY PROCESSING

1 February 2023 • 1:30 PM - 3:00 PM | Moscone Center, Room 210 (Level 2 South)

Session Chair: Jie Qiao, Rochester Institute of Technology (United States)

12408-40 • 1:30 PM - 2:00 PM

Advances in laser processing for silicon solar cell production (*Invited Paper*)

Author(s): Andreas A. Brand, Fraunhofer-Institut für Solare Energiesysteme ISE (Germany)

12408-41 • 2:00 PM - 2:20 PM

Influence of wavelength and pulse duration on the selective laser ablation of WO_x, VO_x and MoO_x thin films

Author(s): Carlos Molpeceres, Miguel Morales, Cristina Munoz-Garcia, David Canteli, Sara Lauzurica, Univ. Politécnica de Madrid (Spain); Eloi Ros, Pablo Ortega, Juan Miguel López-González, Cristobal Voz, Univ. Politécnica de Catalunya (Spain)

12408-42 • 2:20 PM - 2:40 PM

A high-quality hydroxyapatite layer coated by droplets eliminated the pulsed-laser deposition scheme

Author(s): Hidehiko Yashiro, Masayuki Kakehata, National Institute of Advanced Industrial Science and Technology (Japan)

12408-43 • 2:40 PM - 3:00 PM

Laser structured electrodes for battery production

Author(s): Simon Walker, Marcel-David Zwahlen, Axel Fuerst, Beat Neuenschwander, Berner Fachhochschule Technik und Informatik (Switzerland)

Coffee Break 3:00 PM - 3:30 PM

SESSION 11: FRONTIERS IN LASER BEAM TECHNOLOGIES II

1 February 2023 • 3:30 PM - 4:10 PM | Moscone Center, Room 210 (Level 2 South)

Session Chair: Daniela Serien, National Institute of Advanced Industrial Science and Technology (Japan)

12408-53 • 3:30 PM - 3:50 PM

Radial scanning strategies leading to substantial improvements in processing time

Author(s): Beat Neuenschwander, Torsten Maehne, Dominic J. von Bergen, Berner Fachhochschule Technik und Informatik (Switzerland)

12408-54 • 3:50 PM - 4:10 PM

Ultrafast ablation dynamics of Cu by single pulse and GHz fs laser bursts

Author(s): Minok Park, Yueran Gu, Xianglei Mao, Lawrence Berkeley National Lab. (United States); Costas P. Grigoropoulos, Univ. of California, Berkeley (United States); Vassilia Zorba, Lawrence Berkeley National Lab. (United States)

LAMOM BEST STUDENT PAPER AWARDS CEREMONY

1 February 2023 • 4:10 PM - 4:20 PM | Moscone Center, Room 210 (Level 2 South)

A cash prize will be awarded to the best student oral and poster presentation in this conference.

To be eligible for the awards, you must:

- Be a graduate or undergraduate full-time student
- Have conducted the majority of the work to be presented
- Submit your abstract online by the deadline
- Be the submitting author and select "Yes" when asked if you are a full-time student
- Select yourself as the speaker
- Under topic selection, choose "Consider for Best Student Paper Award"
- Submit your manuscript online by the deadline
- Present your paper as scheduled
- Not have received this award in the past

Throughout the conference, qualifying student presentations will be evaluated by the conference committee, and the results will be announced during the award ceremony. Student presentations (both oral and poster) will be judged based on scientific merit of the work, and clarity of the presentation. While the award is not judged by the manuscript, a manuscript must be submitted.

Award presented by **Aiko Narazaki, National Institute of Advanced Industrial Science and Technology (Japan)**

Conference 12409

Laser-based Micro- and Nanoprocessing XVII

31 January - 2 February 2023 | Moscone Center, Room 208 (Level 2 South)

Conference Chair: **Rainer Kling**, ALPhANOV (France)

Conference Co-Chairs: **Akira Watanabe**, Tohoku Univ. (Japan); **Wilhelm Pfleging**, Karlsruhe Institute of Technology (Germany)

Program Committee: **Antonio Ancona**, CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Ya Cheng**, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences (China); **Jiyeon Choi**, Univ. of Science and Technology (Republic of Korea), Korea Institute of Machinery & Materials {Korea, Republic of}; **Francois Courvoisier**, FEMTO-ST (France); **Oliver Haupt**, Coherent LaserSystems GmbH & Co. KG (Germany); **Miguel Holgado Bolaños**, Univ. Politécnica de Madrid (Spain); **Minghui Hong**, National Univ. of Singapore (Singapore); **Andrés-Fabián Lasagni**, TU Dresden (Germany); **Yongfeng Lu**, Univ. of Nebraska-Lincoln (United States); **Futoshi Matsumoto**, Kanagawa Univ. (Japan); **Razvan Stoian**, Lab. Hubert Curien (France); **Koji Sugioka**, RIKEN Ctr. for Advanced Photonics (Japan); **Hong-Bo Sun**, Tsinghua Univ. (China); **Michael J. Withford**, Macquarie Univ. (Australia); **Cliff Haibin Zhang**, MKS Instruments, Inc. (United States)

TUESDAY 31 JANUARY

SESSION 1: TRANSPARENT MATERIALS PROCESSING I

31 January 2023 • 8:30 AM - 10:00 AM | Moscone Center, Room 208 (Level 2 South)

Session Chair: Rainer Kling, ALPhANOV (France)

12409-2 • 8:30 AM - 8:50 AM

CANCELED: Selective laser-induced etching for 3D ion traps

Author(s): Sebastian Simeth, Fraunhofer-Institut für Lasertechnik ILT (Germany); Alexander Müller, Jan Müller, Björn Lekitsch, Institut für Physik, Johannes Gutenberg Univ. Mainz (Germany); Martin Reininghaus, Fraunhofer-Institut für Lasertechnik ILT (Germany); Ferdinand Schmidt-Kaler, Institut für Physik, Johannes Gutenberg Univ. Mainz (Germany)

12409-1 • 8:50 AM - 9:20 AM

Silicon-metal and silicon-silicon ultrafast laser welding with domesticated filaments (*Invited Paper*)

Author(s): Maxime Chambonneau, Qingfeng Li, Markus Blothe, Friedrich-Schiller-Univ. Jena (Germany); Vladimir Y. Fedorov, Texas A&M Univ. at Qatar (Qatar), P. N. Lebedev Physical Institute of the RAS (Russian Federation); Stelios Tzortzakakis, Texas A&M Univ. at Qatar (Qatar), Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas (Greece), Univ. of Crete (Greece); Stefan Nolte, Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

12409-4 • 9:20 AM - 9:40 AM

A study on the incubation effect during multi-shot fs laser ablation of quartz

Author(s): Raffaele De Palo, Univ. degli Studi di Bari Aldo Moro (Italy); Annalisa Volpe, Politecnico di Bari (Italy); Caterina Gaudiuso, Pietro Patimisco, Univ. degli Studi di Bari Aldo Moro (Italy); Vincenzo Luigi Spagnolo, Politecnico di Bari (Italy); Antonio Ancona, Univ. degli Studi di Bari Aldo Moro (Italy)

12409-5 • 9:40 AM - 10:00 AM

Ultrafast laser processing of flexible ultrathin glass

Author(s): Jonas Kleiner, TRUMPF Laser- und Systemtechnik GmbH (Germany); Keyou Chen, TRUMPF China Co., Ltd. (China); Felix Zimmermann, Christian Weddeling, TRUMPF Laser- und Systemtechnik GmbH (Germany); Timo Flaig, TRUMPF Laser GmbH (Germany); Myriam Kaiser, TRUMPF Laser- und Systemtechnik GmbH (Germany); Julian Hellstern, Christoph Tillkorn, TRUMPF Laser GmbH (Germany); Daniel Flamm, TRUMPF Laser- und Systemtechnik GmbH (Germany)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: TRANSPARENT MATERIALS PROCESSING II

31 January 2023 • 10:30 AM - 11:30 AM | Moscone Center, Room 208 (Level 2 South)

Session Chair: Rainer Kling, ALPhANOV (France)

12409-6 • 10:30 AM - 10:50 AM

The formation of ultrafast laser-induced periodic nano- and micro-ripples on fused silica

Author(s): Kewei Li, Xin Zhao, Clemson Univ. (United States)

12409-7 • 10:50 AM - 11:10 AM

Anomalous efficient high-speed ultrafast laser nanostructuring in silica glass

Author(s): Huijun Wang, Yuhao Lei, Chun Deng, Gholamreza Shayeganrad, Peter Kazansky, Univ. of Southampton (United Kingdom)

12409-8 • 11:10 AM - 11:30 AM

Observation of crack propagation and stress distribution in diamond induced by ultrashort-pulsed laser illumination

Author(s): Daijiro Tokunaga, Kousuke Sakamoto, Sho Itoh, Chiba Univ. (Japan); Hirofumi Hidai, Takashige Omatsu, Molecular Chirality Research Ctr., Chiba Univ. (Japan); Souta Matsusaka, Chiba Univ. (Japan)

Lunch/Exhibition Break 11:30 AM - 1:30 PM

SESSION 3: MICRO/NANO PROCESSING OF METALS I

31 January 2023 • 1:30 PM - 3:00 PM | Moscone Center, Room 208 (Level 2 South)

Session Chair: Akira Watanabe, Tohoku Univ. (Japan)

12409-11 2023 • 1:30 PM - 2:00 PM

CANCELED: Multifunctional laser nano-processed surfaces (*Invited Paper*)

Author(s): Saulius Juodkazis, Swinburne Univ. of Technology (Australia)

12409-12 • 2:00 PM - 2:20 PM

Towards mass production of functionalized plastic components via multi-beam nanostructuring of moulds

Author(s): Petr Hauschwitz, Institute of Physics of the CAS, v.v.i. (Czech Republic)

Conference 12409

12409-13 • 2:20 PM - 2:40 PM

High precision drilling with aspect ratios of 1:40: from laser source to application

Author(s): Roswitha Giedl-Wagner, Florian Lendner, GFH GmbH (Germany); Steffen Ruebling, Marc Sailer, Axel Fehrenbacher, TRUMPF Laser GmbH (Germany)

12409-14 • 2:40 PM - 3:00 PM

Ultrashort-pulse laser system for nanostructuring the inner copper surface of up to 15 m long vacuum tubes

Author(s): Elena Bez, CERN (Switzerland), Univ. Leipzig (Germany); Marcel Himmerlich, Ana Karen Reascos Portilla, CERN (Switzerland); Stefan Wackerow, Robin Uren, Amin Abdolvand, Univ. of Dundee (United Kingdom); Mauro Taborelli, Paolo Chiggiato, CERN (Switzerland)

Coffee Break 3:00 PM - 3:30 PM

SESSION 4: MICRO/NANO PROCESSING OF METALS II

31 January 2023 • 3:30 PM - 4:30 PM | Moscone Center, Room 208 (Level 2 South)

Session Chair: Koji Sugioka, RIKEN Ctr. for Advanced Photonics (Japan)

12409-16 • 3:30 PM - 3:50 PM

Ultrafast vortex beams for improved energy feedthrough and low roughness surface ablation of metals

Author(s): David Pallarés Aldeiturriaga, Alain Abou Khalil, Jean-Philippe Colombier, Razvan Stoian, Sedao Xxx, Lab. Hubert Curien (France)

12409-173 • 3:50 PM - 4:10 PM

Directional broadband emissivity with fin-shaped microstructures produced via femtosecond laser surface processing

Author(s): Andrew Reicks, Andrew Butler, George Gogos, Jeffrey Shield, Christos Argyropoulos, Craig Zuhlke, Univ. of Nebraska-Lincoln (United States)

12409-56 • 4:10 PM - 4:30 PM

Increasing the ablation efficiency of metals using femtosecond fiber laser

Author(s): Bogusz Stepak, Kacper Kinastowski, Natalia Grudzien, Yuriy Stepanenko, Michal Nejbauer, Fluence sp. z o.o (Poland)

POSTERS-TUESDAY

31 January 2023 • 6:00 PM - 8:00 PM |

Moscone Center, Level 2 West

Conference attendees are invited to attend the LASE poster Session on Tuesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12409-3

High-precision micromachining of sapphire towards optical waveguiding structures using femtosecond lasers

Author(s): Stefan Kefer, Julian Zettl, Technische Hochschule Aschaffenburg (Germany); Bernhard Schmauss, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Cemal Esen, Ruhr-Univ. Bochum (Germany); Ralf Hellmann, Technische Hochschule Aschaffenburg (Germany)

12409-18

Optimization of femtosecond laser treated superhydrophobic surface functionalization using machine learning

Author(s): Chloe T. Zhang, Tianshu Xu, Subhash Singh, Chunlei Guo, Univ. of Rochester (United States)

12409-33

Improvement of cutting tools using laser-induced periodic surface structures for machining aluminium alloy Al 6061 T6

Author(s): Robert Baumann, TU Dresden (Germany); Yasmine Bouraoui, Technische Univ. Dresden (Germany); Uwe Teicher, Erik Selbmann, TU Dresden (Germany); Steffen Ihlenfeld, TU Dresden (Germany), Fraunhofer-Institut für Werkzeugmaschinen und Umformtechnik IWU (Germany); Andrés F. Lasagni, TU Dresden (Germany), Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany)

12409-54

PVDF type AE Sensor monitoring system for AL-7075 surface polishing using fiber laser

Author(s): Hyojeong Kim, Seounghwan Lee, Juheon Lee, Sinyeop Lee, Hyungjin Park, Jaehyeon Nam, Heehwan Lee, Hanyang Univ. (Republic of Korea)

12409-55

Low organic concentration sol-gel 3D optical devices via two-photon polymerization direct laser writing

Author(s): Moran Bin Nun, Galit Bar, Soreq Nuclear Research Ctr. (Israel); Yoav Dana, Dan M. Marom, Yehudit Garcia, The Hebrew Univ. of Jerusalem (Israel); Shlomi Lightman, Nurit Atar, Raphael Dror, Raz Gvishi, Soreq Nuclear Research Ctr. (Israel)

WEDNESDAY 1 FEBRUARY

SESSION 5: THIN FILM AND DISPLAY

2023 • 9:00 AM - 10:00 AM | Moscone Center, Room 208 (Level 2 South)

Session Chair: Wilhelm Pfleging, Karlsruher Institut für Technologie (Germany)

12409-20 • 9:00 AM - 9:20 AM

How lasers support the climate roadmap by enabling zero-carbon fusion reactors

Author(s): Ralph F. Delmdahl, Oliver Haupt, Max Fischer, Coherent LaserSystems GmbH & Co. KG (Germany)

12409-21 • 9:20 AM - 9:40 AM

Microfabrication of ITO transparent conductive film and formation of micro-metal grid structure

Author(s): Akira Watanabe, Ashiqur Rahman, Tohoku Univ. (Japan); Megumi Komada, Sumitomo Chemical Co., Ltd. (Japan)

12409-22 • 9:40 AM - 10:00 AM

Ultrashort pulse selective laser ablation of multi-layer thin film systems

Author(s): Astrid Sassmannshausen, RWTH Aachen Univ. (Germany); Semjon Mooraj, Saint-Gobain Sekurit Deutschland GmbH (Germany); Martin Kratz, Fraunhofer-Institut für Lasertechnik ILT (Germany)

Coffee Break 10:00 AM - 10:20 AM

SESSION 6: LASERS IN ENERGY STORAGE

1 February 2023 • 10:20 AM - 12:30 PM | Moscone Center, Room 208 (Level 2 South)

Session Chair: Wilhelm Pfleging, Karlsruher Institut für Technologie (Germany)

12409-24 • 10:20 AM - 10:50 AM

Laser structuring of electrodes in roll-to-roll environment using multi-beam processing: process upscaling and its perspective *(Invited Paper)*

Author(s): Alexandra Meyer, Karlsruher Institut für Technologie (Germany); Yannic Sterzl, Karlsruhe Institute of Technology (Germany); Ulrich Rädle, TOPAG Lasertechnik GmbH (Germany); Shizhou Xiao, EdgeWave GmbH (Germany); Manuel Zenz, Sill Optics GmbH & Co. KG (Germany); Daniel Schwab, Novanta Inc. (United States); Wilhelm Pfleging, Karlsruher Institut für Technologie (Germany)

12409-25 • 10:50 AM - 11:10 AM

Laser patterning and electrochemical characterization of thick-film cathodes for lithium-ion batteries

Author(s): Penghui Zhu, Peter Smyrek, Benjamin Ebert, Wilhelm Pfleging, Karlsruher Institut für Technologie (Germany)

12409-26 • 11:10 AM - 11:30 AM

CANCELED: Laser-induced nanostructuring of metallic anode coated by carbon nanoparticles for Li-ion cells and supercapacitors

Author(s): Iaroslav Gniliitskyi, NoviNano (Ukraine), Lviv Polytechnic National Univ. (Ukraine); Claudio Leonardi, Pier Gianni Medaglia, Riccardo Pezzilli, Univ. degli Studi di Roma "Tor Vergata" (Italy); Lorenzo Rizzo, Stefano Bellucci, Istituto Nazionale di Fisica Nucleare (Italy)

12409-27 • 11:30 AM - 11:50 AM

High-throughput battery foil cutting: a comparison of different pulsed laser approaches

Author(s): Marc Sailer, TRUMPF Laser GmbH (Germany); Adam Rosowski, Jack Gabzdyl, TRUMPF Laser UK Ltd. (United Kingdom); Axel Fehrenbacher, TRUMPF Laser GmbH (Germany); Lin Li, TRUMPF (China) Co., Ltd. (China); Daniel Huerta Murillo, TRUMPF Inc. (United States)

12409-28 • 11:50 AM - 12:10 PM

3D printing of anode architectures for customized lithium-ion batteries

Author(s): Ulrich Rist, Fabian Ball, Wilhelm Pfleging, Karlsruher Institut für Technologie (Germany)

12409-29 • 12:10 PM - 12:30 PM

Extending the 3D-battery concept: large areal ultrashort pulsed laser structuring of multilayered electrode coatings

Author(s): Yannic Sterzl, Wilhelm Pfleging, Karlsruher Institut für Technologie (Germany)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

SESSION 7: LARGE AREA MICRO/NANO-STRUCTURING, DLIP & LIPSS I

1 February 2023 • 2:00 PM - 3:10 PM | Moscone Center, Room 208 (Level 2 South)

Session Chair: Robert Baumann, TU Dresden (Germany)

12409-30 • 2:00 PM - 2:30 PM

GHz burst mode processing: ablation, LIPSS, TPP, LIPAA *(Invited Paper)*

Author(s): Koji Sugioka, Kotaro Obata, Shota Kawabata, RIKEN Ctr. for Advanced Photonics (Japan)

12409-31 • 2:30 PM - 2:50 PM

Direct laser interference patterning of cemented cutting tools

Author(s): Robert Baumann, Yasmine Bouraoui, Uwe Teicher, Erik Selbmann, TU Dresden (Germany); Steffen Ihlenfeld, TU Dresden (Germany); Fraunhofer-Institut für Werkzeugmaschinen und Umformtechnik IWU (Germany); Andrés F. Lasagni, TU Dresden (Germany); Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany)

12409-32 • 2:50 PM - 3:10 PM

Forming of metal sheets textured by LIPSS

Author(s): Girolamo Mincuzzi, ALPhANOV (France); Sylwia Rzepa, Comtes FHT (Czech Republic); Sergi Parareda Oriol, EURECAT-Ctr Tecnològic Catalunya (Spain); Alexandra Bourtereau, Laura Gemini, Marc Faucon, Rainer Kling, ALPhANOV (France)

Coffee Break 3:10 PM - 3:40 PM

SESSION 8: LARGE AREA MICRO/NANO-STRUCTURING, DLIP & LIPSS II

1 February 2023 • 3:40 PM - 5:00 PM | Moscone Center, Room 208 (Level 2 South)

Session Chair: Antonio Ancona, CNR-Istituto di Fotonica e Nanotecnologie (Italy)

12409-34 • 3:40 PM - 4:00 PM

Initial surface roughness influence on the generation of LIPSS on titanium and stainless steel and their effect on cell/bacteria viability

Author(s): Lamborghini Sotelo, Institut für Nanotechnologie und korrelative Mikroskopie gGmbH (Germany); Tommaso Fontanot, Fraunhofer-Institut für Keramische Technologien und Systeme IKTS (Germany); Sanjana Vig, Maria Helena Fernandes, Univ. do Porto (Portugal); George Sarau, Fraunhofer-Institut für Keramische Technologien und Systeme IKTS (Germany); Gerd Leuchs, Friedrich-Alexander Univ. Erlangen-Nürnberg (Germany); Silke Christiansen, Fraunhofer-Institut für Keramische Technologien und Systeme IKTS (Germany); Max-Planck-Institut für die Physik des Lichts (Germany)

Conference 12409

12409-35 • 4:00 PM - 4:20 PM

Visualization of laser-induced periodic Nano structures beyond optical-resolution by noninvasive optical method

Author(s): Jose-Alberto Aguilar Mora, XLIM (France); Alain Abou Khalil, Lab. Hubert Curien (France), Univ. de Lyon (France); Univ. Jean Monnet (France); David Pallarés Aldeiturriaga, Lab. Hubert Curien (France); Sedao Xxx, Lab. Hubert Curien (France); GIE Manutech-USD (France); Cyril Maucclair, Lab. Hubert Curien (France); Pierre Bon, XLIM (France)

12409-36 • 4:20 PM - 4:40 PM

Dynamics of development of laser-induced structures on the surface of a titanium alloy

Author(s): Iana Fomicheva, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Petr Druzhinin, Hans Amler, Wolfgang Schuesslbauer, PHOTON ENERGY GmbH (Germany); Silke Christiansen, Innovations-Institut für Nanotechnologie und korrelative Mikroskopie gGmbH (Germany), Fraunhofer-Institut für Keramische Technologien und Systeme IKTS (Germany); Gerd Leuchs, Friedrich-Alexander Univ. Erlangen-Nürnberg (Germany)

12409-37 • 4:40 PM - 5:00 PM

Laser-driven self-assembly of periodic structures on metal surfaces: assembling of carbon nanotube architectures

Author(s): Norbert A. Hampf, Philipps-Univ. Marburg (Germany)

THURSDAY 2 FEBRUARY

SESSION 9: BEAM ENGINEERING FOR HIGH POWER LASERS

2 February 2023 • 8:20 AM - 10:10 AM | Moscone Center, Room 208 (Level 2 South)

Session Chair: Yongfeng Lu, Univ. of Nebraska-Lincoln (United States)

12409-38 • 8:20 AM - 8:50 AM

kW-level USP lasers for high-rate drilling of airplane structures *(Invited Paper)*

Author(s): Emeric Biver, Multitel A.S.B.L. (Belgium); Alexandre Vendramini, Lasea (Belgium); Julien Pouysegur, Amplitude (France); Julien Dupuy, Multitel A.S.B.L. (Belgium); Anne Henrottin, Lasea (Belgium); Yves Hernandez, Multitel A.S.B.L. (Belgium); Roberto Ocaña, IK4 Tekniker (Spain)

12409-39 • 8:50 AM - 9:10 AM

Thermal accumulation and its threshold repetition rate in ultrafast laser materials processing

Author(s): Xiao Jia, Xin Zhao, Clemson Univ. (United States)

12409-40 • 9:10 AM - 9:30 AM

High-speed processing with ultrafast lasers and resonant scanning systems

Author(s): Thomas Herrmann, Bastian Kaiser, Johannes A. L'huillier, Photonik-Zentrum Kaiserslautern e.V. (Germany)

12409-41 • 9:30 AM - 9:50 AM

Ultrafast laser ablation in the GHz regime with a flexible repetition rate source

Author(s): Hugo Delahaye, Valeria V. Belloni, Maxime Pinaud, Luca Furfaro, FEMTO-ST (France), CNRS (France); Lilia Pontagnier, Giorgio Santarelli, Eric Cormier, Univ. de Bordeaux (France); François Courvoisier, FEMTO-ST (France), CNRS (France)

12409-42 • 9:50 AM - 10:10 AM

Microprocessing with a multi-plane light conversion beam shaper and a femtosecond laser at 515nm

Author(s): Clément Jacquard, CAILabs (France); Kathrin Placzek, Daniel Holder, Institut für Strahlwerkzeuge, Univ. Stuttgart (Germany); Dmitry Nuzhdin, Mahmoud Ziat, Ivan Gusachenko, Gwenn Pallier, Guillaume Labroille, Pu Jian, CAILabs (France)

Coffee Break 10:10 AM - 10:40 AM

SESSION 10: DIRECT WRITE PROCESSING, ABLATION AND SURFACE MODIFICATION

2 February 2023 • 10:40 AM - 12:30 PM | Moscone Center, Room 208 (Level 2 South)

Session Chair: Alexandra Meyer, Karlsruher Institut für Technologie (Germany)

12409-43 • 10:40 AM - 11:10 AM

Sub-micrometer structuring of surfaces with deep UV lasers *(Invited Paper)*

Author(s): Serhiy Danylyuk, Martin Osbild, Leon Korr, Fraunhofer-Institut für Lasertechnik ILT (Germany); Max Fischer, Ralph Delmdahl, Coherent LaserSystems GmbH & Co. KG (Germany); Martin Reininghaus, Fraunhofer-Institut für Lasertechnik ILT (Germany)

12409-44 • 11:10 AM - 11:30 AM

Crystallization of a-Si films deposited by RF sputtering using blue direct diode laser

Author(s): Mitsuoki Hishida, TeraDiode, Inc. (United States); Naohiko Kobata, Kentaro Miyano, Masaki Nobuoka, Panasonic Connect Co., Ltd. (Japan); Tatsuya Okada, Takashi Noguchi, Univ. of the Ryukyus (Japan)

12409-45 • 11:30 AM - 11:50 AM

Individual particle imaging in an ablation plume of a thin metal film

Author(s): Anatoly Efimov, Jon K. S. Baldwin, Brian L. Scott, Los Alamos National Lab. (United States)

12409-46 • 11:50 AM - 12:10 PM

Soret effect in metal-particle doped glass by focused laser heating

Author(s): Kaito Miyakoda, Sho Itoh, Chiba Univ. (Japan); Hirofumi Hidai, Molecular Chirality Research Ctr., Chiba Univ. (Japan); Souta Matsusaka, Chiba Univ. (Japan)

12409-47 • 12:10 PM - 12:30 PM

Laser-induced graphene based on paper for smart food decay sensor

Author(s): JinKi Min, Seung Hwan Ko, Yeongju Jung, Seoul National Univ. (Republic of Korea); Jinwoo Lee, Georgia Institute of Technology (United States)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

SESSION 11: ADVANCED ADDITIVE AND SUBTRACTIVE PROCESSES

2 February 2023 • 2:00 PM - 3:10 PM | Moscone Center, Room 208 (Level 2 South)

Session Chair: Akira Watanabe, Tohoku Univ. (Japan)

12409-48 • 2:00 PM - 2:30 PM

Smart procedures for the femtosecond laser-based fabrication of polymeric lab-on-a-chip *(Invited Paper)*

Author(s): Annalisa Volpe, Politecnico di Bari (Italy); Maria Serena Chiriaco, Istituto di Nanotecnologia (Italy); Petra Paiè, Politecnico di Milano (Italy); Filippo Maria Conte Capodacqua, Caterina Gaudioso, Univ. degli Studi di Bari Aldo Moro (Italy); Elisabetta Primiceri, Istituto di Nanotecnologia (Italy); Roberto Osellame, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Antonio Ancona, Univ. degli Studi di Bari Aldo Moro (Italy)

12409-52 • 2:30 PM - 2:50 PM

Laser-written Mach Zehnder interferometer in silica with surface-written sensing arms and sub-micron thick doped-polymer film for increased evanescent field interferometric methane sensing

Author(s): George Ong, Timothy Lee, Martynas Beresna, Sam McQuillan, Rand Ismaeel, Gilberto Brambilla, Univ. of Southampton (United Kingdom)

12409-53 • 2:50 PM - 3:10 PM

Laser-induced entanglement of liquid metal and silver nanowire for monolithically variable and stretchable heater

Author(s): Wooseop Shin, Chulmin Cho, Seung Hwan Ko, Seoul National Univ. (Republic of Korea)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12409-19

Ag-Au bimetallic ladder-like nanostructures achieved with femtosecond Bessel beam for real-time sensing of tetryl and ammonium nitrate

Author(s): Dipanjan Banerjee, Mangababu Akkanaboina, Ravi Kumar Kanaka, Venugopal Rao Soma, Univ. of Hyderabad (India)

12409-49

Hybrid laser microfabrication of three-dimensional large-scale fused silica microfluidic chips

Author(s): Aodong Zhang, Jian Xu, East China Normal Univ. (China); Ming Hu, Xin Li, Xiaolong Li, Jia Qi, East China Normal University (China); Ya Cheng, East China Normal Univ. (China)

Nanoscale and Quantum Materials: From Synthesis and Laser Processing to Applications 2023

28 - 29 January 2023 | Moscone Center, Room 311 (Level 3 South)

Conference Chairs: **Andrei V. Kabashin**, Aix-Marseille Univ. (France); **Maria Farsari**, Foundation for Research and Technology-Hellas (Greece); **Masoud Mahjouri-Samani**, Auburn Univ. (United States)

Program Committee: **Jan J. Dubowski**, Univ. de Sherbrooke (Canada); **David B. Geohegan**, Oak Ridge National Lab. (United States); **Bilal Gökce**, Bergische Univ. Wuppertal (Germany); **Anderson S. L. Gomes**, Univ. Federal de Pernambuco (Brazil); **Costas P. Grigoropoulos**, Univ. of California, Berkeley (United States); **Tatiana E. Itina**, Lab. Hubert Curien (France); **Yongfeng Lu**, Univ. of Nebraska-Lincoln (United States); **Mangirdas Malinauskas**, Vilnius Univ. (Lithuania); **Anton V. Malko**, The Univ. of Texas at Dallas (United States); **Igor V. Meglinski**, Univ. of Oulu (Finland), Aston Univ. (United Kingdom); **Edik U. Rafailov**, Aston Univ. (United Kingdom); **Koji Sugioka**, RIKEN Ctr. for Advanced Photonics (Japan); **Vladislav V. Yakovlev**, Texas A&M Univ. (United States); **Ioanna Zergioti**, National Technical Univ. of Athens (Greece); **Vassilia Zorba**, Lawrence Berkeley National Lab. (United States)

SATURDAY 28 JANUARY

SESSION 1: LASER MICRO/NANOSTRUCTURING AND APPLICATIONS

28 January 2023 • 10:20 AM - 12:00 PM | Moscone Center, Room 311 (Level 3 South)

Session Chair: Andrei V. Kabashin, Aix-Marseille Univ. (France)

12410-4 • 10:20 AM - 10:50 AM

Laser structuring and functionalization of nanoscaled battery materials (*Invited Paper*)

Author(s): Wilhelm Pflöging, Alexandra Meyer, Ulrich Rist, Peter Smyrek, Yannic Sterzl, Yijing Zheng, Penghui Zhu, Karlsruher Institut für Technologie (Germany)

12410-5 • 10:50 AM - 11:10 AM

Laser surface modification of titanium for enhanced human cell growth and antimicrobial effect

Author(s): Parvin Fathi-Hafshejani, Auburn Univ. (United States); Hunter B. Tinker, Jonathan B. Vickers, Sahar Hasim, Mercer Univ. (United States); Masoud Mahjouri-Samani, Auburn Univ. (United States)

12410-6 • 11:10 AM - 11:40 AM

Single-step laser-fabrication of arrays of deep holes of submicrometer diameter on dielectrics surface (*Invited Paper*)

Author(s): Nicolas Sanner, Lab. Lasers, Plasmas et Procédés Photoniques (France), Aix-Marseille Univ. (France); Xin Liu, Lab. Lasers, Plasmas et Procédés Photoniques (France); Srijoyee Datta, Raphaël Clady, Olivier Utéza, Lab. Lasers, Plasmas et Procédés Photoniques (France), Aix-Marseille Univ. (France)

12410-7 • 11:40 AM - 12:00 PM

A repetitive detection of *Bacillus thuringiensis* spores using digital photocorrosion aptasensor

Author(s): Jan J. Dubowski, Univ. de Sherbrooke (Canada); Ishika Ishika, Walid M. Hassen, Interdisciplinary Institute for Technological Innovation, Univ. de Sherbrooke (Canada); Jonathan Vermette, Univ. de Sherbrooke (Canada); Houman Moteshareie, Azam Tayabali, Environmental Health Science and Research Bureau, Health Canada (Canada)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 2: 2D MATERIALS: SYNTHESIS PROCESSING AND DIAGNOSTICS

28 January 2023 • 1:30 PM - 3:30 PM | Moscone Center, Room 311 (Level 3 South)

Session Chairs: Masoud Mahjouri-Samani, Auburn Univ. (United States), Gordon Zyla, Foundation for Research and Technology-Hellas (Greece)

12410-8 • 1:30 PM - 2:00 PM

Photoexcitation dynamics and long-lived excitons in strain-engineered transition metal dichalcogenides (*Invited Paper*)

Author(s): Anton V. Malko, Navendu Mondal, The Univ. of Texas at Dallas (United States); Nurul Azam, Auburn Univ. (United States); Yuri Gartstein, The Univ. of Texas at Dallas (United States); Masoud Mahjouri-Samani, Auburn Univ. (United States)

12410-9 • 2:00 PM - 2:30 PM

New optical features of substitutional defects in 2D materials (*Invited Paper*)

Author(s): Shengxi Huang, Rice Univ. (United States)

12410-11 • 2:30 PM - 3:00 PM

Laser-based modification of ALD-grown 2D-transition metal dichalcogenides (*Invited Paper*)

Author(s): Andreas Ostendorf, Malte Becher, Julia Jagosz, Claudia Bock, Ruhr-Univ. Bochum (Germany)

12410-12 • 3:00 PM - 3:30 PM

Combining gas-phase, structural, and optical diagnostics for in situ feedback and control during pulsed laser deposition (*Invited Paper*)

Author(s): Sumner Harris, Christopher Rouleau, Alexander Poretzky, Seok Joon Yun, Liangbo Liang, Ondrej Dyck, Tom Berlijn, Gyula Eres, Ctr. for Nanophase Materials Sciences, Oak Ridge National Lab. (United States); Gerd Duscher, Austin Houston, The Univ. of Tennessee Knoxville (United States); Yu-Chuan Lin, The Pennsylvania State Univ. (United States); Mina Yoon, Kai Xiao, David Geohegan, Ctr. for Nanophase Materials Sciences, Oak Ridge National Lab. (United States)

Coffee Break 3:30 PM - 4:00 PM

SESSION 3: NANOSCALE MATERIALS: SYNTHESIS PROCESSING AND DIAGNOSTICS

28 January 2023 • 4:00 PM - 5:00 PM | Moscone Center, Room 311 (Level 3 South)

Session Chair: Shengxi Huang, Rice Univ. (United States)

12410-3 • 4:00 PM - 4:20 PM

Photothermal effects and nonlinearity in photocatalysis

Author(s): Ieng-Wai Un, Yonatan Dubi, Yonatan Sivan, Ben-Gurion Univ. of the Negev (Israel)

12410-14 • 4:20 PM - 4:40 PM

Continuously graded CdSe quantum dots: Tomorrow's bright single photon emitters

Author(s): Christopher B. Marble, Texas A&M Univ. (United States), Los Alamos National Lab. (United States); Donghyo Hahm, Zachary L. Robinson, Los Alamos National Lab. (United States); Vladislav V. Yakovlev, Texas A&M Univ. (United States); Victor I. Klimov, Los Alamos National Lab. (United States)

12410-15 • 4:40 PM - 5:00 PM

Laser induced transfer of 2D materials for optoelectronic applications

Author(s): Ilias Cheliotis, Adamantia Logotheti, Filimon Zacharatos, National Technical Univ. of Athens (Greece); Amaia Pesquera, Amaia Zurutuza, Graphenea S.A. (Spain); Doron Naveh, Bar-Ilan Univ. (Israel); Leonidas Tsetseris, Ioanna Zergioti, National Technical Univ. of Athens (Greece)

SUNDAY 29 JANUARY

SESSION 4: LASER-BASED ADDITIVE MICRO/NANOMANUFACTURING

29 January 2023 • 8:00 AM - 10:40 AM | Moscone Center, Room 311 (Level 3 South)

Session Chairs: Masoud Mahjouri-Samani, Auburn Univ. (United States), Anton V. Malko, The Univ. of Texas at Dallas (United States)

12410-16 • 8:00 AM - 8:20 AM

Additive nanomanufacturing of electronics with high electrical and mechanical performance

Author(s): Aarsh Patel, Zabihollah Ahmadi, Seungjong Lee, Nima Shamsaei, Masoud Mahjouri-Samani, Auburn Univ. (United States)

12410-17 • 8:20 AM - 8:40 AM

Generation of photonic nanojets using 3D microstructures printed by two-photon polymerization

Author(s): Gordon Zyla, Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas (Greece); Göran Maconi, Univ. of Helsinki (Finland); Dimitra Ladika, Univ. of Crete (Greece); Vasileia Melissinaki, Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas (Greece); Georgios D. Barmparis, Univ. of Crete (Greece); Anton Nolvi, Ivan Kassamakov, Univ. of Helsinki (Finland); Maria Farsari, Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas (Greece)

12410-18 • 8:40 AM - 9:10 AM

Additive manufacturing of metal interconnects using microscale selective laser sintering (*Invited Paper*)

Author(s): Aaron Liao, Joshua Grose, Farzana Tasnim, Michael Cullinan, The Univ. of Texas at Austin (United States)

12410-19 • 9:10 AM - 9:30 AM

A novel dry multimaterial printing for flexible hybrid electronics and sensors

Author(s): Zabihollah Ahmadi, Aarsh Patel, Adib Taba, Seungjong Lee, Nima Shamsaei, Masoud Mahjouri-Samani, Auburn Univ. (United States)

12410-20 • 9:30 AM - 10:00 AM

3D printing at the micro- and nanoscale: a powerful approach for engineering future applications (*Invited Paper*)

Author(s): Gordon Zyla, Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas (Greece)

12410-21 • 10:00 AM - 10:20 AM

Dry printing electronics on biodegradable papers

Author(s): Adib Taba, Zabihollah Ahmadi, Aarsh Patel, Parvin Fathi-Hafshejani, Seungjong Lee, Nima Shamsaei, Masoud Mahjouri-Samani, Auburn Univ. (United States)

12410-22 • 10:20 AM - 10:40 AM

Three dimensional photonic nanostructures as effective nonlinear devices at telecommunication spectrum

Author(s): Dimitra Ladika, Foundation for Research and Technology-Hellas (Greece), Univ. of Crete (Greece); Argyro Klini, Panagiotis Loukakos, Maria Kafesaki, Maria Farsari, David Gray, Foundation for Research and Technology-Hellas (Greece)

Coffee Break 10:40 AM - 11:10 AM

SESSION 5: NOVEL NANOPHOTONIC APPROACHES FOR BIOMEDICAL AND OTHER APPLICATIONS

29 January 2023 • 11:10 AM - 12:45 PM | Moscone Center, Room 311 (Level 3 South)

Session Chair: Andrei V. Kabashin, Aix-Marseille Univ. (France)

12410-23 • 11:10 AM - 11:55 AM

Multiscale modeling and materials informatics guided nanochemistry and laser processing of nanostructured materials for opto-electronics and biomedicine (*Keynote Presentation*)

Author(s): Paras Prasad, Univ. at Buffalo (United States)

12410-25 • 11:55 AM - 12:15 PM

Er³⁺-Yb³⁺ co-doped nanoparticles as contrast agents for near infrared biomedical photoacoustic imaging application

Author(s): Arthur C. M. V. Pereira, Univ. Federal de Pernambuco (Brazil); Roberta S. Pugina, Univ. Federal de Pernambuco (Brazil), Univ. de São Paulo (Brazil); Avishek Das, Univ. Federal Rural de Pernambuco (Brazil); Karmel de Oliveira Lima, Luiz Fernando dos Santos, Rogéria Rocha Gonçalves, Univ. de São Paulo (Brazil); Anderson S. L. Gomes, Univ. Federal de Pernambuco (Brazil)

12410-24 • 12:15 PM - 12:45 PM

Quantitative phase microscopy for metrology in nanophotonics (*Invited Paper*)

Author(s): Guillaume Baffou, Institut Fresnel (France)

Lunch/Exhibition Break 12:45 PM - 2:40 PM

Conference 12410

SESSION 6: BIOMEDICAL APPLICATIONS OF NANOSTRUCTURED MATERIALS

29 January 2023 • 2:40 PM - 3:40 PM | Moscone Center, Room 311 (Level 3 South)

Session Chair: Anderson S.L. Gomes, Univ. Federal de Pernambuco (Brazil)

12410-26 • 2:40 PM - 3:00 PM

A tissue-mimicking phantom with flexible optical properties for studying photoacoustic response of nanoparticles

Author(s): Gleb V. Tikhonowski, MEPHI, Institute of Engineering Physics for Biomedicine (Russian Federation); Andrei V. Kabashin, Aix-Marseille Univ. (France); Anton A. Popov, MEPHI, Institute of Engineering Physics for Biomedicine (Russian Federation)

12410-28 • 3:00 PM - 3:20 PM

Pulsed laser deposition of crystalline hydroxyapatite coatings for biomedical implant applications

Author(s): Salizhan Kylychbekov, Zikrulloh Khuzhakulov, Ali Oguz Er, Western Kentucky Univ. (United States)

12410-29 • 3:20 PM - 3:40 PM

Colloidal semi-conductor nanocrystals in microcavity for lasing and biosensing

Author(s): Agnès Maître, Institut des nanosciences de Paris (France); Charlie Kersuzan, Institut des nanosciences de Paris (France), Lab. de Physique et d'étude des Matériaux, ESPCI (France); Sergei Celaj, Institut des nanosciences de Paris (France); Thomas Pons, Lab. de Physique et d'étude des Matériaux, ESPCI (France)

Coffee Break 3:40 PM - 4:10 PM

SESSION 7: PHOTONIC PROPERTIES AND APPLICATIONS OF NANOMATERIALS

29 January 2023 • 4:10 PM - 6:00 PM | Moscone Center, Room 311 (Level 3 South)

Session Chair: Nicolas Sanner, Lab. Lasers, Plasmas et Procédés Photoniques (France)

12410-30 • 4:10 PM - 4:40 PM

Nanoplasmonics as the modern interface between Nanophotonics and Plasmonics: examples in nonlinear optics and random lasers (*Invited Paper*)

Author(s): Anderson Gomes, Univ. Federal de Pernambuco (Brazil)

12410-31 • 4:40 PM - 5:00 PM

High-speed photographic investigation of pulsed laser ablation in liquids with ultrahigh spatial and sub-100-ps temporal resolution

Author(s): Norbert Linz, Sebastian Freidank, Alfred Vogel, Univ. zu Lübeck (Germany)

12410-32 • 5:00 PM - 5:20 PM

Pulsed laser ablation in gaseous ambience for the synthesis of photoluminescent Si and Ge nanoparticles for bioimaging

Author(s): Andrei V. Kabashin, Aix-Marseille Univ. (France); Anastasiya Fronya, Sergey Antonenko, Nikita Karpov, Nikolay Pokryshkin, Anna Eremina, Alexander Kharin, Yaroslava Dombrovska, Alexander Garmash, Nikolay Kargin, Sergey Klimentov, Victor Timoshenko, National Research Nuclear Univ. MEPhI (Russian Federation)

12410-33 • 5:20 PM - 5:40 PM

Laser implantation of plasmonic nanoparticles for photoluminescence enhancement of silicon quantum dots

Author(s): Lukas Janos Richter, Jürgen Ihlemann, Institut für Nanophotonik Göttingen e.V. (Germany)

12410-34 • 5:40 PM - 6:00 PM

Transient interferometric scattering microscopy on nanoscale objects with high sensitivity

Author(s): Konrad Birkmeier, TOPTICA Photonics AG (Germany), Ludwig-Maximilians-Univ. München (Germany); Andreas Brodschelm, Florian Tauser, Reto Häring, Bernhard Wolfring, TOPTICA Photonics AG (Germany); Achim Hartschuh, Ludwig-Maximilians-Univ. München (Germany)

Conference 12411

Frontiers in Ultrafast Optics: Biomedical, Scientific, and Industrial Applications XXIII

29 - 31 January 2023 | Moscone Center, Room 158 (Upper Mezzanine South)

Conference Chairs: **Peter R. Herman**, Univ. of Toronto (Canada); **Roberto Osellame**, CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Adela Ben-Yakar**, The Univ. of Texas at Austin (United States)

Program Committee: **Craig B. Arnold**, Princeton Univ. (United States); **Yves Bellouard**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Daniel Flamm**, TRUMPF Laser- und Systemtechnik GmbH (Germany); **Alexander Heisterkamp**, Leibniz Univ. Hannover (Germany); **Denise M. Krol**, Univ. of California, Davis (United States); **Eric Mazur**, Harvard Univ. (United States); **Eric P. Mottay**, Amplitude Systèmes (France); **Beat Neuenschwander**, Berner Fachhochschule Technik und Informatik (Switzerland); **Stefan Nolte**, Friedrich-Schiller-Univ. Jena (Germany); **Aleks Ovsianikov**, Technische Univ. Wien (Austria); **Christopher B. Schaffer**, Cornell Univ. (United States); **Jan Siegel**, Instituto de Óptica “Daza de Valdés” (Spain); **Koji Sugioka**, RIKEN Ctr. for Advanced Photonics (Japan); **Mitsuhiro Terakawa**, Keio Univ. (Japan); **Alfred Vogel**, Univ. zu Lübeck (Germany); **Dvir Yelin**, Technion-Israel Institute of Technology (Israel)

SUNDAY 29 JANUARY

SESSION 1: ULTRAFAST LASER SYSTEMS FOR BIOMEDICAL APPLICATIONS

29 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 158 (Upper Mezzanine South)

Session Chair: Michel Meunier, Polytechnique Montréal (Canada)

12411-1 • 8:00 AM - 8:20 AM

CANCELED: Multimodal biomedical optical imaging probe based on a single compact laser source

Author(s): Marco Andreana, Medizinische Univ. Wien (Austria); Ming Yang, VIULASE GmbH (Austria); Frederic Delahaye, GLOphotonics (France); Frédéric Gêrôme, GLOphotonics (France), XLIM, Univ. de Limoges (France); Foued Amrani, GLOphotonics (France); Manfred Magrutsch, VIULASE GmbH (Austria); Wolfgang Drexler, Medizinische Univ. Wien (Austria); Tuan Le, VIULASE GmbH (Austria); Fetah Benabid, XLIM (France), GLOphotonics (France); Angelika Unterhuber, Medizinische Univ. Wien (Austria)

12411-2 • 8:20 AM - 8:40 AM

Femtosecond fiber delivery for industrial applications

Author(s): Sebastien Guilmet, Florent Basin, Jean Chabrierie, Eric Mottay, Clemens Hönninger, Amplitude (France); Girolamo Mincuzzi, Mathieu Valentin, Rainer Kling, Kamil Aouati, ALPhANOV (France)

12411-3 • 8:40 AM - 9:00 AM

Versatile phase and amplitude pulse shaping using 2D spatial light modulator for spectrally optimized multimodal optical imaging

Author(s): Lingxiao Yang, Rishiyashring R. Iyer, Janet E. Sorrells, Carlos A. Renteria, Kayvan F. Tehrani, Darold R. Spillman, Stephen A. Boppart, Univ. of Illinois (United States)

12411-4 • 9:00 AM - 9:20 AM

Soliton-pulse-based, wavelength-tunable femtosecond fiber laser light source for NIR 1650-1900 nm emission

Author(s): Ryota Kakei, Makoto Nakano, Shigetoshi Okazaki, Hamamatsu Photonics K.K. (Japan); Norihiko Nishizawa, Nagoya Univ. (Japan); Shin Kato, Hamamatsu Photonics K.K. (Japan)

12411-5 • 9:20 AM - 9:40 AM

From research to industry: transferring bioactive laser treated surfaces to the production of biomedical screws

Author(s): Yoan Di Maio, Guillaume Aubert, Alina Pascale-Hamri, GIE Manutech-USD (France); Xxx Sedao, Lab. Hubert Curien (France), Univ. de Lyon (France), Univ. Jean Monnet Saint-Etienne (France); Mathieu Maalouf, SAINBIOSE, Univ. Jean Monnet Saint-Etienne (France), Univ. de Lyon (France); Martina Muck, Institute of Applied Physics, Johannes Kepler Univ. Linz (Austria); David Pallarés Aldeiturriaga, Lab Hubert Curien, Univ. Jean Monnet Saint-Etienne (France), Univ. de Lyon (France); Julien Granier, GIE Manutech-USD (France); Steve Papa, Virginie Dumas, Alain Guignandon, SAINBIOSE, Univ. Jean Monnet Saint-Etienne (France), Univ. de Lyon (France); Johannes Heitz, Institute of Applied Physics, Johannes Kepler Univ. Linz (Austria); Nicolas Compère, GIE Manutech-USD (France)

12411-6 • 9:40 AM - 10:00 AM

Black marking for medical industry with ultrashort-pulsed lasers at different laser pulse durations

Author(s): Bernd Docters, Stefan Marzenell, TRUMPF Schweiz AG (Switzerland); Myriam Kaiser, Josephin Böhm, TRUMPF Laser- und Systemtechnik GmbH (Germany); Holger Breitenborn, Robert Groß, TRUMPF Schweiz AG (Switzerland); Steffen Rübling, TRUMPF Laser GmbH (Germany); Christoph Weinert, Sebastian Groß, TRUMPF Schweiz AG (Switzerland); Daniel Flamm, Bernd Block, TRUMPF Laser- und Systemtechnik GmbH (Germany); Aleksander Budnicki, TRUMPF Laser GmbH (Germany); Sören Richter, TRUMPF Schweiz AG (Switzerland); Ulf Quentin, TRUMPF Laser- und Systemtechnik GmbH (Germany)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: BIOMEDICAL APPLICATIONS FOR ULTRAFAST LASER SYSTEMS

29 January 2023 • 10:30 AM - 12:10 PM | Moscone Center, Room 158 (Upper Mezzanine South)

Session Chair: Adela Ben-Yakar, The Univ. of Texas at Austin (United States)

12411-7 • 10:30 AM - 11:00 AM

Towards precision tumour surgery with picosecond lasers (Invited Paper)

Author(s): Jonathan D. Shephard, Rainer J. Beck, Ioannis Bitharas, Katjana Ehrlich, Heriot-Watt Univ. (United Kingdom); Thomas I. Maisey, Ryan K. Mathew, Univ. of Leeds (United Kingdom); James Moor, Leeds Teaching Hospitals NHS Trust (United Kingdom); Andrew J. Moore, Robert R. Thomson, Heriot-Watt Univ. (United Kingdom); David G. Jayne, Univ. of Leeds (United Kingdom)

12411-8 • 11:00 AM - 11:20 AM

Optimization of laser parameters for ultrashort-laser spinal surgeries

Author(s): Biswajit Mishra, Liam Andrus, Aditya Roy, Adela Ben-Yakar, The Univ. of Texas at Austin (United States)

Conference 12411

12411-9 • 11:20 AM - 11:40 AM

Ultrafast laser functionalization of dental implants: influence of wavelength and polarization on tissues adhesion and bacterial repellency

Author(s): Sedao Xxx, Lab. Hubert Curien (France); Steve Papa, Mathieu Maalouf, Univ. Jean Monnet Saint-Etienne (France); Yoan Di Maio, GIE Manutech-USD (France); Alain Abou Khalil, Lab. Hubert Curien (France); Hind Hamzeh-Cognasse, Mireille Thomas, Alain Guignandon, Univ. Jean Monnet Saint-Etienne (France); Virginie Dumas, Ecole Nationale d'Ingénieurs de Saint-Etienne (France), Ecole Centrale de Lyon (France)

12411-10 • 11:40 AM - 12:10 PM Ultrafast ablation of bone tissue: process optimisation and species dependence (Invited Paper)

Author(s): Laura Gemini, Samy Al-Bourgol, Guillaume Machinet, Aboubakr Bakkali, Marc Faucon, Rainer Kling, ALPhANOV (France)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

SESSION 3: ULTRAFAST LASERS FOR CELL MANIPULATION

29 January 2023 • 1:40 PM - 3:00 PM | Moscone Center, Room 158 (Upper Mezzanine South)

Session Chair: Adela Ben-Yakar, The Univ. of Texas at Austin (United States)

12411-11 • 1:40 PM - 2:10 PM

Plasmonic cell fusion for potential therapeutic applications (Invited Paper)

Author(s): Dvir Yelin, Technion-Israel Institute of Technology (Israel)

12411-12 • 2:10 PM - 2:30 PM

Laser bioprinting of cells and tumor organoids for organ-on-chip applications

Author(s): Evina Elezoglou, Maria Chliara, Marianneza Chatzipetrou, National Technical Univ. of Athens (Greece); Symeon Papazoglou, PhosPrint (Greece); Katerina Tsilingiri, Apostolos Klinakis, Biomedical Research Foundation, Academy of Athens (Greece); Ioanna Zergioti, National Technical Univ. of Athens (Greece)

12411-13 • 2:30 PM - 3:00 PM

Fundamentals and applications of plasmonic enhanced ultrafast laser drug and gene delivery (Invited Paper)

Author(s): Michel Meunier, Polytechnique Montréal (Canada)

Coffee Break 3:00 PM - 3:30 PM

SESSION 4: ULTRAFAST LASER-MATTER INTERACTION

29 January 2023 • 3:30 PM - 5:20 PM | Moscone Center, Room 158 (Upper Mezzanine South)

Session Chair: Roberto Osellame, CNR-Istituto di Fotonica e Nanotecnologie (Italy)

12411-14 • 3:30 PM - 4:00 PM

Optical computing using nonlinear propagation in multi-mode fibers (Invited Paper)

Author(s): Demetri Psaltis, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12411-15 • 4:00 PM - 4:20 PM

Sub-femtosecond dynamics in photoionization and photodissociation processes

Author(s): Farshad Shobeiry, Divya Bharti, Patrick Fross, Hemkumar Srinivas, Max-Planck-Institut für Kernphysik (Germany); Eric Brunner, Andreas Buchleitner, Univ. of Freiburg (Germany); Kathryn Hamilton, Klaus Bartschat, Drake Univ. (United States); Thomas Pfeifer, Robert Moshhammer, Max-Planck-Institut für Kernphysik (Germany); Anne Harth, Max-Planck-Institut für Kernphysik (Germany), Hochschule Aalen - Technik und Wirtschaft (Germany)

12411-46 • 4:20 PM - 4:40 PM

Few cycle pulse compression and white light generation in cascaded multipass cells

Author(s): Semyon Goncharov, Oleg Pronin, Helmut-Schmidt Univ. (Germany); Kilian Fritsch, n2-Photonics GmbH (Germany)

12411-48 • 4:40 PM - 5:00 PM

Convex-concave multipass cells for spectral broadening and compression

Author(s): Kilian Fritsch, Helmut-Schmidt Univ. (Germany), n2-Photonics GmbH (Germany); Victor Hariton, Helmut-Schmidt Univ. (Germany), Instituto Superior Técnico (Portugal); Nazar Kovalenko, Kevin Schwarz, Helmut-Schmidt Univ. (Germany); Gonçalo Figueira, Instituto Superior Técnico (Portugal); Oleg Pronin, Helmut-Schmidt Univ. (Germany)

12411-47 • 5:00 PM - 5:20 PM

Pulse contrast enhancement by an aperiodic converter and self-focusing in hybrid Yb-fiber / Nd:glass CPA system

Author(s): Zaharit Refaeli, Marcelo Wyszkin, Soreq Nuclear Research Ctr. (Israel); Irit Juwiler, Sami Shamon College (Israel); Gilad Marcus, The Hebrew Univ. of Jerusalem (Israel); Haim Suchowski, 3DOptix (Israel); Yariv Shamir, Soreq Nuclear Research Ctr. (Israel)

MONDAY 30 JANUARY

SESSION 5: ULTRAFAST LASER MICRO/NANO-MACHINING

30 January 2023 • 8:00 AM - 9:50 AM | Moscone Center, Room 158 (Upper Mezzanine South)

Session Chair: Vytautas Jukna, Laser Research Ctr., Vilnius Univ. (Lithuania)

12411-19 • 8:00 AM - 8:30 AM

Ultra-high-speed high-resolution laser lithography for lithium niobate integrated photonics (Invited Paper)

Author(s): Jinming Chen, Zhaoxiang Liu, Lvbin Song, Chao Sun, Guanhua Wang, East China Normal University (China); Ya Cheng, Shanghai Institute of Optics and Fine Mechanics (China)

12411-20 • 8:30 AM - 8:50 AM

High-quality cutting of heat-sensitive polymers with a high-power femtosecond UV laser

Author(s): Victor V. Matyilitsky, Chandra Nathala, MKS Instruments, Inc. (Austria); Jim Bovatsek, MKS Instruments, Inc. (United States)

12411-21 • 8:50 AM - 9:10 AM

Optimization and characterization of near-field enhancement generated nanogrooves

Author(s): Ernesto Gribaudo, Yves Bellouard, Ruben Ricca, Pieter Vlugter, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12411-22 • 9:10 AM - 9:30 AM

Generation of micro-pillars by ultrafast first-order Bessel beam

Author(s): Valeria Viviana Belloni, Mostafa Hassan, Luc Froehly, Luca Furfaro, Cyril Billet, Remo Giust, Francois Courvoisier, FEMTO-ST (France)

12411-23 • 9:30 AM - 9:50 AM

Time-resolved measurement of stress wave profile during femtosecond laser processing of synthetic silica glass

Author(s): Junya Hattori, Yusuke Ito, The Univ. of Tokyo (Japan); David Veyssset, Stanford Univ. (United States); Keiichi Nakagawa, The Univ. of Tokyo (Japan); Keith Nelson, Massachusetts Institute of Technology (United States); Naohiko Sugita, The Univ. of Tokyo (Japan)

Coffee Break 9:50 AM - 10:20 AM

SESSION 6: LASER MODIFICATIONS IN TRANSPARENT MATERIALS

30 January 2023 • 10:20 AM - 12:10 PM | Moscone Center, Room 158 (Upper Mezzanine South)

Session Chair: Peter R. Herman, Univ. of Toronto (Canada)

12411-24 • 10:20 AM - 10:50 AM

Ultrafast laser microfabrication of guided wave components for spatial mode manipulation *(Invited Paper)*

Author(s): Robert R. Thomson, Heriot-Watt Univ. (United Kingdom)

12411-25 • 10:50 AM - 11:10 AM

Comparative study of laser-assisted etching using femtosecond laser pulses emitted at IR (1030 nm) and UV (343 nm) wavelengths

Author(s): Benedikt Hermann, Luca Muscarella, Yves Bellouard, Olivier Bernard, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12411-26 • 11:10 AM - 11:30 AM

Femtosecond laser-written vapor cells for integrated chip-scale atomic sensing

Author(s): Vito Giovanni Lucivero, ICFO - Institut de Ciències Fotòniques (Spain), The Barcelona Institute of Science and Technology - BIST (Spain); Andrea Zanon, Giacomo Corrielli, Roberto Osellame, Politecnico di Milano (Italy); Morgan Mitchell, ICFO - Institut de Ciències Fotòniques (Spain)

12411-28 • 11:30 AM - 11:50 AM

Kilohertz thermo-optic phase shifting in femtosecond laser written photonic integrated circuits

Author(s): Roberto Memeo, Politecnico di Milano (Italy); Francesco Ceccarelli, Giacomo Corrielli, Roberto Osellame, CNR-Istituto di Fotonica e Nanotecnologie (Italy)

12411-27 • 11:50 AM - 12:10 PM

First demonstration of type A volume Bragg grating for the VIS-NIR applications

Author(s): Joelle Harb, Univ. de Bordeaux (France); Lauris Talbot, Martin Bernier, Univ. Laval (Canada); Yannick Petit, Lionel Canioni, Univ. de Bordeaux (France)

Lunch Break 12:10 PM - 1:30 PM

SESSION 7: BEAM SHAPING FOR LASER MICROMACHINING

30 January 2023 • 1:30 PM - 3:30 PM | Moscone Center, Room 158 (Upper Mezzanine South)

Session Chair: Robert R. Thomson, Heriot-Watt Univ. (United Kingdom)

12411-29 • 1:30 PM - 2:00 PM

Beam shaping of high-energy beams for laser micromachining of transparent materials *(Invited Paper)*

Author(s): Vytautas Jukna, Laser Research Ctr., Vilnius Univ. (Lithuania); Ernestas Nacius, Ctr. for Physical Sciences and Technology (Lithuania), Workshop of Photonics (Lithuania); Orestas Ulcinas, Workshop of Photonics (Lithuania); Sergejus Orlov, Ctr. for Physical Sciences and Technology (Lithuania)

12411-30 • 2:00 PM - 2:20 PM

Laser glass cutting of complex contours with tailored edges

Author(s): Jonas Kleiner, Tobias König, Myriam Kaiser, Daniel Flamm, TRUMPF Laser- und Systemtechnik GmbH (Germany)

12411-32 • 2:20 PM - 2:40 PM

High power shaped femtosecond beams for riblets manufacturing

Author(s): Eric Audouard, Martin Delaigue, Clemens Hoenninger, Eric Mottay, Amplitude (France); Gwenn Pallier, Ivan Gusachenko, Guillaume Labroille, CAILabs (France); Marie Fleureau, Amplitude (France)

12411-33 • 2:40 PM - 3:10 PM

Nanoarchitected materials and mechanical metamaterials *(Invited Paper)*

Author(s): Jens Bauer, Karlsruher Institut für Technologie (Germany)

12411-31 • 3:10 PM - 3:30 PM

Laser written waveguides with engineered cross-section

Author(s): Patrick S. Salter, Bangshan Sun, Zhi Kai Pong, Martin J. Booth, Univ. of Oxford (United Kingdom)

Coffee Break 3:30 PM - 3:45 PM

Conference 12411

MONDAY 30 JANUARY

LASE PLENARY AND HOT TOPICS

30 January 2023 • 3:45 PM - 6:05 PM | Moscone Center, Room 207/215 (Level 2 South)

3:45 PM - 3:50 PM: **Welcome and Opening Remarks**

Stefan Kaierle, Laser Zentrum Hannover e.V. (Germany) and John Ballato, Clemson Univ. (United States)

3:50 PM - 3:55 PM: **Announcement of the 3D Printing, Fabrication, and Manufacturing Best Paper Awards**

Henry Helvajian, The Aerospace Corp. (United States)

****Announcement of the LASE AI/ML Best Paper Award moved to 6:00 PM****

12408-500 • 4:00 PM - 4:30 PM

Status and potential of fully integrated photonic systems (*Plenary Presentation*)

Author(s): Arnan Mitchell, RMIT Univ. (Australia)

12412-601 • 4:30 PM - 4:45 PM

How laser AM can mitigate insecurities with supply chain issues and carbon footprint (*Plenary Presentation*)

Author(s): Eliana Fu, TRUMPF Inc. (United States)

12412-602 • 4:45 PM - 5:00 PM

Innovations in lidar driving the next generation of autonomy and safety (Hot Topic) (*Plenary Presentation*)

Author(s): Jason M. Eichenholz, Luminar Technologies, Inc. (United States)

12407-603 • 5:00 PM - 5:15 PM

Quantum computing with lasers (Hot Topic) (*Plenary Presentation*)

Author(s): Jürgen Stuhler, TOPTICA Photonics AG (Germany)

12401-501 • 5:15 PM - 5:45 PM

First demonstration of fusion ignition by inertial confinement fusion (ICF) at the National Ignition Facility (NIF) at LLNL (*Plenary Presentation*)

Author(s): Jean-Michel G. Di Nicola, Lawrence Livermore National Lab. (United States)

TUESDAY 31 JANUARY

SESSION 8: LASER WRITING OF STRUCTURAL MODIFICATIONS

31 January 2023 • 8:10 AM - 10:00 AM | Moscone Center, Room 158 (Upper Mezzanine South)

Session Chair: Yves Bellouard, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12411-34 • 8:10 AM - 8:40 AM

Ultrashort pulse laser processing of silicon (*Invited Paper*)

Author(s): Stefan Nolte, Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Namig Alasgarzade, Alessandro Alberucci, Markus Blothe, Jisha Chandroth Pannian, Gabor Matthäus, Maxime Chambonneau, Friedrich-Schiller-Univ. Jena (Germany)

12411-35 • 8:40 AM - 9:00 AM

Direct writing of conductive and semiconductive structures via the femtosecond laser-induced carbonization of a silicone elastomer

Author(s): Shuichiro Hayashi, Mitsuhiro Terakawa, Keio Univ. (Japan)

12411-36 • 9:00 AM - 9:20 AM

Laser processing and electrical analysis of embedded graphitic wires in diamond

Author(s): Marta Krüger, Martin Booth, Patrick Salter, Univ. of Oxford (United Kingdom)

12411-37 • 9:20 AM - 9:40 AM

Femtosecond direct-write photo-conductive tracks on the surface of a tellurite glass

Author(s): Gözden Torun, Anastasia Romashkina, Loic Chautems, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Tetsuo Kishi, Tokyo Institute of Technology (Japan); Yves Bellouard, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Show Abstract +

12411-39 • 9:40 AM - 10:00 AM

In situ wide-field third harmonic generation microscopy for monitoring femtosecond laser-induced defects

Author(s): Olivier Bernard, Andrea Kraxner, Assim Boukhayma, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Jeff Squier, Colorado School of Mines (United States); ChristianENZ, Yves Bellouard, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 9: NOVEL ULTRAFAST LASER SOURCES

31 January 2023 • 10:30 AM - 12:30 PM | Moscone Center, Room 158 (Upper Mezzanine South)

Session Chair: Stefan Nolte, Friedrich-Schiller-Univ. Jena (Germany)

12411-40 • 10:30 AM - 10:50 AM

Nonlinear post-compression of mJ-class ytterbium-based ultrafast laser pulses

Author(s): Torsten G. Mans, Jonathan Brons, TRUMPF Laser GmbH (Germany); Tino Eidam, Active Fiber Systems GmbH (Germany); Tom Metzger, TRUMPF Scientific Lasers GmbH + Co., KG (Germany); Christian Grebing, Maxim Tschernajew, Evgeny Shestaev, Jens Limpert, Active Fiber Systems GmbH (Germany); Yanik Pfaff, Gaia Barbiero, Michael Rampp, Haochuan Wang, Sandro Klingebiel, Catherine Teisset, Robert Jung, Abel Hailu Woldegeorgis, TRUMPF Scientific Lasers GmbH + Co., KG (Germany)

12411-41 • 10:50 AM - 11:10 AM

Active and passive new optical fibers for laser development and beam delivery

Author(s): Eric Mottay, Amplitude (France)

12411-42 • 11:10 AM - 11:30 AM

Miniature GHz repetition-rate femtosecond solid-state laser cavity in a glass substrate

Author(s): Antoine Delgoffe, Saood Nazir, Sargis Hakobyan, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Clemens Hoenninger, Amplitude (France); Yves Bellouard, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12411-43 • 11:30 AM - 11:50 AM

Femtosecond UV lasers for industrial applications: recent advances and challenges

Author(s): Aurimas Augus, Julius Darginavicius, Lukas Rimkus, Light Conversion Ltd. (Lithuania)

12411-44 • 11:50 AM - 12:10 PM

300-W femtosecond laser with ultrashort compressed pulses

Author(s): Florent Guichard, Florent Basin, Benoit Trophe, Eric Mottay, Clemens Hönninger, Amplitude (France)

12411-49 • 12:10 PM - 12:30 PM

Compact ultra-fast pulse modulation device based on rotated chirped volume Bragg gratings

Author(s): Murat Yessenov, Oussama Mhibik, Lam Mach, Leonid Glebov, Ayman F. Abouraddy, Ivan Divliansky, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

FRONTIERS IN ULTRAFAST OPTICS BEST STUDENT PAPER COMPETITION AND AWARDS CEREMONY

31 January 2023 • 2:00 PM - 3:20 PM | Moscone Center, Room 158 (Upper Mezzanine South)

SIGN UP FOR THE AWARD COMPETITION

Fill out this Google form so the chairs know to expect you:

<https://forms.gle/SY2vCCPM18XCWRXt6>

Competition • 2:00 PM to 3:00 PM

Judging & Award Ceremony • 3:00 PM to 3:20 PM

We are pleased to announce that a cash prize will be awarded to the best student presentation in this conference (both poster and oral papers considered).

Papers submitted and presented by graduate and undergraduate students are eligible. In order to ensure a fair evaluation, the conference chairs and the program committee will judge the students during a special student competition Session held during the conference. Here the students present a brief 5-minute summary of their original talk or poster presented at the conference.

Following the student competition, the judges will meet and decide on the winner. The winner and runner-up will be announced during the award ceremony and awarded a cash prize.:

POSTERS-TUESDAY

31 January 2023 • 6:00 PM - 8:00 PM |

Moscone Center, Level 2 West

Conference attendees are invited to attend the LASE poster Session on Tuesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12411-45

Femtosecond laser rangefinder for precise 3D coordinate measurement

Author(s): Seongheum Han, Seungman Kim, Jeong Seok Oh, Gyungho Khim, Seung-Kook Ro, Korea Institute of Machinery & Materials (Republic of Korea)

12411-50

Polarisation-independent ultrafast laser selective etching processing in fused silica

Author(s): Mario Ochoa, Pablo Roldán-Varona, Jose Francisco Algorri, José Miguel López-Higuera, Luis Rodríguez-Cobo, Univ. de Cantabria (Spain)

Conference 12412

Laser 3D Manufacturing X

31 January - 2 February 2023

Moscone West Room 2018 (Tue AM) and Moscone South Room 215 (Tue PM-Thu)

Conference Chairs: **Bo Gu**, Bos Photonics (United States); **Hongqiang Chen**, GE Research (United States)

Conference Co-Chair: **Henry Helvajian**, The Aerospace Corp. (United States)

Program Committee: **John T. Fourkas**, Univ. of Maryland, College Park (United States); **Youping Gao**, Aerojet Rocketdyne, Inc. (United States); **Dongdong Gu**, Nanjing Univ. of Aeronautics and Astronautics (China); **Andreas Heinrich**, Hochschule Aalen - Technik und Wirtschaft (Germany); **Ruth Houbertz**, ThinkMade Engineering & Consulting (Germany); **Linas Jonušauskas**, Femtika UAB (Lithuania); **Aravinda Kar**, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Edward C. Kinzel**, Univ. of Notre Dame (United States); **Christoph Leyens**, Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Jian Liu**, PolarOnyx, Inc. (United States); **Shuang Liu**, Miller Electric Manufacturing Co. (United States); **Robert Martinsen**, nLIGHT, Inc. (United States); **Henrikki Pantisar**, TRUMPF Inc. (United States); **Shailesh Patkar**, II-VI Incorporated (United States); **Henry Peng**, Chinese Academy of Sciences (China); **Alberto Piqué**, U.S. Naval Research Lab. (United States); **Jianrong Qiu**, Zhejiang Univ. (China); **Markus Rütering**, Laserline GmbH (Germany); **Yuji Sano**, Institute for Molecular Science (Japan); **Michael Thiel**, Nanoscribe GmbH & Co. KG (Germany); **Andrea Toulouse**, Institut für Technische Optik (Germany); **Thejaswi U. Tumkur Umanath**, Lawrence Livermore National Lab. (United States); **Augustine M. Urbas**, Air Force Research Lab. (United States); **Martin Wegener**, Karlsruher Institut für Technologie (Germany); **Xianfan Xu**, Purdue Univ. (United States)

MONDAY 30 JANUARY

LASE PLENARY AND HOT TOPICS

30 January 2023 • 3:45 PM - 6:05 PM | Moscone Center, Room 207/215 (Level 2 South)

3:45 PM - 3:50 PM: **Welcome and Opening Remarks**

Stefan Kaierle, Laser Zentrum Hannover e.V. (Germany) and John Ballato, Clemson Univ. (United States)

3:50 PM - 3:55 PM: **Announcement of the 3D Printing, Fabrication, and Manufacturing Best Paper Awards**

Henry Helvajian, The Aerospace Corp. (United States)

Announcement of the LASE AI/ML Best Paper Award moved to 6:00 PM**

12408-500 • 4:00 PM - 4:30 PM

Status and potential of fully integrated photonic systems (Plenary Presentation)

Author(s): Arnan Mitchell, RMIT Univ. (Australia)

12412-601 • 4:30 PM - 4:45 PM

How laser AM can mitigate insecurities with supply chain issues and carbon footprint (Plenary Presentation)

Author(s): Eliana Fu, TRUMPF Inc. (United States)

12412-602 • 4:45 PM - 5:00 PM

Innovations in lidar driving the next generation of autonomy and safety (Hot Topic) (Plenary Presentation)

Author(s): Jason M. Eichenholz, Luminar Technologies, Inc. (United States)

12407-603 • 5:00 PM - 5:15 PM

Quantum computing with lasers (Hot Topic) (Plenary Presentation)

Author(s): Jürgen Stuhler, TOPTICA Photonics AG (Germany)

12401-501 • 5:15 PM - 5:45 PM

First demonstration of fusion ignition by inertial confinement fusion (ICF) at the National Ignition Facility (NIF) at LLNL (Plenary Presentation)

Author(s): Jean-Michel G. Di Nicola, Lawrence Livermore National Lab. (United States)

TUESDAY 31 JANUARY

SESSION 1: QUALITY CONTROL FOR MICRO/NANO FABRICATION

Joint Session with Conferences 12433 and 12412

31 January 2023 • 9:00 AM - 10:00 AM | Moscone Center, Room 2018 (Level 2 West)

Session Chair: Robert R. McLeod, Univ. of Colorado Boulder (United States)

12433-31 • 9:00 AM - 9:20 AM

Towards efficient structure prediction and pre-compensation in multiphoton lithography

Author(s): Julian Hering-Stratemeier, Univ. of Kaiserslautern-Landau (Germany), Opti-Cal GmbH (Germany); Nicolas Lang, Sven Enns, Univ. of Kaiserslautern-Landau (Germany); Georg von Freymann, Univ. of Kaiserslautern-Landau (Germany), Fraunhofer-Institut für Techno- und Wirtschaftsmathematik ITWM (Germany), Opti-Cal GmbH (Germany)

12433-32 • 9:20 AM - 9:40 AM

Manufacturing acceleration of free-form micro-optical arrays (FMOAs) with CAD algorithms

Author(s): Frédéric Zanella, Oscar Fernandez, Ton Offermans, Tamara Aderneuer, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); Julio Chaves, Rubén Mohedano, Limbak 4PI S.L. (Spain); Guillaume Basset, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland)

12412-1 • 9:40 AM - 10:00 AM

Optical coherence tomography for multi-photon 3D laser printing: towards in-situ imaging and quality control

Author(s): Roman Zvahelskyi, Frederik Mayer, Dominik Beutel, Carsten Rockstuhl, Karlsruher Institut für Technologie (Germany); Guillaume Gomard, Carl Zeiss AG (Germany); Martin Wegener, Karlsruher Institut für Technologie (Germany)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: EMERGING TECHNOLOGY FOR BIO AND OPTICS 3D PRINTING

Joint Session with Conferences 12412 and 12433

31 January 2023 • 10:30 AM - 11:20 AM | Moscone Center, Room 2018 (Level 2 West)

Session Chair: Bo Gu, Bos Photonics (United States)

12412-2 • 10:30 AM - 11:00 AM

LIFT printing of cells and DNA damage study (*Invited Paper*)

Author(s): Evina Elezoglou, National Technical Univ. of Athens (Greece); Panagiotis Karakaidos, Biomedical Research Foundation, Academy of Athens (Greece); Christina Kryou, National Technical Univ. of Athens (Greece); Antonis Hatziaepostolou, Univ. of West Attica (Greece); Apostolos Klinakis, Biomedical Research Foundation, Academy of Athens (Greece); Ioanna Zergioti, National Technical Univ. of Athens (Greece)

12412-3 • 11:00 AM - 11:20 AM

4D microprinting of programmable polymers: towards “living” behaviours

Author(s): Eva Blasco, Christoph A. Spiegel, Li-Yun Hsu, Ruprecht-Karls-Univ. Heidelberg (Germany)

Lunch/Exhibition Break 11:20 AM - 1:00 PM

SESSION 3: 3D MICRO-NANO PRINTING I

ROOM CHANGE

31 January 2023 • 1:00 PM - 2:40 PM | Moscone Center, Room 215 (Level 2 South)

Session Chair: Henry Helvajian, The Aerospace Corp. (United States)

12412-5 • 1:00 PM - 1:30 PM

A 7×7-foci 3D laser nanoprinter using a diffractive optical element and an aspheric-lens array made by 3D laser nanoprnting (*Invited Paper*)

Author(s): Pascal Kiefer, Vincent Hahn, Martin Wegener, Karlsruher Institut für Technologie (Germany)

12412-6 • 1:30 PM - 2:00 PM

Rapid micro-prototyping by single-photon two-wavelength volumetric lithography (*Invited Paper*)

Author(s): Dirk Jan Mulder, Wesley Alexander van Vliet, Mark Laagland, Aditya Narayanan, Alexander Kostenko, Photosynthetic B.V. (Netherlands)

12412-7 • 2:00 PM - 2:20 PM

Efficient in-situ material replacement in two-photon 3D laser writing

Author(s): Robert Kirchner, Ye Yu, Man Ho Wong, Souha Toukabri, Jörg Knorr, TU Dresden (Germany)

12412-8 • 2:20 PM - 2:40 PM

Towards improving projection two-photon lithography for 3D nanoprnting

Author(s): Paul Somers, Jason E. Johnson, Zihao Liang, Gavin Noel, Bryan W. Boudouris, Liang Pan, Xianfan Xu, Purdue Univ. (United States)

Coffee Break 2:40 PM - 3:10 PM

SESSION 4: LASER 3D MANUFACTURING 10TH ANNIVERSARY SESSION: HISTORY AND FUTURE TREND

31 January 2023 • 3:10 PM - 5:40 PM | Moscone Center, Room 215 (Level 2 South)

Session Chair: Hongqiang Chen, GE Research (United States)

Photonics West 2023 marks the 10th year anniversary for the LASE Laser 3D Manufacturing Conference. It has been a great journey since 2014 to explore and advance laser technologies on 3D printing and manufacturing. To celebrate the remarkable achievements along with looking to the future, we have invited a few speakers from the last 10 years to return and share the latest progress. In addition, The Conference will host a panel discussion on the latest trends and hot topics that stretch from nano-printing to additive manufacturing for outer space applications. Please join us for this definitive event!

12412-9 • 3:10 PM - 3:40 PM

NSF Advanced Manufacturing program and laser 3D manufacturing research (*Invited Paper*)

Author(s): Khershed P. Cooper, The National Science Foundation (United States)

12412-10 • 3:40 PM - 4:10 PM

Probing the physics of metal 3D printing: Past, present, and future (*Invited Paper*)

Author(s): Manyalibo J. Matthews, Lawrence Livermore National Lab. (United States)

12412-12 • 4:10 PM - 4:40 PM

3D laser micro- and nanoprnting: 10 years of progress (*Invited Paper*)

Author(s): Martin Wegener, Karlsruher Institut für Technologie (Germany)

12412-41 • 4:40 PM - 5:10 PM

Digital printing of photonic devices by ink-jet and aerosol-jet: Competition or complement to laser manufacturing? (*Invited Paper*)

Author(s): Ulrich Lemmer, Karlsruher Institut für Technologie (Germany)

12412-11 • 5:10 PM - 5:40 PM

Advanced manufacturing technologies for future operations in outer space: What we have and what we need (*Invited Paper*)

Author(s): Henry Helvajian, The Aerospace Corp. (United States)

PANEL DISCUSSION: LASER 3D MANUFACTURING

31 January 2023 • 5:40 PM - 6:10 PM | Moscone Center, Room 215 (Level 2 South)

PANELISTS:

Bo Gu, Bos Photonics (United States)

Hongqiang Chen, GE Research (United States)

Henry Helvajian, The Aerospace Corp. (United States)

Ruth Houbertz, ThinkMade Engineering & Consulting (Germany)

Conference 12412

POSTERS-TUESDAY

31 January 2023 • 6:00 PM - 8:00 PM |
Moscone Center, Level 2 West

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Poster Setup: Tuesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12412-40 • 6:00 PM - 8:00 PM

Cu-Zn alloy coating with multi-beam laser metal deposition using blue diode lasers

Author(s): Ritsuko Higashino, Yuji Sato, Keisuke Takenaka, Nobuyuki Abe, Masahiro Tsukamoto, Joining and Welding Research Institute, Osaka Univ. (Japan)

WEDNESDAY 1 FEBRUARY

SESSION 5: 3D MICRO-NANO PRINTING II

1 February 2023 • 8:30 AM - 10:10 AM | Moscone Center, Room 215 (Level 2 South)

Session Chair: Henry Helvajian, The Aerospace Corp. (United States)

12412-13 • 8:30 AM - 9:00 AM

Peculiarities of using beam shaping via spatial light modulator (SLM) for 2-photon polymerization (*Invited Paper*)

Author(s): Linas Jonušauskas, Vital3D Technologies (Lithuania), Vilnius Univ. (Lithuania); Konradas Stonkus, Vital3D Technologies (Lithuania)

12412-14 • 9:00 AM - 9:30 AM

Two steps towards compact 3D laser nanoprinters (*Invited Paper*)

Author(s): Tobias Messer, Karlsruher Institut für Technologie (Germany); Matthias Blaicher, Michael Thiel, Nanoscribe GmbH & Co. KG (Germany); Martin Wegener, Karlsruher Institut für Technologie (Germany)

12412-15 • 9:30 AM - 9:50 AM

Model for multi-step absorption and polymerization in 3D nanolithography

Author(s): Jason E. Johnson, Paul Somers, Xianfan Xu, Purdue Univ. (United States)

12412-16 • 9:50 AM - 10:10 AM

High-speed laser exposure of slow photopolymers

Author(s): Alexander Hochwallner, Wolfgang Steiger, Christian Gorsche, Robert Gmeiner, Cubicure GmbH (Austria)

Coffee Break 10:10 AM - 10:40 AM

SESSION 6: POWDER-BED SLM METAL PRINTING

1 February 2023 • 10:40 AM - 12:10 PM | Moscone Center, Room 215 (Level 2 South)

Session Chair: Hongqiang Chen, GE Research (United States)

12412-17 • 10:40 AM - 11:10 AM

Unique materials for additive manufacturing enabling new series application (*Invited Paper*)

Author(s): Nicholas Risch, Jan Christian Schauer, Naimish Shah, Dennis Pedé, Severin Luzius, TRUMPF Inc. (Germany); Eliana Fu, TRUMPF Inc. (United States)

12412-18 • 11:10 AM - 11:40 AM

Advanced optics for laser additive manufacturing: F-Theta lenses for laser powder bed fusion (*Invited Paper*)

Author(s): Adam Argondizzo, Kyle Branigan, II-VI Incorporated (United States)

12412-19 • 11:40 AM - 12:10 PM

Directional distribution of reflected laser power in powder bed metal additive manufacturing (*Invited Paper*)

Author(s): David C. Deisenroth, Sergey Mekhontsev, National Institute of Standards and Technology (United States)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

SESSION 7: HYBRID AND MULTI-MATERIAL PRINTING

1 February 2023 • 1:40 PM - 2:30 PM | Moscone Center, Room 215 (Level 2 South)

Session Chair: Hongqiang Chen, GE Research (United States)

12412-21 • 1:40 PM - 2:10 PM

Additive multimaterial 3D-structures (*Invited Paper*)

Author(s): Robert Bernhard, Laser Zentrum Hannover e.V. (Germany); Philipp Neef, Clausthaler Zentrum für Materialtechnik, Technische Univ. Clausthal (Germany); Jörg Hermsdorf, Laser Zentrum Hannover e.V. (Germany); Henning Wiche, Clausthaler Zentrum für Materialtechnik, Technische Univ. Clausthal (Germany); Stefan Kaierle, Laser Zentrum Hannover e.V. (Germany); Volker Wesling, Clausthaler Zentrum für Materialtechnik, Technische Univ. Clausthal (Germany)

12412-24 • 2:10 PM - 2:30 PM

A truly hybrid laser AM part for space exploration

Author(s): Ulli Kraske, TRUMPF Inc. (United States)

Coffee Break 2:30 PM - 3:00 PM

SESSION 8: DIGITAL CIRCUIT AND ELECTRONICS PRINTING

1 February 2023 • 3:00 PM - 4:40 PM | Moscone Center, Room 215 (Level 2 South)

Session Chair: Aravinda Kar, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

12412-25 • 3:00 PM - 3:30 PM

Additive nanomanufacturing and dry printing multimaterial electronics and sensors (*Invited Paper*)

Author(s): Masoud Mahjouri-Samani, Zabihollah Ahmadi, Aarsh Patel, Adib Taba, Seungjong Lee, Nima Shamsaei, Auburn Univ. (United States); Raymond R. Unocic, Oak Ridge National Lab. (United States)

12412-26 • 3:30 PM - 4:00 PM

Direct laser printing of functional micro-electronics (*Invited Paper*)

Author(s): Liang Yang, Hongrong Hu, Alexander Scholz, Florian Feist, Gabriel Cadilha Marques, Niklas Maximilian Bojanowski, Karlsruher Institut für Technologie (Germany); Eva Blasco, Ruprecht-Karls-Univ. Heidelberg (Germany); Jasmin Aghassi-Hagmann, Martin Wegener, Karlsruher Institut für Technologie (Germany)

12412-27 • 4:00 PM - 4:20 PM

Laser processed Ag nanoparticle conductive grids as bottom electrode for flexible ITO-free organic photovoltaics

Author(s): Kostas Andritsos, National Technical Univ. of Athens (Greece); Sergey M. Pozov, Cyprus Univ. of Technology (Cyprus); Ioannis Theodorakos, National Technical Univ. of Athens (Greece); Apostolos Ioakeimidis, Cyprus Univ. of Technology (Cyprus); Ayala Kabla, Semyon Melamed, Fernando de la Vega, PV Nano Cell Ltd. (Israel); Stelios A. Choulis, Cyprus Univ. of Technology (Cyprus); Ioanna Zergioti, National Technical Univ. of Athens (Greece)

12412-28 • 4:20 PM - 4:40 PM

Transmittance of TiO₂ nanoparticle-based films deposited by CO₂ laser heating

Author(s): Yahya Bougdid, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); Francois Chenard, IRflex Corporation (United States); John Sugrim, U.S. Navy (United States); Ranganathan Kumar, Univ. of Central Florida (United States); Aravinda Kar, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

THURSDAY 2 FEBRUARY

SESSION 9: FUNCTIONAL PHOTONIC DEVICES PRINTING I

2 February 2023 • 8:00 AM - 9:10 AM | Moscone Center, Room 215 (Level 2 South)

Session Chair: Linas Jonušauskas, Vital3D Technologies UAB (Lithuania)

12412-29 • 8:00 AM - 8:30 AM

Towards additive manufacturing of multiplexed volume scattering devices using two-photon polymerization (*Invited Paper*)

Author(s): Johannes Drozella, Andrea Toulouse, Alois M. Herkommer, Stuttgart Research Ctr. of Photonic Engineering, Univ. Stuttgart (Germany)

12412-30 • 8:30 AM - 8:50 AM

Laser 3D printing of expanded beam connectors for optical connectivity

Author(s): Lei Yuan, Corning Incorporated (United States); Aofei Mao, Univ. of Nebraska-Lincoln (United States); Jie Liu, Ying Liu, Arron L. Webster, Clark Jeffrey, Zheng Xiong, Randy McClure, Qi Wu, Ming-Jun Li, Corning Incorporated (United States); Peizi Li, Peixun Fan, Yongfeng Lu, Univ. of Nebraska-Lincoln (United States)

12412-313 • 8:50 AM - 9:10 AM In situ process monitoring of two-photon lithography with optical diffraction tomography

Author(s): Cheng Zheng, Peter So, Massachusetts Institute of Technology (United States)

Coffee Break 9:10 AM - 9:30 AM

SESSION 10: FUNCTIONAL PHOTONIC DEVICES PRINTING II

2 February 2023 • 9:30 AM - 10:40 AM | Moscone Center, Room 215 (Level 2 South)

Session Chair: Johannes Drozella, Univ. Stuttgart (Germany)

12412-33 • 9:30 AM - 10:00 AM

3D optomechanical metamaterials (*Invited Paper*)

Author(s): Alexander Münchinger, Karlsruher Institut für Technologie (Germany); Li-Yun Hsu, Ruprecht-Karls-Univ. Heidelberg (Germany); Franziska Fürniß, Karlsruher Institut für Technologie (Germany); Eva Blasco, Ruprecht-Karls-Univ. Heidelberg (Germany); Martin Wegener, Karlsruher Institut für Technologie (Germany)

12412-34 • 10:00 AM - 10:20 AM

3D nanofabrication of multi-functional optical/multi-functional metamaterials

Author(s): Gaojie Yang, Quansan Yang, Cheng Zheng, Peter T. C. So, Edward Boyden, Massachusetts Institute of Technology (United States)

12412-36 • 10:20 AM - 10:40 AM

Laser-based additive manufacturing of high-performance polymers

Author(s): Wolfgang Steiger, Christian Frank, Christian Gorsche, Thomas Förster-Romswinkel, Bernhard Buseti, Raphael Krobath, Robert Gmeiner, Cubicure GmbH (Austria)

Coffee Break 10:40 AM - 11:00 AM

SESSION 11: FUNCTIONAL PHOTONIC DEVICES PRINTING III

2 February 2023 • 11:00 AM - 12:20 PM | Moscone Center, Room 215 (Level 2 South)

Session Chair: Edward C. Kinzel, Univ. of Notre Dame (United States)

12412-37 • 11:00 AM - 11:30 AM

Optical tweezers for large-scale 3D assembly of micro and nanoscale building blocks (*Invited Paper*)

Author(s): Euan McLeod, Wyant College of Optical Sciences (United States)

Conference 12412

12412-38 • 11:30 AM - 12:00 PM

Photoinitiator-free two-photon polymerization for 3D cell-scaffold fabrication *(Invited Paper)*

Author(s): Atsushi Nakayama, Osaka Univ. (Japan), AIST-Osaka Univ. Advanced Photonics and Biosensing (Japan); Yasuaki Kumamoto, Osaka Univ. (Japan); Menglu Li, Osaka Univ. (Japan), AIST-Osaka Univ. Advanced Photonics and Biosensing (Japan); Teng Li, Meiling Zheng, Chinese Academy of Sciences (China), Univ. of Chinese Academy of Sciences (China); Katsumasa Fujita, Osaka Univ. (Japan), AIST-Osaka Univ. Advanced Photonics and Biosensing (Japan), Osaka Univ. Institute for Open and Transdisciplinary Research Initiatives (Japan)

12412-39 • 12:00 PM - 12:20 PM

Development of a multifaceted mapping mirror using two-photon polymerization for snapshot image mapping spectrometer

Author(s): Jiawei Lu, Rice Univ. (United States); Xue Wen Ng, David Piston, Washington Univ. in St. Louis (United States); Tomasz Tkaczyk, Rice Univ. (United States)

Conference 12413

Free-Space Laser Communications XXXV

30 January - 1 February 2023 | Moscone Center, Room 206 (Level 2 South)

Conference Chairs: **Hamid Hemmati**, ViaSat, Inc. (United States); **Bryan S. Robinson**, MIT Lincoln Lab. (United States)

Program Committee: **Abhijit Biswas**, Jet Propulsion Lab. (United States); **Don M. Boroson**, MIT Lincoln Lab. (United States); **Kerri L. Cahoy**, Massachusetts Institute of Technology (United States); **Donald M. Cornwell Jr.**, Amazon.com, Inc. (United States); **Baris I. Erkmey**, Hedron (United States); **Harald Hauschildt**, European Space Research and Technology Ctr. (Netherlands); **Frank F. Heine**, Tesat-Spacecom GmbH & Co. KG (Germany); **William S. Rabinovich**, U.S. Naval Research Lab. (United States); **Todd S. Rose**, The Aerospace Corp. (United States); **Julie Smith**, Air Force Research Lab. (United States); **Sarah A. Tedder**, NASA Glenn Research Ctr. (United States); **Linda M. Thomas**, U.S. Naval Research Lab. (United States); **Morio Toyoshima**, National Institute of Information and Communications Technology (Japan)

MONDAY 30 JANUARY

WELCOME AND INTRODUCTION

30 January 2023 • 8:05 AM - 8:15 AM | Moscone Center, Room 206 (Level 2 South)

Hamid Hemmati, ViaSat, Inc. (United States) and Bryan S. Robinson, MIT Lincoln Lab. (United States)

SESSION 1: FLIGHT DEMONSTRATIONS

30 January 2023 • 8:15 AM - 10:15 AM | Moscone Center, Room 206 (Level 2 South)

Session Chair: Hamid Hemmati, ViaSat, Inc. (United States)

12413-1 • 8:15 AM - 8:45 AM

On-orbit demonstration of 200-Gbps laser communication downlink from the TBIRD CubeSat *(Invited Paper)*

Author(s): Curt M. Schieler, Kathleen M. Riesing, Bryan C. Bilyeu, Jessica S. Chang, Ajay S. Garg, Noah C. Gilbert, Andrew J. Horvath, Robert S. Reeve, Bryan S. Robinson, Jade P. Wang, MIT Lincoln Lab. (United States); Sabino Piazzolla, W. Thomas Roberts, Joseph M. Kovalik, Jet Propulsion Lab. (United States); Beth Keer, NASA Goddard Space Flight Ctr. (United States)

12413-2 • 8:45 AM - 9:15 AM

Early results from NASA's laser communications relay demonstration (LCRD) experiment program *(Invited Paper)*

Author(s): David J. Israel, Bernard L. Edwards, Richard L. Butler, NASA Goddard Space Flight Ctr. (United States); John D. Moores, MIT Lincoln Lab. (United States); Sabino Piazzolla, NASA Goddard Space Flight Ctr. (United States); Nic du Toit, ASRC (United States); Lena Braatz, BAH (United States)

12413-3 • 9:15 AM - 9:35 AM

Multi-platform secure laser communication system

Author(s): Aaron P. Freeman, Cody Wenner, General Atomics (United States)

12413-4 • 9:35 AM - 9:55 AM

On-orbit results of pointing, acquisition, and tracking for the TBIRD CubeSat mission

Author(s): Kathleen M. Riesing, Curt M. Schieler, Jessica S. Chang, Noah C. Gilbert, Andrew J. Horvath, Robert S. Reeve, Bryan S. Robinson, Jade P. Wang, MIT Lincoln Lab. (United States)

12413-71 • 9:55 AM - 10:15 AM

Optical satellite links at DLR

Author(s): Christian Fuchs, Florian Moll, Juraj Poliak, Andrew Reeves, Christopher Schmidt, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

Coffee Break 10:15 AM - 10:45 AM

SESSION 2: MISSION CONCEPTS AND SYSTEM ARCHITECTURES

30 January 2023 • 10:45 AM - 12:25 PM | Moscone Center, Room 206 (Level 2 South)

Session Chair: Bryan S. Robinson, MIT Lincoln Lab. (United States)

12413-5 • 10:45 AM - 11:05 AM

Telesat Lightspeed: enabling mesh network solutions for managed data service flexibility across the globe

Author(s): Nader Yared, Telesat (Canada); Gerry Jansson, Telesat U.S. Services, LLC (United States)

12413-6 • 11:05 AM - 11:25 AM

High-rate 256+ Gbit/s laser communications for enhanced high-resolution imaging using space-based very long baseline interferometry (VLBI)

Author(s): Jade P. Wang, Bryan Bilyeu, Don Boroson, David Caplan, Bryan Robinson, Curt Schieler, MIT Lincoln Lab. (United States); Michael Johnson, Lindy Blackburn, Sheperd Doleman, Kari Haworth, Harvard-Smithsonian Ctr. for Astrophysics (United States)

12413-7 • 11:25 AM - 11:45 AM

Laser transmission of quantum bits and multi-tera-bits over multi-hop satellite orbital constellations

Author(s): Maximilian Koegler, Joachim Horwath, Carsten Fechtmann, Le Binh, Axel Hof, Federica Bonomo, Mynaric Lasercom GmbH (Germany)

12413-9 • 11:45 AM - 12:05 PM

Optical communications operations concept for the Artemis II crewed mission to the Moon

Author(s): Farzana I. Khatri, MIT Lincoln Lab. (United States); Michael Bay, NASA Goddard Space Flight Ctr. (United States); Jonathan B. King, NASA Johnson Space Ctr. (United States); Jessica Chang, MIT Lincoln Lab. (United States); Terry Hudson, NASA Johnson Space Ctr. (United States); Robert T. Schulein, Olga Mikulina, MIT Lincoln Lab. (United States); Jeffrey J. Zinchuk, Robert J. McGraw, Jacob Gregory, NASA Goddard Space Flight Ctr. (United States); Paul W. Gramm, NASA Johnson Space Ctr. (United States); Nikki M. Desch, Steven J. Horowitz, NASA Goddard Space Flight Ctr. (United States); Bryan S. Robinson, MIT Lincoln Lab. (United States)

12413-10 • 12:05 PM - 12:25 PM

Development and implementation of command and control for space-based adaptive communications node (Space-BACN) cross-constellation communications

Author(s): Shankaraman Ramakrishnan, Michael Vai, Alice Lee, Todd Ulmer, John D. Moores, Jonah Tower, MIT Lincoln Lab. (United States); Gregory Kuperman, Defense Advanced Research Projects Agency (United States)

Lunch Break 12:25 PM - 1:55 PM

Conference 12413

SESSION 3: FLIGHT TRANSCEIVER TECHNOLOGIES AND STUDIES

30 January 2023 • 1:55 PM - 3:15 PM | Moscone Center, Room 206 (Level 2 South)

Session Chair: Linda M. Thomas, U.S. Naval Research Lab. (United States)

12413-11 • 1:55 PM - 2:15 PM

Status on laser communication activities at Tesat-Spacecom

Author(s): Frank F. Heine, Andrej Brzoska, Mark Gregory, Thomas Hiemstra, Robert Mahn, Patricia Martin-Pimentel, Herwig Zech, Tesat-Spacecom GmbH & Co. KG (Germany)

12413-12 • 2:15 PM - 2:35 PM

Generalized spatial acquisition for a space-based adaptive communications node optical terminal

Author(s): Todd Ulmer, Shankaraman Ramakrishnan, John D. Moores, Robert Murphy, MIT Lincoln Lab. (United States); Julie Smith, Seth L. Lacy, Air Force Research Lab. (United States); Michael C. Butterfield, Gregory Kuperman, Defense Advanced Research Projects Agency (United States)

12413-13 • 2:35 PM - 2:55 PM

System level TVAC functional testing for the Integrated LCRD Low-Earth Orbit User Modem and Amplifier Terminal (ILLUMA-T) payload destined for the International Space Station

Author(s): Farzana I. Khatri, MIT Lincoln Lab. (United States); Zachary Gonnsen, NASA Goddard Space Flight Ctr. (United States); Jade P. Wang, Olga Mikulina, Robert T. Schulein, Jessica Chang, MIT Lincoln Lab. (United States); John J. Veselka, NASA Goddard Space Flight Ctr. (United States); Catherine DeVoe, Steven Gillmer, Daniel Han, Anthony Matt, Corrie Smeaton, James Torres, Neal Spellmeyer, Kyle McAnney, Robert Buchanan, Alexandra Karliceck, Daniel Howe, Mark Stevens, MIT Lincoln Lab. (United States); Trisha Randazzo, Eric Lidwa, NASA Goddard Space Flight Ctr. (United States); Bryan S. Robinson, Mark Padula, MIT Lincoln Lab. (United States); Chetan Sayal, NASA Goddard Space Flight Ctr. (United States)

12413-14 • 2:55 PM - 3:15 PM

FWM-PEV statistics in 8 channel 50W high power WDM PPM Tx with and without TDM based FWM mitigation

Author(s): Doruk Engin, Jacob Hwang, Fibertek, Inc. (United States); Xung Dang, Patrick Olmstead, Ted Wysocki, mark storm, Fibertek (United States)

Coffee Break 3:15 PM - 3:45 PM

LASE PLENARY AND HOT TOPICS

30 January 2023 • 3:45 PM - 6:05 PM | Moscone Center, Room 207/215 (Level 2 South)

3:45 PM - 3:50 PM: **Welcome and Opening Remarks**

Stefan Kaierle, Laser Zentrum Hannover e.V. (Germany) and John Ballato, Clemson Univ. (United States)

3:50 PM - 3:55 PM: **Announcement of the 3D Printing, Fabrication, and Manufacturing Best Paper Awards**
Henry Helvajian, The Aerospace Corp. (United States)

Announcement of the LASE AI/ML Best Paper Award moved to 6:00 PM**

12408-500 • 4:00 PM - 4:30 PM

Status and potential of fully integrated photonic systems (*Plenary Presentation*)

Author(s): Arnan Mitchell, RMIT Univ. (Australia)

12412-601 • 4:30 PM - 4:45 PM

How laser AM can mitigate insecurities with supply chain issues and carbon footprint (*Plenary Presentation*)

Author(s): Eliana Fu, TRUMPF Inc. (United States)

12412-602 • 4:45 PM - 5:00 PM

Innovations in lidar driving the next generation of autonomy and safety (*Hot Topic*) (*Plenary Presentation*)

Author(s): Jason M. Eichenholz, Luminar Technologies, Inc. (United States)

12407-603 • 5:00 PM - 5:15 PM

Quantum computing with lasers (*Hot Topic*) (*Plenary Presentation*)

Author(s): Jürgen Stuhler, TOPTICA Photonics AG (Germany)

12401-501 • 5:15 PM - 5:45 PM

First demonstration of fusion ignition by inertial confinement fusion (ICF) at the National Ignition Facility (NIF) at LLNL (*Plenary Presentation*)

Author(s): Jean-Michel G. Di Nicola, Lawrence Livermore National Lab. (United States)

TUESDAY 31 JANUARY

SESSION 4: TRANSMITTER TECHNOLOGIES

31 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 206 (Level 2 South)

Session Chair: Frank F. Heine, Tesat-Spacecom GmbH & Co. KG (Germany)

12413-15 • 8:00 AM - 8:20 AM

Development of a continuous wave single transverse mode polarization-maintaining 10 W Er/Yb-codoped fiber amplifier for space communications

Author(s): Hiroki Kobayashi, Ryoko Kano, Takashi Seo, Yasushi Suzuki, Nikon Corp. (Japan); Eiichi Mizuta, Yosuke Hashimoto, Tomohiro Araki, Japan Aerospace Exploration Agency (Japan); Yasutoshi Takada, Nikon Corp. (Japan)

12413-16 • 8:20 AM - 8:40 AM

Extremely powerful optical sources (EPOS) for Tbit/s satellite links

Author(s): Matthew Welch, James Edmunds, Naresh Thipparapu, Aubin Donnot, Peter Kean, G&H Group (United Kingdom)

12413-17 • 8:40 AM - 9:00 AM

1.06-micron high power laser propagation in low-altitude atmosphere

Author(s): Chueh Ting, New Mexico State Univ. (United States); Hang Xu, Tianjin Univ. (China); Changhai Lin, ChenAn intelligent manufacturing R&D ctr. (China)

12413-18 • 9:00 AM - 9:20 AM

High-capacity optical wireless VCSEL array transmitter with uniform coverage

Author(s): Yi Liu, Wajahat Ali, Rui Chen, Nikos Bamiedakis, Michael Crisp, Univ. of Cambridge (United Kingdom); Ian White, Univ. of Bath (United Kingdom); Richard Pentty, Univ. of Cambridge (United Kingdom)

12413-19 • 9:20 AM - 9:40 AM

Coherent beam combine based on a single photodetector without local beam optics

Author(s): Tomohiro Akiyama, Akihiro Fujie, Yuta Takemoto, Hitomi Ono, Eisuke Haraguchi, Toshiyuki Ando, Yosuke Akino, Hideaki Ochimizu, Mitsubishi Electric Corp. (Japan)

12413-20 • 9:40 AM - 10:00 AM

Hemispherical retro-modulation technologies for passive free-space optical communication links

Author(s): Alexander C. MacGillivray, Sayra Gorgani, Ilija R. Hristovski, Matthias F. Jenne, Nikolai I. Lesack, Jonathan F. Holzman, The Univ. of British Columbia (Canada)

Coffee Break 10:00 AM - 10:30 AM

SESSION 5: BEAM-POINTING COMPONENTS

31 January 2023 • 10:30 AM - 11:30 AM | Moscone Center, Room 206 (Level 2 South)

Session Chair: Donald M. Cornwell, Amazon.com, Inc. (United States)

12413-21 • 10:30 AM - 10:50 AM

Demonstration of wireless data transmission using passive silica optical phased array

Author(s): Jae-Yong Kim, Hyeonho Yoon, Jinhyeong Yoon, Junhyeong Kim, Namhyun Kwon, KAIST (Republic of Korea); Yongtae Lee, Wayoptics (Republic of Korea); Hamza Kurt, Hyo-Hoon Park, KAIST (Republic of Korea)

12413-22 • 10:50 AM - 11:10 AM

Conceptual design and analysis of a compact liquid crystal on silicon non-mechanical optical beam steering antenna for lean platforms

Author(s): Femi M. Ishola, National Institute of Information and Communications Technology (NICT) (Japan); Dimitar Kolev, Hiroo Kunimori, National Institute of Information and Communications Technology (Japan); Alberto Carrasco-Casado, National Institute of Information and Communications Technology (NICT) (Japan); Hiroyuki Tsuji, National Institute of Information and Communications Technology (Japan); Morio Toyoshima, National Institute of Information and Communications Technology (NICT) (Japan)

12413-23 • 11:10 AM - 11:30 AM

Fast steering prism for correction of tip tilt aberrations

Author(s): Antonio Vanzo, Kevin Campaci, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Tommaso Furieri, Univ. degli Studi di Padova (Italy); Francesco Mazzocco, Jacopo Mocci, Dynamic Optics S.r.l. (Italy); Stefano Bonora, CNR-Istituto di Fotonica e Nanotecnologie (Italy)

Lunch/Exhibition Break 11:30 AM - 1:40 PM

SESSION 6: GROUND TRANSCEIVER TECHNOLOGIES I

31 January 2023 • 1:40 PM - 3:00 PM | Moscone Center, Room 206 (Level 2 South)

Session Chair: Don M. Boroson, MIT Lincoln Lab. (United States)

12413-26 • 1:40 PM - 2:00 PM

A real-time optical ground receiver for photon starved environments

Author(s): Jennifer N. Downey, Sarah A. Tedder, Brian E. Vyhnaelek, Nicholas C. Lantz, Michael A. Marsden, William P. Simon, Thomas P. Bizon, Daniel J. Zeleznikar, NASA Glenn Research Ctr. (United States)

12413-27 • 2:00 PM - 2:20 PM

The Deep Space Optical Communications project ground laser transmitter

Author(s): Meera Srinivasan, Angel Velasco, Malcolm Wright, Sean Meenehan, Michael Y. Peng, Ryan Rogalin, Nate Richard, Abhijit Biswas, Alexa Aguilar, Yuri Beregovski, Mark Brewer, William Buehlman, Jason Allmaras, Gerardo Ortiz, Vachik Garkanian, Jet Propulsion Lab. (United States)

12413-28 • 2:20 PM - 2:40 PM

The Deep Space Optical Communications project ground laser receiver

Author(s): Meera Srinivasan, Erik Alerstam, Emma Wollman, Ryan Rogalin, Sean Meenehan, Matthew Shaw, Angel Velasco, Abhijit Biswas, Nate Richard, Daniel Cho, Vachik Garkanian, Jason Allmaras, Gregory Miles, Edwin Grigorian, Jet Propulsion Lab. (United States)

12413-29 • 2:40 PM - 3:00 PM

A transmitter and receiver for lunar communications on the ANU Optical Ground Station

Author(s): Michael Copeland, Francis Bennet, Marcus Birch, Kate Ferguson, Doris Grosse, Noelia Martinez Rey, Tony Travouillon, The Australian National Univ. (Australia)

Coffee Break 3:00 PM - 3:30 PM

SESSION 7: GROUND TRANSCEIVER TECHNOLOGIES II

31 January 2023 • 3:30 PM - 5:30 PM | Moscone Center, Room 206 (Level 2 South)

Session Chair: Julie Smith, Air Force Research Lab. (United States)

12413-30 • 3:30 PM - 3:50 PM

Optical-to-Orion (O2O) ground terminal (GT) at Table Mountain Facility (TMF)

Author(s): Abhijit Biswas, Jet Propulsion Lab. (United States), Caltech (United States); Sabino Piazzolla, Arvid Croonquist, Erik Alerstam, Malcolm Wright, Matthew Shaw, Emma Wollman, Ryan Rogalin, Sean Meenehan, Christine Chen, Jason Allmaras, Jet Propulsion Lab. (United States)

Conference 12413

12413-31 • 3:50 PM - 4:10 PM

Fiber-detector subsystem loss comparison for a ground-based photon-counting optical receiver

Author(s): Brian E. Vyhnaelek, Sarah A. Tedder, NASA Glenn Research Ctr. (United States)

12413-32 • 4:10 PM - 4:30 PM

NASA's Low-Cost Optical Terminal (LCOT) at Goddard Space Flight Center

Author(s): Robert E. Lafon, Yingxin Bai, Armen Caroglanian, James M. Dailey, Nikki Desch, NASA Goddard Space Flight Ctr. (United States); Howard Garon, Science Systems and Applications, Inc. (United States); Steve Hall, Cimarron Software Services, Inc. (United States); Peraton Inc. (United States); Ronald Miller, Bay Engineering Innovations, Inc. (United States); Daniel A. Paulson, Science Systems and Applications, Inc. (United States); Haleh Safavi, NASA Goddard Space Flight Ctr. (United States); Predrag Sekulic, KBR, Inc. (United States); John V. Speer, Bay Engineering Innovations, Inc. (United States); Patrick Thompson, Victoria Wu, NASA Goddard Space Flight Ctr. (United States)

12413-33 • 4:30 PM - 4:50 PM

18km bidirectional free-space optical link with multi-aperture antenna and DWDM SFP+ transceivers (VERTIGO project)

Author(s): Nicolas Perlot, Peter Hanne, Abraham Johst, Marcel Rothe, Bill-Antonio Bernhardt, Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); Anagnostis Paraskevopoulos, Ronald Freund, Fraunhofer-Institut für Nachrichtentechnik (Germany)

12413-34 • 4:50 PM - 5:10 PM

NASA's LCOT (low-cost optical terminal) FSOS (free-space optical subsystem): concept, design, build, and test

Author(s): Patrick L. Thompson, Armen Caroglanian, NASA Goddard Space Flight Ctr. (United States); Jeffrey A. Guzek, Design Interface, Inc. (United States); Stephen A. Hall, Cimarron Software Services, Inc. (United States); Robert E. Lafon, NASA Goddard Space Flight Ctr. (United States); Kristoffer C. Olsen, Genesis Engineering Solutions, Inc. (United States); Daniel A. Paulson, Science Systems and Applications, Inc. (United States); Haleh Safavi, NASA Goddard Space Flight Ctr. (United States); Predrag Sekulic, KBR Wyle Services, LLC (United States), KBR Inc. (United States); Oscar Ta, Genesis Engineering Solutions, Inc. (United States); Mark E. Wilson, KBR Wyle Services, LLC (United States), KBR Inc. (United States)

12413-35 • 5:10 PM - 5:30 PM

Initial test results for NASA Goddard's low-cost optical terminal adaptive optics system

Author(s): Daniel A. Paulson, Science Systems and Applications, Inc. (United States), NASA Goddard Space Flight Ctr. (United States); Predrag Sekulic, KBR Wyle Services, LLC (United States), NASA Goddard Space Flight Ctr. (United States); Robert E. Lafon, Patrick L. Thompson, NASA Goddard Space Flight Ctr. (United States); Stephen A. Hall, Cimarron Software Services, Inc. (United States), NASA Goddard Space Flight Ctr. (United States); Kristoffer C. Olsen, Genesis Engineering Solutions, Inc. (United States), NASA Goddard Space Flight Ctr. (United States); Nikki M. Desch, Haleh Safavi, NASA Goddard Space Flight Ctr. (United States)

POSTERS-TUESDAY

31 January 2023 • 6:00 PM - 8:00 PM |

Moscone Center, Level 2 West

Conference attendees are invited to attend the LASE poster Session on Tuesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12413-58

Folded optical design for high fidelity atmospheric emulation with a spatial light modulator

Author(s): Sarah A. Tedder, Yousef K. Chahine, NASA Glenn Research Ctr. (United States)

12413-59

Analysis of diversity gain and outage capacity in multiple beam transmission spatial diversity vertical FSO Links

Author(s): Sungjin Kim, Hyemin Park, Youngjin Hyun, Sangkook Han, Yonsei Univ. (Republic of Korea)

12413-60

Simulation framework for classical and quantum communications over the free-space optical channel

Author(s): Roza Navitskaya, Shi Li, Piotr Novik, Igor Koltchanov, André Richter, VPIphotonics GmbH (Germany)

12413-61

Statistical analysis of fading power vectors for real-time atmospheric channel emulation

Author(s): Yousef K. Chahine, Evan Katz, Brian E. Vyhnaelek, Sarah A. Tedder, NASA Glenn Research Ctr. (United States)

12413-63

Characterization of infrared laser beam through atmospheric optical turbulence in laboratory environment

Author(s): Juan F. Coronel, Karim Elayoubi, Asma Alahmadi, Safa Alhosani, Ali Alblooshi, Reem Alameri, Steevy Cordette, Abdellatif Bouchalkha, Jawaher Alameri, Guillaume Matras, Chaouki Kasmi, Technology Innovation Institute (United Arab Emirates)

12413-64

Research and development of key technologies for cislunar optical communication systems in Japan

Author(s): Hideaki Kotake, Yoshihiko Saito, National Institute of Information and Communications Technology (NICT) (Japan); Tomohiro Araki, Katsumi Makino, Masaru Koga, Kota Tanabe, Naoki Sato, Japan Aerospace Exploration Agency (Japan); Hiroyuki Tsuji, Morio Toyoshima, National Institute of Information and Communications Technology (NICT) (Japan)

12413-65

Entanglement-based QKD over LEO satellite-to-ground time-varying atmospheric channel

Author(s): Argiris Ntanos, Nikolaos Lyras, Aristeidis Stathis, Dimitris Zavitsanos, Giannis Giannoulis, Athanasios D. Panagopoulos, Hercules Avramopoulos, Institute of Communication and Computer Systems (Greece), National Technical Univ. of Athens (Greece)

12413-67

Development of spatial coherent optical receiver with a size of 100mm square for inter-satellite communication

Author(s): Hitomi Ono, Tomohiro Akiyama, Eisuke Haraguchi, Toshiyuki Ando, Mitsubishi Electric Corp. (Japan)

12413-68

A polarization division multiplexing-based 112 Gbps 16-QAM PON-FSO convergent system with high splitting ratio for last-mile access networks

Author(s): Mehtab Singh, Chandigarh Univ. (India); Rohit Sharma, Ina Singh, Satyam Institute of Engineering & Technology (India); Amit Grover, Shaheed Bhagat Singh State Univ. (India)

12413-69

Lighthouse: an externally mountable high-power beacon for use in optical ground stations

Author(s): Stijn Mast, Thomas Dreischer, Remco den Breeje, Guus Borst, André Glas, Raj Nalla, Arjan Greven, Airbus Defence and Space Netherlands (Netherlands)

12413-70

Aperture averaging of scintillation from entrance pupil imaging

Author(s): Rita Mahon, Christopher I. Moore, Mike S. Ferraro, William S. Rabinovich, U.S. Naval Research Lab. (United States)

12413-73

Tool influence functions of advanced optical components for free space optical communication

Author(s): Jeong-Yeol Han, Korea Astronomy and Space Science Institute (Republic of Korea), Univ. of Science and Technology (Republic of Korea); Min Gab Bog, Y&DK Co., Ltd. (Republic of Korea)

12413-74

Radiation hardness studies of butterfly single mode DFB lasers at 1064 nm

Author(s): Adrian Zepeda, Shivaraman Asoda, Wiktor Walasik, Robert E. Tench, Jean-Marc Delavaux, Cybel, LLC (United States); Yasunari Maeda, Yutaka Onishi, Keizo Takemasa, QD Laser, Inc. (Japan)

LASER COMMUNICATIONS

31 January 2023 • 7:30 PM - 9:00 PM | InterContinental Hotel, Intercontinental Ballroom C (5th Floor)

Chairs: Hamid Hemmati, ViaSat, Inc. (United States) and Bryan S. Robinson, MIT Lincoln Lab. (United States)

This technical event on Laser Communications will hold its informal annual meeting in conjunction with the Free-Space Laser Communications conference. All professionals involved in theory and applications of free-space laser communications, remote sensing and supporting technologies are invited to participate in an open discussion on a variety of topics related to the challenges and advancement of the field. Attendees are invited to bring suggestions for discussion topics.

WEDNESDAY 1 FEBRUARY**SESSION 8: GROUND TRANSCIEVER TECHNOLOGIES III**

1 February 2023 • 8:00 AM - 9:00 AM | Moscone Center, Room 206 (Level 2 South)

Session Chair: Sarah A. Tedder, NASA Glenn Research Ctr. (United States)

12413-36 • 8:00 AM - 8:20 AM

Optical ground station for LEO-to-ground link utilizing a multi-plane light conversion device for turbulence mitigation

Author(s): Matthieu Meunier, Domitille Schanne, Grégoire Vallet, Aubin Beauland, Pu Jian, David Allieux, Guillaume Labroille, Olivier Pinel, CAILabs (France)

12413-37 • 8:20 AM - 8:40 AM

100 Gbps and 45-mode multi-plane-light-conversion-based turbulence mitigation for free space optical communication

Author(s): Thibault Michel, Adeline Orieux, Cédric Dautancourt, Tanguy Luttmann, Stephane Bernard, Claire Autebert, Louis Andreoli, Pu Jian, David Allieux, Olivier Pinel, Guillaume Labroille, Antonin Billaud, CAILabs (France)

12413-38 • 8:40 AM - 9:00 AM

Ground station for terabyte infrared delivery (TBIRD)

Author(s): Sabino Piazzolla, William T. Roberts, Joseph Kovalik, Michael Y. Peng, Vachik Garkanian, Christine P. Chen, William Buehlman, Mark Brewer, Gerardo G. Ortiz, Kittrin T. Matthews, Jet Propulsion Lab. (United States)

SESSION 9: AO-ASSISTED MITIGATION I

1 February 2023 • 9:00 AM - 10:00 AM | Moscone Center, Room 206 (Level 2 South)

Session Chair: Baris I. Erkmen, Hedron (United States)

12413-39 • 9:00 AM - 9:20 AM

Evaluating the performance of a sensorless wavefront correction algorithm for turbulent horizontal point-to-point links

Author(s): Ondrej Cierny, Massachusetts Institute of Technology (United States); Bruce Moision, X (United States); Kerri Cahoy, Massachusetts Institute of Technology (United States)

12413-40 • 9:20 AM - 9:40 AM

FAST simulation of bidirectional ground-space optical links with adaptive optics

Author(s): Ollie J. D. Farley, James Osborn, Matthew J. Townson, Durham Univ. (United Kingdom)

12413-42 • 9:40 AM - 10:00 AM

Optimisation of the pre-compensation phase for GEO-feeder optical uplinks

Author(s): Perrine Lognoné, ONERA (France), Télécom Paris (France); Jean-Marc Conan, ONERA (France); Ghaya Rekaya, Télécom Paris (France); Laurie Paillier, Nicolas Védrenne, ONERA (France)

Coffee Break 10:00 AM - 10:30 AM

Conference 12413

SESSION 10: AO-ASSISTED MITIGATION II

1 February 2023 • 10:30 AM - 11:10 AM | Moscone Center, Room 206 (Level 2 South)

Session Chair: Todd S. Rose, The Aerospace Corp. (United States)

12413-45 • 10:30 AM - 10:50 AM

Large field of view wavefront correction with deformable lenses

Author(s): Tommaso Furiere, Univ. degli Studi di Padova (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy); Stefano Bonora, CNR-Istituto di Fotonica e Nanotecnologie (Italy)

12413-46 • 10:50 AM - 11:10 AM

Performance analysis of adaptive optics compensated uplink and downlink channels

Author(s): Luca Massaro, Dynamic Optics S.r.l. (Italy), Univ. degli Studi di Padova (Italy); Tommaso Furiere, CNR-Istituto di Fotonica e Nanotecnologie (Italy), Univ. degli Studi di Padova (Italy); Stefano Bonora, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Federico Pettazzi, Officina Stellare S.p.A. (Italy)

Lunch/Exhibition Break 11:10 AM - 1:40 PM

SESSION 11: RECEIVER TECHNOLOGIES

1 February 2023 • 1:40 PM - 3:00 PM | Moscone Center, Room 206 (Level 2 South)

Session Chair: Bryan S. Robinson, MIT Lincoln Lab. (United States)

12413-47 • 1:40 PM - 2:00 PM

Dual-control technique for temperature-stabilization and tunability of narrowband fiber Bragg gratings

Author(s): Jeffrey M. Roth, Daniel Klisiewicz, Ian J. Briggs, Shankaraman Ramakrishnan, Craig M. Langlois, Bryan G. Malinsky, Vincent Scalesse, MIT Lincoln Lab. (United States)

12413-48 • 2:00 PM - 2:20 PM

Recovery of single-polarization waveforms with dual-polarization coherent receivers at low SNRs

Author(s): Christopher C. Foy, Jeffrey Minch, MIT Lincoln Lab. (United States); Thomas C. Royster, LinQuest Corp. (United States); Derrick Feld, Margaret Boning, Timothy M. Yarnall, MIT Lincoln Lab. (United States)

12413-49 • 2:20 PM - 2:40 PM

Large-area SNSPD array for RF/optical hybrid 7-segment pathfinder receiver

Author(s): Jason Allmaras, Boris A. Korzh, Andrew D. Beyer, Emma Wollman, Bruce Bumble, Ryan Rogalin, Erik Alerstam, Makan Mohageg, Meera Srinivasan, Daniel Hoppe, Matthew Shaw, Jet Propulsion Lab. (United States)

12413-72 • 2:40 PM - 3:00 PM

Towards the implementation of the HyDRON Demonstration System

Author(s): Josep Maria Perdigués Armengol, Harald Hauschildt, Guray Acar, Wael El-Dali, Christopher Vasko, Pantelis-Daniel Arapoglou, Emiliano Re, Angelo Altamura, Alberto Mengali, Dirk Thurnes, Kasia Balakier, European Space Agency (Netherlands)

Coffee Break 3:00 PM - 3:30 PM

SESSION 12: ATMOSPHERICS I

1 February 2023 • 3:30 PM - 4:40 PM | Moscone Center, Room 206 (Level 2 South)

Session Chair: William S. Rabinovich, U.S. Naval Research Lab. (United States)

12413-51 • 3:30 PM - 4:00 PM

Global atmospheric turbulence forecasting for free-space optical communications *(Invited Paper)*

Author(s): James Osborn, Durham Univ. (United Kingdom); Jean-Edouard Communal, Frédéric Jabet, Miratlas (France)

12413-52 • 4:00 PM - 4:20 PM

A small, low-cost, turbulence profiling instrument for free-space optical communication

Author(s): Marcus Birch, Francis Bennet, Michael Copeland, Doris Grosse, Josephine Munro, Tony Travouillon, The Australian National Univ. (Australia)

12413-53 • 4:20 PM - 4:40 PM

Wavefront reversal (phase conjugation) using a MEMS spatial phase modulator (SPM) integrated with a metasurface retro-array: a proposal

Author(s): David M. Pepper, Malibu Scientific (United States)

SESSION 13: ATMOSPHERICS II

1 February 2023 • 4:40 PM - 6:00 PM | Moscone Center, Room 206 (Level 2 South)

Session Chair: Harald Hauschildt, European Space Research and Technology Ctr. (Netherlands)

12413-54 • 4:40 PM - 5:00 PM

The 24hSHIMM: a continuous day and night turbulence monitor for optical communications

Author(s): Ryan Griffiths, James Osborn, Oliver Farley, Timothy Butterley, Matthew Townson, Richard Wilson, Ctr. for Advanced Instrumentation, Durham Univ. (United Kingdom)

12413-55 • 5:00 PM - 5:20 PM

Atmospheric optical turbulence analysis in London's financial district

Author(s): Lily Westerby-Griffin, James Osborn, Ollie J. D. Farley, Ryan Griffiths, Gordon D. Love, Durham Univ. (United Kingdom)

12413-56 • 5:20 PM - 5:40 PM

Atmospheric optical turbulence measurements at varying elevation angles

Author(s): Lily Westerby-Griffin, James Osborn, Ollie J. D. Farley, Ryan Griffiths, Gordon D. Love, Durham Univ. (United Kingdom)

12413-57 • 5:40 PM - 6:00 PM

Scintillation distribution functions in a marine environment

Author(s): William S. Rabinovich, Rita Mahon, Mike Ferraro, U.S. Naval Research Lab. (United States)

Conference 12414

High-Power Laser Materials Processing: Applications, Diagnostics, and Systems XII

1 - 2 February 2023 | Moscone Center, Room 211 (Level 2 South)

Conference Chairs: **Stefan Kaierle**, Laser Zentrum Hannover e.V. (Germany); **Klaus R. Kleine**, Coherent, Inc. (United States)

Program Committee: **Bo Gu**, Bos Photonics (United States); **Wolfgang Knapp**, Univ. de Nantes (France); **Markus Kogel-Hollacher**, Precitec GmbH & Co. KG (Germany); **Henrikki Pantisar**, TRUMPF Inc. (United States); **Stephan Roth**, BLZ Bayerisches Laserzentrum GmbH (Germany); **Masahiro Tsukamoto**, Joining and Welding Research Institute, Osaka Univ. (Japan); **Stefaan Vandendriessche**, Edmund Optics Inc. (United States); **Verena Wippo**, Laser Zentrum Hannover e.V. (Germany)

TUESDAY 31 JANUARY

POSTERS-TUESDAY

31 January 2023 • 6:00 PM - 8:00 PM |
Moscone Center, Level 2 West

Conference attendees are invited to attend the LASE poster Session on Tuesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12414-31

The effects of laser shock peening on microstructural characteristics and mechanical properties of AZ31 magnesium alloy

Author(s): Jeonghong Ha, Jihwan Choi, Jeong Hun Lee, Korea Institute of Industrial Technology (Republic of Korea)

12414-5

Laser drilling of an aluminosilicate foam

Author(s): Igor V. Melnikov, Yakov S. Fironov, Moscow Institute of Physics and Technology (Russian Federation); Vladimir N. Tokarev, A. M. Prokhorov General Physics Institute (Russian Federation); Evgeny R. Nadezhdin, Artem R. Nepop, Daniil S. Mironov, Moscow Institute of Physics and Technology (Russian Federation); Alexei S. Lagutchev, Purdue Univ. (United States)

WEDNESDAY 1 FEBRUARY

SESSION 1: SURFACE TREATMENT

1 February 2023 • 2:00 PM - 3:10 PM | Moscone Center, Room 211 (Level 2 South)

Session Chair: Stefan Kaierle, Laser Zentrum Hannover e.V. (Germany)

12414-1 • 2:00 PM - 2:30 PM

Integrated numerical-experimental design of laser shock processing treatments of metallic alloys for high-reliability applications (*Invited Paper*)

Author(s): José Luis Ocaña, Ignacio Angulo, Francisco Cordovilla, Wsewolod Warzanskyj, Ángel García-Beltrán, Juan Antonio Porro, Marcos Díaz, Univ. Politécnica de Madrid (Spain)

12414-2 • 2:30 PM - 2:50 PM

High energy ultrafast laser surface texturing with variable multi-spot patterns

Author(s): Jonas Mayer, Christian Weddeling, Felix Zimmermann, TRUMPF Laser- und Systemtechnik GmbH (Germany); Fabian Kimmich, Julian Hellstern, Max Kahmann, Christoph Tillkorn, TRUMPF Laser GmbH (Germany); Jonas Kleiner, Andreas Heimes, Daniel Flamm, TRUMPF Laser- und Systemtechnik GmbH (Germany)

12414-3 • 2:50 PM - 3:10 PM

Microstructure modification of copper by femtosecond laser shock peening

Author(s): Wenjing Yang, The Univ. of Akron (United States); Yuxin Li, Xin Zhao, Clemson Univ. (United States); Yalin Dong, The Univ. of Akron (United States)

Coffee Break 3:10 PM - 3:40 PM

SESSION 2: HIGH POWER ULTRA SHORT PULSE PROCESSING

1 February 2023 • 3:40 PM - 6:00 PM | Moscone Center, Room 211 (Level 2 South)

Session Chair: Bill Holtkamp, TRUMPF Inc. (United States)

12414-6 • 3:40 PM - 4:00 PM

Fast spectral measurement of soft x-ray emission from ultrafast laser processing

Author(s): Julian Holland, Rudolf Weber, Thomas Graf, Univ. Stuttgart (Germany)

12414-7 • 4:00 PM - 4:20 PM

A numerical study of ultrafast laser-induced shock waves

Author(s): Yuxin Li, Clemson Univ. (United States); Wenjing Yang, Yalin Dong, The Univ. of Akron (United States); Xin Zhao, Clemson Univ. (United States)

12414-8 • 4:20 PM - 4:40 PM

Broadband low dispersion mirror pairs for high reflectivity and low dispersion of ultrafast pulses

Author(s): Vladimir Pervak, Ludwig-Maximilians-Univ. München (Germany), UltraFast Innovations GmbH (Germany); Michael Middleton, Edmund Optics Inc. (United States)

12414-9 • 4:40 PM - 5:00 PM

Direct and low-loss connection between a hollow-core optical fiber and a dispersion compensating fiber for dispersion-free delivery of short optical pulses in hollow-core fiber

Author(s): Ailing Zhong, Czech Technical Univ. in Prague (Czech Republic); Radan Slavik, Univ. of Southampton (United Kingdom); Daniel Dousek, Dmytro Suslov, Stanislav Zvanovec, Czech Technical Univ. in Prague (Czech Republic); Francesco Poletti, David J. Richardson, University of Southampton (United Kingdom); Matej Komanec, Czech Technical Univ. in Prague (Czech Republic)

Conference 12414

12414-10 • 5:00 PM - 5:20 PM

Real-time holographic 3D beam manipulation for ultrashort pulse laser processing

Author(s): Bastian Kaiser, Mareike Schäfer, Johannes A. L'huillier, Photonik-Zentrum Kaiserslautern e.V. (Germany), Technische Univ. Kaiserslautern (Germany)

12414-11 • 5:20 PM - 5:40 PM

Ultraviolet and infrared femtosecond laser irradiation on PET and PA66 textiles for liquid repellent clothing

Author(s): Sedao Xxx, Hyeon Jin Jung, Erieta-Katerina Koussi, Christophe Donnet, Cyril Maclair, Lab. Hubert Curien (France)

12414-12 • 5:40 PM - 6:00 PM

SAVANNA-HP: a stretched flexible hollow-core fiber compressor for high-power lasers

Author(s): Minjie Zhan, Verónica Oliver, Asger Kreiner, UltraFast Innovations GmbH (Germany); Hendrik Wrigge, Peter Simon, Institut für Nanophotonik Göttingen e.V. (Germany); Tamas Nagy, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); Alexander Guggenmos, UltraFast Innovations GmbH (Germany)

THURSDAY 2 FEBRUARY

SESSION 3: PROCESS MONITORING AND CONTROL

2 February 2023 • 9:00 AM - 10:20 AM | Moscone Center, Room 211 (Level 2 South)

Session Chair: Klaus R. Kleine, Coherent Corp. (United States)

12414-13 • 9:00 AM - 9:20 AM

Predicting algorithm for laser processing parameters using spectral-domain optical coherence tomography

Author(s): Masaki Hosoda, Daisuke Oida, Takumi Ishikawa, Think-Lands Co., Ltd. (Japan); Haruyuki Sakurai, Kuniaki Konishi, The Univ. of Tokyo (Japan)

12414-14 • 9:20 AM - 9:40 AM

High-power fiber optic cable with pre-aligned integrated sensors for high-speed process monitoring

Author(s): Mats E. Blomqvist, Fredrik Johansson, Olle Sallhammar, Andreas Hessel, Coherent, Inc. (Sweden)

12414-16 • 9:40 AM - 10:00 AM

Powder-based laser metal deposition of VDM Alloy 780: strategy development for efficient buildup of thin-walled components

Author(s): Pascal Paulus, Univ. des Saarlandes (Germany); Yannick Ruppert, Hochschule für Technik und Wirtschaft des Saarlandes (Germany); Michael Vielhaber, Univ. des Saarlandes (Germany); Jürgen Griebisch, Hochschule für Technik und Wirtschaft des Saarlandes (Germany)

12414-17 • 10:00 AM - 10:20 AM

Quality and physical properties revealed: sensors for monitoring and controlling laser processes in combination with sophisticated data models

Author(s): Markus Kogel-Hollacher, Jens Reiser, Precitec GmbH & Co. KG (Germany); Sebastian Moser, Precitec, Inc. (United States); Fabian Mack, Precitec GmbH & Co. KG (Germany); Joachim Schwarz, Precitec Vision GmbH & Co. KG (Switzerland)

Coffee Break 10:20 AM - 10:50 AM

SESSION 4: JOINING AND WELDING I

2 February 2023 • 10:50 AM - 11:50 AM | Moscone Center, Room 211 (Level 2 South)

Session Chair: Verena Wippo, Laser Zentrum Hannover e.V. (Germany)

12414-19 • 10:50 AM - 11:10 AM

In situ synchrotron observation of the vapor capillary geometry in laser welding of copper with 1030 nm and 515 nm laser beam sources

Author(s): Marc Hummel, Christian Meier, RWTH Aachen Univ. (Germany); Alexander Olowinsky, Fraunhofer-Institut für Lasertechnik ILT (Germany); Arnold Gillner, Fraunhofer-Institut für Lasertechnik ILT (Germany); RWTH Aachen Univ. (Germany); Felix Beckmann, Helmholtz-Zentrum Hereon GmbH (Germany); Julian Moosmann, Helmholtz-Zentrum Hereon GmbH (Georgia); Constantin Häfner, Fraunhofer-Institut für Lasertechnik ILT (Germany); RWTH Aachen Univ. (Germany)

12414-21 • 11:10 AM - 11:30 AM

Stainless steel laser beam welding with a dynamic tailored beam shaping laser-head based on multi-plane light conversion

Author(s): Matthieu Meunier, Avinash Kumar, Aymeric Lucas, Stephane Bernard, CAILabs (France); Rosa Arias, Jorge Luis Arias Otero, AIMEN - Asociación de Investigación Metalúrgica del Noroeste (Spain); Gwenn Pallier, Guillaume Labroille, CAILabs (France)

12414-20 • 11:30 AM - 11:50 AM

Laser welding of e-mobility materials with variable beam profile lasers and pulse shaping

Author(s): Mohammed Naeem, Jason Zhou, Jia Li, Shuming Chang, Chih-Hao Wang, Imtiaz Majid, Everfoton Technologies (China)

Lunch/Exhibition Break 11:50 AM - 1:20 PM

SESSION 5: JOINING AND WELDING II

2 February 2023 • 1:20 PM - 2:40 PM | Moscone Center, Room 211 (Level 2 South)

Session Chair: Markus Kogel-Hollacher, Precitec GmbH & Co. KG (Germany)

12414-22 • 1:20 PM - 1:40 PM

An optimal tailored beam-shape to improve copper welding with a 1µm 8kW laser

Author(s): Avinash Kumar, Matthieu Meunier, CAILabs (France); Nicolas Gaillard, David Lemaitre, Institut Maupertuis (France); Gwenn Pallier, Guillaume Labroille, CAILabs (France)

12414-23 • 1:40 PM - 2:00 PM

Implementation of a multispot optic for temperature field-adapted welding of complex plastic components

Author(s): Verena Wippo, Julian Kuklik, Peter Jaeschke, Laser Zentrum Hannover e.V. (Germany); Stefan Kaierle, Laser Zentrum Hannover e.V. (Germany); Leibniz Univ. Hannover (Germany)

12414-24 • 2:00 PM - 2:20 PM

Influence of ring-shaped laser beam during welding of AW-5083 and AW-6082

Author(s): Soeren Hollatz, Fraunhofer-Institut für Lasertechnik ILT (Germany); Marc Hummel, RWTH Aachen Univ. (Germany); Marie-Cathrin Lach, Alexander Olowinsky, Fraunhofer-Institut für Lasertechnik ILT (Germany); Arnold Gillner, Constantin Häfner, Fraunhofer-Institut für Lasertechnik ILT (Germany), RWTH Aachen Univ. (Germany); Felix Beckmann, Julian Moosmann, Helmholtz-Zentrum Hereon GmbH (Germany)

12414-25 • 2:20 PM - 2:40 PM

Seam geometry manipulation by oscillation amplitude adjustment in the LDNA process

Author(s): Tjorben Bokelmann, Marius Lammers, Stefan Kaierle, Laser Zentrum Hannover e.V. (Germany); Sobhan Emadmostoufi, Oleg Mokrov, Rahul Sharma, Uwe Reisgen, RWTH Aachen Univ. (Germany); Jörg Hermsdorf, Laser Zentrum Hannover e.V. (Germany)

Coffee Break 2:40 PM - 3:10 PM

SESSION 6: SYSTEMS

2 February 2023 • 3:10 PM - 5:10 PM | Moscone Center, Room 211 (Level 2 South)

Session Chair: Stefaan Vandendriessche, Edmund Optics Inc. (United States)

12414-26 • 3:10 PM - 3:30 PM

Material efficient production of Functionally Graded Materials using coaxial Laser Double-Wire Directed Energy Deposition

Author(s): Nick Schwarz, Marius Lammers, Laser Zentrum Hannover e.V. (Germany), Hochschule Hannover (Germany); Jörg Hermsdorf, Laser Zentrum Hannover e.V. (Germany); Stefan Kaierle, Laser Zentrum Hannover e.V. (Germany), Leibniz Univ. Hannover (Germany); Henning Ahlers, Hochschule Hannover (Germany); Roland Lachmayer, Leibniz Univ. Hannover (Germany)

12414-27 • 3:30 PM - 3:50 PM

Ultrafast compact fiber CPA at 2 μ m central wavelength

Author(s): Christian Gaida, Fabian Stutzki, Frieder Jansen, Active Fiber Systems GmbH (Germany); Malte Kumkar, TRUMPF Laser GmbH (Germany); Sven Breitskopf, Oliver Herrfurth, Tino Eidam, Jens Limpert, Active Fiber Systems GmbH (Germany)

12414-28 • 3:50 PM - 4:10 PM

Application of machine learning to overcome challenges of generating phase masks for dynamic beam shaping in complex optical systems

Author(s): Robin Kurth, Oskar Hofmann, RWTH Aachen Univ. (Germany); Jochen Stollenwerk, Carlo Holly, RWTH Aachen Univ. (Germany), Fraunhofer-Institut für Lasertechnik (Germany)

12414-29 • 4:10 PM - 4:30 PM

High-throughput spatial light modulator based multi-beam laser marking system

Author(s): Gregory Jacob, Lars Eng, Stephen Hamann, Jim Hunter, Tianbo Liu, Hirofumi Mizuno, Alex Payne, Silicon Light Machines (United States)

12414-32 • 4:30 PM - 4:50 PM

Application-adapted beam shaping with cutting-edge optical elements in laser materials processing

Author(s): Annika Völl, Paul Buske, RWTH Aachen Univ. (Germany); Jochen Stollenwerk, Carlo Holly, RWTH Aachen Univ. (Germany), Fraunhofer-Institut für Lasertechnik ILT (Germany)

12414-34 • 4:50 PM - 5:10 PM

Fused silica step-index fibers tailored for applications from UV to IR wavelength range

Author(s): Andreas Langner, Maximilian Fischer, Peter Bauer, Gerhard Schötz, Heraeus Quarzglas GmbH & Co. KG (Germany)

OPTO

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Chair(s): Pierre-Alexandre J. Blanche; Seung-Hyun Lee

Physics and Simulation of Optoelectronic Devices XXXI

31 January - 2 February 2023 | Moscone Center, Room 156 (Upper Mezzanine South)

Conference Chairs: **Bernd Witzigmann**, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); **Marek Osiński**, The Univ. of New Mexico (United States); **Yasuhiko Arakawa**, Institute of Industrial Science, The Univ. of Tokyo (Japan)

Program Committee: **Hiroshi Amano**, Nagoya Univ. (Japan); **Toshihiko Baba**, Yokohama National Univ. (Japan); **Jing Bai**, Univ. of Minnesota, Duluth (United States); **Enrico Bellotti**, Boston Univ. (United States); **Guillermo Carpintero**, Univ. Carlos III de Madrid (Spain); **Weng W. Chow**, Sandia National Labs. (United States); **Alexandre Freundlich**, Univ. of Houston (United States); **Michael D. Gerhold**, U.S. Army Research Office (United States); **Frédéric Grillot**, Télécom ParisTech (France); **Stephan W. Koch**, Philipps-Univ. Marburg (Germany); **Kathy Lüdge**, Technische Univ. Ilmenau (Germany); **Cun-Zheng Ning**, Arizona State Univ. (United States); **Joachim Piprek**, NUSOD Institute LLC (United States); **Daniel S. Renner**, Freedom Photonics, LLC (United States); **Marc Sciamanna**, CentraleSupélec (France); **Volker J. Sorger**, The George Washington Univ. (United States); **Ikuo Suemune**, Hokkaido Univ. (Japan); **Cheng Wang**, ShanghaiTech Univ. (China); **Kaikai Xu**, Univ. of Electronic Science and Technology of China (China)

TUESDAY 31 JANUARY

SESSION 1: LIGHT EMITTING DIODES

31 January 2023 • 1:30 PM - 2:30 PM | Moscone Center, Room 156 (Upper Mezzanine South)

Session Chair: Gadi Eisenstein, Technion-Israel Institute of Technology (Israel)

12415-3 • 1:30 PM - 1:50 PM

Simulation error estimation in non-coherent light emitting devices

Author(s): Nicolas Michit, CEA-LETI (France)

12415-4 • 1:50 PM - 2:10 PM

Polarization induced doping for carrier transport in graded III-nitride layers: a simulation study

Author(s): Bernd Witzigmann, Friedhard Römer, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

12415-5 • 2:10 PM - 2:30 PM

Impact of the IR LED temperature on the throughput of optical wireless communication links

Author(s): Diego Vargas Romero, Technische Univ. Eindhoven (Netherlands); Jean-Paul M. G. Linnartz, Technische Univ. Eindhoven (Netherlands), Signify N.V. (Netherlands)

Coffee Break 2:30 PM - 3:00 PM

SESSION 2: SEMICONDUCTOR LASERS I

31 January 2023 • 3:00 PM - 4:00 PM | Moscone Center, Room 156 (Upper Mezzanine South)

Session Chair: Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

12415-7 • 3:00 PM - 3:20 PM

Investigating the effect of energy level spacing and inhomogeneous broadening on performance of quantum dash ridge-wavelengths lasers at elevated temperatures

Author(s): Sebastian W. Schaefer, Ras-Jeevan K. Obhi, Christopher E. Valdivia, Univ. of Ottawa (Canada); Philip J. Poole, Pedro J. Barrios, Jiaren Liu, Zhenguo Lu, National Research Council Canada (Canada); Karin Hinzer, Univ. of Ottawa (Canada)

12415-8 • 3:20 PM - 3:40 PM

Ultrafast gain recovery in model type-II heterostructures active media

Author(s): Felix Schäfer, Markus Stein, Janine Lorenz, Justus-Liebig-Univ. Giessen (Germany); Johannes T. Steiner, Cong Ngo, Univ. Paderborn (Germany); Jörg Hader, The Univ. of Arizona (Germany); Jerome V. Moloney, The Univ. of Arizona (United States); Stephan W. Koch, Wolfgang Stolz, Kerstin Volz, Philipps-Univ. Marburg (Germany); Torsten Meier, Univ. Paderborn (Germany); Sangam Chatterjee, Justus-Liebig-Univ. Giessen (Germany)

12415-9 • 3:40 PM - 4:00 PM

Use of the Fourier method for robust single-frequency index-patterned laser design.

Author(s): Niall D. Boohan, Tyndall National Institute (Ireland), Univ. College Cork (Ireland); Brian Kelly, Eblana Photonics Ltd. (Ireland); Eoin P. O'Reilly, Tyndall National Institute (Ireland), Univ. College Cork (Ireland)

WEDNESDAY 1 FEBRUARY

SESSION 3: ACTIVE MATERIALS

1 February 2023 • 8:00 AM - 9:40 AM | Moscone Center, Room 156 (Upper Mezzanine South)

Session Chair: Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

12415-14 • 8:00 AM - 8:20 AM

Electroabsorption characteristics of semi-insulating indium phosphide as applied to optoelectronic modulation

Author(s): Alexander C. MacGillivray, Nikolai I. Lesack, Ilija R. Hristovski, Matthias F. Jenne, Sayra Gorgani, The Univ. of British Columbia Okanagan (Canada); Benjamin C. Maglio, Cardiff Univ. (United Kingdom); Jonathan F. Holzman, The Univ. of British Columbia Okanagan (Canada)

12415-10 • 8:20 AM - 8:40 AM

Low-cost GeSn focal plane arrays for extended SWIR imaging

Author(s): Maddy Woodson, Estefano Fodor, Kenneth A. Hay, Daniel S. Renner, Freedom Photonics, LLC (United States)

12415-11 • 8:40 AM - 9:00 AM

Strain-balanced InGaAs/GaAsSb type-II superlattices on InP for extended short-wavelength infrared detection

Author(s): Nuha Ahmed-Babikir, Jamie Phillips, Univ. of Delaware (United States); Martin H. Ettenberg, Michael Lange, Matt R. Wizeman, Princeton Infrared Technologies, Inc. (United States)

12415-12 • 9:00 AM - 9:20 AM

Potential of hydrogenated microcrystalline silicon-germanium for low thermal budget near infrared sensors

Author(s): Alestair Wilson, STMicroelectronics S.A. (France), Institut des Nanotechnologies de Lyon (France); Erwann Fourmond, Institut des Nanotechnologies de Lyon (France); Bilel Saidi, Jean-Gabriel Mattei, STMicroelectronics S.A. (France); Benjamin Fornacciari, Institut des Nanotechnologies de Lyon (France); Mickael Gros-Jean, STMicroelectronics S.A. (France)

12415-13 • 9:20 AM - 9:40 AM

Theory of lateral field electro-absorption modulation in quantum dot heterostructures

Author(s): Tommy Murphy, Tyndall National Institute (Ireland), Univ. College Cork (Ireland); Christopher A. Broderick, Univ. of California, Santa Barbara (United States); Tyndall National Institute (Ireland), Univ. College Cork (Ireland); Eoin P. O'Reilly, Frank H. Peters, Tyndall National Institute (Ireland), Univ. College Cork (Ireland)

Coffee Break 9:40 AM - 10:10 AM

SESSION 4: PHOTODETECTION

1 February 2023 • 10:10 AM - 11:50 AM | Moscone Center, Room 156 (Upper Mezzanine South)

Session Chair: Maddy Woodson, Freedom Photonics, LLC (United States)

12415-16 • 10:10 AM - 10:30 AM

CANCELED: Theoretical study of impacts of traps on optical response of side-coupled InGaAs waveguide photodetectors

Author(s): Qian Ding, Andreas Schenk, ETH Zurich (Switzerland)

12415-17 • 10:30 AM - 10:50 AM

Design and optimization of NUV-enhanced 4H-SiC separate-absorption-charge-multiplication avalanche photodiodes

Author(s): Jonathan Schuster, Anand V. Sampath, Jeremy L. Smith, Stephen B. Kelley, Michael A. Derenge, Gregory A. Garrett, Daniel B. Habersat, DEVCOM Army Research Lab. (United States); Dina M. Bower, Univ. of Maryland (United States); Tilak Hewagama, Shahid Aslam, NASA Goddard Space Flight Ctr. (United States); Michael Wraback, DEVCOM Army Research Lab. (United States)

12415-18 • 10:50 AM - 11:10 AM

Design risk for fabrication stability of silicon single-photon avalanche diodes with deep N-well implantation

Author(s): Haewon Lee, Dongseok Shin, Hyejeong Choi, Yonsei Univ. (Republic of Korea); Ilgu Yun, Yonsei Univ. (Republic of Korea)

12415-19 • 11:10 AM - 11:30 AM

Equivalent circuit modeling of traveling-wave superconducting-nanostripe single-photon detectors for silicon quantum photonic integrated circuits

Author(s): Loic H. Djamen Tchaptada, Sami A. Nazib, Troy A. Hutchins-Delgado, Hosuk Lee, Erika M. Sommer, The Univ. of New Mexico (United States); John Nogan, Tzu-Ming Lu, Sandia National Labs. (United States); Ivan Komissarov, Roman Sobolewski, Univ. of Rochester (United States); Marek Osinski, The Univ. of New Mexico (United States)

12415-20 • 11:30 AM - 11:50 AM

Parametric study on the electro-optical performances of curved CMOS BSI image sensors

Author(s): Wilfried Jahn, Marc Renard, Kelly Joaquina, Sabri Lemared, Quentin Struss, SILINA (France)

Lunch/Exhibition Break 11:50 AM - 1:20 PM

SESSION 5: SEMICONDUCTOR LASERS II

1 February 2023 • 1:20 PM - 2:20 PM | Moscone Center, Room 156 (Upper Mezzanine South)

Session Chair: Laurent Cerutti, Institut d'Électronique et des Systèmes (France)

12415-23 • 1:20 PM - 1:40 PM

Full parameter extraction of a temperature-insensitive quantum well DFB laser using an optical injection technique

Author(s): Shihao Ding, Télécom Paris (France); Nate Doggett, Daniel J. Herrera, Virginia Polytechnic Institute and State Univ. (United States); Heming Huang, Télécom Paris (France); Vassilios I. Kovanis, Luke F. Lester, Virginia Polytechnic Institute and State Univ. (United States); Frédéric Grillot, Télécom Paris (France), Univ. of New Mexico (United States)

12415-24 • 1:40 PM - 2:00 PM

Isochrons in tunable photonic oscillators and applications in precise positioning

Author(s): Georgia Himona, National Technical Univ. of Athens (Greece); Alireza Famili, Vassilios I. Kovanis, Virginia Polytechnic Institute and State Univ. (United States); Yiannis Kominis, National Technical Univ. of Athens (Greece)

12415-25 • 2:00 PM - 2:20 PM

Vertical and lateral carrier transport into InP quantum dots of a membrane external-cavity surface-emitting laser structure

Author(s): Gordon Schmidt, Frank Bertram, Peter Veit, Otto-von-Guericke-Univ. Magdeburg (Germany); Julie Kernchen, Otto-von-Guericke Univ. Magdeburg (Germany); Jürgen H. Christen, Otto-von-Guericke-Univ. Magdeburg (Germany); Ana Cutuk, Michael Jetter, Peter Michler, Univ. Stuttgart (Germany)

Coffee Break 2:20 PM - 2:50 PM

Conference 12415

SESSION 6: OPTICAL SENSING

1 February 2023 • 2:50 PM - 4:30 PM | Moscone Center, Room 156 (Upper Mezzanine South)

Session Chair: Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

12415-26 • 2:50 PM - 3:10 PM

Mie resonance structures for sensing applications

Author(s): Muhamed Sewidan, Muhammad A. Othman, Mohamed A. Swillam, The American Univ. in Cairo (Egypt)

12415-27 • 3:10 PM - 3:30 PM

Graphene-based surface plasmon resonance for glucose concentration detection

Author(s): Quoc-Hung Phan, National United Univ. (Taiwan)

12415-28 • 3:30 PM - 3:50 PM

Amorphous silicon photonic optical phased array for beam steering

Author(s): Alessandro Fantoni, Paulo Lourenço, João Costa, Manuela Vieira, Instituto Superior de Engenharia de Lisboa (Portugal)

12415-29 • 3:50 PM - 4:10 PM

Plasmonic gas sensor based on electromagnetic induced Transparency (EIT)

Author(s): Sarah Shafaay, Sherif M. Sherif El Sayed, Mohamed A. Swillam, The American Univ. in Cairo (Egypt)

12415-30 • 4:10 PM - 4:30 PM

Study and analysis of the tunable plasmonic sensor based on surface conductivity of graphene

Author(s): Yadvendra Singh, Harish Subbaraman, Boise State Univ. (United States)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12415-42

Post-fabrication performance of nested hollow-core fibers with perturbed cladding structures

Author(s): Michael Petry, Florida Polytechnic Univ. (United States), Hochschule Karlsruhe Technik und Wirtschaft (Germany); Md. Selim Habib, Florida Polytechnic Univ. (United States)

12415-43

Tuning the structural and photophysical behavior of non-toxic CsSnCl₃ using reduced graphene oxide for optoelectronic applications

Author(s): Ajay Kumar, Nivedita Pandey, Deepak Punetha, Rajib Saha, Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)

12415-44

Investigation of properties of undoped and doped bulk vanadium disulphide using DFT calculations for supercapacitor applications

Author(s): Ashish K. Yadav, National Institute of Technology, Karnataka, Surathkal (India); Kiran G, Shiv Nadar Univ. (India); Nivedita Pandey, Anuprava Mandal, Indian Institute of Technology Bombay (India); Rohit Singh, Shiv Nadar Univ. (India); Subhananda Chakrabarti, Indian Institute of Technology Bombay (India); Sushil K. Pandey, National Institute of Technology, Karnataka, Surathkal (India)

12415-45

Impact of linear alloy on strain coupled bilayer InAs/GaAs_{1-y}Sb_y quantum dot heterostructures

Author(s): Ravindra Kumar, Indian Institute of Technology Bombay (India); Jhuma Saha, Indian Institute of Technology Gandhinagar (India); Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)

12415-46

Hall effect of light unaffected by incident polarization

Author(s): Monu N. Baitha, Jonghyeok Im, Kyoungsik Kim, Yonsei Univ. (Republic of Korea)

12415-47

Compact sensor based on inversely designed ultrahigh RI metamaterial

Author(s): Maxim Elizarov, Andrea Fratallocchi, King Abdullah Univ. of Science and Technology (Saudi Arabia)

12415-48

GPU libraries speed performance analysis for RCWA simulation matrix operations

Author(s): Jingxiao Xu, Martin D. B. Charlton, Univ. of Southampton (United Kingdom)

12415-49

Two-step machine learning assisted extraction of VCSEL parameters

Author(s): Ihtesham Khan, Muhammad Umar Masood, Lorenzo Tunesi, Politecnico di Torino (Italy); Enrico Ghillino, Synopsys, Inc. (United States); Andrea Carena, Vittorio Curri, Paolo Bardella, Politecnico di Torino (Italy)

12415-50

Valley selective routing of excitons in two-dimensional semiconductor heterostructures via microresonators

Author(s): Kishor Kumar Mandal, Anuj Kumar Singh, Lekshmi Eswaramoorthy, Brijesh Kumar, Anshuman Kumar, Indian Institute of Technology Bombay (India)

12415-51

High efficiency multi-taper coupler based optical modulator

Author(s): Ted Frumkin, Amiel A. Ishaaya, Zeev Zalevsky, Bar-Ilan Univ. (Israel)

12415-52

Comparative studies on reflection defect between textured and planar surface based on TCO materials

Author(s): Alassane Diaw, Univ. Cheikh Anta Diop (Senegal)

12415-53

InAs/GaSb T2SL mid-wavelength infrared (MWIR) photodetector with above-room-temperature operation

Author(s): Khalifa M. Azizur-Rahman, California NanoSystems Institute (United States), Univ. of California, Los Angeles (United States); Jasmine J. Mah, Opto Diode Corp. (United States); Baolai Liang, California NanoSystems Institute (United States); Diana L. Huffaker, The Univ. of Texas at Arlington (United States); Jeung Hun Park, Richard S. Kim, Russell Dahl, Opto Diode Corp. (United States)

12415-54

Modulation Transfer Function simulation methodology on CMOS image sensors using add-on structures for near infrared applications

Author(s): Felix Bardonnnet, Axel Crocherie, STMicroelectronics S.A. (France); Henri Benisty, Lab. Charles Fabry (France); Olivier Jeannin, Gabriel Mugny, STMicroelectronics S.A. (France)

THURSDAY 2 FEBRUARY**SESSION 7: ELECTROMAGNETICS**

2 February 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 156 (Upper Mezzanine South)

Session Chair: Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

12415-31 • 8:00 AM - 8:20 AM

Speed efficiency optimization for GPU accelerated rigorous coupled-wave analysis program

Author(s): Jingxiao Xu, Martin D. B. Charlton, Univ. of Southampton (United Kingdom)

12415-32 • 8:20 AM - 8:40 AM

Black-box simulation method: train the optical model from output

Author(s): Zibo Hu, The George Washington Univ. (United States); Behrouz Movahhed Nouri, Hamed Dalir, The George Washington Univ. (United States), Optelligence LLC (United States); Volker J. Sorger, The George Washington Univ. (United States)

12415-33 • 8:40 AM - 9:00 AM

SuPyMode: an open-source Python library for design and optimization of fiber couplers

Author(s): Martin Poinsinet de Sivry-Houle, Caroline Boudoux, Nicolas Godbout, Polytechnique Montréal (Canada)

12415-34 • 9:00 AM - 9:20 AM

Optimal input excitation for SBS suppression in multimode fibers

Author(s): Kabish Wisal, Chun-Wei Chen, Zeyu Kuang, Yale Univ. (United States); Stephen C. Warren-Smith, Univ. of South Australia (Australia); Owen D. Miller, Hui Cao, A. Douglas Stone, Yale Univ. (United States)

12415-35 • 9:20 AM - 9:40 AM

Switchable color filters using metal-hydrides

Author(s): Micah Karahadian, Jeremy N. Munday, Univ. of California, Davis (United States)

12415-36 • 9:40 AM - 10:00 AM

Angle-independent narrowband spectral response of thin film optics via ultra-strong light-matter coupling

Author(s): Andreas Mischok, Univ. of St. Andrews (United Kingdom), Univ. zu Köln (Germany); Sabina Hillebrandt, Univ. zu Köln (Germany); Bernhard Siegmund, Univ. Hasselt (Belgium); Seonil Kwon, Univ. zu Köln (Germany); Koen Vandewal, Univ. Hasselt (Belgium); Malte C. Gather, Univ. zu Köln (Germany)

SESSION 8: QUANTUM CASCADE LASER MODELING

2 February 2023 • 10:00 AM - 10:30 AM | Moscone Center, Room 156 (Upper Mezzanine South)

Session Chair: Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

12415-37 • 10:00 AM - 10:30 AM

GaSb-based Interband cascade lasers grown onto silicon substrates (Invited Paper)

Author(s): Laurent Cerutti, Daniel A. Díaz Thomas, Maëva Fagot, Audrey Gilbert, Gad Ndemengoye-Kombila, Jean-Baptiste Rodriguez, Alexei N. Baranov, Eric Tournié, Institut d'Électronique et des Systèmes (France)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12415-55

End-to-end sensor system modeling and validation for AR/VR/MR applications

Author(s): Evan Kramer, Massachusetts Institute of Technology (United States); Qing Chao, Michael P. Schaub, Song Chen, Wei Gao, Meta (United States)

Physics, Simulation, and Photonic Engineering of Photovoltaic Devices XII

=30 January - 1 February 2023 | Moscone Center, Room 159 (Upper Mezzanine South)

Conference Chairs: **Alexandre Freundlich**, Univ. of Houston (United States); **Stéphane Collin**, Ctr. de Nanosciences et de Nanotechnologies (France); **Karin Hinzer**, Univ. of Ottawa (Canada)

Conference Co-Chair: **Ian R. Sellers**, The Univ. of Oklahoma (United States)

Program Committee: **Urs Aeberhard**, ETH Zurich (Switzerland), FLUXim AG (Switzerland); **Mariana Bertoni**, Arizona State Univ. (United States); **Abderrauof Boucherif**, Univ. de Sherbrooke (Canada); **Gavin C. Conibeer**, The Univ. of New South Wales (Australia); **Olivier Durand**, Fonctions Optiques pour les Technologies de l'information (France); **Jean-François Guillemoles**, Institut Photovoltaïque d'Ile-de-France (France), NextPV LIA (Japan); **Oliver Höhn**, Fraunhofer-Institut für Solare Energiesysteme ISE (Germany); **Seth M. Hubbard**, Rochester Institute of Technology (United States); **Marina S. Leite**, Univ. of California, Davis (United States); **Laurent Lombez**, Lab. de Physique et Chimie des Nano-objets (France); **Ian R. Sellers**, The Univ. of Oklahoma (United States); **Samuel D. Stranks**, Univ. of Cambridge (United Kingdom); **Masakazu Sugiyama**, The Univ. of Tokyo (Japan)

MONDAY 30 JANUARY

OPTO PLENARY SESSION

30 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 207/215 (Level 2 South)

8:00 AM - 8:05 AM: **Welcome and Opening Remarks**

Sonia García-Blanco, Univ. Twente (Netherlands) and Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

8:05 AM - 8:15 AM: **Announcement of the OPTO AI/ML and Net Zero Best Paper Awards**

12424-501 • 8:15 AM - 8:50 AM

High-performance electronic-photonic interfaces: from AI to quantum (*Plenary Presentation*)

Author(s): Rajeev Ram, Massachusetts Institute of Technology (United States)

12416-501 • 8:50 AM - 9:25 AM

Tandem photovoltaic devices: more than one way to make a solar cell (*Plenary Presentation*)

Author(s): Emily L. Warren, National Renewable Energy Lab. (United States)

12421-501 • 9:25 AM - 10:00 AM

Are III-nitride semiconductors also suitable for red emission? (*Plenary Presentation*)

Author(s): Nicolas Grandjean, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

CONFERENCE WELCOME AND INTRODUCTORY REMARKS

30 January 2023 • 10:30 AM - 10:40 AM | Moscone Center, Room 159 (Upper Mezzanine South)

Alexandre Freundlich, Univ. of Houston (United States); Stéphane Collin, Ctr. de Nanosciences et de Nanotechnologies (France); Karin Hinzer, Univ. of Ottawa (Canada); Ian R. Sellers, The Univ. of Oklahoma (United States)

SESSION 1: AVANT-GARDE APPROACHES FOR NEXT GENERATION PHOTOVOLTAICS

30 January 2023 • 10:40 AM - 12:10 PM | Moscone Center, Room 159 (Upper Mezzanine South)

Session Chairs: Stéphane Collin, Ctr. de Nanosciences et de Nanotechnologies (France), Karin Hinzer, Univ. of Ottawa (Canada)

12416-1 • 10:40 AM - 11:10 AM

Ultrathin solar cells based on quasi-2D materials (*Invited Paper*)

Author(s): Elisa Antolin, Univ. Politécnica de Madrid (Spain)

12416-2 • 11:10 AM - 11:40 AM

Thermoradiative power conversion (*Invited Paper*)

Author(s): Nicholas J. Ekins-Daukes, The Univ. of New South Wales (Australia)

12416-3 • 11:40 AM - 12:10 PM

Photovoltaic surfaces to reverse global warming (*Invited Paper*)

Author(s): Ian R. Sellers, The Univ. of Oklahoma (United States); Christiana B. Honsberg, Stuart G. Bowden, Richard R. King, Stephen M. Goodnick, Arizona State Univ. (United States)

Lunch Break 12:10 PM - 1:40 PM

SESSION 2: PHYSICS AND SIMULATION OF PEROVSKITE PV

30 January 2023 • 1:40 PM - 3:20 PM | Moscone Center, Room 159 (Upper Mezzanine South)

Session Chairs: Thomas R. Hopper, Stanford Univ. (United States), Elisa Antolin, Univ. Politécnica de Madrid (Spain)

12416-4 • 1:40 PM - 2:10 PM

2D multilayered perovskites and 2D/3D bilayers for stable solar cells (*Invited Paper*)

Author(s): Jacky Even, Institut National des Sciences Appliquées de Rennes (France); Siraj Sidhik, Rice Univ. (United States); Mikael kepenekian, boubacar traoré, Claudine Katan, Institut des Sciences Chimiques de Rennes (France); Mercouri G. Kanatzidis, Northwestern Univ. (United States); Aditya D. Mohite, Rice Univ. (United States)

12416-5 • 2:10 PM - 2:30 PM

First-principles density functional calculations for non-lead perovskites

Author(s): Emily M. Esther, The Univ. of Tulsa (United States); Peifen Zhu, Univ. of Missouri (United States); John Henshaw, The Univ. of Tulsa (United States)

12416-6 • 2:30 PM - 2:50 PM

Observation of largest band-like transport index value in CsPbI₃ perovskite nanocrystalline thin films

Author(s): Kanishka Kobbekaduwa, Exian Liu, Clemson Univ. (United States); Joseph Luther, Matthew Beard, National Renewable Energy Lab. (United States); Jianbo Gao, Brock Univ. (Canada)

12416-7 • 2:50 PM - 3:20 PM

Advanced simulation of perovskite-based tandem solar cells (*Invited Paper*)

Author(s): Urs Aeberhard, ETH Zurich (Switzerland)

Coffee Break 3:20 PM - 3:50 PM

SESSION 3: EMERGING MULTIJUNCTION PV DEVICES AND DESIGNS

30 January 2023 • 3:50 PM - 5:30 PM | Moscone Center, Room 159 (Upper Mezzanine South)

Session Chairs: Christiana B. Honsberg, Arizona State Univ. (United States), Seth M. Hubbard, Rochester Institute of Technology (United States)

12416-8 • 3:50 PM - 4:20 PM

High efficiency multijunction devices: solar cells, thermophotovoltaic cells, and LEDs (*Invited Paper*)

Author(s): Ryan M. France, National Renewable Energy Lab. (United States)

12416-93 • 4:20 PM - 4:40 PM

Optical wireless power transfer for terrestrial and space-based applications

Author(s): Igor P. Marko, Dominic A. Duffy, Ravi Misra, Univ. of Surrey (United Kingdom); Keval Dattani, Space Power Ltd. (United Kingdom); Stephen J. Sweeney, Univ. of Surrey (United Kingdom)

12416-10 • 4:40 PM - 5:00 PM

Strategies for high-performance O-band photonic power converters

Author(s): Karin Hinzer, Meghan N. Beattie, Neda Nouri, Univ. of Ottawa (Canada); Henning Helmers, Fraunhofer-Institut für Solare Energiesysteme ISE (Germany); Gavin Forcade, Christopher E. Valdivia, Univ. of Ottawa (Canada); Oliver Höhn, Fraunhofer-Institut für Solare Energiesysteme ISE (Germany); Jacob J. Krich, Univ. of Ottawa (Canada)

12416-11 • 5:00 PM - 5:30 PM

Improving InGaP/GaAs dual junction photovoltaic efficiency with high quality InGaAs quantum wells (*Invited Paper*)

Author(s): Stephen J. Polly, Brandon Bogner, Anastasiia Fedorenko, Rochester Institute of Technology (United States); Subhra Chowdhury, Dhruves Biswas, Magnolia Optical Technologies, Inc. (United States); Seth M. Hubbard, Rochester Institute of Technology (United States)

TUESDAY 31 JANUARY**SESSION 4: PHYSICS AND RELIABILITY OF PEROVSKITE PHOTOVOLTAICS**

31 January 2023 • 8:30 AM - 9:50 AM | Moscone Center, Room 159 (Upper Mezzanine South)

Session Chairs: Jacky Even, Institut National des Sciences Appliquées de Rennes (France), Mariana I. Bertoni, Arizona State Univ. (United States)

12416-12 • 8:30 AM - 9:00 AM

Understanding degradation in metal halide perovskite solar cells and modules (*Invited Paper*)

Author(s): Laura T. Schelhas, National Renewable Energy Lab. (United States)

12416-13 • 9:00 AM - 9:20 AM

Automated Optical Measurements and Machine Learning Analysis of Cs-FA Halide Perovskites

Author(s): Abigail Hering, Meghna Srivastava, Univ. of California, Davis (United States); Yu An, Juan-Pablo Correa-Baena, Georgia Institute of Technology (United States); Marina S. Leite, Univ. of California, Davis (United States)

12416-15 • 9:20 AM - 9:50 AM

Heat transformation and dissipation in photoexcited perovskites (*Invited Paper*)

Author(s): Thomas R. Hopper, Stanford Univ. (United States); Burak Guzelturk, Argonne National Lab. (United States); Julian A. Vigil, Nicholas Rolston, Mathilde Fievez, Austin C. Flick, Reinhold H. Dauskardt, Hemamala Karunadasa, Aaron M. Lindenberg, Stanford Univ. (United States)

Coffee Break 9:50 AM - 10:20 AM

SESSION 5: OPTICAL CHARACTERIZATION AND LIGHT MANAGEMENT

31 January 2023 • 10:20 AM - 12:00 PM | Moscone Center, Room 159 (Upper Mezzanine South)

Session Chair: Ian R. Sellers, The Univ. of Oklahoma (United States)

12416-16 • 10:20 AM - 10:50 AM

Looking at solar cells operation from higher dimensions (*Invited Paper*)

Author(s): Jean-François Guillemoles, Institut Photovoltaïque d'Ile-de-France (France)

12416-17 • 10:50 AM - 11:10 AM

Downshifting of photonic wavelengths to enhance conversion efficiency in silicon solar cells

Author(s): Parameswar Hari, The Univ. of Tulsa (United States)

12416-18 • 11:10 AM - 11:30 AM

Impact of spectral versus broadband albedo on bifacial silicon heterojunction photovoltaic devices across North America

Author(s): Erin M. Tonita, Christopher E. Valdivia, Annie C. J. Russell, Karin Hinzer, Univ. of Ottawa (Canada)

Conference 12416

12416-19 • 11:30 AM - 12:00 PM

Scattering surfaces for light management in ultra-thin photovoltaics (*Invited Paper*)

Author(s): Louise C. Hirst, Eduardo Camarillo-Abad, Armin Barthel, Larkin Sayre, Univ. of Cambridge (United Kingdom)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 6: EMERGING THERMOPHOTOVOLTAIC AND THERMOPHOTONIC DEVICES

31 January 2023 • 1:30 PM - 3:00 PM | Moscone Center, Room 159 (Upper Mezzanine South)

Session Chairs: Ryan France, National Renewable Energy Lab. (United States), Urs Aeberhard, ETH Zurich (Switzerland)

12416-20 • 1:30 PM - 2:00 PM

Narrow Bandgap Interband cascade photovoltaic cells (*Invited Paper*)

Author(s): Rui Q. Yang, Michael B. Santos, The Univ. of Oklahoma (United States)

12416-21 • 2:00 PM - 2:20 PM

Recent work toward a valley photovoltaic solar cell

Author(s): Ian R. Sellers, Kyle R. Dorman, The Univ. of Oklahoma (United States); Hamidreza Esmailpour, Walter Schottky Institut (Germany); David K. Ferry, Arizona State Univ. (United States); Vincent R. Whiteside, Tetsuya D. Mishima, Michael B. Santos, The Univ. of Oklahoma (United States)

12416-22 • 2:20 PM - 2:40 PM

Transforming a type-II InAs/InAsSb superlattice MWIR photodetector into a thermophotovoltaic cell

Author(s): Basile Roux, Institut d'Électronique et des Systèmes (France)

12416-23 • 2:40 PM - 3:00 PM

A study of AlGaAs PIN homojunctions for near-field thermophotonic applications

Author(s): Julien Legendre, Pierre-Olivier Chapuis, Ctr. d'Énergétique et de Thermique de Lyon (France)

Coffee Break 3:00 PM - 3:30 PM

SESSION 7: RECENT AVANCES IN PHYSICS OF HOT CARRIER PHOTOVOLTAICS

31 January 2023 • 3:30 PM - 4:50 PM | Moscone Center, Room 159 (Upper Mezzanine South)

Session Chairs: Nicholas J. Ekins-Daukes, The Univ. of New South Wales (Australia), Jean-François Guillemoles, Institut Photovoltaïque d'Ile-de-France (France)

12416-24 • 3:30 PM - 3:50 PM

Monte Carlo simulation of ultrafast carrier relaxation in type I and type II InAs based quantum wells

Author(s): Izak Baranowski, Arizona State Univ. (United States); Yongjie Zou, First Solar, Inc. (United States); Hamidreza Esmailpour, Technische Univ. München (Germany); Ian R. Sellers, The Univ. of Oklahoma (United States); Dragica Vasileska, Stephen M. Goodnick, Arizona State Univ. (United States)

12416-25 • 3:50 PM - 4:10 PM

Time-resolved infrared spectroscopy for hot carrier dynamics in InAs-AlAsSb core-shell nanowires

Author(s): Daniel Sandner, Hamidreza Esmailpour, Fabio del Giudice, Matthias Nuber, Reinhard Kienberger, Gregor Koblmüller, Hristo Iglev, Technische Univ. München (Germany)

12416-27 • 4:10 PM - 4:30 PM

Quantum transport simulation of valley-photovoltaic devices

Author(s): Urs Aeberhard, ETH Zurich (Switzerland)

12416-28 • 4:30 PM - 4:50 PM

Evidence of hot carrier effects in metal halide perovskite solar cells

Author(s): Ian R. Sellers, Shashi Sourabh, Hadi Afshari, Vincent R. Whiteside, The Univ. of Oklahoma (United States); Giles E. Eperon, Swift Solar Inc. (United States); Rebecca A. Scheidt, Matthew C. Beard, National Renewable Energy Lab. (United States)

WEDNESDAY 1 FEBRUARY

SESSION 8: EMERGING PROCESSES/CHARACTERIZATION

1 February 2023 • 8:30 AM - 10:20 AM | Moscone Center, Room 159 (Upper Mezzanine South)

Session Chairs: Stéphane Collin, Ctr. de Nanosciences et de Nanotechnologies (France), Ian R. Sellers, The Univ. of Oklahoma (United States)

12416-29 • 8:30 AM - 9:00 AM

The emerging role of operando science (*Invited Paper*)

Author(s): Mariana I. Bertoni, Arizona State Univ. (United States)

12416-30 • 9:00 AM - 9:20 AM

Graphene assisted III-V layer epitaxy for transferable solar cells

Author(s): Carlos Macías, Institut Photovoltaïque d'Ile-de-France (France); Dyhia Tamsaout, Antonella Cavanna, Ali Madouri, Ctr. de Nanosciences et de Nanotechnologies (France); Solène Béchu, Institut Léonard de Vinci (France); Laurent Travers, Jean-Christophe Harmand, Stéphane Collin, Andrea Cattoni, Amaury Delamarre, Ctr. de Nanosciences et de Nanotechnologies (France)

12416-31 • 9:20 AM - 9:40 AM

Sonic lift-off of single-junction GaAs devices: a path to \$0.5/W through substrate reusability

Author(s): Pablo Guimera Coll, Crystal Sonic, Inc. (United States); Andrew Sindermann, Stephen J. Polly, Rochester Institute of Technology (United States); Arno Merkle, Crystal Sonic, Inc. (United States); Seth M. Hubbard, Rochester Institute of Technology (United States); Mariana I. Bertoni, Arizona State Univ. (United States), Crystal Sonic, Inc. (United States)

12416-32 • 9:40 AM - 10:00 AM

Design, fabrication, and characterization of multi-junction micro-photovoltaic devices

Author(s): Amirhossein Ghods, David Sandquist, Karim Tatah, Matthew Dummer, Guoyang Xu, Erin Ambrosius, Jennifer Ren, Klein Johnson, ams OSRAM (United States)

12416-33 • 10:00 AM - 10:20 AM

Increasing efficiency of solar panels using curved solar cells and innovative optics

Author(s): Sujay M. Swain, Princeton Univ. (United States); Sudhish M. Swain, Montgomery Blair High School (United States); David Mark, Mark Resources (United States)

CONFERENCE CLOSING REMARKS

1 February 2023 • 10:20 AM - 10:30 AM | Moscone Center, Room 159 (Upper Mezzanine South)

Alexandre Freundlich, Univ. of Houston (United States); Stéphane Collin, Ctr. de Nanosciences et de Nanotechnologies (France); Karin Hinzer, Univ. of Ottawa (Canada)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12416-35

All-fiber 3D system for permanent seismic monitoring of a coastal shelf

Author(s): Alexandr N. Antonov, Sergey V. Golovin, Ruslan M. Markov, Igor V. Melnikov, Evgeny R. Nadezhdin, Viktor A. Sokolov, Moscow Institute of Physics and Technology (Russian Federation); Alexei S. Lagutchev, Purdue Univ. (United States)

12416-36

Room temperature synthesis and experimental study of novel double perovskite MA₂KBiCl₆ for photovoltaic application

Author(s): Neelu Sharma, Nivedita Pandey, Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)

12416-37

Surfactant free, easy, low cost, and large scale hydrothermal synthesis and characterization of CZTS ink for photovoltaic utility

Author(s): Nivedita Pandey, Indian Institute of Technology Bombay (India); Sudheendra Prabhu, Indian Institute of Technology Bombay (India); Manipal Institute of Technology (India); Deepak Punetha, Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)

12416-38

Investigation of structural and optical properties of rGo alloyed CsSnBr₃ for solar cell application

Author(s): Ajay Kumar, Nivedita Pandey, Deepak Punetha, Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)

12416-39

Ag cation substitution induced growth promotion and defects suppression in CZTSSe thin-film solar cells

Author(s): NAFEES AHMAD, College of Physics and Optoelectronic Engineering, Shenzhen University (China)

Optical Components and Materials XX

30 - 31 January 2023 | Moscone Center, Room 214 (Level 2 South)

Conference Chairs: **Shibin Jiang**, AdValue Photonics, Inc. (United States); **Michel J. F. Digonnet**, Stanford Univ. (United States)

Program Committee: **Jean-Luc Adam**, Univ. de Rennes 1 (France); **Joel Bagwell**, Elbit Systems of America, LLC (United States); **Rolindes Balda**, Univ. del País Vasco (Spain); **Robert P. Dahlgren**, NASA Ames Research Ctr. (United States); **Angel Flores**, Air Force Research Lab. (United States); **Jesse A. Frantz**, U.S. Naval Research Lab. (United States); **Parminder Ghuman**, NASA Earth Science Technology Office (United States); **Leonid B. Glebov**, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Seppo K. Honkanen**, Microsoft Oy (Finland), Microsoft HoloLens (Finland); **Jacques Lucas**, Univ. de Rennes 1 (France); **Yasutake Ohishi**, Toyota Technological Institute (Japan); **Aydogan Ozcan**, UCLA Samueli School of Engineering (United States); **Giancarlo C. Righini**, Istituto di Fisica Applicata "Nello Carrara" (Italy); **Setsumi Tanabe**, Kyoto Univ. (Japan); **John M. Zavada**, Polytechnic Institute of New York Univ. (United States); **Jun Zhang**, DEVCOM Army Research Lab. (United States)

MONDAY 30 JANUARY

OPTO PLENARY SESSION

30 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 207/215 (Level 2 South)

8:00 AM - 8:05 AM: **Welcome and Opening Remarks**

Sonia García-Blanco, Univ. Twente (Netherlands) and Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

8:05 AM - 8:15 AM: **Announcement of the OPTO AI/ML and Net Zero Best Paper Awards**

12424-501 • 8:15 AM - 8:50 AM

High-performance electronic-photonic interfaces: from AI to quantum (*Plenary Presentation*)

Author(s): Rajeev Ram, Massachusetts Institute of Technology (United States)

12416-501 • 8:50 AM - 9:25 AM

Tandem photovoltaic devices: more than one way to make a solar cell (*Plenary Presentation*)

Author(s): Emily L. Warren, National Renewable Energy Lab. (United States)

12421-501 • 9:25 AM - 10:00 AM

Are III-nitride semiconductors also suitable for red emission? (*Plenary Presentation*)

Author(s): Nicolas Grandjean, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 1: FLUORIDE AND CHALCOGENIDE FIBERS

30 January 2023 • 10:30 AM - 11:40 AM | Moscone Center, Room 214 (Level 2 South)

Session Chair: Shibin Jiang, AdValue Photonics, Inc. (United States)

12417-1 • 10:30 AM - 11:00 AM

Fabrication of chalcogenide microstructured optical preforms and fibers by additive manufacturing of chalcogenide glasses (*Invited Paper*)

Author(s): Johann Troles, Univ. de Rennes 1 (France); Julie Carcreff, Univ. de Rennes 1 (France); ALPhANOV (France); François Cheviré, Ronan Lebullenger, Antoine Gautier, Univ. de Rennes 1 (France); Radwan Chahal, SelenOptics (France); Laurent Calvez, Catherine Boussard, Univ. de Rennes 1 (France); Laurent Brilland, SelenOptics (France); Frédéric Charpentier, Hugues Tariel, DIAFIR (France); Yann Guimond, Mathieu Rozé, Umicore IR Glass (France); Leo Szymczyk, Umicore IR Glass (France), Univ. de Rennes 1 (France); Gilles Renversez, Aix-Marseille Univ. (France)

12417-2 • 11:00 AM - 11:20 AM

Spectroscopic characterization of Er³⁺ doped low-phonon crystalline materials and chalcogenide glasses

Author(s): Ei E. Brown, Zackery Fleischman, Jason McKay, DEVCOM Army Research Lab. (United States); Uwe Hömmerich, Hampton Univ. (United States); Witold Palosz, Sudhir Trivedi, Brimrose Corp. of America (United States); Mark Dubinskii, DEVCOM Army Research Lab. (United States)

12417-3 • 11:20 AM - 11:40 AM

Effects of LEO space exposure on GeSbTe phase-change metasurface spectral filters

Author(s): Kiumars Aryana, Hyun Jung Kim, NASA Langley Research Ctr. (United States); Matthew Julian, Booz Allen Hamilton Inc. (United States); Stephen E. Borg, Scott M. Bartram, William M. Humphreys, NASA Langley Research Ctr. (United States)

Lunch Break 11:40 AM - 1:10 PM

SESSION 2: FIBER BRAGG GRATINGS

30 January 2023 • 1:10 PM - 2:50 PM | Moscone Center, Room 214 (Level 2 South)

Session Chair: Michel J.F. Digonnet, Stanford Univ. (United States)

12417-6 • 1:10 PM - 1:30 PM

Apodized, plane-by-plane written chirped fiber Bragg gratings in polarization-maintaining fibers for dispersion control in all-fiber ultrafast lasers

Author(s): Yannick Willer, Zhenyu Zhang, Martin Angelmahr, Günter Flachenecker, Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); Ahmad Abdalwareth, Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany), Technische Univ. Clausthal (Germany); Christoph Skrobel, Florian Tauser, Yik Long Li, TOPTICA Photonics AG (Germany); Wolfgang Schade, Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany), Technische Univ. Clausthal (Germany)

12417-7 • 1:30 PM - 1:50 PM

Inscription of high order fiber Bragg gratings using point-by-point femtosecond laser technique and their applications

Author(s): Romain Cotillard, Nicolas Roussel, Alexandre Lerner, Guillaume Laffont, CEA (France)

12417-8 • 1:50 PM - 2:10 PM

Characterisation of a polymer-based eccentric FBG 3D shape deformation sensor

Author(s): Lennart Leffers, Bernhard Roth, Ludger Overmeyer, Leibniz Univ. Hannover (Germany)

12417-9 • 2:10 PM - 2:30 PM

Compact fiber optic spectrometers formed by chirped diffraction gratings inscribed with a femtosecond laser platform

Author(s): Jean-Baptiste Quélène, Matilde Sosa Marti, Romain Cotillard, Guillaume Laffont, CEA-Paris-Saclay (France)

12417-10 • 2:30 PM - 2:50 PM

Gold-coated femtosecond FBGs and their performance as a highly sensitive temperature sensor up to 500°C

Author(s): Felix Leyssner, engionic Fiber Optics GmbH (Germany); William Jacobsen, Abdel Soufiane, AFL (United States)

Coffee Break 2:50 PM - 3:20 PM

SESSION 3: LASER MATERIALS

30 January 2023 • 3:20 PM - 4:50 PM | Moscone Center, Room 214 (Level 2 South)

Session Chair: Angel S. Flores, Air Force Research Lab. (United States)

12417-11 • 3:20 PM - 3:50 PM

Crystal fiber laser materials (*Invited Paper*)

Author(s): Daniel J. Gibson, U.S. Naval Research Lab. (United States); Robert Nicol, Jacobs Engineering Group Inc. (United States); Rick Kim, Shyam Bayya, Jasbinder S. Sanghera, Brandon Shaw, Daniel Rhonehouse, Jason Myers, Adam Floyd, U.S. Naval Research Lab. (United States); Tony Zhou, Univ. Research Foundation (United States); Kent Everett, Ben Gray, Air Force Research Lab. (United States); Hyunjun Kim, UES, Inc. (United States), Air Force Research Lab. (United States)

12417-12 • 3:50 PM - 4:10 PM

Transition metal and rare earth doped Zn_{1.3}Ga_{1.4}Sn_{0.3}O₄ persistent phosphors for anti-counterfeiting applications

Author(s): Guanyu Cai, Institut de Recherche de Chimie Paris, CNRS (France); Teresa Delgado, Institut de Recherche de Chimie Paris (France); Cyrille Richard, Unité de Technologies Chimiques et Biologiques pour la Santé (France); Bruno Viana, Institut de Recherche de Chimie Paris, CNRS (France)

12417-13 • 4:10 PM - 4:30 PM

Fabrication of ultra-low-density InAs quantum dots on InP(311)B substrates for telecom-band single-photon sources

Author(s): Kouichi Akahane, National Institute of Information and Communications Technology (Japan); Kiyora Kaneki, Aoyama Gakuin Univ. (Japan); Atsushi Matsumoto, Toshimasa Umezawa, Naokatsu Yamamoto, National Institute of Information and Communications Technology (Japan); Tomohiro Maeda, Hideyuki Sotobayashi, Aoyama Gakuin Univ. (Japan); Yoriko Tominaga, Hiroshima Univ. (Japan); Atsushi Kanno, National Institute of Information and Communications Technology (Japan)

12417-14 • 4:30 PM - 4:50 PM

Fast-acting halide-perovskite-based RGB fluorescent materials for aggregate Gb/s visible light communication

Author(s): Yue Wang, Hong Wang, Omar Alkhazragi, Ziad O. F. Mohammed, Luis Gutiérrez-Arzaluz, Chun Hong Kang, Tien Khee Ng, Omar F. Mohammed, Boon S. Ooi, King Abdullah Univ. of Science and Technology (Saudi Arabia)

TUESDAY 31 JANUARY**SESSION 4: OPTICAL FILTERS AND COATINGS**

31 January 2023 • 8:30 AM - 9:50 AM | Moscone Center, Room 214 (Level 2 South)

Session Chair: Jesse A. Frantz, U.S. Naval Research Lab. (United States)

12417-16 • 8:30 AM - 8:50 AM

Method of determination of the optical constants of particulate samples

Author(s): Jesse A. Frantz, James B. Selby, Matthew B. Hart, Abbie T. Watnik, Jasbinder S. Sanghera, U.S. Naval Research Lab. (United States)

12417-17 • 8:50 AM - 9:10 AM

Inversely designed miniature light filtering structures with back-reflection minimization

Author(s): Zunnoor Fayyaz Awan, Muhammad Fasih, Jinhyeong Yoon, Hamza Kurt, KAIST (Republic of Korea)

12417-18 • 9:10 AM - 9:30 AM

Executing highly optimized sputtered interference-coating designs for colorimetry and light balance filters using broadband monitoring

Author(s): John Atkinson, Chroma Technology Corp. (United States)

12417-19 • 9:30 AM - 9:50 AM

Comparison between effective-medium and structure-distribution models for antireflective nanostructures on functional diffractive optics

Author(s): Praneeth Gadamsetti, Menelaos K. Poutous, The Univ. of North Carolina at Charlotte (United States)

Coffee Break 9:50 AM - 10:20 AM

SESSION 5: OPTICAL COMPONENTS

31 January 2023 • 10:20 AM - 12:00 PM | Moscone Center, Room 214 (Level 2 South)

Session Chair: Rolindes B. Balda, Univ. del País Vasco (Spain)

12417-22 • 10:20 AM - 10:40 AM

High performance EO polymer modulator for visible wavelength

Author(s): Shun Kamada, Rieko Ueda, Chiyumi Yamada, Kouichi Tanaka, Toshiki Yamada, Akira Otomo, National Institute of Information and Communications Technology (Japan)

12417-23 • 10:40 AM - 11:00 AM

Spectrum converting nanocomposites for sensitive detectors of short-wavelength radiation

Author(s): Darayas N. Patel, Oakwood Univ. (United States); Sergey S. Sarkisov, SSS Optical Technologies, LLC (United States); Abdalla M. Darwish, Dillard Univ. (United States); Kelly Whyte, Sabrina Collins, Crystal Smith, Oakwood Univ. (United States)

12417-24 • 11:00 AM - 11:20 AM

Low-noise AlGaAsSb avalanche photodiodes for 1550 nm light detection

Author(s): Xiao Collins, Benjamin S. Sheridan, David M. Price, Phlux Technology Ltd. (United Kingdom); Ye Cao, Tarick Blain, Jo Shien Ng, Chee Hing Tan, The University of Sheffield (United Kingdom); Benjamin S. White, Phlux Technology Ltd. (United Kingdom)

Conference 12417

12417-25 • 11:20 AM - 11:40 AM

Bi-encoded metasurfaces for the infrared spectral range

Author(s): Micheal McLamb, The Univ. of North Carolina at Charlotte (United States); Yanzeng Li, The University of Chicago (United States); Victoria P. Stinson, Nuren Shuchi, Dustin Louisis, Tino Hofmann, The Univ. of North Carolina at Charlotte (United States)

12417-47 • 11:40 AM - 12:00 PM

Variation of sidewall passivation on sub- μm selectively grown Ge-on-Si single photon avalanche detectors

Author(s): Conor Coughlan, Muhammad M. A. Mirza, Jaroslaw Kirdoda, Derek Dumas, Charles Smith, Charlie McCarthy, Hannah Mowbray, Scott Watson, Ross Millar, Douglas J. Paul, Univ. of Glasgow (United Kingdom)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 6: SOLID-STATE LASERS

31 January 2023 • 1:30 PM - 3:10 PM | Moscone Center, Room 214 (Level 2 South)

Session Chair: Jun Zhang, DEVCOM Army Research Lab. (United States)

12417-26 • 1:30 PM - 2:00 PM

Independent reliability assessment of the laser transmitter for the ESA-NASA Laser Interferometer Space Antenna (LISA) Program *(Invited Paper)*

Author(s): Upendra N. Singh, NASA Langley Research Ctr. (United States); Anthony Yu, NASA Goddard Space Flight Ctr. (United States)

12417-27 • 2:00 PM - 2:30 PM

NIR and VIS solid state random lasers: a combined experimental and theoretical study *(Invited Paper)*

Author(s): Ignacio Iparraguirre, Jon Azkargorta, Sara García-Revilla, Rolindes B. Balda, Univ. del País Vasco (Spain); Joaquín Fernández, Donostia International Physics Ctr. (Spain)

12417-28 • 2:30 PM - 2:50 PM

Tunable photoluminescence from carbon-based nanostructures

Author(s): Frank Güell, Marçal Blasco-Solvas, Arevik Musheghyan-Avetisyan, Paulina R. Martínez-Alanis, Roger Amade, Enric Bertran, Univ. de Barcelona (Spain)

12417-29 • 2:50 PM - 3:10 PM

Color-tunable upconversion luminescence of Er³⁺ in oxyfluoride nano-glass-ceramics

Author(s): Rolindes B. Balda, Univ. del País Vasco (Spain); Giulio Gorni, ALBA Synchrotron (Spain); José J. Velázquez, FunGlass – Ctr. for Functional and Surface Functionalized Glass (Slovakia), Alexander Dubcek Univ. of Trencin (Slovakia); Marcin Kochanowicz, Bialystok Univ. of Technology (Poland); Dominik Dorosz, AGH Univ. of Science and Technology (Poland); Alicia Durán, María Jesús Pascual, Instituto de Cerámica y Vidrio (Spain); Joaquín Fernández, Donostia International Physics Ctr. (Spain)

Coffee Break 3:10 PM - 3:40 PM

SESSION 7: OPTICAL SENSORS

31 January 2023 • 3:40 PM - 5:00 PM | Moscone Center, Room 214 (Level 2 South)

Session Chair: Michel J.F. Dignonnet, Stanford Univ. (United States)

12417-30 • 3:40 PM - 4:00 PM

Optical sensors for versatile carbon dioxide monitoring devices

Author(s): Xiaolei Li, Juan Pedro Cascales, Emmanuel Roussakis, Conor Evans, Massachusetts General Hospital (United States); Daniel A. Greenfield, Wellman Ctr. for Photomedicine (United States)

12417-31 • 4:00 PM - 4:20 PM

CANCELED: WEST tokamak plasma facing components in-line monitoring using an innovative fiber Bragg grating sensor

Author(s): Nour Daher, Romain Cotillard, Nicolas Roussel, Laure Lago, Guillaume Laffont, Univ. Paris-Saclay (France), CEA-LIST (France); Rémy Bernard, Aymeric Pastre, Géraud Bouwmans, Univ. de Lille (France), Lab. de Physique des Lasers, Atomes et Molécules (France); Aurélie Quet, CEA-DAM Ile-de-France (France); Caroline Hernandez, Alan Durif, CEA-IRFM (France)

12417-32 • 4:20 PM - 4:40 PM

Polymer-optical sensor glove prototype based on eccentric FBGs

Author(s): Lennart Leffers, Bernhard Roth, Ludger Overmeyer, Leibniz Univ. Hannover (Germany)

12417-33 • 4:40 PM - 5:00 PM

Uncooled nano-thermoelectric bolometers for infrared imaging and sensing

Author(s): Aapo Varpula, Anton Murros, Kuura Sovanto, Arto Rantala, David Gomes-Martins, Kirsi Tappura, Jonna Tiira, Mika Prunnila, VTT Technical Research Ctr. of Finland Ltd. (Finland)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12417-4

Fabrication and characterization of fluoride optical fiber couplers for the mid-infrared

Author(s): Alexis Seguin, Rodrigo Becerra, Edith Ducharme, Stéphane Virally, Nicolas Godbout, Polytechnique Montréal (Canada)

12417-20

A compact ring modulator with very large extinction ratio and high quality factor fabricated in AIM photonics technology at Albany Nanotech Complex

Author(s): Mohammad Rakib Uddin, Jin Wallner, Amit Dikshit, M. Jobayer Hossain, Yukta Timalisina, Nicholas M. Fahrenkopf, David L. Harambe, SUNY Polytechnic Institute (United States)

12417-21

Photonic-integrated wavelength selective switch for S+C+L applications

Author(s): Lorenzo Tunesi, Ihtesham Khan, Muhammad Umar Masood, Politecnico di Torino (Italy); Enrico Ghillino, Synopsys, Inc. (United States); Andrea Carena, Vittorio Curri, Paolo Bardella, Politecnico di Torino (Italy)

12417-34

Spectroscopic and optical properties of large-sized Yb:YAG transparent ceramics produced by solid-state reaction method

Author(s): Masato Nakazaki, Akihiro Tsunoda, JX Nippon Mining & Metals (Japan)

12417-35

Characterization of optical fiber at cryogenic temperatures

Author(s): Adam J. Christiansen, Univ. of Lethbridge (Canada), Blue Sky Spectroscopy Inc. (Canada); Matthew Popelka, OFS (United States); Brad G. Gom, Univ. of Lethbridge (Canada), Blue Sky Spectroscopy Inc. (Canada); David A. Naylor, Univ. of Lethbridge (Canada); Andrei A. Stolov, OFS (United States)

12417-36

Characterization of dynamically compressed oxide and hydroxide minerals

Author(s): Nick Jenkins, Miami Univ. (United States); Xuan Zhou, The Univ. of Texas at San Antonio (United States); Mark Krekeler, Mithun Bhowmick, Miami Univ. (United States)

12417-37

Detection of petrol adulteration using TiO₂ coated etched clad based FBG sensor

Author(s): Md Tauseef Iqbal Ansari, Sanjeev Kumar Raghuwanshi, Azhar Shadab, Indian Institute of Technology (Indian School of Mines), Dhanbad (India); Santosh Kumar, Liaocheng Univ. (China)

12417-38

Precision alignment for next generation semiconductor packaging

Author(s): Tim Cloppenborg, DELO Industrie Klebstoffe GmbH & Co. KGaA (Germany)

12417-39

Spatial uniformity of black silicon induced junction photodiode responsivity

Author(s): Juha Heinonen, Antti Haarahiltunen, ElFys Oy (Finland); Toni Pasanen, Ville Vähänissi, Hele Savin, Aalto Univ. (Finland); Juha Toivanen, ElFys, Inc. (Finland); Mikko Juntunen, ElFys Oy (Finland)

12417-40

Development and manufacturing of micro lens array diffuser for VCSEL with super-wide-angle distribution and high efficiency

Author(s): Hirotaka Tsujii, Toshimitsu Takaoka, Kenta Ishii, Yasuhiro Tanabe, Toshiki Hamatani, Yuya Nakamura, Masanori Endo, Kohei Nakayama, Akio Takahashi, Nalux Co., Ltd. (Japan); Syunya Ishii, Seiichiro Kitagawa, Nalux Co. (Japan)

12417-41

Polarization-maintaining chalcogenide all-solid hybrid microstructured optical fibers and their mid-infrared supercontinuum generation

Author(s): Tong Hoang Tuan, Ayaka Koumura, Asuka Nakatani, Toyota Technological Institute (Japan); Goichi Sakai, Morio Matsumoto, Furukawa Denshi Co., Ltd. (Japan); Takenobu Suzuki, Yasutake Ohishi, Toyota Technological Institute (Japan)

12417-42

Spectrally resolved temporal coherence of spectrally narrowband filtered high-power supercontinuum light source versus an appropriately treated laser-driven plasma light source

Author(s): Tobias Baselt, Westsächsische Hochschule Zwickau (Germany), Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); Christopher Taudt, Westsächsische Hochschule Zwickau (Germany); Daniel Ruf, Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany), Westsächsische Hochschule Zwickau (Germany); Peter Hartmann, Westsächsische Hochschule Zwickau (Germany)

12417-43

An experimental study of optical anisotropy of blue-phase liquid crystals as a function of alignment layers

Author(s): Sumanyu Chauhan, Univ. Gent (Belgium), Huawei Munich Research Ctr. (Germany); Markus Wahle, Grigory Lazarev, Huawei Technologies Co., Ltd. (Germany); Dieter Cuypers, Herbert De Smet, Univ. Gent (Belgium)

12417-44

A numerical investigation of ultrawideband metamaterial absorber for infrared wavelength spectrum for the solar cell application

Author(s): Vishal Sorathiya, Parul Univ. (India); Sunil Lavadiya, Marwadi Univ. (India)

12417-45

Low-cost fringe projection measurement system using DMD beamer

Author(s): Alexander Gröger, Institut für Technische Optik, Univ. Stuttgart (Germany)

12417-46

Disordered plasmonic nanoparticle-driven etalon for colorimetric gas sensor

Author(s): Chunghwan Jung, Jaehyuck Jang, Junsuk Rho, Pohang Univ. of Science and Technology (Republic of Korea)

12417-48

Development of hybrid optical coating with multifunction of UV-VIS absorption, NIR transmission, mechanical hardness, and easy cleanability for automotive LiDAR window

Author(s): Jung-Hwan In, Seon Hoon Kim, Ju Hyeon Choi, Korea Photonics Technology Institute (Republic of Korea)

Organic Photonic Materials and Devices XXV

1 - 2 February 2023 | Moscone Center, Room 214 (Level 2 South)

Conference Chairs: William M. Shensky III, DEVCOM Army Research Lab. (United States); Ileana Rau, Univ. Politehnica din Bucuresti (Romania); Okihito Sugihara, Utsunomiya Univ. (Japan)

Program Committee: Chantal Andraud, Ecole Normale Supérieure de Lyon (France); Werner J. Blau, Trinity College Dublin (Ireland); Ken Caster, Air Force Office of Scientific Research (United States); Fabrice Charra, CEA (France); Beata J. Derkowska-Zielinska, Nicolaus Copernicus Univ. (Poland); Raluca Dinu, GigPeak, Inc. (United States); Manfred Eich, Technische Univ. Hamburg-Harburg (Germany); James G. Grote, Photonics and Electronics Engineering Research Consultant (United States); Alex K. Y. Jen, Univ. of Washington (United States); Michael H. C. Jin, Johns Hopkins Univ. Applied Physics Lab., LLC (United States); Toshiyuki Kaino, Tohoku Univ. (Japan); François Kajzar, Univ. Politehnica din Bucuresti (Romania); Eunkyoung Kim, Yonsei Univ. (Republic of Korea); Jang-Joo Kim, Seoul National Univ. (Republic of Korea); Junya Kobayashi, NTT Advanced Technology Corp. (Japan); Yasuhiro Koike, Keio Univ. (Japan); Isabelle Ledoux-Rak, Lab. de Photonique Quantique et Moléculaire (France); Kwang-Sup Lee, Hannam Univ. (Republic of Korea); Misoon Y. Mah, Air Force Office of Scientific Research (United States); Seth R. Marder, Georgia Institute of Technology (United States); Antoni C. Mitus, Wrocław Univ. of Science and Technology (Poland); Jaroslaw Mysliwiec, Wrocław Univ. of Science and Technology (Poland); Robert A. Norwood, Wyant College of Optical Sciences (United States); Jean-Michel Nunzi, Queen's Univ. (Canada); Shuji Okada, Yamagata Univ. (Japan); Akira Otomo, National Institute of Information and Communications Technology (Japan); Lada N. Puntus, Kotelnikov Institute of Radio Engineering and Electronics of RAS (Russian Federation); Niyazi Serdar Sariciftci, Johannes Kepler Univ. Linz (Austria); Devanand K. Shenoy, U.S. Dept. of Energy (United States); Kenneth D. Singer, Case Western Reserve Univ. (United States); Rebecca E. Taylor, Lockheed Martin Space Systems Co. (United States); Jeong-Weon Wu, Ewha Womans Univ. (Republic of Korea); Shiyoshi Yokoyama, Kyushu Univ. (Japan); Roberto Zamboni, Istituto per la Sintesi Organica e la Fotoreattività (Italy); Wei Zhou, Virginia Polytechnic Institute and State Univ. (United States)

WEDNESDAY 1 FEBRUARY

SESSION 1: OLEDs I

1 February 2023 • 8:30 AM - 10:20 AM | Moscone Center, Room 214 (Level 2 South)

Session Chair: Timothy R. Cook, Univ. at Buffalo (United States)

12418-1 • 8:30 AM - 8:50 AM

Side-by-side white phosphorescent organic light-emitting diodes for white illumination sources

Author(s): Claire Arneson, Stephen R. Forrest, Xinjing Huang, Univ. of Michigan (United States)

12418-2 • 8:50 AM - 9:10 AM

Extending the lifetime of blue phosphorescent organic light-emitting diodes via the Purcell effect and plasmonic coupling management

Author(s): Haonan Zhao, Stephen Forrest, Univ. of Michigan (United States)

12418-4 • 9:10 AM - 9:40 AM

High efficiency stable deep blue OLEDs (Invited Paper)

Author(s): Jang-Joo Kim, Seoul National Univ. (Republic of Korea), JooAM Co. (Republic of Korea)

12418-8 • 9:40 AM - 10:00 AM

Organic-inorganic hybrid functional layer with efficient electron injection/hole blocking ability in organic light emitting diodes

Author(s): Rachith S. N. Kumar, Inge Verboven, Robbe Breugelmans, Koen Vandewal, Michael Daenen, Wim Deferme, Univ. Hasselt (Belgium)

12418-36 • 10:00 AM - 10:20 AM

Analysis of the charge and exciton distributions in white organic light emitting diodes with charge blocking layers

Author(s): Boning Qu, Haonan Zhao, Stephen R. Forrest, Univ. of Michigan (United States)

Coffee Break 10:20 AM - 10:50 AM

SESSION 2: OLEDs II

1 February 2023 • 10:50 AM - 11:30 AM | Moscone Center, Room 214 (Level 2 South)

Session Chair: Ryan M. O'Donnell, DEVCOM Army Research Lab. (United States)

12418-5 • 10:50 AM - 11:10 AM

Deposition of ultra-thin coatings by a nature-inspired spray-on-screen technology for Organic Light Emitting Diodes

Author(s): Rachith S. N. Kumar, Andrea V. Ramirez, Pieter Verding, Philippe Nivelle, Frank Renner, Jan D'Haen, Wim Deferme, Univ. Hasselt (Belgium)

12418-6 • 11:10 AM - 11:30 AM

Improved performance of solution processed, multi-stacked OLEDs by interface engineering: NaCl as a charge injection facilitator

Author(s): Shabnam Ahadzadeh, Rachith S. N. Kumar, Melissa Van Landeghem, Univ. Hasselt (Belgium); Sofie Cambré, Univ. Antwerpen (Belgium); Koen Vandewal, Wim Deferme, Univ. Hasselt (Belgium)

SESSION 3: SPECTROSCOPY

1 February 2023 • 11:30 AM - 12:30 PM | Moscone Center, Room 214 (Level 2 South)

Session Chair: Ryan M. O'Donnell, DEVCOM Army Research Lab. (United States)

12418-9 • 11:30 AM - 11:50 AM

Synergetic ferroelectric luminescence from self-assembled tetraphenylethene aggregates

Author(s): Donghwan Kim, Hoang Tran Thi Thuy, Byeonggwon Kim, Eunkyoung Kim, Yonsei Univ. (Republic of Korea)

12418-10 • 11:50 AM - 12:30 PM

Photons, radicals, bubbles, and beer: using EPR spectroscopy to understand the universe (Keynote Presentation)

Author(s): Malcolm Forbes, Bowling Green State Univ. (United States)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

SESSION 4: RSA

1 February 2023 • 2:00 PM - 3:30 PM | Moscone Center, Room 214 (Level 2 South)

Session Chair: William M. Shensky, DEVCOM Army Research Lab. (United States)

12418-11 • 2:00 PM - 2:30 PM

Shining light on the photophysics of polymethine dyes with chalcogenopyrylium termini (*Invited Paper*)

Author(s): Lauren Rosch, Univ. at Buffalo (United States); Matthew Crawley, T.J. Rohrbaugh, Trenton Ensley, Ryan O'Donnell, DEVCOM Army Research Lab. (United States); Timothy R. Cook, Univ. at Buffalo (United States)

12418-12 • 2:30 PM - 3:00 PM

Installation of hole transport functionality in iridium complexes for reverse saturable absorption (RSA) materials development (*Invited Paper*)

Author(s): Ryan M. O'Donnell, DEVCOM Army Research Lab. (United States); Thomas N. Rohrbaugh, DEVCOM Army Research Lab. (United States); Jack M. Harrison, Justin Yeung, Victor A. Jaffett, Chi Nguyen, U.S. Military Academy (United States); William M. Shensky, DEVCOM Army Research Lab. (United States)

12418-13 • 3:00 PM - 3:30 PM

Triplet migration and reverse-saturable absorption in cyclometalated iridium complexes with pyrene isocyanide ligands (*Invited Paper*)

Author(s): Morris E. Olumba, Univ. of Houston (United States); Ryan M. O'Donnell, Thomas N. Rohrbaugh, CCDC Army Research Lab. (United States); Thomas S. Teets, Univ. of Houston (United States)

Coffee Break 3:30 PM - 4:00 PM

SESSION 5: ORGANIC PHOTOVOLTAICS AND PHOTODETECTORS

1 February 2023 • 4:00 PM - 4:40 PM | Moscone Center, Room 214 (Level 2 South)

Session Chair: Okihito Sugihara, Utsunomiya Univ. (Japan)

12418-14 • 4:00 PM - 4:20 PM

Chemical stability of archetype non-fullerene acceptor ternary OPVs

Author(s): Yongxi Li, Univ. of Michigan (United States)

12418-15 • 4:20 PM - 4:40 PM

Color-fast semi-transparent organic photovoltaics

Author(s): Hafiz K. Sheriff, Yongxi Li, Stephen R. Forrest, Univ. of Michigan (United States)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12418-31

Additively manufactured micro-optics for dense multi-chip photonic integration

Author(s): Michael Wood, Darwin K. Serkland, Sandia National Labs. (United States); Melanie T. Murillo, Stanford Univ. (United States); Alejandro J. Grine, Michael A. Gallegos, Bryan J. Kaehr, Sandia National Labs. (United States)

12418-32

Properties of the flexible polymer multimode optical waveguides fabricated by using the direct microdispensing method

Author(s): Vaclav Prajzler, Vaclav Chlupaty, Matej Latecka, Czech Technical Univ. in Prague (Czech Republic)

12418-33

Molecularly architected ferroelectric electroluminescent copolymer for single-material self-powered displays

Author(s): Seokyeong Lee, Taebin Kim, Cheolmin Park, Yonsei Univ. (Republic of Korea)

12418-34

Ultrafast black color tunability of electrochromic dimming films using polyoxometalate-anchored metal oxide nanoparticles

Author(s): Hwandong Jang, Jinbo Kim, Eunyoung Kim, Yonsei Univ. (Republic of Korea)

12418-35

Elastomeric indoor organic photovoltaics with superb photo-thermal endurance

Author(s): Tae Hyuk Kim, Jae Won Shim, Ho Jin Lee, Tae Geun Kim, Korea Univ. (Republic of Korea)

SESSION 6: PLASMONIC AND NANOPARTICLES APPLICATIONS

2 February 2023 • 8:30 AM - 10:10 AM | Moscone Center, Room 214 (Level 2 South)

Session Chair: William M. Shensky, DEVCOM Army Research Lab. (United States)

12418-18 • 8:30 AM - 9:00 AM

Nonlinear and chiral hybrid plasmonic glasses (*Invited Paper*)

Author(s): Stéphane Parola, Ecole Normale Supérieure de Lyon (France)

Conference 12418

12418-19 • 9:00 AM - 9:20 AM

Plasmonic organic hybrid electro-optic modulators as a platform for process optimization towards extraordinary nonlinearity and exceptional stability enabling commercial applications

Author(s): Scott R. Hammond, NLM Photonics (United States), Univ. of Washington (United States); Kevin O'Malley, NLM Photonics (United States); Delwin L. Elder, Lewis E. Johnson, NLM Photonics (United States), Univ. of Washington (United States)

12418-20 • 9:20 AM - 9:40 AM

Photo-switchable optical properties polymers with enhanced reversibility

Author(s): Sebastian Inacker, Norbert A. Hampp, Philipps-Univ. Marburg (Germany)

12418-21 • 9:40 AM - 10:10 AM

Control of lasing in complex networks of nanofibers: from one- to three-dimensions (Invited Paper)

Author(s): Dario Pisignano, Univ. di Pisa (Italy)

Coffee Break 10:10 AM - 10:40 AM

SESSION 7: POLYMER WAVEGUIDES

2 February 2023 • 10:40 AM - 12:10 PM | Moscone Center, Room 214 (Level 2 South)

Session Chair: Chantal Andraud, Ecole Normale Supérieure de Lyon (France)

12418-23 • 10:40 AM - 11:10 AM

Textiles based on nanofibers for energy harvesting and smart non-colorimetric labelling (Invited Paper)

Author(s): Luana Persano, Istituto Nanoscienze (Italy)

12418-24 • 11:10 AM - 11:30 AM

Amorphous optical polyimides for thermally stable, high-temperature optical components

Author(s): Armand Rosenberg, Gary Kushto, U.S. Naval Research Lab. (United States); Sang Ho Lee, Jacobs Corp. (United States)

12418-25 • 11:10 AM - 11:30 AM

Recent Progress of Photonics Polymer in Error-free POF and Real Color Display (Keynote Presentation)

Author(s): Yasuhiro Koike, Keio Univ. (Japan)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

SESSION 8: ORGANIC PHOTONIC DEVICES

2 February 2023 • 1:40 PM - 4:20 PM | Moscone Center, Room 214 (Level 2 South)

Session Chair: Luana Persano, Istituto Nanoscienze (Italy)

12418-26 • 1:40 PM - 2:10 PM

Organic Photonic Devices (Invited Paper)

Author(s): Chantal Andraud, Sylvain David, Thibaut Baron, Olivier Maury, Ecole Normale Supérieure de Lyon (France); Denis Chateau, Mathym SAS (France); Stéphane Parola, Ecole Normale Supérieure de Lyon (France); Gérard Berginc, Thales LAS France SAS (France)

12418-27 • 2:10 PM - 2:40 PM

Photonic components with strain-dependent properties made by additive manufacturing technologies (Invited Paper)

Author(s): Andrea Camposeo, Istituto Nanoscienze (Italy)

12418-28 • 2:40 PM - 3:10 PM

High efficiency electro-optic modulators of strong Pockels effect waveguides (Invited Paper)

Author(s): Shiyoshi Yokoyama, Jiawei Mao, Futa Uemura, Alisa Bannaron, Hiromu Sato, Kyushu Univ. (Japan)

Coffee Break 3:10 PM - 3:40 PM

12418-29 • 3:40 PM - 4:00 PM

Towards pressure sensors based on polymer planar Bragg gratings

Author(s): Stefan Kefer, Natalie Pape, Nikola Gries, Technische Hochschule Aschaffenburg (Germany); Bernhard Schmauss, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Ralf Hellmann, Technische Hochschule Aschaffenburg (Germany)

12418-30 • 4:00 PM - 4:20 PM

Locally and temporally resolved image-based determination of the refractive index distribution during additive manufacturing of polymer

Author(s): Andreas Heinrich, Manuel Rank, Hochschule Aalen - Technik und Wirtschaft (Germany)

Ultrafast Phenomena and Nanophotonics XXVII

29 January - 1 February 2023 | Moscone Center, Room 306 (Level 3 South)

Conference Chairs: **Markus Betz**, Technische Univ. Dortmund (Germany); **Abdulahkem Y. Elezzabi**, Univ. of Alberta (Canada)

Program Committee: **Alan D. Bristow**, West Virginia Univ. (United States); **Keshav Dani**, Okinawa Institute of Science and Technology Graduate Univ. (Japan); **Jeff Davis**, Swinburne Univ. of Technology (Australia); **Kimberley C. Hall**, Dalhousie Univ. (Canada); **Rupert Huber**, Univ. Regensburg (Germany); **Robert A. Kaindl**, Arizona State Univ. (United States); **Dai-Sik Kim**, Ulsan National Institute of Science and Technology (Republic of Korea); **Xiaoqin Li**, The Univ. of Texas at Austin (United States); **Christoph Lienau**, Carl von Ossietzky Univ. Oldenburg (Germany); **James Lloyd-Hughes**, The Univ. of Warwick (United Kingdom); **Torsten Meier**, Univ. Paderborn (Germany); **Frank J. Meyer zu Heringdorf**, Univ. Duisburg-Essen (Germany); **Walter Pfeiffer**, Univ. Bielefeld (Germany); **Pascal Ruello**, Le Mans Univ. (France); **Volker J. Sorger**, The George Washington Univ. (United States); **Fabrice Vallee**, Institut Lumière Matière (France); **Kam Sing Wong**, Hong Kong Univ. of Science and Technology (Hong Kong, China)

SUNDAY 29 JANUARY

SESSION 1: TERAHERTZ RADIATION SPECTROSCOPY, GENERATION, AND SOURCES

29 January 2023 • 8:00 AM - 9:50 AM | Moscone Center, Room 306 (Level 3 South)

Session Chair: Abdulhakem Y. Elezzabi, Univ. of Alberta (Canada)

12419-1 • 8:00 AM - 8:30 AM

Passive optical-to-terahertz conversion through semiconductor band engineering (*Invited Paper*)

Author(s): Ping Keng Lu, Deniz Turan, Mona Jarrahi, UCLA Samueli School of Engineering (United States)

12419-2 • 8:30 AM - 9:00 AM

Generation of intense terahertz pulses with variable elliptical polarization (*Invited Paper*)

Author(s): Xavier Ropagnol, Institut National de la Recherche Scientifique (Canada), École de Technologie Supérieure (ÉTS) (Canada); François Blanchard, École de Technologie Supérieure (ÉTS) (Canada); Tsuneyuki Ozaki, Institut National de la Recherche Scientifique (Canada)

12419-3 • 9:00 AM - 9:30 AM

Capturing microsecond dynamics one pulse at a time: single-shot time-resolved terahertz spectroscopy at 50 kHz (*Invited Paper*)

Author(s): Angela Gamouras, National Research Council Canada (Canada), Univ. of Ottawa (Canada); Nicolas Couture, Wei Cui, Univ. of Ottawa (Canada), Max-Planck-Zentrum für Extrem- und Quantenphotonik (Canada); Markus Lippl, Max-Planck-Institut für die Physik des Lichts (Germany), Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Rachel Ostic, Défi J. Jubgang Fandio, Eeswar K. Yalavarthi, Aswin V. Radhan, Univ. of Ottawa (Canada), Max-Planck-Zentrum für Extrem- und Quantenphotonik (Canada); Nicolas Y. Joly, Max-Planck-Institut für die Physik des Lichts (Germany), Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Jean-Michel Ménard, Univ. of Ottawa (Canada), Max-Planck-Zentrum für Extrem- und Quantenphotonik (Canada), National Research Council Canada (Canada)

12419-4 • 9:30 AM - 9:50 AM

Enhanced coupling between lead halide perovskite phonons and THz fields in a flexible Fabry-Perot cavity

Author(s): Hwan Sik Kim, Abbas Ahmad Khan, Yeong-Hwan Ahn, Ajou Univ. (Republic of Korea)

Coffee Break 9:50 AM - 10:20 AM

SESSION 2: ULTRAFAST NANO-OPTICS

29 January 2023 • 10:20 AM - 12:00 PM | Moscone Center, Room 306 (Level 3 South)

Session Chair: Robert Riedel, Class 5 Photonics GmbH (Germany)

12419-5 • 10:20 AM - 10:50 AM

Ultrafast nano-imaging resolving structure, coupling, and dynamics of matter on its natural length and time scales (*Invited Paper*)

Author(s): Markus B. Raschke, Univ. of Colorado Boulder (United States)

12419-6 • 10:50 AM - 11:20 AM

Tip-enhanced cavity-spectroscopy (*Invited Paper*)

Author(s): Kyoung-Duck Park, Pohang Univ. of Science and Technology (Republic of Korea)

12419-7 • 11:20 AM - 11:40 AM

The universal model of strong coupling at the nonlinear resonance in open nanocavity QED systems

Author(s): Alexey Belyanin, Mikhail D. Tokman, Maria Erukhimova, Texas A&M Univ. (United States)

12419-8 • 11:40 AM - 12:00 PM

Reassessing the Siegert relation in partially-coherent regimes of nanolasers

Author(s): Christopher Gies, Monty Drechsler, Frederik Lohof, Univ. Bremen (Germany)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 3: COHERENT AND NONLINEAR DYNAMICS OF OPTICAL EXCITATIONS I

29 January 2023 • 1:30 PM - 2:40 PM | Moscone Center, Room 306 (Level 3 South)

Session Chair: Markus B. Raschke, Univ. of Colorado Boulder (United States)

12419-11 • 1:30 PM - 2:00 PM

Coherent control of the phase transition in indium nanowires on silicon (*Invited Paper*)

Author(s): Jan Gerrit Horstmann, Hannes Böckmann, Felix Kurtz, Max-Planck-Institut für Multidisziplinäre Naturwissenschaften (Germany); Gero Storeck, Max-Planck-Institut für Multidisziplinäre Naturwissenschaften (Germany), Georg-August-Univ. Göttingen (Germany); Bareld Wit, Georg-August-Univ. Göttingen (Germany); Stefan Wippermann, Max-Planck-Institut für Eisenforschung GmbH (Germany); Claus Ropers, Max-Planck-Institut für Multidisziplinäre Naturwissenschaften (Germany), Georg-August-Univ. Göttingen (Germany)

Conference 12419

12419-12 • 2:00 PM - 2:20 PM

Revealing CuO thin film charge dynamics by from ps to μ s transient absorption spectroscopy and numerical modeling

Author(s): Mona Asadinamin, Susanne Ullrich, Henning Meyer, Yiping Zhao, The Univ. of Georgia (United States)

12419-13 • 2:20 PM - 2:40 PM

Ultrafast dynamics of electron injection from Cu embedded nanoparticles in CeO₂ aerogels

Author(s): Tara Michael, Travis Novak, Paul A. DeSario, Debra R. Rolison, Jeffrey C. Owrutsky, Vanessa M. Breslin, Adam D. Dunkelberger, U.S. Naval Research Lab. (United States)

Coffee Break 2:40 PM - 3:10 PM

SESSION 4: TIME AND SPACE RESOLVED DYNAMICS

29 January 2023 • 3:10 PM - 4:40 PM | Moscone Center, Room 306 (Level 3 South)

Session Chair: Jan Gerrit Horstmann, Max-Planck-Institut für Multidisziplinäre Naturwissenschaften (Germany)

12419-14 • 3:10 PM - 3:40 PM

Attosecond clocking of quantum-material correlations (*Invited Paper*)

Author(s): Mackillo Kira, Univ. of Michigan (United States)

12419-15 • 3:40 PM - 4:10 PM

Ultrafast spatiotemporal dynamics of a charge-density wave using femtosecond dark-field momentum microscopy (*Invited Paper*)

Author(s): Laurenz Rettig, Julian Maklar, Fritz-Haber-Institut der Max-Planck-Gesellschaft (Germany); Phil Walmsley, Geballe Laboratory for Advanced Materials and Department of Applied Physics, Stanford University (United States); Stanford Institute for Materials and Energy Sciences, SLAC National Accelerator Laboratory (United States); Ian R. Fisher, Geballe Laboratory for Advanced Materials and Department of Applied Physics (United States); Stanford Institute for Materials and Energy Sciences, SLAC National Accelerator Laboratory (United States)

12419-16 • 4:10 PM - 4:40 PM

Visualizing electron-phonon and phonon-phonon coupling in momentum and time with ultrafast electron scattering (*Invited Paper*)

Author(s): Bradley Siwick, McGill Univ. (Canada)

MONDAY 30 JANUARY

OPTO PLENARY SESSION

30 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 207/215 (Level 2 South)

8:00 AM - 8:05 AM: **Welcome and Opening Remarks**

Sonia García-Blanco, Univ. Twente (Netherlands) and Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

8:05 AM - 8:15 AM: **Announcement of the OPTO AI/ML and Net Zero Best Paper Awards**

12424-501 • 8:15 AM - 8:50 AM

High-performance electronic-photonic interfaces: from AI to quantum (*Plenary Presentation*)

Author(s): Rajeev Ram, Massachusetts Institute of Technology (United States)

12416-501 • 8:50 AM - 9:25 AM

Tandem photovoltaic devices: more than one way to make a solar cell (*Plenary Presentation*)

Author(s): Emily L. Warren, National Renewable Energy Lab. (United States)

12421-501 • 9:25 AM - 10:00 AM

Are III-nitride semiconductors also suitable for red emission? (*Plenary Presentation*)

Author(s): Nicolas Grandjean, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 5: ULTRAFAST ELECTRON SPIN AND MAGNETISM

30 January 2023 • 10:30 AM - 11:30 AM | Moscone Center, Room 306 (Level 3 South)

Session Chair: Lukas Nadvornik, Charles Univ. (Czech Republic)

12419-17 • 10:30 AM - 11:00 AM

Ultrafast magnetoacoustics in ferromagnetic and antiferromagnetic thin-film heterostructures (*Invited Paper*)

Author(s): Shihao Zhuang, Jiamian Hu, Univ. of Wisconsin-Madison (United States)

12419-20 • 11:00 AM - 11:30 AM

Magnetoresistive phenomena revealed by time-domain terahertz spectroscopy (*Invited Paper*)

Author(s): Lukas Nadvornik, Charles Univ. (Czech Republic)

Lunch Break 11:30 AM - 2:00 PM

SESSION 6: TERAHERTZ SPECTROSCOPY AND SPIN MANIPULATION

30 January 2023 • 2:00 PM - 3:00 PM | Moscone Center, Room 306 (Level 3 South)

Session Chair: Abdulhakem Y. Elezzabi, Univ. of Alberta (Canada)

12419-21 • 2:00 PM - 2:30 PM

Ultrafast single-shot optical and THz spectroscopy: a window into nonlinear dynamics of condensed matter systems *(Invited Paper)*

Author(s): Frank Y. Gao, The Univ. of Texas at Austin (United States); Zhuquan Zhang, Massachusetts Institute of Technology (United States); Edoardo Baldini, The Univ. of Texas at Austin (United States); Keith A. Nelson, Massachusetts Institute of Technology (United States)

12419-22 • 2:30 PM - 3:00 PM

Subcycle field microscopy via quantum dots resolves ultrafast THz nearfields *(Invited Paper)*

Author(s): Georg Herink, Moritz B. Heindl, Univ. Bayreuth (Germany); Nicholas Kirkwood, The Univ. of Melbourne (Australia); Tobias Lauster, Julia A. Lang, Markus Retsch, Univ. Bayreuth (Germany); Paul Mulvaney, The Univ. of Melbourne (Australia)

Coffee Break 3:00 PM - 3:30 PM

SESSION 7: ULTRAFAST IMAGING

30 January 2023 • 3:30 PM - 5:20 PM | Moscone Center, Room 306 (Level 3 South)

Session Chair: Georg Herink, Univ. Bayreuth (Germany)

12419-23 • 3:30 PM - 4:00 PM

Classical vs. quantum effects in photon coupling to free electrons *(Invited Paper)*

Author(s): Ofer Kfir, Tel Aviv Univ. (Israel)

12419-24 • 4:00 PM - 4:30 PM

CANCELED: Imaging ultrafast charge transfer in momentum space *(Invited Paper)*

Author(s): Robert Wallauer, Philipps-Univ. Marburg (Germany)

12419-25 • 4:30 PM - 5:00 PM

Imaging and controlling ultrafast dissociation dynamics: from conventional to surprising paths *(Invited Paper)*

Author(s): Tomoyuki Endo, National Institutes for Quantum and Radiological Science and Technology (Japan); Simon Neville, National Research Council Canada (Canada); Philippe Lassonde, Institut National de la Recherche Scientifique (Canada); Chen Qu, Univ. of Maryland (United States); Bruno E. Schmidt, few-cycle Inc. (Canada); Mizuho Fushitani, Akiyoshi Hishikawa, Nagoya Univ. (Japan); Paul L. Houston, Cornell Univ. (United States); Joel M. Bowman, Emory Univ. (United States); Michael Schuurman, National Research Council Canada (Canada); François Légaré, Heide Ibrahim, Institut National de la Recherche Scientifique (Canada)

12419-26 • 5:00 PM - 5:20 PM

Envelope time reversal with a nonlinear time lens based on accelerating quasi-phase-matching

Author(s): Oded Katz, Alon Bahabad, Tel Aviv Univ. (Israel)

TUESDAY 31 JANUARY

SESSION 8: ULTRAFAST PHENOMENA IN MONOLAYERS AND 2D MATERIALS

31 January 2023 • 8:30 AM - 10:40 AM | Moscone Center, Room 306 (Level 3 South)

Session Chair: Alan D. Bristow, West Virginia Univ. (United States)

12419-27 • 8:30 AM - 9:00 AM

Exciton optics, dynamics, and transport in atomically thin materials *(Invited Paper)*

Author(s): Ermin Malic, Philipps-Univ. Marburg (Germany)

12419-28 • 9:00 AM - 9:30 AM

Bright and dark exciton coherent coupling and hybridization enabled by external magnetic fields *(Invited Paper)*

Author(s): Denis Karauskaj, Univ. of South Florida (United States)

12419-29 • 9:30 AM - 9:50 AM

Ultrafast dynamics of photoexcitations in 2D Ti₃C₂T_z, Mo₂Ti₂C₃T_z, and Nb₂CT_z MXenes

Author(s): Erika Colin-Ulloa, Worcester Polytechnic Institute (United States); Kiana Montazeri, Varun Natu, Drexel Univ. (United States); Andrew M. Fitzgerald, Worcester Polytechnic Institute (United States); Ken Ngo, Joshua Uzarski, US Army DEVCOM Soldier Center (United States); Michel W. Barsoum, Drexel Univ. (United States); Lyubov V. Titova, Worcester Polytechnic Institute (United States)

12419-30 • 9:50 AM - 10:10 AM

Charge carrier transport in mixed dimensional quantum dot/monolayer transition metal dichalcogenide heterostructures

Author(s): Mingxing Li, Brookhaven National Lab. (United States); Sidney Bolden, Bethune-Cookman Univ. (United States); Mircea Cotlet, Brookhaven National Lab. (United States)

12419-31 • 10:10 AM - 10:40 AM

Formation of moiré interlayer excitons in space and time *(Invited Paper)*

Author(s): Stefan Mathias, Georg-August-Univ. Göttingen (Germany)

Coffee Break 10:40 AM - 11:10 AM

SESSION 9: COHERENT AND NONLINEAR DYNAMICS OF OPTICAL EXCITATIONS II

31 January 2023 • 11:10 AM - 12:20 PM | Moscone Center, Room 306 (Level 3 South)

Session Chair: Markus Betz, Technische Univ. Dortmund (Germany)

12419-33 • 11:10 AM - 11:40 AM

Ultrafast spectroscopic studies of topological quantum matter *(Invited Paper)*

Author(s): M. Zahid Hasan, Princeton Univ. (United States)

Conference 12419

12419-34 • 11:40 AM - 12:00 PM

Experimental studies of the excitonic nonlinear response of GaAs-based type I and type II quantum well structures interacting with optical and terahertz fields

Author(s): Markus Stein, Felix Schäfer, Daniel Anders, Jan H. Littmann, Justus-Liebig-Univ. Giessen (Germany); Wolfgang Stolz, Kerstin Volz, Philipps-Univ. Marburg (Germany); Alexander Trautmann, Johannes T. Steiner, Cong Ngo, Torsten Meier, Univ. Paderborn (Germany); Sangam Chatterjee, Justus-Liebig-Univ. Giessen (Germany)

12419-35 • 12:00 PM - 12:20 PM

Analysis of the nonlinear optical response of excitons in type-I and type-II quantum wells including many-body correlations

Author(s): Alexander Trautmann, Univ. Paderborn (Germany); Markus Stein, Felix Schäfer, Daniel Anders, Justus-Liebig-Univ. Giessen (Germany); Cong Ngo, Johannes T. Steiner, Matthias Reichelt, Univ. Paderborn (Germany); Sangam Chatterjee, Justus-Liebig-Univ. Giessen (Germany); Torsten Meier, Univ. Paderborn (Germany)

Lunch/Exhibition Break 12:20 PM - 1:50 PM

SESSION 10: ULTRAFAST PLASMONICS

31 January 2023 • 1:50 PM - 3:10 PM | Moscone Center, Room 306 (Level 3 South)

Session Chair: Torsten Meier, Univ. Paderborn (Germany)

12419-36 • 1:50 PM - 2:20 PM

Two-beam nonlinearity in indium tin oxide in the continuous wave limit *(Invited Paper)*

Author(s): Jared K. Wahlstrand, Chad D. Cruz, National Institute of Standards and Technology (United States)

12419-37 • 2:20 PM - 2:50 PM

A comprehensive theory of the electronic, thermal, and optical response of low electron density Drude materials to ultrafast optical illumination *(Invited Paper)*

Author(s): Subhajit Sarkar, Leng-Wai Un, Yonatan Sivan, Ben-Gurion Univ. of the Negev (Israel)

12419-38 • 2:50 PM - 3:10 PM

30 GHz plasmonic slot MoTe₂ photodetector integrated with silicon photonic circuits at telecom wavelength

Author(s): Hao Wang, The George Washington Univ. (United States); Behrouz Movahhed Nouri, Optelligence Company (United States); Hamed Dalir, Volker J. Sorger, The George Washington Univ. (United States)

Coffee Break 3:10 PM - 3:40 PM

SESSION 11: ULTRAFAST DYNAMICS, NONLINEAR OPTICAL, AND TRANSPORT EFFECTS

31 January 2023 • 3:40 PM - 5:40 PM | Moscone Center, Room 306 (Level 3 South)

Session Chair: Yonatan Sivan, Ben-Gurion Univ. of the Negev (Israel)

12419-39 • 3:40 PM - 4:10 PM

Along for the ride: the influence of dark states in organic polariton transport *(Invited Paper)*

Author(s): Raj Pandya, Arjun Ashoka, Univ. of Cambridge (United Kingdom); Kyriacos Georgiou, The Univ. of Sheffield (United Kingdom); Scott Renken, Cornell Univ. (United States); Rahul Jayaprakash, The Univ. of Sheffield (United Kingdom); Akshay Rao, Univ. of Cambridge (United Kingdom); Andrew J. Musser, Cornell Univ. (United States)

12419-40 • 4:10 PM - 4:40 PM

Electrical control of second harmonic generation from intersubband polaritonic metasurfaces *(Invited Paper)*

Author(s): Jaeyeon Yu, Seongjin Park, Inyong Hwang, Ulsan National Institute of Science and Technology (Republic of Korea); Gerhard Böhm, Mikhail A. Belkin, Technische Univ. München (Germany); Jongwon Lee, Ulsan National Institute of Science and Technology (Republic of Korea)

12419-41 • 4:40 PM - 5:00 PM

Auger effect in carrier relaxation dynamics of lead selenide quantum dots under intense pump conditions

Author(s): Luye Yue, Shanghai Jiao Tong Univ. (China); Xuan Wang, Institute of Physics (China); Jianming Cao, Florida State Univ. (United States)

12419-42 • 5:00 PM - 5:20 PM

Charge transport and dynamics in light-harvesting nanostructures

Author(s): Alan D. Bristow, West Virginia Univ. (United States)

12419-43 • 5:20 PM - 5:40 PM

Probing carrier transport in MAPbI₃-based photovoltaic cells with nonlinear photocurrent spectroscopy

Author(s): Zhenyu Ouyang, Liang Yan, Wei You, Andrew Moran, The Univ. of North Carolina at Chapel Hill (United States)

WEDNESDAY 1 FEBRUARY

SESSION 12: PLASMONIC AND PHOTONIC DEVICES

1 February 2023 • 8:00 AM - 10:20 AM | Moscone Center, Room 306 (Level 3 South)

Session Chair: Volker J. Sorger, The George Washington Univ. (United States)

12419-44 • 8:00 AM - 8:30 AM

Revolutionizing High-Speed Data Transmission: The Transverse Coupled Cavity VCSEL *(Invited Paper)*

Author(s): Hamed Dalir, Optelligence, LLC (United States); Elham Heidari, Behrouz Movahhed Nouri, Volker Sorger, Optelligence (United States)

12419-45 • 8:30 AM - 9:00 AM

Ultrafast charge and field driven optical modulators and switches (*Invited Paper*)

Author(s): Martin Thomaschewski, Yaliang Gui, The George Washington Univ. (United States); Hao Wang, The George Washington Univ. (United States), Optelligence, LLC (United States); Salem Altaieb, The George Washington Univ. (United States); Hamed Dalir, Volker J. Sorger, The George Washington Univ. (United States), Optelligence, LLC (United States)

12419-46 • 9:00 AM - 9:30 AM

Nanoscale manipulating plasmonic silver adatoms for dynamic light modulation (*Invited Paper*)

Author(s): Wu Zhang, Univ. of Alberta (Canada); Haizeng Li, Shandong Univ. (China); Abdulkhem Y. Elezzabi, Univ. of Alberta (Canada)

12419-47 • 9:30 AM - 10:00 AM

Towards active mode locking in terahertz metasurface quantum-cascade lasers (*Invited Paper*)

Author(s): Benjamin S. Williams, Univ. of California, Los Angeles (United States)

12419-48 • 10:00 AM - 10:20 AM

Efficient picosecond ultrasonics with a single-cavity dual-comb laser

Author(s): Justinas Pupeikis, Wenxiang Hu, Benjamin Willenberg, Christopher R. Phillips, Ursula Keller, ETH Zurich (Switzerland)

Coffee Break 10:20 AM - 10:50 AM

SESSION 13: ULTRAFAST SPECTROSCOPY, COHERENT DYNAMICS, AND NON-EQUILIBRIUM PHENOMENA

1 February 2023 • 10:50 AM - 11:50 AM | Moscone Center, Room 306 (Level 3 South)

Session Chair: Martin Thomaschewski, The George Washington Univ. (United States)

12419-49 • 10:50 AM - 11:10 AM

Oscillatory anomalous velocity transients in GaAs quantum wells originating from the excitation of excitonic wavepackets

Author(s): Cong Ngo, Univ. Paderborn (Germany); Shekhar Priyadarshi, Physikalisch-Technische Bundesanstalt (Germany); Huynh Thanh Duc, Vietnam Academy of Science and Technology (Vietnam); Mark Bieler, Physikalisch-Technische Bundesanstalt (Germany); Torsten Meier, Univ. Paderborn (Germany)

12419-51 • 11:10 AM - 11:30 AM

Ultrafast motion of a vortex in the double polariton full Bloch beam

Author(s): Nina S. Voronova, National Research Nuclear Univ. MEPhI (Russian Federation); Lorenzo Dominici, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Fabrice P. Laussy, Univ. of Wolverhampton (United Kingdom); Amir Rahmani, Azarbaijan Shahid Madani Univ. (Iran, Islamic Republic of); Daniele Sanvitto, CNR-Istituto di Fotonica e Nanotecnologie (Italy)

12419-52 • 11:30 AM - 11:50 AM

CANCELED: Resonant polariton-to-electron tunneling in quantum cascade detectors operating in the strong light-matter coupling regime

Author(s): Mathurin Lagree, III-V Lab. (France); Mathieu Jeannin, Ctr. de Nanosciences et de Nanotechnologies (France); Grégory Quinchard, III-V Lab. (France); Oussama Ouznali, Ctr. de Nanosciences et de Nanotechnologies (France); Axel Evirgen, Salvatore Pes, Virginie Trinité, III-V Lab. (France); Raffaele Colombelli, Ctr. de Nanosciences et de Nanotechnologies (France); Alexandre Delga, III-V Lab. (France)

Lunch/Exhibition Break 11:50 AM - 1:20 PM

SESSION 14: ULTRAFAST AND NONLINEAR OPTICAL PROCESSES

1 February 2023 • 1:20 PM - 3:10 PM | Moscone Center, Room 306 (Level 3 South)

Session Chair: Markus Betz, Technische Univ. Dortmund (Germany)

12419-53 • 1:20 PM - 1:40 PM

Theoretical analysis of four-wave mixing on semiconductor quantum dot ensembles with quantum light

Author(s): Hendrik Rose, Univ. Paderborn (Germany); Stefan Grisard, Artur V. Trifonov, Rilana Reichhardt, Technische Univ. Dortmund (Germany); Matthias Reichelt, Torsten Meier, Univ. Paderborn (Germany); Ilya A. Akimov, Manfred Bayer, Technische Univ. Dortmund (Germany)

12419-55 • 1:40 PM - 2:10 PM

Theory of high-harmonic generation in condensed matter: imperfect recollisions and Berry curvatures (*Invited Paper*)

Author(s): Lun Yue, Louisiana State Univ. (United States)

12419-56 • 2:10 PM - 2:30 PM

All-optical spatiotemporal phase-matching of high harmonic generation using a traveling-grating pump field

Author(s): Gilad Robert Barir, Tel-Aviv Univ. (Israel); Georgiy Shoulga, Oded Katz, Alon Bahabad, Tel Aviv Univ. (Israel)

12419-67 • 2:30 PM - 2:50 PM

Modeling of low- and high-order harmonic generation in ultrashort laser-excited resonant semiconductor nanostructures

Author(s): Anton Rudenko, Aoxue Han, Wyant College of Optical Sciences (United States); Maria K. Hagen, Philipps-Univ. Marburg (Germany); Jörg Hader, Wyant College of Optical Sciences (United States); Sergey S. Kruk, Yuri S. Kivshar, The Australian National Univ. (Australia); Stephan W. Koch, Philipps-Univ. Marburg (Germany); Jerome V. Moloney, Wyant College of Optical Sciences (United States)

12419-9 • 2:50 PM - 3:10 PM

Generating structured 3D linear space-time light bullets with nonlocal nanophotonics

Author(s): Cheng Guo, Stanford Univ. (United States); Meng Xiao, Wuhan Univ. (China); Meir Orenstein, Technion-Israel Institute of Technology (Israel); Shanhui Fan, Stanford Univ. (United States)

Conference 12419

BEST STUDENT PAPER AWARD

1 February 2023 • 3:10 PM - 3:20 PM | Moscone Center, Room 306 (Level 3 South)

Join us as we announce the Ultrafast Phenomena and Nanophotonics Best Student Paper Award. All contributed papers from conference 12419 given by a young scientist (PhD student or postdoc within the first two years after graduation) are eligible for the award (contributed papers only). To facilitate handing out the award during the meeting, applications will be collected prior to the meeting (Due 6 January 2023). See the OPTO Awards Page for more details.

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12419-58

Temperature-dependent metamaterial sensing for label-free identification of bacteria

Author(s): Seung-Won Jun, Yeong-Hwan Ahn, Ajou Univ. (Republic of Korea)

12419-59

Probing photoexcited free carrier dynamics of two-dimensional MXene, Nb₂C, using ultrafast terahertz spectroscopy

Author(s): Andrew M. Fitzgerald, Erika Colin-Ulloa, Worcester Polytechnic Institute (United States); Javery A. Mann, SUNY Polytechnic Institute (United States); Kiana Montazeri, Michel W. Barsoum, Drexel Univ. (United States); Lyubov V. Titova, Worcester Polytechnic Institute (United States)

12419-60

Nonlinear refraction and absorption spectra of GaP crystal measurements for all-optical switches figure-of-merit determination

Author(s): Lino Misoguti, Renato M. Moysés, Univ. de São Paulo (Brazil)

12419-61

Ultrafast carrier dynamics in 2D GeS in response to photoexcitation across the visible-NIR range

Author(s): Sepideh Khanmohammadi, Worcester Polytechnic Institute (United States); Catherine Tran, Univ. of California, Davis (United States); Erika Colin-Ulloa, Kateryna Kushnir, Worcester Polytechnic Institute (United States); Kristie J. Koski, Univ. of California, Davis (United States); Lyubov V. Titova, Worcester Polytechnic Institute (United States)

12419-62

Rapid imaging of second harmonic generation in transition-metal dichalcogenides and in situ monitoring of laser thinning

Author(s): Young-Chul Kim, Hoseong Yoo, Ji-Yong Park, Yeong-Hwan Ahn, Ajou Univ. (Republic of Korea)

Show Abstract +

12419-63

Finalizing the ELI-Alps MIR-HE laser system: status and design

Author(s): Torsten Golz, Filippo Campi, Bastian Manschwetus, Luke Maidment, Sebastian Starosielec, Jan Heye Buss, Michael Schulz, Class 5 Photonics GmbH (Germany); Mark J. Prandolini, Univ. Hamburg (Germany); Ádám Börzsönyi, Bálint Kiss, ELI-ALPS Research Institute (Hungary); Subhendu Kahaly, ELI-HU Nonprofit Ltd. (Hungary); Eric Cormier, Katalin G. Varju, ELI-ALPS Research Institute (Hungary); Robert Riedel, Class 5 Photonics GmbH (Germany)

12419-66

Visualization of charge carrier diffusion lengths in perovskites single crystal

Author(s): Razan Nughays, Chen Yang, Sarvarkhodzha Nematulloev, King Abdullah Univ. of Science and Technology (Saudi Arabia); Jun Yin, The Hong Kong Polytechnic Univ. (China); Osman Bakr, Omar Mohammed, King Abdullah Univ. of Science and Technology (Saudi Arabia)

Conference 12420

Terahertz, RF, Millimeter, and Submillimeter-Wave Technology and Applications XVI

30 January - 1 February 2023 | Moscone Center, Room 160 (Upper Mezzanine South)

Conference Chairs: **Laurence P. Sadwick**, InnoSys, Inc. (United States); **Tianxin Yang**, Tianjin Univ. (China)

Program Committee: **René Beigang**, Technische Univ. Kaiserslautern (Germany); **Jianji Dong**, Huazhong Univ. of Science and Technology (China); **Frank Ellrich**, Technische Hochschule Bingen (Germany); **Fabian Friederich**, Fraunhofer-Institut für Techno- und Wirtschaftsmathematik ITWM (Germany); **Robert H. Giles**, Univ. of Massachusetts Lowell (United States); **R. Jennifer Hwu**, InnoSys, Inc. (United States); **Mona Jarrahi**, UCLA Samueli School of Engineering (United States); **Karen K. Lin**, A*STAR Institute of Materials Research and Engineering (Singapore); **Daniel Molter**, Fraunhofer-Institut für Techno- und Wirtschaftsmathematik ITWM (Germany); **J. Anthony Murphy**, National Univ. of Ireland, Maynooth (Ireland); **Crédhe O'Sullivan**, National Univ. of Ireland, Maynooth (Ireland); **Kyung Hyun Park**, Electronics and Telecommunications Research Institute (Republic of Korea); **Alessia Portieri**, TeraView Ltd. (United Kingdom); **Marco Rahm**, Technische Univ. Kaiserslautern (Germany); **Jinghua Teng**, A*STAR Institute of Materials Research and Engineering (Singapore); **Michael Weibel**, Joint Research and Development, Inc. (United States); **Maddy Woodson**, Freedom Photonics, LLC (United States); **Jiangfeng Zhou**, Univ. of South Florida (United States)

MONDAY 30 JANUARY

OPTO PLENARY SESSION

30 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 207/215 (Level 2 South)

8:00 AM - 8:05 AM: **Welcome and Opening Remarks**
Sonia García-Blanco, Univ. Twente (Netherlands) and Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

8:05 AM - 8:15 AM: **Announcement of the OPTO AI/ML and Net Zero Best Paper Awards**

12424-501 • 8:15 AM - 8:50 AM

High-performance electronic-photonic interfaces: from AI to quantum (*Plenary Presentation*)

Author(s): Rajeev Ram, Massachusetts Institute of Technology (United States)

12416-501 • 8:50 AM - 9:25 AM

Tandem photovoltaic devices: more than one way to make a solar cell (*Plenary Presentation*)

Author(s): Emily L. Warren, National Renewable Energy Lab. (United States)

12421-501 • 9:25 AM - 10:00 AM

Are III-nitride semiconductors also suitable for red emission? (*Plenary Presentation*)

Author(s): Nicolas Grandjean, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 1: RF AND MILLIMETER WAVE SOURCES

30 January 2023 • 10:30 AM - 11:50 AM | Moscone Center, Room 160 (Upper Mezzanine South)

Session Chair: Laurence P. Sadwick, InnoSys, Inc. (United States)

12420-1 • 10:30 AM - 10:50 AM

Barrier injection avalanche RF photonic CMOS technology: performance advantages over traditional CMOS-based ASICs and silicon photonics

Author(s): James N. Pan, Northrop Grumman Corp. (United States), American Enterprise and License Co. (United States)

12420-2 • 10:50 AM - 11:10 AM

Optically-generated microwave-sensing by electric field sensor

Author(s): Tomoyuki Uehara, Kenichiro Tsuji, National Defense Academy (Japan)

12420-3 • 11:10 AM - 11:30 AM

100 GHz optical-to-radio converter and its startup performance driven by power over fiber

Author(s): Toshimasa Umezawa, Atsushi Matsumoto, Kouichi Akahane, Atsushi Kanno, Naokatsu Yamamoto, National Institute of Information and Communications Technology (Japan)

12420-4 • 11:30 AM - 11:50 AM

Microwave envelope equations for narrowband optoelectronic oscillators

Author(s): Meenwook Ha, Yanne K. Chembo, Univ. of Maryland, College Park (United States)

Lunch Break 11:50 AM - 1:20 PM

SESSION 2: MILLIMETER-WAVE AND SUB-MILLIMETER-WAVE COMPONENTS

30 January 2023 • 1:20 PM - 2:40 PM | Moscone Center, Room 160 (Upper Mezzanine South)

Session Chair: Laurence P. Sadwick, InnoSys, Inc. (United States)

12420-5 • 1:20 PM - 1:40 PM

CANCELED: Passive WR3 combiner with a reflector-integrated horn for 50 dB gain

Author(s): Ming Che, Kazutoshi Kato, Kyushu Univ. (Japan)

12420-6 • 1:40 PM - 2:00 PM

Purely photonic wireless link at 120 GHz carrier frequency enabled by heterodyne detection with a photoconductive antenna

Author(s): Milan Deumer, Oliver Stiewe, Simon Nellen, Robert B. Kohlhaas, Robert Elschner, Colja Schubert, Ronald Freund, Martin Schell, Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany)

12420-7 • 2:00 PM - 2:20 PM

Broadband RF interconnection technique for terahertz photodiodes enabling multiple waveguide output

Author(s): Muhsin Ali, Alejandro Rivera-Lavado, Daniel Gallego-Cabo, LeapWave Technologies (Spain); Frédéric van Dijk, III-V Lab. (France); Guillermo Carpintero, Univ. Carlos III de Madrid (Spain)

Conference 12420

12420-8 • 2:20 PM - 2:40 PM

Scalable optical frequency comb control by stimulated Brillouin scattering

Author(s): Brandon Redding, U.S. Naval Research Lab. (United States); Jason D. McKinney, Purdue Univ. (United States); Ross Schermer, Joseph Murray, U.S. Naval Research Lab. (United States)

Coffee Break 2:40 PM - 3:10 PM

SESSION 3: BIOMEDICAL APPLICATIONS

30 January 2023 • 3:10 PM - 4:20 PM | Moscone Center, Room 160 (Upper Mezzanine South)

Session Chairs: Laurence P. Sadwick, InnoSys, Inc. (United States), Marco Rahm, Technische Univ. Kaiserslautern (Germany)

12420-11 • 3:10 PM - 3:30 PM

Investigating biological response of human foreskin fibroblasts to Sub THz waves

Author(s): Seung Jae Oh, Inhee Maeng, Yonsei Univ. College of Medicine (Republic of Korea); Hye Young Son, Yonsei Univ. College of Medicine (Kiribati, Republic of); Eui Su Lee, Il-Min Lee, Kyung Hyun Park, Electronics and Telecommunications Research Institute (Republic of Korea)

12420-47 • 3:30 PM - 4:00 PM

Terahertz Portable Handheld Spectral Reflection (PHASR) scanners for accurate classification of burn injuries in clinical settings *(Invited Paper)*

Author(s): Zachery B. Harris, Mahmoud E. Khani, Omar Osman, M. Hassan Arbab, Stony Brook Univ. (United States)

12420-13 • 4:00 PM - 4:20 PM

Dual-band metasurface cross-polarization converter for cancer detection in terahertz band

Author(s): Anirban Chaudhuri, Parama Pal, Beena Rai, Tata Consultancy Services, Ltd. (India)

TUESDAY 31 JANUARY

SESSION 4: TERAHERTZ I

31 January 2023 • 8:00 AM - 9:50 AM | Moscone Center, Room 160 (Upper Mezzanine South)

Session Chairs: Marco Rahm, Technische Univ. Kaiserslautern (Germany), Laurence P. Sadwick, InnoSys, Inc. (United States)

12420-48 • 8:00 AM - 8:30 AM

Deep transfer learning for metamaterials research *(Invited Paper)*

Author(s): Willie J. Padilla, Duke Univ. (United States)

12420-14 • 8:30 AM - 8:50 AM

Rapid THz-TDS enabled by single-cavity solid-state GHz dual-comb oscillator

Author(s): Benjamin Willenberg, Christopher R. Phillips, Justinas Pupekis, ETH Zurich (Switzerland); Lars Liebermeister, Robert B. Kohlhaas, Björn Globisch, Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); Ursula Keller, ETH Zurich (Switzerland)

12420-15 • 8:50 AM - 9:10 AM

A novel terahertz detector technology based on vacuum electronics

Author(s): Naoya Kawai, Hamamatsu Photonics K.K. (Japan); Tobias Olaf Buchmann, DTU Elektro, Technical Univ. of Denmark (Denmark); Hisanari Takahashi, Kota Katsuyama, Hamamatsu Photonics K.K. (Japan); Simon Jappe Lange, Matej Sebek, Peter Uhd Jepsen, DTU Elektro, Technical Univ. of Denmark (Denmark); Hiroshi Satozono, Takayuki Ohmura, Hamamatsu Photonics K.K. (Japan)

12420-16 • 9:10 AM - 9:30 AM

Terahertz wave parametric wavelength conversion monitored by spectral drill cavity

Author(s): Shin'ichiro Hayashi, National Institute of Information and Communications Technology (Japan); Seigo Ohno, Tohoku Univ. (Japan); Katsuhiko Miyamoto, Chiba Univ. (Japan); Yoshiharu Urata, PHLUXI, Inc. (Japan); Norihiko Sekine, National Institute of Information and Communications Technology (Japan)

12420-17 • 9:30 AM - 9:50 AM

Band switchable THz metamaterial based on an etched vanadium dioxide thin film

Author(s): Han-Cheol Ryu, Sahmyook Univ. (Republic of Korea); Jun-Hwan Shin, Kyung Hyun Park, Electronics and Telecommunications Research Institute (Republic of Korea)

Coffee Break 9:50 AM - 10:20 AM

SESSION 5: TERAHERTZ II

31 January 2023 • 10:20 AM - 11:50 AM | Moscone Center, Room 160 (Upper Mezzanine South)

Session Chair: Laurence P. Sadwick, InnoSys, Inc. (United States)

12420-19 • 10:20 AM - 10:40 AM

Cantilever-based photoacoustic sensor for terahertz range

Author(s): Erkki Ikonen, Sucheta Sharma, Mohsen Ahmadi, Aalto Univ. (Finland); Jussi Rossi, Tampere Univ. (Finland); Markku Vainio, Univ. of Helsinki (Finland); Zhipei Sun, Aalto Univ. (Finland); Andreas Steiger, Physikalisch-Technische Bundesanstalt (Germany)

12420-20 • 10:40 AM - 11:10 AM

Polarization-controlled emission from spintronic emitter stacks *(Invited Paper)*

Author(s): Dominik Sokoluk, Jan Kappa, Laura Scheuer, Technische Univ. Kaiserslautern (Germany); Evangelos Th. Papaioannou, Martin-Luther-Univ. Halle-Wittenberg (Germany); Marco Rahm, Technische Univ. Kaiserslautern (Germany)

12420-21 • 11:10 AM - 11:30 AM

CANCELED: Perfect THz cavities based on metasurfaces

Author(s): Stan ter Huurne, Jaime Gómez Rivas, Technische Univ. Eindhoven (Netherlands)

12420-22 • 11:30 AM - 11:50 AM

Terahertz pixel-super-resolution imaging with a plasmonic focal-plane array

Author(s): Xurong Li, Deniz Mengü, Aydogan Ozcan, Mona Jarrahi, Univ. of California, Los Angeles (United States)

Lunch/Exhibition Break 11:50 AM - 1:20 PM

SESSION 6: TERAHERTZ III

31 January 2023 • 1:20 PM - 3:10 PM | Moscone Center, Room 160 (Upper Mezzanine South)

Session Chairs: Marco Rahm, Technische Univ. Kaiserslautern (Germany), Laurence P. Sadwick, InnoSys, Inc. (United States)

12420-23 • 1:20 PM - 1:50 PM

One-dimensional terahertz focal plane arrays based on plasmonic nanocavities for terahertz line scanning (Invited Paper)

Author(s): Nezh T. Yardimci, Lookin, Inc. (United States), UCLA Samueli School of Engineering (United States); Deniz Turan, UCLA Samueli School of Engineering (United States); Ali Charkhesht, Lookin, Inc. (United States); Mona Jarrahi, UCLA Samueli School of Engineering (United States)

12420-24 • 1:50 PM - 2:10 PM

CANCELED: Ultrabroadband THz pulses with electric field amplitude above 100 kV/cm at a 200 kHz repetition rate

Author(s): Niloufar Nilforoushan, Lab. de Physique de l'Ecole Normale Supérieure (France), Univ. PSL, CNRS (France), Sorbonne Univ., Univ. Paris-Saclay (France); Thibault Apretna, Lab. de Physique de l'Ecole Normale Supérieure (France), Univ. PSL, CNRS (France), Sorbonne Univ., Univ. Paris (France); Chao Song, Lab. de Physique de l'Ecole Normale Supérieure (France), Univ. PSL, CNRS (France), Sorbonne Univ., Univ. Paris-Saclay (France); Thomas Boulter, Jérôme Tignon, Sukhdeep Dhillon, Lab. de Physique de l'Ecole Normale Supérieure (France); Marc Hanna, Univ. Paris-Saclay, Institut d'Optique Graduate School, CNRS, Lab. Charles Fabry (France); Juliette Mangeney, Lab. de Physique de l'Ecole Normale Supérieure (France)

12420-25 • 2:10 PM - 2:30 PM

Optically modulated waveguide-coupled spintronic terahertz radiation emitters

Author(s): Basem Y. Shahriar, Eric Hopmann, Abdulhakem Y. Elezzabi, Univ. of Alberta (Canada)

12420-26 • 2:30 PM - 2:50 PM

THz optical beatnote detection with a fast hot electron bolometer operating up to 31 GHz

Author(s): Sara Cibella, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Andres Forrer, Matthias Beck, Institut für Quantenelektronik, ETH Zurich (Switzerland); Pasquale Carelli, Fabio Chiarello, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Jérôme Faist, Institut für Quantenelektronik, ETH Zurich (Switzerland); Alessandro Gaggero, Ennio Giovine, Francesco Martini, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Urban Senica, Institut für Quantenelektronik, ETH Zurich (Switzerland); Roberto Leoni, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Giacomo Scalari, Institut für Quantenelektronik, ETH Zurich (Switzerland)

12420-27 • 2:50 PM - 3:10 PM

Precision excitation of multicycle THz radiation using modular pulse trains

Author(s): Nicholas Matlis, Ctr. for Free-Electron Laser Science (Germany); Zhelin Zhang, Ümit Demirbas, Christian Rentschler, Mikhail Pergament, Koustouban Ravi, Deutsches Elektronen-Synchrotron (Germany); Franz X. Kärtner, Ctr. for Free-Electron Laser Science (Germany), Hamburg Ctr. for Ultrafast Imaging, Univ. Hamburg (Germany)

Coffee Break 3:10 PM - 3:40 PM

SESSION 7: TERAHERTZ IV

31 January 2023 • 3:40 PM - 5:20 PM | Moscone Center, Room 160 (Upper Mezzanine South)

Session Chairs: Marco Rahm, Technische Univ. Kaiserslautern (Germany), Laurence P. Sadwick, InnoSys, Inc. (United States)

12420-28 • 3:40 PM - 4:00 PM

Integrated photonic-microfluidic chip for FIR/THz excitation of liquid samples in ultrafast pump-probe bioscience experiments

Author(s): Vanessa Scheller, Sergio Carbajo, Univ. of California, Los Angeles (United States)

12420-29 • 4:00 PM - 4:20 PM

Stable optical beats in laser chaos near the threshold level for THz waves generation

Author(s): Fumiyoshi Kuwashima, Fukui Univ. of Technology (Japan); Mona Jarrahi, Semih Cakmakyan, Univ. of California, Los Angeles (United States); Osamu Morikawa, Japan Coast Guard Academy (Japan); Takuya Shirao, Kazuyuki Iwao, Fukui Univ. of Technology (Japan); Kazuyoshi Kurihara, Hideaki Kitahara, Takashi Furuya, Univ. of Fukui (Japan); Kenji Wada, Osaka Metropolitan Univ. (Japan); Makoto Nakajima, Osaka Univ. (Japan); Masahiko Tani, Univ. of Fukui (Japan)

12420-30 • 4:20 PM - 4:40 PM

Ultrafast nonlinear carrier dynamics in graphene monolayer driven by intense terahertz pulse

Author(s): Hee Jun Shin, Pohang Accelerator Lab. (Republic of Korea); Seongchu Lim, Sungkyunkwan Univ. (Republic of Korea)

12420-31 • 4:40 PM - 5:00 PM

Graphene-based tunable plasmonic metamaterials for nitric oxide in breath-sensing application

Author(s): Pei-Jung Wu, Jing-Ting Hung, National Taiwan Normal Univ. (Taiwan); Cho-Fan Hsieh, Metrology laboratory, Center for Measurement Standards/Industrial Technology Research Institute (Taiwan); Chii-Rong Yang, Chan-Shan Yang, National Taiwan Normal Univ. (Taiwan)

12420-32 • 5:00 PM - 5:20 PM

Monitoring of military-designated composites and processing of the images obtained with the use of Terahertz radiation

Author(s): Martyna Strag, Adam Szymanowski, Waldemar Swiderski, Military Institute of Armament Technology (Poland)

WEDNESDAY 1 FEBRUARY

SESSION 8: TERAHERTZ V

1 February 2023 • 8:20 AM - 10:00 AM | Moscone Center, Room 160 (Upper Mezzanine South)

Session Chairs: Marco Rahm, Technische Univ. Kaiserslautern (Germany), Laurence P. Sadwick, InnoSys, Inc. (United States)

12420-33 • 8:20 AM - 8:50 AM

Emission and sensing of high-frequency terahertz electric fields using second-order nonlinear crystals (Invited Paper)

Author(s): Brett N. Carnio, Mingyuan Zhang, Univ. of Alberta (Canada); Peter Schunemann, Kevin Zawilski, BAE Systems (United States); Oussama Moutanabbir, Polytechnique Montréal (Canada); Abdulhakem Y. Elezzabi, Univ. of Alberta (Canada)

Conference 12420

12420-34 • 8:50 AM - 9:20 AM

Potential of ultra-wideband gap semiconductors for sub-THz and THz applications (*Invited Paper*)

Author(s): Michael S. Shur, Rensselaer Polytechnic Institute (United States)

12420-35 • 9:20 AM - 9:40 AM

Single-shot time-domain spectrometers and THz digitizers using Diversity Electro-Optic Sampling (DEOS): principles and limitations

Author(s): Eléonore Roussel, Christophe Szwej, Clément Evain, Lab. de Physique des Lasers, Atomes et Molécules, CNRS (France); Bernd Steffen, Christopher Gerth, Deutsches Elektronen-Synchrotron (Germany); Bahram Jalali, Univ. of California, Los Angeles (United States); Serge Bielawski, Lab. de Physique des Lasers, Atomes et Molécules, CNRS (France)

12420-36 • 9:40 AM - 10:00 AM

Technologies for focusing and aperturing terahertz radiation in the realization of terahertz spectroscopy on the subwavelength scale

Author(s): Alexis N. Guidi, Michael E. Mitchell, Alexander C. MacGillivray, Jonathan F. Holzman, The Univ. of British Columbia (Canada)

Coffee Break 10:00 AM - 10:30 AM

SESSION 9: COMMUNICATION AND SENSING SYSTEMS

1 February 2023 • 10:30 AM - 11:50 AM | Moscone Center, Room 160 (Upper Mezzanine South)

Session Chair: Laurence P. Sadwick, InnoSys, Inc. (United States)

12420-37 • 10:30 AM - 10:50 AM

Demonstration of THz wireless communication with directly-modulated BCB-planar type dual mode laser

Author(s): Young-Hoon Kim, Eui Su Lee, Dong Woo Park, Jin Chul Cho, Da-Hye Choi, Dong Hun Lee, Yongsoon Baek, Sang-Rok Moon, Eon-Sang Kim, Seung-Hyun Cho, Joon Ki Lee, Young Ahn Leem, Il-Min Lee, Kyung Hyun Park, Electronics and Telecommunications Research Institute (Republic of Korea)

12420-38 • 10:50 AM - 11:10 AM

Microcomb-based 560-GHz terahertz wave generation for next-generation wireless communication

Author(s): Shota Okada, Kenji Nishimoto, Yu Tokizane, Hiroki Kishikawa, Yasuhiro Okamura, Naoya Kuse, Takeshi Yasui, Tokushima Univ. (Japan)

12420-39 • 11:10 AM - 11:30 AM

Photonics-based CW terahertz system stabilization technology

Author(s): Jin Chul Cho, Eui Su Lee, Mugeon Kim, Jun-Hwan Shin, Dong Woo Park, Young-Hoon Kim, Il-Min Lee, Kyung Hyun Park, Electronics and Telecommunications Research Institute (Republic of Korea)

12420-40 • 11:30 AM - 11:50 AM

CdSe/PbSe high-temperature mid-infrared heterostructure photovoltaic photodetector

Author(s): Lance L. McDowell, Milad Rastkar Mirzaei, Zhisheng Shi, The Univ. of Oklahoma (United States)

Lunch/Exhibition Break 11:50 AM - 1:20 PM

SESSION 10: INNOVATIONS, NOVEL CONCEPTS, AND TECHNOLOGY

1 February 2023 • 1:20 PM - 3:10 PM | Moscone Center, Room 160 (Upper Mezzanine South)

Session Chair: Laurence P. Sadwick, InnoSys, Inc. (United States)

12420-41 • 1:20 PM - 1:50 PM

Advances in high-speed detector technologies (*Invited Paper*)

Author(s): Maddy Woodson, Estefano Fodor, Kenneth A. Hay, Fatt Foong, Freedom Photonics, LLC (United States); Brian D. Krejca, Kenneth Vaccaro, Celine Gribbon, William D. Waters, William R. Clark, OptoGration Inc. (United States); Daniel S. Renner, Freedom Photonics, LLC (United States)

12420-42 • 1:50 PM - 2:10 PM

Multi-spectral and polarization-sensitive infrared sensing using nanoantennas

Author(s): Gergo P. Szakmany, Hadrian Aquino, Gary H. Bernstein, David Burghoff, Chao Dong, Edward C. Kinzel, Alexei O. Orlov, Wolfgang Porod, Univ. of Notre Dame (United States); David Strobel, Space Micro, Inc. (United States); Stephen M. White, Air Force Research Lab. (United States)

12420-43 • 2:10 PM - 2:30 PM

High-speed signal reconstruction for an RF spectrometer based on laser speckle imaging

Author(s): Matthew Kelley, Thomas J. Shaw, George C. Valley, The Aerospace Corp. (United States)

12420-44 • 2:30 PM - 2:50 PM

Low phase noise microwave synthesis via an optically stabilized electro-optic frequency comb

Author(s): Igor S. Kudelin, William Groman, Megan Kelleher, Dahyeon Lee, Alexander Lind, Charles Mclemore, Univ. of Colorado Boulder (United States), National Institute of Standards and Technology (United States); Franklyn Quinlan, National Institute of Standards and Technology (United States); Scott Diddams, Univ. of Colorado Boulder (United States), National Institute of Standards and Technology (United States)

12420-45 • 2:50 PM - 3:10 PM

1x2 printed element based MIMO antenna with UWB and multiband response for airborne and naval radar communication

Author(s): Sunil Lavadiya, Marwadi Univ. (India); Vishal Sorathiya, Parul Univ. (India); Shobhit Patel, Marwadi Univ. (India)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center,
Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12420-12

THz application for monitoring of polymer medical films crosslinked by electron beam

Author(s): Hyeon Sang Bark, Korea Atomic Energy Research Institute (Republic of Korea); Inhee Maeng, Yonsei Univ. College of Medicine (Republic of Korea); Jungsup Byun, Jae Hun Na, Gimhae Biomedical Industry Promotion Agency (Republic of Korea); Seung Jae Oh, Yonsei Univ. College of Medicine (Republic of Korea); Youngbin Ji, Gimhae Biomedical Industry Promotion Agency (Republic of Korea)

Gallium Nitride Materials and Devices XVIII

30 January - 2 February 2023 | Moscone Center, Room 152 (Upper Mezzanine South)

Conference Chairs: **Hiroshi Fujioka**, Institute of Industrial Science, The Univ. of Tokyo (Japan); **Hadis Morkoç**, Virginia Commonwealth Univ. (United States); **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

Program Committee: **Frank Bertram**, Otto-von-Guericke-Univ. Magdeburg (Germany); **Michal Bockowski**, Institute of High Pressure Physics (Poland); **Raffaella Calarco**, Paul-Drude-Institut für Festkörperelektronik (Germany); **Mitch M. C. Chou**, National Sun Yat-Sen Univ. (Taiwan); **Jen-Inn Chyi**, National Central Univ. (Taiwan); **Martin Feneberg**, Otto-von-Guericke-Univ. Magdeburg (Germany); **Mitsuru Funato**, Kyoto Univ. (Japan); **Bernard Gil**, Lab. Charles Coulomb (France); **Nicolas Grandjean**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Jung Han**, Yale Univ. (United States); **Hideki Hirayama**, RIKEN (Japan); **Ray-Hua Horng**, National Yang Ming Chiao Tung Univ. (Taiwan); **Chih-Fang Huang**, National Tsing Hua Univ. (Taiwan); **Motoaki Iwaya**, Meijo Univ. (Japan); **Michael Kneissl**, Technische Univ. Berlin (Germany); **Elison Matioli**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Koh Matsumoto**, Nagoya Univ. (Japan); **Hideto Miyake**, Mie Univ. (Japan); **Eva Monroy**, CEA-DRF (France); **Yasushi Nanishi**, Ritsumeikan Univ. (Japan); **Ümit Özgür**, Virginia Commonwealth Univ. (United States); **Piotr Perlin**, Institute of High Pressure Physics (Poland); **Fan Ren**, Univ. of Florida (United States); **Tae-Yeon Seong**, Korea Univ. (Republic of Korea); **Bo Shen**, Peking Univ. (China); **Jong-In Shim**, Hanyang Univ. (Republic of Korea); **Maria Tchernycheva**, Ctr. de Nanosciences et de Nanotechnologies (France); **Akio Wakejima**, Nagoya Institute of Technology (Japan); **Chih-Chung Yang**, National Taiwan Univ. (Taiwan); **Euijoon Yoon**, Seoul National Univ. (Republic of Korea)

MONDAY 30 JANUARY

OPTO PLENARY SESSION

30 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 207/215 (Level 2 South)

8:00 AM - 8:05 AM: **Welcome and Opening Remarks**
Sonia García-Blanco, Univ. Twente (Netherlands) and Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

8:05 AM - 8:15 AM: **Announcement of the OPTO AI/ML and Net Zero Best Paper Awards**

12424-501 • 8:15 AM - 8:50 AM

High-performance electronic-photonic interfaces: from AI to quantum (*Plenary Presentation*)

Author(s): Rajeev Ram, Massachusetts Institute of Technology (United States)

12416-501 • 8:50 AM - 9:25 AM

Tandem photovoltaic devices: more than one way to make a solar cell (*Plenary Presentation*)

Author(s): Emily L. Warren, National Renewable Energy Lab. (United States)

12421-501 • 9:25 AM - 10:00 AM

Are III-nitride semiconductors also suitable for red emission? (*Plenary Presentation*)

Author(s): Nicolas Grandjean, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 1: GROWTH I

30 January 2023 • 10:30 AM - 12:30 PM | Moscone Center, Room 152 (Upper Mezzanine South)

Session Chair: Juergen H. Christen, Otto-von-Guericke-Univ. Magdeburg (Germany)

12421-1 • 10:30 AM - 11:00 AM

Growth of 1-inch aluminium nitride crystals with an efficient diameter increase technology and structural characterization (*Invited Paper*)

Author(s): Thomas Straubinger, Carsten Hartmann, Martin Albrecht, Matthias Bickermann, Andrew Klump, Uta Juda, Leibniz-Institut für Kristallzüchtung (Germany); Merve P. Kabukcuoglu, Daniel Hänschke, Karlsruher Institut für Technologie (Germany); Carsten Richter, Leibniz-Institut für Kristallzüchtung (Germany)

12421-2 • 11:00 AM - 11:30 AM

Recent progress in bulk GaN crystal growth technology (*Invited Paper*)

Author(s): Malgorzata Iwinska, Institute of High Pressure Physics (Poland)

12421-3 • 11:30 AM - 12:00 PM

X-ray topography analysis of high perfection GaN substrates showing dynamic diffraction effects (*Invited Paper*)

Author(s): Lutz Kirste, Fraunhofer-Institut für Angewandte Festkörperphysik IAF (Germany); Thu Nhi Tran Thi Caliste, José Baruchel, European Synchrotron Radiation Facility (France); Tomasz Sochacki, Robert Kucharski, Malgorzata Iwinska, Michal Bockowski, Institute of High Pressure Physics (Poland)

12421-4 • 12:00 PM - 12:30 PM

ScAlMgO₄ as a promising substrate for InGaN-based long wavelength emitters: demonstration of far-red LEDs (*Invited Paper*)

Author(s): Mitsuru Funato, Keita Maehara, Yoshinobu Matsuda, Takuya Ozaki, Yoichi Kawakami, Kyoto Univ. (Japan)

Lunch Break 12:30 PM - 1:45 PM

SESSION 2: GROWTH II

30 January 2023 • 1:45 PM - 3:30 PM | Moscone Center, Room 152 (Upper Mezzanine South)

Session Chair: Thomas Straubinger, Leibniz-Institut für Kristallzüchtung (Germany)

12421-5 • 1:45 PM - 2:15 PM

Epitaxial growth of NbN superconductors on lattice-matched AlN wide-bandgap semiconductors *(Invited Paper)*

Author(s): Atsushi Kobayashi, Kohei Ueno, Hiroshi Fujioka, The Univ. of Tokyo (Japan)

Show Abstract +

12421-6 • 2:15 PM - 2:30 PM

Sputtering growth of n++-GaN shell in the tunnel junction on core-shell GaInN/GaN multi-quantum shell/nanowires

Author(s): Yukimi Jinno, Sae Katsuro, Shiori Yamamura, Nanami Nakayama, Shiori Ii, Yuki Yamanaka, Mizuki Takahashi, Soma Inaba, Ayaka Shima, Satoshi Kamiyama, Tetsuya Takeuchi, Motoaki Iwaya, Meijo Univ. (Japan)

12421-7 • 2:30 PM - 2:45 PM

Effect of boron incorporation on the luminescence and structural properties of B xAl yGa 1-x-yN/AlGaIn MQWs for UV emitters

Author(s): Thomas O'Connor, Tyndall National Institute (Ireland), Univ. College Cork (Ireland); Vitaly Zubialevich, Tyndall National Institute (Ireland); Praveen Kumar, Miryam Arredondo-Arechavala, Queen's Univ. Belfast (United Kingdom); Stefan Schulz, Peter Parbrook, Tyndall National Institute (Ireland), Univ. College Cork (Ireland)

12421-8 • 2:45 PM - 3:00 PM

Impact of AlN buffer layers on MBE grown cubic GaN layers

Author(s): Jörg Schörmann, Mario F. Zscherp, Nils Mengel, Detlev M. Hofmann, Justus-Liebig-Univ. Giessen (Germany); Vitalii Lider, Celina Becker, Andreas Beyer, Kerstin Volz, Philipps-Univ. Marburg (Germany); Sangam Chatterjee, Justus-Liebig-Univ. Giessen (Germany)

12421-9 • 3:00 PM - 3:15 PM

Wing tilt in ELO grown GaN

Author(s): Ronny Kirste, North Carolina State Univ. (United States); Seiji Mita, Adroit Materials Inc. (United States); Houston Dycus, EAG Labs. (United States); Jack Almeter, North Carolina State Univ. (United States); James Tweedie, Adroit Materials Inc. (United States); James Loveless, North Carolina State Univ. (United States); Pramod Reddy, Adroit Materials Inc. (United States); Ramon Collazo, Zlatko Sitar, North Carolina State Univ. (United States)

12421-81 • 3:15 PM - 3:30 PM

Influence of dislocation density and interfacial lattice mismatch on MOCVD-grown Be-doped GaN

Author(s): Benjamin McEwen, SUNY Polytechnic Institute (United States); Michael A. Reshchikov, Virginia Commonwealth Univ. (United States); Emma Rocco, Vincent Meyers, Alireza Lanjani, SUNY Polytechnic Institute (United States); Oleksandr Andrieiev, Mykhailo Vorobiov, Denis O. Demchenko, Virginia Commonwealth Univ. (United States); F. Shadi Shahedipour-Sandvik, SUNY Polytechnic Institute (United States)

Coffee Break 3:30 PM - 4:00 PM

SESSION 3: CHARACTERIZATION I

30 January 2023 • 4:00 PM - 6:00 PM | Moscone Center, Room 152 (Upper Mezzanine South)

Session Chair: Mitsuru Funato, Kyoto Univ. (Japan)

12421-10 • 4:00 PM - 4:15 PM

Detecting buried silicon interlayers in GaN/diamond bonded structures

Author(s): Gregory E. Triplett, Virginia Commonwealth Univ. (United States); Samuel Graham, Univ. of Maryland, College Park (United States); Nicholar Hines, Georgia Institute of Technology (United States)

12421-11 • 4:15 PM - 4:30 PM

Fundamental features of a Pd-based contact on p-GaN

Author(s): Iryna Levchenko, Eliana Kaminska, Szymon Grzanka, Institute of High Pressure Physics (Poland); Serhii Kryvyi, Institute of Physics (Poland); Piotr Perlin, Institute of High Pressure Physics (Poland)

12421-12 • 4:30 PM - 4:45 PM

Deep-UV photoemission electron microscopy for imaging nanoscale heterogeneity and defects in gallium nitride

Author(s): Andrew J. Winchester, National Institute of Standards and Technology (United States), Georgetown Univ. (United States); Michael Mastro, Travis Anderson, Jennifer Hite, U.S. Naval Research Lab. (United States); Andrei Kolmakov, Sujitra Pookpanratana, National Institute of Standards and Technology (United States)

12421-13 • 4:45 PM - 5:00 PM

Nano-characterization of a space-charge region in a pn-diode with long drift layer: detailed cathodoluminescence and EBIC correlation

Author(s): Konstantin Wein, Otto-von-Guericke Univ. Magdeburg (Germany); Frank Bertram, Gordon Schmidt, Peter Veit, Jürgen Christen, Otto-von-Guericke-Univ. Magdeburg (Germany); Samuel Faber, Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Michael Heuken, AIXTRON SE (Germany), RWTH Aachen Univ. (Germany); Thorsten Zweipfennig, Holger Kalisch, Andrei Vescan, Arne Debald, RWTH Aachen Univ. (Germany)

12421-14 • 5:00 PM - 5:15 PM

Degradation of GaN-based InGaIn-GaN MQWs solar cells caused by thermally-activated diffusion

Author(s): Marco Nicoletto, Alessandro Caria, Carlo De Santi, Matteo Buffolo, Univ. degli Studi di Padova (Italy); xuanqui huang, Houqiang fu, hong chen, Yuji Zhao, Arizona State Univ. (United States); Gaudenzio Meneghesso, Enrico Zanoni, Matteo Meneghini, Univ. degli Studi di Padova (Italy)

12421-15 • 5:15 PM - 5:30 PM

Characterizations of GaN nano-LED-based tactile sensors for robotics applications

Author(s): Nathan A. Dvorak, Xili Yi, Nima Fazeli, Pei-Cheng Ku, Univ. of Michigan (United States)

Conference 12421

12421-16 • 5:30 PM - 5:45 PM

Degradation of AlGaIn-based SQW UV-C LEDs investigated by capacitance deep level transient spectroscopy

Author(s): Francesco Piva, Matteo Buffolo, Carlo De Santi, Marco Pilati, Nicola Roccato, Univ. degli Studi di Padova (Italy); Anton Muhin, Norman Susilo, Technische Univ. Berlin (Germany); Daniel Hauer Vidal, Ferdinand Braun Institute (FBH) (Germany); Luca Sulmoni, Tim Wernicke, Michael Kneissl, Technische Univ. Berlin (Germany); Gaudenzio Meneghesso, Enrico Zanoni, Matteo Meneghini, Univ. degli Studi di Padova (Italy)

12421-86 • 5:45 PM - 6:00 PM

Physical Nitriding Reaction for Solventless Gallium Nitride

Author(s): Rick Qiu, Mivium (United States)

TUESDAY 31 JANUARY

SESSION 4: CHARACTERIZATION II

31 January 2023 • 8:00 AM - 9:45 AM | Moscone Center, Room 152 (Upper Mezzanine South)

Session Chair: Bernard Gil, Lab. Charles Coulomb (France)

12421-17 • 8:00 AM - 8:30 AM

Photoluminescence from defects in GaN (*Invited Paper*)

Author(s): Michael A. Reshchikov, Virginia Commonwealth Univ. (United States)

12421-18 • 8:30 AM - 9:00 AM

Carrier dynamics of polar, semipolar, and nonpolar InGaIn/GaN LEDs measured by small-signal electroluminescence (*Invited Paper*)

Author(s): Daniel F. Feezell, Arman Rashidi, Xuefeng Li, Mohsen Nami, Morteza Monavarian, Elizabeth DeJong, The Univ. of New Mexico (United States); Robert Armitage, Lumileds, LLC (United States)

12421-19 • 9:00 AM - 9:30 AM

Properties of III-nitride wide quantum wells and their application to optoelectronic devices (*Invited Paper*)

Author(s): Greg Muziol, Mateusz Hajdel, Marcin Siekacz, Henryk Turski, Tadek Suski, Witold Trzeciakowski, Czesław Skierbiszewski, Institute of High Pressure Physics (Poland)

12421-79 • 9:30 AM - 9:45 AM

Electrical properties of AlGaIn/GaN based heterojunction field effect transistor structures with a β -Ga₂O₃ gate dielectric grown by MOCVD

Author(s): Samiul Hasan, Mohi Uddin Jewel, Scott R. Crittenden, Dongkyu Lee, Univ. of South Carolina (United States); Vitaliy S. Avrutin, Ümit Özgür, Hadis Morkoç, Virginia Commonwealth Univ. (United States); Iftikhar Ahmad, Univ. of South Carolina (United States)

Coffee Break 9:45 AM - 10:15 AM

SESSION 5: CHARACTERIZATION III

31 January 2023 • 10:15 AM - 11:45 AM | Moscone Center, Room 152 (Upper Mezzanine South)

Session Chair: Shigefusa F. Chichibu, Tohoku Univ. (Japan)

12421-20 • 10:15 AM - 10:30 AM

Growth of cubic In_xGa_{1-x}N over whole composition by MBE

Author(s): Mario F. Zscherp, Silas A. Jentsch, Marius J. Müller, Justus-Liebig-Univ. Giessen (Germany); Mario Littmann, Falco Meier, University of Paderborn (Germany); Detlev M. Hofmann, Justus-Liebig-Univ. Giessen (Germany); Donat J. As, University of Paderborn (Germany); Sangam Chatterjee, Jörg Schörmann, Justus-Liebig-Univ. Giessen (Germany)

12421-21 • 10:30 AM - 10:45 AM

Micro-photoluminescence and micro-electroluminescence analysis of wide InGaIn/GaN quantum wells

Author(s): Conny Becht, Ulrich Theodor Schwarz, Technische Univ. Chemnitz (Germany); Mateusz Hajdel, Grzegorz Muziol, Institute of High Pressure Physics (Poland)

12421-23 • 10:45 AM - 11:15 AM

Spontaneous and stimulated emission physics of aluminum nitride (*Invited Paper*)

Author(s): Ryota Ishii, Kyoto Univ. (Japan); Toru Nagashima, Reo Yamamoto, Tatsuya Hitomi, Tokuyama Corp. (Japan); Mitsuru Funato, Yoichi Kawakami, Kyoto Univ. (Japan)

12421-24 • 11:15 AM - 11:30 AM

Carrier localization effects in c-plane (Al,Ga)N quantum wells

Author(s): Stefan Schulz, Robert Finn, Tyndall National Institute (Ireland)

12421-80 • 11:30 AM - 11:45 AM

Excitons in InGaIn: a numerical study

Author(s): Aurelien David, Google (United States); Claude Weisbuch, Ecole Polytechnique (France), Univ. of California, Santa Barbara (United States)

Lunch/Exhibition Break 11:45 AM - 1:15 PM

SESSION 6: CHARACTERIZATION IV

31 January 2023 • 1:15 PM - 3:15 PM | Moscone Center, Room 152 (Upper Mezzanine South)

Session Chair: Lutz Kirste, Fraunhofer-Institut für Angewandte Festkörperphysik IAF (Germany)

12421-25 • 1:15 PM - 1:45 PM

Annealing properties of vacancy-type defects in ion implanted GaN during ultra-high-pressure annealing studied by using a monoenergetic positron beam (*Invited Paper*)

Author(s): Akira Uedono, Univ. of Tsukuba (Japan); Hideki Sakurai, Nagoya Univ. (Japan); Jun Uzuhashi, National Institute for Materials Science (Japan); Tetsuo Narita, Toyota Central R&D Labs., Inc. (Japan); Kacper Sierakowski, Institute of High Pressure Physics (Poland); Shoji Ishibashi, National Institute of Advanced Industrial Science and Technology (Japan); Shigefusa F. Chichibu, Tohoku Univ. (Japan); Michal Bockowski, Institute of High Pressure Physics (Poland); Jun Suda, Nagoya Univ. (Japan); Tadakatsu Ohokubo, National Institute for Materials Science (Japan); Nobuyuki Ikarashi, Nagoya Univ. (Japan); Kazuhiro Hono, National Institute for Materials Science (Japan); Tetsu Kachi, Nagoya Univ. (Japan)

12421-26 • 1:45 PM - 2:15 PM

Impacts of vacancy clusters on the recombination dynamics in Mg-implanted GaN on GaN structures
(Invited Paper)

Author(s): Shigefusa F. Chichibu, Kohei Shima, Tohoku Univ. (Japan); Hiroko Iguchi, Tetsuo Narita, Keita Kataoka, Toyota Central R&D Labs., Inc. (Japan); Hideki Sakurai, Nagoya Univ. (Japan), Aichi Univ. of Technology (Japan), ULVAC, Inc. (Japan); Michal Bockowski, Institute of High Pressure Physics (Poland), Nagoya Univ. (Japan); Jun Suda, Tetsu Kachi, Nagoya Univ. (Japan); Shinya Takashima, Ryo Tanaka, Katsunori Ueno, Masaharu Edo, Fuji Electric Co., Ltd. (Japan); Shoji Ishibashi, National Institute of Advanced Industrial Science and Technology (Japan); Akira Uedono, Univ. of Tsukuba (Japan)

12421-27 • 2:15 PM - 2:45 PM

Ion implantation of acceptors into gallium nitride
(Invited Paper)

Author(s): Kacper Sierakowski, Institute of High Pressure Physics (Poland); Rafal Jakiela, Institute of Physics (Poland); Tomasz Sochacki, Malgorzata Iwinska, Piotr Jaroszynski, Michal Fijalkowski, Institute of High Pressure Physics (Poland); Marcin Turek, Maria Curie-Skłodowska Univ. (Poland); Michal Bockowski, Institute of High Pressure Physics (Poland)

12421-28 • 2:45 PM - 3:00 PM

Experimental analysis of degradation of multi-quantum well GaN based solar cells under current stress

Author(s): Alessandro Caria, Marco Nicoletto, Carlo De Santi, Matteo Buffolo, Univ. degli Studi di Padova (Italy); Xuanqi Huang, Houqiang Fu, Hong Chen, Arizona State Univ. (United States); Yuji Zhao, Rice Univ. (United States), Arizona State Univ. (United States); Gaudenzio Meneghesso, Enrico Zanoni, Matteo Meneghini, Univ. degli Studi di Padova (Italy)

12421-29 • 3:00 PM - 3:15 PM

Study of ultra high pressure annealing of Si-implanted GaN epilayers with different ion fluences

Author(s): Andrzej Taube, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); Oskar Sadowski, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland), Warsaw Univ. of Technology (Poland); Iwona Sankowska, Karolina Pagowska, Marek Ekielski, Pawel Michalowski, Joanna Jankowska-Sliwinska, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); Jaroslaw Tarenko, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland), Warsaw Univ. of Technology (Poland); Anna Szerling, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); Pawel Prystawko, Kacper Sierakowski, Piotr Jaroszynski, Michal Bockowski, Izabella Grzegory, Institute of High Pressure Physics (Poland)

Coffee Break 3:15 PM - 3:45 PM**SESSION 7: ELECTRON DEVICES**

31 January 2023 • 3:45 PM - 6:15 PM | Moscone Center, Room 152 (Upper Mezzanine South)

Session Chair: Motoaki Iwaya, Meijo Univ. (Japan)

12421-30 • 3:45 PM - 4:15 PM

Recent development of GaN Power switching devices with Ion Implantation technology (Invited Paper)

Author(s): Tetsu Kachi, Nagoya Univ. (Japan); Hideki Sakurai, Nagoya Univ. (Japan), ULVAC, Inc. (Japan); Tetsuo Narita, Toyota Central R&D Labs., Inc. (Japan); Maciej Matys, Jun Suda, Nagoya Univ. (Japan)

12421-31 • 4:15 PM - 4:45 PM

Electric field mapping of wide-bandgap semiconductor devices at a submicrometre resolution (Invited Paper)

Author(s): Yuke Cao, James W. Pomeroy, Univ. of Bristol (United Kingdom); Jingshan Wang, Patrick Fay, University of Notre Dame (United States); Bhawani Shankar, Srabanti Chowdhury, Stanford University (United States); Martin Kuball, Univ. of Bristol (United Kingdom)

12421-32 • 4:45 PM - 5:15 PM

Optical and structural nano-characterization of GaN-based power devices (Invited Paper)

Author(s): Jürgen Christen, Gordon Schmidt, Frank Bertram, Otto-von-Guericke-Univ. Magdeburg (Germany); Arne Debald, Michael Heuken, RWTH Aachen Univ. (Germany), AIXTRON SE (Germany); Thorsten Zweipfennig, Holger Kalisch, Andrei Vescan, RWTH Aachen Univ. (Germany)

12421-33 • 5:15 PM - 5:30 PM

Optimization of bevelled mesa fabrication process for vertical GaN p-n diodes

Author(s): Jaroslaw Tarenko, Maciej Kaminski, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland), Warsaw Univ. of Technology (Poland); Renata Kruszka, Magdalena Zadura, Andrzej Taube, Marek Ekielski, Joanna Jankowska-Sliwinska, Anna Szerling, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); Pawel Prystawko, Michal Bockowski, Institute of High Pressure Physics (Poland); Izabella Grzegory, Institute of High Pressure Physics (Poland)

12421-34 • 5:30 PM - 5:45 PM

Optimization of low resistivity Ti/Al/TiN/Au ohmic contacts to buffer-free AlGaIn/GaN high electron mobility transistor structures

Author(s): Maciej Kaminski, Oskar Sadowski, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland), Warsaw Univ. of Technology (Poland); Andrzej Taube, Marek Ekielski, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); Jaroslaw Tarenko, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland), Warsaw Univ. of Technology (Poland); Magdalena Zadura, Marek Wzorek, Anna Szerling, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland)

Conference 12421

12421-64 • 5:45 PM - 6:15 PM

Novel approaches of epitaxial growth and layer transfer techniques using 2D h-BN for flexible GaN-based LEDs and Micro-LEDs *(Invited Paper)*

Author(s): Abdallah Ougazzaden, Suresh Sundaram, Georgia Tech-Lorraine (France), Georgia Tech - CNRS (France); Phuong Vuong, Soufiane Karakchou, Adama Mballo, Georgia Tech - CNRS (France); Rajat Gujrat, Ashutosh Srivastava, Jean-Paul Salvestrini, Paul Voss, Georgia Tech-Lorraine (France), Georgia Tech - CNRS (France); Gilles Patriarche, Univ. Paris-Saclay (France), Ctr. de Nanosciences et de Nanotechnologies (France)

SESSION 8: LASER DIODES I

1 February 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 152 (Upper Mezzanine South)

Session Chair: Åsa Haglund, Chalmers Univ. of Technology (Sweden)

12421-35 • 8:00 AM - 8:30 AM

Blue and green edge-emitting laser diodes and vertical-cavity surface emitting lasers on C-plane GaN substrates *(Invited Paper)*

Author(s): Yoshitaka Nakatsu, Tsuyoshi Hirao, Tomonori Morizumi, Yoji Nagao, Kenichi Terao, Hitoshi Nagai, Shingo Masui, Tomoya Yanamoto, Shin-ichi Nagahama, Nichia Corp. (Japan)

12421-36 • 8:30 AM - 9:00 AM

InGaN semiconductor laser diodes for the visible spectral range: design and process optimization of single emitters and bars for applications from mW to kW output power *(Invited Paper)*

Author(s): Sven Gerhard, Lars Naehle, Bruno Jentzsch, Harald Koenig, Elisabeth Reiger, Urs Heine, Soenke Tautz, Christoph Eichler, Georg Bruederl, Teresa Wurm, Damir Borovac, Martin Behringer, Laura Kreiner, Mariel Jama, Norwin von Malm, ams-OSRAM International GmbH (Germany); Anne Balck, Markus Baumann, Volker Krause, Laserline GmbH (Germany)

12421-37 • 9:00 AM - 9:30 AM

Watt-class high-power high-beam quality operation of GaN-based photonic-crystal surface-emitting laser *(Invited Paper)*

Author(s): Kei Emoto, Tomoaki Koizumi, Stanley Electric Co., Ltd. (Japan), Kyoto Univ. (Japan); Takuya Inoue, Masaki Hirose, Masahiro Jutori, Kenji Ishizaki, Menaka De Zoysa, Kyoto Univ. (Japan); Hiroyuki Togawa, Stanley Electric Co., Ltd. (Japan); Susumu Noda, Kyoto Univ. (Japan)

12421-38 • 9:30 AM - 9:45 AM

Ultra-compact low-loss GaN waveguides for potential large-scale Photonic Integrated Circuit (PICs) applications

Author(s): Kiran Saba, Institute of High Pressure Physics (Poland); Anna Kafar, Dario Schiavon, Szymon Grzanka, Piotr Perlin, Institute of High Pressure Physics (Poland), TopGaN Ltd. (Poland)

12421-39 • 9:45 AM - 10:00 AM

Gallium Nitride-based moiré photonic crystals for applications in low-threshold nano-lasers

Author(s): Alexander Raun, Haoning Tang, Xueqi Ni, Eric Mazur, Evelyn L. Hu, Harvard Univ. (United States)

Coffee Break 10:00 AM - 10:30 AM

WEDNESDAY 1 FEBRUARY

SESSION 9: LASER DIODES II

1 February 2023 • 10:30 AM - 11:45 AM | Moscone Center, Room 152 (Upper Mezzanine South)

Session Chair: Daniel F. Feezell, The Univ. of New Mexico (United States)

12421-40 • 10:30 AM - 11:00 AM

Current-injected continuous-wave AlGaIn-based UVC laser diodes *(Invited Paper)*

Author(s): Maki Kushimoto, Ziyi Zhang, Akira Yoshikawa, Koji Aoto, Yoshio Honda, Leo J. Schowalter, Chiaki Sasaoka, Hiroshi Amano, Nagoya Univ. (Japan)

12421-41 • 11:00 AM - 11:30 AM

Progress in UV-B laser diodes fabricated on lattice relaxed AlGaIn *(Invited Paper)*

Author(s): Motoaki Iwaya, Ryosuke Kondo, Ryota Hasegawa, Ayumu Yabutani, Eri Matsubara, Toma Nishibayashi, Meijo Univ. (Japan); Shoji Iwayama, Meijo Univ. (Japan), Mie Univ. (Japan); Tetsuya Takeuchi, Satoshi Kamiyama, Meijo Univ. (Japan); Hideto Miyake, Mie Univ. (Japan)

12421-43 • 11:30 AM - 11:45 AM

Visible InGaN laser diodes with polarization-doped p-type layers

Author(s): Piotr Perlin, Muhammed Aktas, Anna Kafar, Szymon Grzanka, Dario Schiavon, Institute of High Pressure Physics (Poland)

Lunch/Exhibition Break 11:45 AM - 1:15 PM

SESSION 10: LASER DIODES III

1 February 2023 • 1:15 PM - 3:00 PM | Moscone Center, Room 152 (Upper Mezzanine South)

Session Chair: Piotr Perlin, Institute of High Pressure Physics (Poland)

12421-44 • 1:15 PM - 1:45 PM

Highly-efficient operation and mode control in GaN-based VCSELs with a curved mirror *(Invited Paper)*

Author(s): Tatsushi Hamaguchi, Sony Corp. (Japan), Sony Group Corp. (Japan); Maiko Ito, Jared A. Kearns, Tomohiro Makino, Kentaro Hayashi, Maho Ohara, Noriko Kobayashi, Tatsuro Jyokawa, Eiji Nakayama, Shouetsu Nagane, Koichi Sato, Yuki Nakamura, Yukio Hoshina, Yuichiro Kikuchi, Takumi Watanabe, Yuya Kanitani, Seiji Kasahara, Yoshihiro Kudo, Susumu Kusanagi, Rintaro Koda, Noriyuki Fuutagawa, Sony Group Corp. (Japan)

12421-45 • 1:45 PM - 2:15 PM

MOVPE-growth of conductive AlInN/GaN DBRs towards GaN-based VCSELs *(Invited Paper)*

Author(s): Tetsuya Takeuchi, Satoshi Kamiyama, Motoaki Iwaya, Meijo Univ. (Japan)

12421-46 • 2:15 PM - 2:45 PM

Electrochemical etching for thin-film light-emitters
(Invited Paper)

Author(s): Åsa Haglund, Filip Hjort, Chalmers Univ. of Technology (Sweden); Johannes Enslin, Technische Univ. Berlin (Germany); Michael A. Bergmann, Chalmers Univ. of Technology (Sweden); Munise Cobet, Giulia Cardinali, Nando Prokop, Technische Univ. Berlin (Germany); Lars Persson, Estrella Torres, Chalmers Univ. of Technology (Sweden); Martin Guttman, Luca Sulmoni, Neysha Lobo-Ploch, Technische Univ. Berlin (Germany); Tim Kolbe, Ferdinand-Braun-Institut (Germany); Joachim Ciers, Chalmers Univ. of Technology (Sweden); Tim Wernicke, Michael Kneissl, Technische Univ. Berlin (Germany)

12421-47 • 2:45 PM - 3:00 PM

Continuous-wave operation of long-cavity m-plane GaN-based vertical-cavity surface-emitting lasers with a topside curved mirror and nanoporous GaN DBR

Author(s): Nathan Palmquist, Ryan M. Anderson, Jared A. Kearns, Joonho Back, Emily S. Trageser, Stephen Gee, Univ. of California, Santa Barbara (United States); Stephen P. DenBaars, Univ. of California (United States); Shuji Nakamura, Univ. of California, Santa Barbara (United States)

Coffee Break 3:00 PM - 3:30 PM**SESSION 11: LASER DIODES IV**

1 February 2023 • 3:30 PM - 5:45 PM | Moscone Center, Room 152 (Upper Mezzanine South)

Session Chair: Maki Kushimoto, Nagoya Univ. (Japan)

12421-48 • 3:30 PM - 4:00 PM

Influence of threading dislocations on performance of InGaN laser diodes (Invited Paper)

Author(s): Agata Bojarska-Cieslinska, Institute of High Pressure Physics (Poland); Lucja Marona, Julita Smalc-Koziorowska, Szymon Grzanka, Institute of High Pressure Physics (Poland), TopGaN Ltd. (Poland); Jan Weyher, Institute of High Pressure Physics (Poland); Dario Schiavon, Piotr Perlin, Institute of High Pressure Physics (Poland), TopGaN Ltd. (Poland)

12421-49 • 4:00 PM - 4:30 PM

Narrow ridge III-nitride m-plane violet edge-emitting laser diodes with sidewall passivation using atomic layer deposition (Invited Paper)

Author(s): Matthew S. Wong, Haojun Zhang, Emily S. Trageser, Ryan M. Anderson, James S. Speck, Shuji Nakamura, Steven P. DenBaars, Univ. of California, Santa Barbara (United States)

12421-50 • 4:30 PM - 4:45 PM

Time-dependent characterization of spectral-lateral dynamics in InGaN laser diodes with various ridge width

Author(s): Lukas Uhlig, Technische Univ. Chemnitz (Germany); Anna Kafar, Szymon Grzanka, Piotr Perlin, Institute of High Pressure Physics (Poland), TopGaN Ltd. (Poland); Ulrich T. Schwarz, Technische Univ. Chemnitz (Germany)

12421-51 • 4:45 PM - 5:00 PM

CANCELED: Ge doping for strain-free cladding layers in InGaN/GaN lasers

Author(s): Dario Schiavon, Anna Kafar, Szymon Grzanka, Piotr Perlin, Institute of High Pressure Physics (Poland)

12421-52 • 5:00 PM - 5:15 PM

Green edge-emitting laser diodes with porous GaN cladding and deep ridge waveguiding

Author(s): Emily S. Trageser, Matthew S. Wong, Ryan M. Anderson, Haojun Zhang, Steven P. DenBaars, Shuji Nakamura, Univ. of California, Santa Barbara (United States)

12421-53 • 5:15 PM - 5:30 PM

Dynamics of blue laser diodes with narrow and wide quantum wells

Author(s): Jannina Tepass, Lukas Uhlig, Technische Univ. Chemnitz (Germany); Mateusz Hajdel, Grzegorz Muziol, Polish Academy of Sciences (Poland); Ulrich Theodor Schwarz, Technische Univ. Chemnitz (Germany)

12421-54 • 5:30 PM - 5:45 PM

Single-frequency DFB laser diodes at visible wavelengths grown with low temperature remote plasma chemical vapor deposition p-AlGaIn

Author(s): Ryan Anderson, Josh Brown, BluGlass, Ltd. (Australia); Emily Trageser, University of California Santa Barbara (United States); Qian Gao, Satya Barik, Marie Wintrebert-Fouquet, Alanna Fernandes, Patrick Chen, Brad Zadrozny, Pablo Bee Olmedo, Ignacio Cruz, Teckseong Ho, Denis Timoney, Stephen O'Farrell, Brad Siskavich, Ian Mann, Martin Aguilera, BluGlass, Ltd. (Australia); Steve DenBaars, Shuji Nakamura, University of California Santa Barbara (United States); Jim Haden, BluGlass, Ltd. (Australia)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12421-75

Metal-semiconductor-metal structured p-i-n GaN/AlGaIn ultrafast detectors for deep-UV photodetection

Author(s): Solumtochukwu F. Nwabunwanne, William R. Donaldson, Univ. of Rochester (United States)

12421-76

Modeling of capacitance phenomena in nitride VCSELs

Author(s): Patrycja Spiewak, Michal Wasiak, Magdalena Marciniak, Robert P. Sarzala, Lodz Univ. of Technology (Poland)

12421-77

Influence of forward-current stress on the generation of deep-level traps in InGaN/GaN blue micro-LEDs

Author(s): A. B. M. Hamidul Islam, Korea Institute of Energy Technology (Republic of Korea); Tae Kyoung Kim, Korea Institute of Energy Technology (Republic of Korea); Yu-Jung Cha, Korea Institute of Energy Technology (Republic of Korea); Jae Won Seo, Jiun Oh, Korea Institute of Energy Technology (Republic of Korea); Jong-In Shim, Dong-Soo Shin, Hanyang Univ. (Republic of Korea); Joon Seop Kwak, Korea Institute of Energy Technology (Republic of Korea)

12421-78

Demonstration and optimization of c-plane InGaN based edge emitting laser diodes grown on strain relaxed template

Author(s): Hsun-Ming Chang, Philip Chan, Norleakvisoth Lim, Vincent Rienzi, Haojun Zhang, Michael J. Gordon, Steven P. DenBaars, Shuji Nakamura, Univ. of California, Santa Barbara (United States)

12421-84

Development of technology of buffer-free AlGaIn/GaN high electron mobility transistor structures for microwave application

Author(s): Andrzej Taube, Lukaszewicz Research Network - Institute of Microelectronics and Photonics (Poland); Maciej Kamiński, Lukaszewicz Research Network - Institute of Microelectronics and Photonics (Poland), Warsaw Univ. of Technology, Institute of Microelectronics and Optoelectronics (Poland); Marek Ekielski, Lukaszewicz Research Network - Institute of Microelectronics and Photonics (Poland); Jaroslaw Tarenko, Oskar Sadowski, Lukaszewicz Research Network - Institute of Microelectronics and Photonics (Poland), Warsaw Univ. of Technology, Institute of Microelectronics and Optoelectronics (Poland); Magdalena Zadura, Karolina Pagowska, Anna Szerling, Lukaszewicz Research Network - Institute of Microelectronics and Photonics (Poland)

12421-85

Development of technology of high power, normally-off p-GaN-gate AlGaIn/GaN high electron mobility transistors

Author(s): Andrzej Taube, Maciej Kamiński, Marek Ekielski, Lukaszewicz Research Network - Institute of Microelectronics and Photonics (Poland); Jaroslaw Tarenko, Lukaszewicz Research Network - Institute of Microelectronics and Photonics (Poland), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics (Poland); Karolina Pagowska, Ernest Brzozowski, Kamil Kosiel, Joanna Jankowska-Śliwińska, Anna Szerling, Lukaszewicz Research Network - Institute of Microelectronics and Photonics (Poland)

SESSION 12: LEDS I

2 February 2023 • 8:00 AM - 10:30 AM | Moscone Center, Room 152 (Upper Mezzanine South)

Session Chair: Benjamin Damilano, CRHEA (France)

12421-55 • 8:00 AM - 8:30 AM

Advances in far-UVC LEDs and irradiation systems for medicine and sensing (*Invited Paper*)

Author(s): Sven Einfeldt, Jan Ruschel, Hyun Kyong Cho, Jens Rass, Martin Guttmann, Thomas Filler, Ferdinand-Braun-Institut (Germany); Marcel Schilling, Technische Univ. Berlin (Germany); Tim Kolbe, Arne Knauer, Sylvia Hagedorn, Ferdinand-Braun-Institut (Germany); Luca Sulmoni, Heiko Gundlach, Technische Univ. Berlin (Germany); Christoph Stoelmacker, Steffen Knigge, Johannes Glaab, Ferdinand-Braun-Institut (Germany); Tim Wernicke, Technische Univ. Berlin (Germany); Lucas Wittenbecher, Neysha Lobo-Ploch, Markus Weyers, Olaf Krueger, Ferdinand-Braun-Institut (Germany); Ulrike Woggon, Technische Univ. Berlin (Germany); Axel Kramer, Ernst Moritz Arndt Univ. Greifswald (Germany); Martina C. Meinke, Charité Universitätsmedizin Berlin (Germany); Michael Kneissl, Technische Univ. Berlin (Germany)

12421-56 • 8:30 AM - 9:00 AM

High-speed solar-blind optical wireless communications based on AlGaIn deep-ultraviolet light-emitting diodes grown on AlN/sapphire templates with dense macro-steps (*Invited Paper*)

Author(s): Kazunobu Kojima, Osaka Univ. (Japan); Yuki Yoshida, Masaki Shiraiwa, Yoshinari Awaji, Atsushi Kanno, Naokatsu Yamamoto, National Institute of Information and Communications Technology (Japan); Akira Hirano, Yosuke Nagasawa, Masamichi Ippommatsu, UV Craftory Co., Ltd. (Japan); Shigefusa F. Chichibu, Tohoku Univ. (Japan)

12421-57 • 9:00 AM - 9:30 AM

Fabrication of 265 nm LED on face-to-face annealed sputter-deposited AlN/sapphire (*Invited Paper*)

Author(s): Hideto Miyake, Mie Univ. (Japan)

12421-58 • 9:30 AM - 10:00 AM

Exploring the efficiency limits of AlGaIn multi-quantum well deep UV-LEDs (*Invited Paper*)

Author(s): Michael Kneissl, Giulia Cardinali, Martin Guttmann, Anton Muhin, Marcel Schilling, Luca Sulmoni, Tim Wernicke, Technische Univ. Berlin (Germany); Hyun Kyong Cho, Johannes Glaab, Arne Knauer, Tim Kolbe, Jan Ruschel, Sylvia Hagedorn, Neysha Lobo-Ploch, Carsten Netzel, Jens Rass, Sven Einfeldt, Markus Weyers, Ferdinand-Braun-Institut (Germany)

12421-59 • 10:00 AM - 10:15 AM

Advantages of concave quantum barriers in AlGaIn deep ultraviolet light-emitting diodes

Author(s): Barsha T. Jain, New Jersey Institute of Technology (United States); Manobalasankar Muthu, New Jersey Institute of Technology (United States); Ravi Teja Velpula, Ngoc Thi Ai Nguyen, Hieu Pham Trung Nguyen, New Jersey Institute of Technology (United States)

12421-60 • 10:15 AM - 10:30 AM

Electrical characteristics of highly mg-doped AlGaIn contact layers for duv leds

Author(s): Hayata Takahata, Tetsuya Takeuchi, Satoshi Kamiyama, Motoaki Iwaya, Hianori Ishiguro, Tomoaki Kachi, Rie Iwatsuki, Meijo Univ. (Japan); Yoshiki Saito, Koji Okuno, Kengo Nagata, Toyoda Gosei Co., Ltd. (Japan)

Coffee Break 10:30 AM - 11:00 AM

SESSION 13: LEDS II

2 February 2023 • 11:00 AM - 12:15 PM | Moscone Center, Room 152 (Upper Mezzanine South)

Session Chair: Hideto Miyake, Mie Univ. (Japan)

12421-61 • 11:00 AM - 11:30 AM

Strain-compensated InGaN quantum-well red standard/micro-LEDs (*Invited Paper*)

Author(s): Kazuhiro Ohkawa, Pavel Kirilenko, Mohammed A. Najmi, Martin Velazquez-Rizo, King Abdullah Univ. of Science and Technology (Saudi Arabia); Zhe Zhuang, Nanjing Univ. (China); Daisuke Iida, King Abdullah Univ. of Science and Technology (Saudi Arabia)

12421-62 • 11:30 AM - 12:00 PM

Towards ultrahigh-resolution micro-LED displays using a monolithic vertically stacked full-color LED (*Invited Paper*)

Author(s): Yasufumi Fujiwara, Shuhei Ichikawa, Dolf Timmerman, Jun Tatebayashi, Osaka Univ. (Japan)

12421-63 • 12:00 PM - 12:15 PM

6.5% external quantum efficiency in V-defect engineered red InGaN LEDs

Author(s): Jacob Ewing, Cheyenne Lynsky, Univ. of California, Santa Barbara (United States); Feng Wu, Univ. of California (United States); Matthew S. Wong, Michael Iza, James S. Speck, Steven P. DenBaars, Univ. of California, Santa Barbara (United States)

Lunch/Exhibition Break 12:15 PM - 1:30 PM

SESSION 14: LEDS III

2 February 2023 • 1:30 PM - 3:00 PM | Moscone Center, Room 152 (Upper Mezzanine South)

Session Chair: Michael Kneissl, Technische Univ. Berlin (Germany)

12421-65 • 1:30 PM - 2:00 PM

A high-efficiency full-color monolithic micro-LED display for AR/MR/VR applications using NPQD technology (*Invited Paper*)

Author(s): Chen Chen, Jie Song, Saphlux Inc. (United States)

12421-69 • 2:00 PM - 2:15 PM

Controlled nanopatterning and plasma etching of sub-100 nm nanopillars for low dislocation density of pendeo-epitaxy GaN: Towards MicroDisplays

Author(s): Nabil Labchir, Univ. Grenoble Alpes (France), MINATEC, CEA-LETI (France), Lab. des Technologies de la Microélectronique (France); Saber Hammami, Lab. des Technologies de la Microélectronique (France); Kilian Baril, Univ. Côte d'Azur (France), CRHEA (France); Maya Wehbe, CEA-LETI (France); Sébastien Labau, Univ. Grenoble Alpes (France), MINATEC, CEA-LETI (France), Lab. des Technologies de la Microélectronique (France); Camille Petit-Etienne, Univ. Grenoble Alpes (France); Blandine Alloing, Univ. Côte d'Azur (France); Ludovic Dupré, Matthew Charles, CEA-LETI (France); Jesus Zuniga Perez, Univ. Côte d'Azur (France); Cécile Gourgon, Univ. Grenoble Alpes (France)

12421-67 • 2:15 PM - 2:30 PM

Properties of implanted InGaN micro-LEDs with tunnel junctions

Author(s): Julia Slawinska, Greg Muziol, Mikolaj Zak, Anna Kafar, Czeslaw Skierbiszewski, Institute of High Pressure Physics (Poland)

12421-68 • 2:30 PM - 2:45 PM

Photoresist planarized trench isolation for monolithic GaN μ LED displays

Author(s): Bryan Melanson, Matthew Seitz, Jing Zhang, Rochester Institute of Technology (United States)

12421-66 • 2:45 PM - 3:00 PM

Recent micro-LED technology for display applications based on GaN pendeo-epitaxy using SOI nanopillars

Author(s): Saber Hammami, Univ. Grenoble Alpes (France), CEA-LETI (France), Univ. Côte d'Azur (France); Nabil Labchir, Univ. Grenoble Alpes (France), MINATEC, CEA-LETI (France), Lab. des Technologies de la Microélectronique (France); Kilian Baril, Pierre Marie Coulon, Blandine Alloing, Jesus Zuniga Perez, Univ. Côte d'Azur (France), CRHEA (France); Cécile Gourgon, Univ. Grenoble Alpes (France), MINATEC, CEA-LETI (France), Lab. des Technologies de la Microélectronique (France); Matthew Charles, Ludovic Dupré, Univ. Grenoble Alpes (France), CEA-LETI (France)

Coffee Break 3:00 PM - 3:30 PM

SESSION 15: LEDS IV

2 February 2023 • 3:30 PM - 5:15 PM | Moscone Center, Room 152 (Upper Mezzanine South)

Session Chair: Kazuhiro Ohkawa, King Abdullah Univ. of Science and Technology (Saudi Arabia)

12421-70 • 3:30 PM - 4:00 PM

UV emission from MOVPE nanowire LEDs (*Invited Paper*)

Author(s): Christophe Durand, Univ. Grenoble Alpes (France); Vincent Grenier, Univ. Grenoble Alpes/CEA/PHELIQS (France); Sylvain Finot, Univ. Grenoble Alpes/Institut Néel (France); Lucie Valera, Univ. Grenoble Alpes/CEA/PHELIQS (France); Catherine Bougerol, Univ. Grenoble Alpes/Institut Néel (France); Joël Eymery, Univ. Grenoble Alpes/CEA/IRIG/MEM (France); Gwénolé Jacopin, Univ. Grenoble Alpes/Institut Néel (France)

12421-71 • 4:00 PM - 4:30 PM

Porous (In)GaN made by combining nanomasking and sublimation: from material properties to LEDs (*Invited Paper*)

Author(s): Benjamin Damilano, Stéphane Vézian, CRHEA (France), Univ. Côte d'Azur (France); Nuño Amado-Mendez, Ctr. de Nanosciences et de Nanotechnologies (France), Univ. Paris-Saclay (France); Marie-Pierre Chauvat, Ctr. de Recherche sur les Ions, les Matériaux et la Photonique (France), Ecole Nationale Supérieure d'Ingenieurs de Caen et Ctr. de Recherche (France); Virginie Brändli, Sébastien Chenot, Aimeric Courville, Julien Brault, CRHEA (France), Univ. Côte d'Azur (France); Pierre Valvin, Lab. Charles Coulomb (France), Univ. de Montpellier (France); Magali Morales, Pierre Ruterana, Ctr. de Recherche sur les Ions, les Matériaux et la Photonique (France), Ecole Nationale Supérieure d'Ingenieurs de Caen et Ctr. de Recherche (France); Bernard Gil, Lab. Charles Coulomb (France), Univ. de Montpellier (France); Maria Tchernycheva, Ctr. de Nanosciences et de Nanotechnologies (France), Univ. Paris-Saclay (France)

Conference 12421

12421-72 • 4:30 PM - 4:45 PM

Establishment of process to suppress (0001)-plane emission by introducing EBL in GaInN/GaN multi-quantum shells/nanowires for efficient 480 nm-LEDs

Author(s): Sae Katsuro, Meijo Univ. (Japan); Weifang Lu, Xiamen Univ. (China); Nanami Nakayama, Soma Inaba, Yukimi Jinno, Shiori Yamamura, Ayaka Shima, Shiori Ii, Mizuki Takahashi, Yuki Yamanaka, Motoaki Iwaya, Tetsuya Takeuchi, Satoshi Kamiyama, Meijo Univ. (Japan)

Show Abstract +

12421-82 • 4:45 PM - 5:00 PM

Fabrication method for Micro-LEDs on a hetero substrate with ultra-low defect density utilized advanced epitaxial lateral overgrowth technique

Author(s): Takeshi Kamikawa, Toshihiro Kobayashi, Yuuta Aoki, Noboru Suda, Hiroyuki Ogura, Mitsunari Seida, Kazuma Takeuchi, Kosuke Mishima, Yuuki Taniguchi, Fumio Yamashita, Yuuichiro Hayashi, Katsuaki Masaki, KYOCERA Corp. (Japan)

12421-83 • 5:00 PM - 5:15 PM

A novel fabrication technique using GaN-on-Si epitaxial lateral overgrowth for 100 μm cavity GaN-based edge emitting laser diodes

Author(s): Yoshinobu Kawaguchi, Kentaro Murakawa, Motohisa Usagawa, Akiko Komoda, Mizuki Tonomura, Takeshi Yokoyama, Yuuta Aoki, Kazuma Takeuchi, Takeshi Kamikawa, KYOCERA Corp. (Japan)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12421-73

Investigating self-assembled strain-free growth of In droplets on GaN using droplet epitaxy

Author(s): Malak Refaei, Univ. of Arkansas (United States), Jazan Univ. (Saudi Arabia); Rohith Allaparthi, Mirsaeid Sarollahi, Morgan E. Ware, Univ. of Arkansas (United States)

Oxide-based Materials and Devices XIV

30 January - 2 February 2023 | Moscone Center, Room 151 (Upper Mezzanine South)

Conference Chairs: **David J. Rogers**, Nanovation (France); **Ferechteh H. Teherani**, Nanovation (France)

Program Committee: **Vitaliy S. Avrutin**, Virginia Commonwealth Univ. (United States); **Philippe Bove**, Nanovation (France); **James Connolly**, Univ. Paris-Saclay (France); **Nicolas de France**, Univ. de Lille (France); **Jean-Jacques Delaunay**, The Univ. of Tokyo (Japan); **Aleksandra B. Djurić**, The Univ. of Hong Kong (Hong Kong, China); **Adrián Hierro**, Univ. Politécnica de Madrid (Spain); **Seref Kalem**, Bahçeşehir Univ. (Turkey); **David C. Look**, Wright State Univ. (United States); **Luna Lu**, Purdue Univ. (United States); **Bianchi Méndez Martín**, Univ. Complutense de Madrid (Spain); **Norbert H. Nickel**, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany); **Ümit Özgür**, Virginia Commonwealth Univ. (United States); **Seong-Ju Park**, Gwangju Institute of Science and Technology (Republic of Korea); **Manijeh Razeghi**, Northwestern Univ. (United States); **Vinod Eric Sandana**, Nanovation (France); **Michael L. Schuette**, Air Force Research Lab. (United States); **Cuong Ton-That**, Univ. of Technology, Sydney (Australia); **Chris G. Van de Walle**, Univ. of California, Santa Barbara (United States); **Bruno Viana**, Ecole Nationale Supérieure de Chimie de Paris (France); **Markus R. Wagner**, Technische Univ. Berlin (Germany); **Magnus Willander**, Linköping Univ. (Sweden); **Hideki Yamamoto**, NTT Basic Research Labs. (Japan)

MONDAY 30 JANUARY

OPTO PLENARY SESSION

30 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 207/215 (Level 2 South)

8:00 AM - 8:05 AM: **Welcome and Opening Remarks**

Sonia García-Blanco, Univ. Twente (Netherlands) and Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

8:05 AM - 8:15 AM: **Announcement of the OPTO AI/ML and Net Zero Best Paper Awards**

12424-501 • 8:15 AM - 8:50 AM

High-performance electronic-photonic interfaces: from AI to quantum (*Plenary Presentation*)

Author(s): Rajeev Ram, Massachusetts Institute of Technology (United States)

12416-501 • 8:50 AM - 9:25 AM

Tandem photovoltaic devices: more than one way to make a solar cell (*Plenary Presentation*)

Author(s): Emily L. Warren, National Renewable Energy Lab. (United States)

12421-501 • 9:25 AM - 10:00 AM

Are III-nitride semiconductors also suitable for red emission? (*Plenary Presentation*)

Author(s): Nicolas Grandjean, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

CONFERENCE INTRODUCTION

30 January 2023 • 10:30 AM - 10:35 AM | Moscone Center, Room 151 (Upper Mezzanine South)

David Rogers, Nanovation (France)

SESSION 1: FIRST-PRINCIPLES: THEORY AND MODELING OF Ga₂O₃ I

30 January 2023 • 10:35 AM - 12:15 PM | Moscone Center, Room 151 (Upper Mezzanine South)

Session Chairs: Chris G. Van de Walle, Univ. of California, Santa Barbara (United States); Bruno Viana, Institut de Recherche de Chimie Paris (France)

12422-1 • 10:35 AM - 11:00 AM

Doping, compensation, and optical signals of acceptors in ultrawide-bandgap oxides (*Invited Paper*)

Author(s): John L. Lyons, U.S. Naval Research Lab. (United States)

12422-2 • 11:00 AM - 11:25 AM

First-principles study of planar defects in gallium oxide (*Invited Paper*)

Author(s): Mengen Wang, Binghamton Univ. (United States)

12422-3 • 11:25 AM - 11:50 AM

Phase stability of (Al_xGa_{1-x})₂O₃ polymorphs: a first-principles study (*Invited Paper*)

Author(s): Sai Mu, Univ. of South Carolina (United States)

12422-68 • 11:50 AM - 12:15 PM

Diversity of split Ga vacancies in β-Ga₂O₃ (*Invited Paper*)

Author(s): Filip Tuomisto, Iuliia Zhelezova, Ilja Makkonen, Univ. of Helsinki (Finland)

Lunch Break 12:15 PM - 1:35 PM

SESSION 2: FIRST-PRINCIPLES: THEORY AND MODELING OF Ga₂O₃ II

30 January 2023 • 1:35 PM - 2:50 PM | Moscone Center, Room 151 (Upper Mezzanine South)

Session Chairs: John Lambert Lyons, U.S. Naval Research Lab. (United States); Bruno Viana, Institut de Recherche de Chimie Paris (France)

12422-4 • 1:35 PM - 2:00 PM

Orthorhombic alloys of Ga₂O₃ (*Invited Paper*)

Author(s): Hartwin Peelaers, The Univ. of Kansas (United States)

12422-5 • 2:00 PM - 2:25 PM

Doping of aluminum gallium oxide alloys (*Invited Paper*)

Author(s): Darshana Wickramaratne, U.S. Naval Research Lab. (United States)

Conference 12422

12422-6 • 2:25 PM - 2:50 PM

First-principles simulations of transition metal dopants and impurities in in Ga₂O₃ and related alloys (*Invited Paper*)

Author(s): Joel B. Varley, Lawrence Livermore National Lab. (United States)

Coffee Break 2:50 PM - 3:15 PM

SESSION 3: ROLE OF HYDROGEN IN GA₂O₃

30 January 2023 • 3:15 PM - 4:55 PM | Moscone Center, Room 151 (Upper Mezzanine South)

Session Chair: Mengen Wang, Univ. of California, Santa Barbara (United States)

12422-7 • 3:15 PM - 3:40 PM

Hydrogen diffusion on β -Ga₂O₃ (*Invited Paper*)

Author(s): Norbert H. Nickel, K. Geilert, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany)

12422-8 • 3:40 PM - 4:05 PM

Role of hydrogen in gallium oxide (*Invited Paper*)

Author(s): Chris G. Van de Walle, Univ. of California, Santa Barbara (United States)

12422-9 • 4:05 PM - 4:30 PM

Persistent optical phenomena in oxide semiconductors (*Invited Paper*)

Author(s): Matthew D. McCluskey, Christopher Pansegrau, Syeed E. Ahmed, Macarena Santillan, Jani Jesenovc, John S. McCloy, Washington State Univ. (United States)

12422-73 • 4:30 PM - 4:55 PM

Annealing effect on orthorhombic κ -Ga₂O₃ and role of hydrogen-related defects (*Invited Paper*)

Author(s): Piero Mazzolini, Univ. degli Studi di Parma (Italy), Istituto dei Materiali per l'Elettronica ed il Magnetismo, Consiglio Nazionale delle Ricerche (Italy); Antonella Parisini, Univ. degli Studi di Parma (Italy); Andreas Falkenstein, RWTH Aachen Univ. (Germany); Maura Pavesi, Alessio Bosio, Univ. degli Studi di Parma (Italy); Vivien Peltason, Benjamin M. Janzen, Markus R. Wagner, Technische Univ. Berlin (Germany); Matteo Bosi, Luca Seravalli, Istituto dei Materiali per l'Elettronica ed il Magnetismo, Consiglio Nazionale delle Ricerche (Italy); Andrea Ardenghi, Oliver Bierwagen, Paul-Drude-Institut für Festkörperelektronik (Germany); Francesco Mezzadri, Univ. degli Studi di Parma (Italy); Manfred Martin, RWTH Aachen Univ. (Germany); Carmine Borelli, Andrea Baraldi, Roberto Fornari, Univ. degli Studi di Parma (Italy)

Transitional Break 4:55 PM - 5:00 PM

SESSION 4: MODELLING AND THEORETICAL STUDIES OF OXIDES

30 January 2023 • 5:00 PM - 5:50 PM | Moscone Center, Room 151 (Upper Mezzanine South)

Session Chair: Chris G. Van de Walle, Univ. of California, Santa Barbara (United States)

12422-10 • 5:00 PM - 5:25 PM

Polarons as a universal source of leakage currents in amorphous oxides: a multiscale modeling approach (*Invited Paper*)

Author(s): Dominic Waldhoer, Christian Schleich, Al-Moatasem El-Sayed, Tibor Grasser, Technische Univ. Wien (Austria)

12422-11 • 5:25 PM - 5:50 PM

Charging and degradation of amorphous oxide films in electronic devices (*Invited Paper*)

Author(s): Jack Strand, Alex Shluger, Univ. College London (United Kingdom)

TUESDAY 31 JANUARY

SESSION 5: GROWTH AND DOPING OF GA₂O₃

31 January 2023 • 8:00 AM - 10:55 AM | Moscone Center, Room 151 (Upper Mezzanine South)

Session Chairs: Kei Kamada, Tohoku Univ. (Japan), Norbert H. Nickel, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany)

12422-13 • 8:00 AM - 8:25 AM

Crucible free growth of oxide crystals (*Invited Paper*)

Author(s): Kei Kamada, Tohoku Univ. (Japan), C&A Corp. (Japan); Tomida Taketoshi, Isao Takahashi, Vladimir Kochurikhin, Yasuhiro Shoji, C&A Corp. (Japan); Koichi Kakimoto, Tohoku Univ. (Japan); Akira Yoshikawa, Tohoku Univ. (Japan), C&A Corp. (Japan)

12422-14 • 8:25 AM - 8:45 AM

Tin/gallium oxide alloying probed using X-ray microanalysis and cathodoluminescence

Author(s): Daniel Hunter, Naresh-Kumar Gunasekar, Paul R. Edwards, Fabien Massabau, Univ. of Strathclyde (United Kingdom); Isa Hatipoglu, Sirkak Ünv. (Turkey); Partha Mukhopadhyay, Winston V. Schoenfeld, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); Robert W. Martin, Univ. of Strathclyde (United Kingdom)

12422-15 • 8:45 AM - 9:05 AM

Demonstration of thick phase-pure β -Ga₂O₃ on a c-plane sapphire substrate using MOCVD

Author(s): Mohi Uddin Jewel, Samiul Hasan, Scott R. Crittenden, Univ. of South Carolina (United States); Vitaliy S. Avrutin, Ümit Özgür, Hadis Morkoç, Virginia Commonwealth Univ. (United States); Iftikhar Ahmad, Univ. of South Carolina (United States)

12422-16 • 9:05 AM - 9:25 AM

Oxygen mediated optical and electrical property modification of RF sputtered Ga₂O₃ thin films for photodetector application

Author(s): Sangita Bhowmick, Rajib Saha, Madhuri Mishra, Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)

Coffee Break 9:25 AM - 9:45 AM

12422-17 • 9:45 AM - 10:05 AM

Polarization and orientation dependent optical properties in Czochralski-grown transition metal doped β -Ga₂O₃

Author(s): Benjamin L. Dutton, Cassandra Remple, Jani Jesenovec, Washington State Univ. (United States); Soroush Ghandiparsi, Miranda S. Gottlieb, Joel B. Varley, Lars F. Voss, Lawrence Livermore National Lab. (United States); Matthew D. McCluskey, John S. McCloy, Washington State Univ. (United States)

12422-67 • 10:05 AM - 10:30 AM

Atomic layer deposited gallium oxide thin film monitored by continuous in-situ spectroscopic ellipsometry *(Invited Paper)*

Author(s): Florian Maudet, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany)

12422-69 • 10:30 AM - 10:55 AM

Influence of rotational domains on disorder-induced variable-range-hopping conduction in Si-doped β -Ga₂O₃ epitaxial films *(Invited Paper)*

Author(s): Antonella Parisini, Piero Mazzolini, Univ. degli Studi di Parma (Italy); Matteo Bosi, Luca Seravalli, Istituto dei Materiali per l'Elettronica ed il Magnetismo, Consiglio Nazionale delle Ricerche (Italy); Alessio Bosio, Roberto Fornari, Univ. degli Studi di Parma (Italy)

Transitional Break 10:55 AM - 11:00 AM

SESSION 6: GA₂O₃ BASED APPLICATIONS

31 January 2023 • 11:00 AM - 12:40 PM | Moscone Center, Room 151 (Upper Mezzanine South)

Session Chair: Bruno Viana, Institut de Recherche de Chimie Paris (France)

12422-18 • 11:00 AM - 11:25 AM

Ultrawide bandgap Ga₂O₃ technologies: benefits of heterogenous integration *(Invited Paper)*

Author(s): Abhishek Mishra, Arpit Nandi, Indraneel Sanyal, Zeina Abdallah, James W. Pomeroy, Martin Kuball, Univ. of Bristol (United Kingdom)

12422-19 • 11:25 AM - 11:50 AM

Materials development for high voltage vertical gallium oxide devices *(Invited Paper)*

Author(s): James S. Speck, Univ. of California, Santa Barbara (United States)

12422-20 • 11:50 AM - 12:15 PM

Near-junction thermal management of lateral gallium-oxide transistors *(Invited Paper)*

Author(s): Marko J. Tadjer, Hannah Masten, James Spencer Lundh, Tatyana Feygelson, Cory Cress, Joseph Spencer, Alan Jacobs, Jennifer Hite, Daniel Pennachio, U.S. Naval Research Lab. (United States); Kohei Sasaki, Akito Kuramata, Novel Crystal Technology, Inc. (Japan); Yuhao Zhang, Virginia Polytechnic Institute and State Univ. (United States); Boris Feygelson, Rachael Myers-Ward, Bradford Pate, Karl Hobart, Travis Anderson, U.S. Naval Research Lab. (United States)

12422-21 • 12:15 PM - 12:40 PM

Materials and device engineering for high-performance gallium oxide electronics *(Invited Paper)*

Author(s): Sushovan Dhara, Ashok Dheenan, Joishi Chandan, Joe McGlone, Hongping Zhao, Siddharth Rajan, The Ohio State Univ. (United States)

Lunch/Exhibition Break 12:40 PM - 2:00 PM

SESSION 7: PHOTODETECTION USING OXIDES

31 January 2023 • 2:00 PM - 3:15 PM | Moscone Center, Room 151 (Upper Mezzanine South)

Session Chairs: Bruno Viana, Institut de Recherche de Chimie Paris (France); Victor Castaing, Consejo Superior de Investigaciones Científicas (Spain)

12422-22 • 2:00 PM - 2:25 PM

Dynamical properties and performances of β -Ga₂O₃ UVC photodetectors of extreme solar blindness *(Invited Paper)*

Author(s): Luc Damé, Lucile Conan, Univ. Paris-Saclay, CNRS (France); Carlo De Santi, Alessandro Caria, Matteo Buffolo, Matteo Meneghini, Univ. degli Studi di Padova (Italy); Pierre Maso, Clément Dias, Univ. Paris-Saclay, CNRS (France); Halima Ghorbel, Univ. Paris-Saclay (France); Pierre Gilbert, Mustapha Meftah, Univ. Paris-Saclay, CNRS (France); Philippe Bove, Vinod Sandana, David Rogers, Ferechteh Teherani, Nanovation (France)

12422-25 • 2:25 PM - 2:50 PM

Tuning of titanium dioxide surface energy levels by self-assembled monolayers for optoelectronic applications *(Invited Paper)*

Author(s): Thierry Pauporté, Tao Zhu, Ecole Nationale Supérieure de Chimie de Paris (France); Selina Olthof, Univ. zu Köln (Germany)

12422-65 • 2:50 PM - 3:15 PM

Novel P-type wide bandgap manganese oxide quantum dots for self-powered solar-blind deep UV devices *(Invited Paper)*

Author(s): Iman S. Roqan, Somak Mitra, Norah Alwadai, Hadeel Alamoudi, Zohoor Alharbi, Fatimah Alreshidi, Bin Xin, Yusin Pak, King Abdullah Univ. of Science and Technology (Saudi Arabia)

Coffee Break 3:15 PM - 3:35 PM

SESSION 8: ZNO BASED MATERIALS

31 January 2023 • 3:35 PM - 4:45 PM | Moscone Center, Room 151 (Upper Mezzanine South)

Session Chairs: Vitaliy S. Avrutin, Virginia Commonwealth Univ. (United States); Olivier Durand, Fonctions Optiques pour les Technologies de l'information (France)

12422-26 • 3:35 PM - 4:00 PM

The making of oxide semiconductors by decomposition of carbon dioxide *(Invited Paper)*

Author(s): Henryk Teisseyre, Institute of Physics (Poland); Tomasz Andryszewski, Institute of Physical Chemistry (Poland); Wiktoria Zajkowska, Institute of Physics (Poland); Jan Suffczynski, Institute of Experimental Physics, Univ. of Warsaw (Poland); Krzysztof Fronc, Marcin Stachowicz, Slawomir Kret, Institute of Physics (Poland)

Conference 12422

12422-28 • 4:00 PM - 4:20 PM

High-field electron transport and microwave noise in ZnO channels with 2 dimensional electron gas

Author(s): Vitaliy S. Avrutin, Ümit Özgür, Hadis Morkoç, Virginia Commonwealth Univ. (United States); Linas Ardaravicius, Arthur Šimukovic, Emilis Šermukšnis, Ctr. for Physical Sciences and Technology (Lithuania)

12422-76 • 4:20 PM - 4:45 PM

Oxide based quantum wells : current status and perspectives *(Invited Paper)*

Author(s): Jean-Michel Chauveau, Univ. Paris-Saclay (France), Univ. de Versailles Saint-Quentin-en Yvelines (France)

SESSION 9: OPTICAL STUDIES

1 February 2023 • 8:00 AM - 10:55 AM | Moscone Center, Room 151 (Upper Mezzanine South)

Session Chair: Bruno Viana, Institut de Recherche de Chimie Paris (France)

12422-31 • 8:00 AM - 8:20 AM

Investigation of structural, optical, and photo responsive properties of Erbium (Er) doped ZnO nanowire/p-Si heterojunction nanodevices for developing self-powered UV-detectors

Author(s): Rajib Saha, Madhuri Mishra, Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)

12422-32 • 8:20 AM - 8:45 AM

Control of stoichiometry in garnet crystals presenting persistent luminescence *(Invited Paper)*

Author(s): Teresa Delgado, Institut de Recherche de Chimie Paris, CNRS (France); Daniel Rytz, BREVALOR Sàrl (Switzerland); Guanyu Cai, Institut de Recherche de Chimie Paris (France); Mathieu Allix, Conditions Extrêmes et Matériaux : Haute Température et Irradiation, CNRS (France); Haytem Bazzouai, Institut de Recherche de Chimie Paris (France); Emmanuel Veron, Conditions Extrêmes et Matériaux : Haute Température et Irradiation (France); Bruno Viana, Institut de Recherche de Chimie Paris, CNRS (France)

12422-33 • 8:45 AM - 9:10 AM

Translucent persistent phosphor films and nanophotonics: beyond limits set by composition *(Invited Paper)*

Author(s): Victor Castaing, Gabriel Lozano, Hernán Míguez, Consejo Superior de Investigaciones Científicas (Spain)

12422-34 • 9:10 AM - 9:30 AM

Tunable photoluminescence from ZnO nanowires

Author(s): Frank Güell, Univ. Autònoma de Barcelona (Spain); Paulina R. Martínez-Alanis, Univ. de Barcelona (Spain)

Coffee Break 9:30 AM - 9:45 AM

12422-35 • 9:45 AM - 10:05 AM

Comparative study of oxides as potential hosts for Tm³⁺ 2.3 μ m laser emission

Author(s): Luidgi Giordano, Pascal Loiseau, Institut de Recherche de Chimie Paris, CNRS (France); Pavel Loiko, Lisa Basyrova, Ctr. de Recherche sur les Ions, les Matériaux et la Photonique (France); Bruno Viana, Institut de Recherche de Chimie Paris, CNRS (France)

12422-74 • 10:05 AM - 10:30 AM

Electronic and optical properties of 3d-transition metals in β -Ga₂O₃ *(Invited Paper)*

Author(s): Jan Eric Stehr, Mattias Jansson, Weimin M. Chen, Irina Bouianova, Linköping Univ. (Sweden); Stephen J. Pearton, Univ. of Florida (United States)

12422-75 • 10:30 AM - 10:55 AM

Defect characterization of undoped and doped b-Ga₂O₃ *(Invited Paper)*

Author(s): Cuong Ton-That, Curtis P. Irvine, Univ. of Technology, Sydney (Australia); Attila Stopic, Australian Nuclear Science and Technology Organisation (Australia); Karin Yamamura, Mika T. Westerhausen, Matthew R. Phillips, Univ. of Technology, Sydney (Australia)

Transitional Break 10:55 AM - 11:00 AM

WEDNESDAY 1 FEBRUARY

SESSION 10: SENSORS

1 February 2023 • 11:00 AM - 12:40 PM | Moscone Center, Room 151 (Upper Mezzanine South)

Session Chairs: Bruno Viana, Institut de Recherche de Chimie Paris (France), Jean-Paul Salvestrini, Georgia Tech - CNRS (France)

12422-37 • 11:00 AM - 11:20 AM

Realization of prism-based surface plasmon resonance sensor for detection of methane gas

Author(s): Vikash Kumar, Sanjeev Kumar Raghuwanshi, Indian Institute of Technology (Indian School of Mines), Dhanbad (India); Santosh Kumar, Liaocheng Univ. (China)

12422-38 • 11:20 AM - 11:40 AM

Experimental analysis of rGO coated eFBG sensor for the detection of harmful smokes

Author(s): Azhar Shadab, Sanjeev Kumar Raghuwanshi, Indian Institute of Technology (Indian School of Mines), Dhanbad (India); Purnendu Shekhar Pandey, G L Bajaj Institute of Technology and Management (India); Santosh Kumar, Liaocheng Univ. (China)

12422-39 • 11:40 AM - 12:00 PM

A novel miniaturized mid-IR sensor for glucose detection using on-chip plasmonics and quantum cascade detectors

Author(s): Elena Arigliani, Mauro David, Technische Univ. Wien (Austria); Erik Hinkelmann, Brno Univ. of Technology (Czech Republic); Hedwig Knötig, Technische Univ. Wien (Austria); Valeria Butera, CEITEC - Central European Institute of Technology (Czech Republic); Adam Konecny, Brno Univ. of Technology (Czech Republic); Florian Pilat, Benedikt Schwarz, Gottfried Strasser, Technische Univ. Wien (Austria); Hermann Detz, Brno Univ. of Technology (Czech Republic); Borislav Hinkov, Technische Univ. Wien (Austria)

12422-40 • 12:00 PM - 12:20 PM

Optical gas sensing at extreme temperatures using perovskite oxides on single crystal fiber

Author(s): Jeffrey K. Wuenschell, National Energy Technology Lab. (United States); Youngseok Jee, National Energy Technology Lab. (United States); Leidos (United States); Geunsik Lim, Gary Lander, National Energy Technology Lab. (United States), Leidos, Inc. (United States); Michael Buric, National Energy Technology Lab. (United States)

12422-41 • 12:20 PM - 12:40 PM

Zn anode-based electrochromic devices

Author(s): Wu Zhang, Univ. of Alberta (Canada); Haizeng Li, Shandong Univ. (China); Abdulhakem Y. Elezzabi, Univ. of Alberta (Canada)

Lunch/Exhibition Break 12:40 PM - 1:40 PM

SESSION 11: MATERIAL GROWTH I

1 February 2023 • 1:40 PM - 3:45 PM | Moscone Center, Room 151 (Upper Mezzanine South)

Session Chairs: Bruno Viana, Institut de Recherche de Chimie Paris (France); Jean-Paul Salvestrini, Georgia Tech - CNRS (France)

12422-42 • 1:40 PM - 2:05 PM

Toward both p- and n-doping of hexagonal boron nitride using sub-bandgap illumination (*Invited Paper*)

Author(s): Rajat Gujrati, Ashutosh Srivastava, Phuong Vuong, Suresh Sundaram, Jean-Paul Salvestrini, Georgia Tech - CNRS (France)

12422-43 • 2:05 PM - 2:30 PM

Development of a novel rutile-type SnO₂-GeO₂-SiO₂ alloy system (*Invited Paper*)

Author(s): Hitoshi Takane, Kyoto Univ. (Japan); Yuichi Ota, Tokyo Metropolitan Industrial Technology Research Institute (Japan); Takeru Wakamatsu, Kyoto Univ. (Japan); Tsutomu Araki, Ritsumeikan Univ. (Japan); Katsuhisa Tanaka, Kyoto Univ. (Japan); Kentaro Kaneko, Ritsumeikan Univ. (Japan)

12422-44 • 2:30 PM - 2:55 PM

Physical and electrical characterization of a silicon suboxide seed layer (*Invited Paper*)

Author(s): Seref Kalem, Bahçesehir Univ. (Turkey)

12422-45 • 2:55 PM - 3:20 PM

Growth of ferroelectric oxides (*Invited Paper*)

Author(s): Roman Engel-Herbert, Paul-Drude-Institut für Festkörperelektronik (Germany)

12422-78 • 3:20 PM - 3:45 PM

MOCVD growth of β -(AlGa)₂O₃ on β -Ga₂O₃ using N₂O (*Invited Paper*)

Author(s): Fikadu Alema, William Brand, Agnitron Technology, Inc. (United States); Takeki Itoh, Univ. of California, Santa Barbara (United States); Andrei Osinsky, Agnitron Technology, Inc. (United States); James S. Speck, Materials Department (United States)

Coffee Break 3:45 PM - 4:00 PM

SESSION 12: MATERIAL GROWTH II

1 February 2023 • 4:00 PM - 5:50 PM | Moscone Center, Room 151 (Upper Mezzanine South)

Session Chairs: Bruno Viana, Institut de Recherche de Chimie Paris (France); Jean-Paul Salvestrini, Georgia Tech - CNRS (France)

12422-47 • 4:00 PM - 4:20 PM

Spatial atomic layer deposition: a new revolution in ultra-fast production of conformal oxide-based optical coatings

Author(s): John-Olof Rönn, Sauli Virtanen, Paula Päivike, Philipp Maydannik, Kalle Niiranen, Sami Sneek, Beneq Oy (Finland)

12422-48 • 4:20 PM - 4:40 PM

Role of oxygen-sensitization temperature on physical characteristics of CBD-grown lead selenide thin films on quartz substrates

Author(s): Jeung Hun Park, Sejeong Park, Richard S. Kim, Russell Dahl, Opto Diode Corp. (United States)

12422-49 • 4:40 PM - 5:00 PM

High quality optical indium tin oxide (ITO) layers deposited by ion beam sputtering (IBS)

Author(s): Konstantina Kostourou, Volker Scheuer, Daniel Kopf, NANO Precision IBS Coatings GmbH (Germany)

12422-71 • 5:00 PM - 5:25 PM

Tungsten oxide nanoparticle and aggregate structure formation through direct femtosecond laser ablation (*Invited Paper*)

Author(s): Thomas A. Haase, Andrew Chan, Shinji Kihara, Claude Agueraray, Neil G. R. Broderick, The Univ. of Auckland (New Zealand)

12422-79 • 5:25 PM - 5:50 PM

Artificial intelligence process control: deep reinforcement learning for Ga₂O₃ wafer production (*Invited Paper*)

Author(s): Matthew Putman, Valerie Bordelanne, Sarah Constantin, Nanotronics (United States)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12422-52

Iodoethylammonium (IEA⁺)-based lead- and iodide-deficient halide perovskites (d-HPs) for solar cells

Author(s): Thierry Pauporté, Liam Gollino, Ecole Nationale Supérieure de Chimie de Paris (France); Nicolas Mercier, Université d'Angers, Moltech-Anjou, UMR6200, 2 boulevard de Lavoisier (France)

12422-57

Investigation of spin-transport properties in the framework of DFT-NEGF of modelled VS₂ device for spintronic application

Author(s): Archishman Saha, Nivedita Pandey, Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)

Conference 12422

12422-59

Upconverted persistent luminescence in β -NaGdO.₈YbO.₁₇ErO.₀₃F₄ and Zn_{1.33}Ga_{1.335}SnO.₃₃CrO.₀₀₅O₄ associated nanoparticles

Author(s): Luidgi Giordano, Institut de Recherche de Chimie Paris, CNRS (France); Guanyu Cai, Institut de Recherche de Chimie Paris (France); Johanne Seguin, Jianhua Liu, Unité de Technologies Chimiques et Biologiques pour la Santé (France); Cyrille Richard, Unité de Technologies Chimiques et Biologiques pour la Santé, Univ. de Paris (France); Lucas Carvalho Veloso Rodrigues, Instituto de Química, Univ. de São Paulo (Brazil); Bruno Viana, Institut de Recherche de Chimie Paris, CNRS (France)

12422-60

H₂ gas sensing properties of a Pd/ZnO:Eu nanosensor

Author(s): C. Lupan, O. Lupan, Univ. Technica a Moldovei (Moldova); Terasa M.-I. Terasa, J. J. Drewes, O. Polonskyi, F. Faupel, R. Adelung, S. Hansen, Christian-Albrechts-Univ. zu Kiel (Germany); B. Viana, Th. Pauporte, Institut de Recherche de Chimie Paris, CNRS (France)

12422-61

Graphene/TiO₂ composite films for efficient photocatalytic degradation of antibiotics in wastewaters

Author(s): Barbora Muzikova, J. Heyrovsky Institute of Physical Chemistry of the CAS, v.v.i. (Czech Republic); Liam Gollino, Ecole Nationale Supérieure de Chimie de Paris (France); Radek Zouzelka, Jiri Rathousky, J. Heyrovsky Institute of Physical Chemistry of the CAS, v.v.i. (Czech Republic); Thierry Pauporté, Ecole Nationale Supérieure de Chimie de Paris (France)

12422-62

CANCELED: Superconducting crystal dense plasma parameters

Author(s): Nadezhda P. Netesova, M. V. Lomonosov Moscow State Univ. (Russian Federation)

12422-63

Temperature induced conductivity reversal in ZnO thin films

Author(s): Madhuri Mishra, Sangita Bhowmick, Rajib Saha, Indian Institute of Technology Bombay (India); Sushil Kumar Pandey, National Institute of Technology, Karnataka, Surathkal (India); Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)

12422-66

Investigation of the role of the dielectric matrix in Cu/SiO₂/W CBRAM for neuromorphic applications

Author(s): Florian Maudet, Morgane Lebarbe, Dini Marlina, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany); Adnan Hammud, Fritz-Haber-Institut der Max-Planck-Gesellschaft (Germany); Markus Wollgarten, Veeresh Deshpande, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany); Catherine Dubourdieu, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany); Freie Univ. Berlin (Germany)

12422-72

Effect of hydrogen-related defects on the photoelectrical performance of κ -Ga₂O₃-based UV-C photodetectors

Author(s): Antonella Parisini, Piero Mazzolini, Maura Pavesi, Univ. degli Studi di Parma (Italy); Andreas Falkenstein, RWTH Aachen Univ. (Germany); Alessio Bosio, Carmine Borelli, Univ. degli Studi di Parma (Italy); Vivien Peltason, Benjamin M. Jantzen, Markus R. Wagner, Technische Univ. Berlin (Germany); Matteo Bosi, Luca Seravalli, Istituto dei Materiali per l'Elettronica ed il Magnetismo, Consiglio Nazionale delle Ricerche (Italy); Andrea Ardenghi, Oliver Bierwagen, Paul-Drude-Institut für Festkörperelektronik (Germany); Francesco Mezzadri, Univ. degli Studi di Parma (Italy); Manfred Martin, RWTH Aachen Univ. (Germany); Andrea Baraldi, Roberto Fornari, Univ. degli Studi di Parma (Italy)

12422-77

Development of high quality Schottky contacts to (001) β -Ga₂O₃ by using amorphous (Ir,Ru)-Si and (Ir,Ru)-Si-O conductive layers

Author(s): Oskar Sadowski, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland), Warsaw Univ. of Technology (Poland); Andrzej Taube, Michal Borysiewicz, Aleksandra Wójcicka, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); Jaroslaw Tarenko, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland), Warsaw Univ. of Technology (Poland); Krzysztof Piskorski, Marek Wzorek, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland)

12422-24

Predicting the response of lead selenide thin film photoconductor in circuits with a series load resistor

Author(s): Jasmine J. Mah, Opto Diode Corp. (United States); Khalifa M. Azizur-Rahman, California NanoSystems Institute, Univ. of California, Los Angeles (United States); Baolai Liang, California NanoSystems Institute (United States); Diana L. Huffaker, University of Texas at Arlington (United States); Stewart Miller, Jeung Hun Park, Richard S. Kim, Russell Dahl, Opto Diode Corp. (United States)

THURSDAY 2 FEBURARY

SESSION 13: PROGRESS IN APPLIED OXIDES

2 February 2023 • 9:00 AM - 10:15 AM | Moscone Center, Room 151 (Upper Mezzanine South)

Session Chair: Bruno Viana, Institut de Recherche de Chimie Paris (France)

12422-51 • 9:00 AM - 9:25 AM

Silicon based heterojunction photovoltaics: use of MoO₃ as emitter layer (*Invited Paper*)

Author(s): Olivier Durand, Flora B. Zerbo, Institut National des Sciences Appliquées de Rennes (France); Mircea Modreanu, Tyndall National Institute, Univ. College Cork (Ireland); Ian Povey, Jun Lin, Tyndall National Institute (Ireland); Antoine Létoublon, Institut National des Sciences Appliquées de Rennes (France); Alain Rolland, Univ. de Rennes 1 (France); Soline Boyer, Laurent Pédessseau, Jacky Even, Alexandre Beck, Institut National des Sciences Appliquées de Rennes (France)

12422-64 • 9:25 AM - 9:50 AM

Potential of ZrO₂ and HfO₂ materials for nonlinear optical applications: first-principle study and experimental challenges *(Invited Paper)*

Author(s): Ali El Boutaybi, Thomas Maroutian, Sylvia Matzen, Laurent Vivien, Ctr. de Nanosciences et de Nanotechnologies (France); Panagiotis Karamanis, Michel Rerat, Univ. de Pau et des Pays de l'Adour (France); Philippe Lecoer, Ctr. de Nanosciences et de Nanotechnologies (France)

12422-70 • 9:50 AM - 10:15 AM

High performance all-oxide thin film tunable capacitors on Si substrates for agile microwave applications *(Invited Paper)*

Author(s): Yating Ruan, Advanced Thin Film Technology, Institute of Materials Science, Technical University of Darmstadt (Germany); Stipo Matic, Institute of Microwave Engineering and Photonics, Technical University of Darmstadt, Germany (Germany); Patrick Salg, Advanced Thin Film Technology, Institute of Materials Science, Technical University of Darmstadt (Germany); Dominik Walk, Institute of Microwave Engineering and Photonics, Technical University of Darmstadt, Germany (Germany); Zeinar Lukas, Philipp Komissinskiy, Advanced Thin Film Technology, Institute of Materials Science, Technical University of Darmstadt (Germany); Rolf Jakoby, Institute of Microwave Engineering and Photonics (Germany); Lambert Alff, Technische Univ. Darmstadt (Germany)

Coffee Break 10:15 AM - 10:45 AM

SESSION 14: PLASMONICS USING ZNO AND VARIOUS OXIDES

2 February 2023 • 10:45 AM - 12:00 PM | Moscone Center, Room 151 (Upper Mezzanine South)

Session Chair: Adrián Hierro, Univ. Politécnica de Madrid (Spain)

12422-53 • 10:45 AM - 11:10 AM

CdO plasmonics on GaAs: using localized and surface plasmon polaritons for mid-IR near-field amplification *(Invited Paper)*

Author(s): Eduardo Martinez Castellano, Univ. Politécnica de Madrid (Spain); Javier Yeste, Univ. de València (Spain); Manuel Abuin, Univ. Politécnica de Madrid (Spain); Maria del Carmen Martinez Tomas, Oleksii Klymov, Vicente Muñoz-Sanjosé, Univ. de València (Spain); Miguel Montes Bajo, Adrian Hierro, José María Ulloa, Pablo Ibañez-Romero, Univ. Politécnica de Madrid (Spain); Said Agouram, Univ. de València (Spain)

12422-54 • 11:10 AM - 11:35 AM

Strong coupling in infrared polaritonic media *(Invited Paper)*

Author(s): Joshua D. Caldwell, Vanderbilt Univ. (United States)

12422-55 • 11:35 AM - 12:00 PM

Investigation of plasmonic losses in TCOs based on heavily doped ZnO *(Invited Paper)*

Author(s): Vitaliy S. Avrutin, Dhruv Fomra, Nathaniel Kinsey, Natalia Izyumskaya, Ümit Özgür, Hadis Morkoç, Virginia Commonwealth Univ. (United States); Martin Feneberg, Ruediger Goldhahn, Otto-von-Guericke-Univ. Magdeburg (Germany)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12422-23

Investigation of optical responsivity of BiFeO₃-based photodetectors equipped with different electrode patterns

Author(s): Ricky W. Chuang, Tsung-Han Tsai, Wei-Che Chuang, Cheng-Liang Huang, National Cheng Kung Univ. (Taiwan)

12422-36

Fabrication and characterization of the surface acoustic wave (SAW) based hydrogen sensor

Author(s): Suganya A., Sujatha L., Rajalakshmi Engineering College (India); Girija K.G., Board of Research in Nuclear Sciences (India)

2D Photonic Materials and Devices VI

Chair(s): Arka Majumdar; Carlos M. Torres Jr.; Hui Deng

31 January - 2 February 2023 | Moscone Center, Room 155 (Upper Mezzanine South)

Conference Chairs: **Arka Majumdar**, Univ. of Washington (United States); **Carlos M. Torres Jr.**, Naval Information Warfare Ctr. Pacific (United States); **Hui Deng**, Univ. of Michigan (United States)

Program Committee: **Ritesh Agarwal**, Univ. of Pennsylvania (United States); **Igor Aharonovich**, Univ. of Technology, Sydney (Australia); **Joshua R. Hendrickson**, Air Force Research Lab. (United States); **Maiken H. Mikkelsen**, Duke Univ. (United States); **Nathaniel P. Stern**, Northwestern Univ. (United States); **A. Nick Vamivakas**, The Institute of Optics, Univ. of Rochester (United States); **Feng Wang**, Univ. of California, Berkeley (United States); **Fengnian Xia**, Yale Univ. (United States); **Xiaodong Xu**, Univ. of Washington (United States)

TUESDAY 31 JANUARY

SESSION 1: QUANTUM OPTOELECTRONICS WITH 2D MATERIALS I

31 January 2023 • 1:30 PM - 3:00 PM | Moscone Center, Room 155 (Upper Mezzanine South)

Session Chair: Carlos M. Torres, Naval Information Warfare Ctr. Pacific (United States)

12423-1 • 1:30 PM - 2:00 PM

Quantum light and strongly correlated electronic states in a moiré heterostructure (*Invited Paper*)

Author(s): Mauro Brotons-Gisbert, Heriot-Watt Univ. (United Kingdom)

12423-2 • 2:00 PM - 2:30 PM

Excitons and correlated physics in semiconducting moiré superlattice. (*Invited Paper*)

Author(s): Sufei Shi, Rensselaer Polytechnic Institute (United States)

12423-3 • 2:30 PM - 3:00 PM

Controlling dark excitons in two-dimensional TMDs for optoelectronic applications (*Invited Paper*)

Author(s): Gabriele Grosso, Saroj B. Chand, John M. Woods, Enrique Mejia, The City Univ. of New York Advanced Science Research Ctr. (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 2: QUANTUM OPTOELECTRONICS WITH 2D MATERIALS II

31 January 2023 • 3:30 PM - 5:10 PM | Moscone Center, Room 155 (Upper Mezzanine South)

Session Chair: Carlos M. Torres, Naval Information Warfare Ctr. Pacific (United States)

12423-4 • 3:30 PM - 4:00 PM

Carrier dynamics and nonlinear photonics in strained graphene with pseudo-magnetic fields (*Invited Paper*)

Author(s): Kunze Lu, Manlin Luo, Hao Sun, Dong-Ho Kang, Donguk Nam, Nanyang Technological Univ. (Singapore)

12423-5 • 4:00 PM - 4:20 PM

Electrical control of optical bistability in atoms interfacing graphene

Author(s): Mikkel Have Eriksen, Jakob Olsen, Christian Wolff, Joel Cox, Univ. of Southern Denmark (Denmark)

12423-6 • 4:20 PM - 4:50 PM

Towards exciton quantum simulators in van der Waals heterostructures (*Invited Paper*)

Author(s): Nathaniel Gabor, Univ. of California, Riverside (United States)

12423-48 • 4:50 PM - 5:10 P

A high-quality-factor chiral metasurface for valley-polarized emission and chiral exciton-polaritons

Author(s): Feng Pan, Jefferson Dixon, Sahil Dagli, Jennifer Dionne, Stanford University (United States)

WEDNESDAY 1 FEBRUARY

SESSION 3: 2D MATERIAL EXCITON-POLARITON

1 February 2023 • 8:30 AM - 10:00 AM | Moscone Center, Room 155 (Upper Mezzanine South)

Session Chair: Sufei Shi, Rensselaer Polytechnic Institute (United States)

12423-8 • 8:30 AM - 9:00 AM

Manipulating optoelectronic properties in atomically thin semiconductors (*Invited Paper*)

Author(s): Parag B. Deotare, Univ. of Michigan (United States)

12423-9 • 9:00 AM - 9:30 AM

α -RuCl₃-based 2D heterostructures for nanoscale control of polaritons (*Invited Paper*)

Author(s): Daniel J. Rizzo, Bjarke S. Jessen, Sara Shabani, Francesco L. Ruta, Zhiyuan Sun, Columbia Univ. (United States); Jin Zhang, Max-Planck-Institut für Struktur und Dynamik der Materie (Germany), Ctr. for Free-Electron Laser Science (Germany); Alexander S. McLeod, Univ. of Minnesota, Twin Cities (United States); Carmen Rubio-Verdú, Columbia Univ. (United States); Matthew Cothrine, Jiaqiang Yan, The Univ. of Tennessee Knoxville (United States); Lede Xian, Max-Planck-Institut für Struktur und Dynamik der Materie (Germany), Ctr. for Free-Electron Laser Science (Germany); Kenji Watanabe, Research Ctr. for Functional Materials, National Institute for Materials Science (Japan); Takashi Taniguchi, International Ctr. for Materials Nanoarchitectonics, National Institute for Materials Science (Japan); Stephen E. Nagler, Oak Ridge National Lab. (United States); David G. Mandrus, The Univ. of Tennessee (United States); Angel Rubio, Max-Planck-Institut für Struktur und Dynamik der Materie (Germany), Ctr. for Free-Electron Laser Science (Germany); Michael M. Fogler, Univ. of California, San Diego (United States); Andrew J. Millis, James C. Hone, Cory R. Dean, Abhay N. Pasupathy, D. N. Basov, Columbia Univ. (United States)

12423-10 • 9:30 AM - 10:00 AM

Unconventional polaritons in van der Waals materials (Invited Paper)

Author(s): Hui Deng, Univ. of Michigan (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 4: ATOMICALLY THIN CLASSICAL AND QUANTUM LIGHT SOURCES

1 February 2023 • 10:30 AM - 12:40 PM | Moscone Center, Room 155 (Upper Mezzanine South)

Session Chair: Parag B. Deotare, Univ. of Michigan (United States)

12423-11 • 10:30 AM - 11:00 AM

Tunable quantum emitters in two-dimensional materials (Invited Paper)

Author(s): Chitraleema Chakraborty, Univ. of Delaware (United States)

12423-12 • 11:00 AM - 11:30 AM

Excited state spectroscopy and coherence protection of spin defects in hexagonal boron nitride (Invited Paper)

Author(s): Charlie Patrickson, Univ. of Exeter (United Kingdom); Andrew J. Ramsay, Hitachi Cambridge Lab. (United Kingdom); Simon Baber, Univ. of Exeter (United Kingdom); David R. M. Arvidsson Shukur, Hitachi Cambridge Lab. (United Kingdom); Reza Hekmati, Anthony J. Bennett, Cardiff Univ. (United Kingdom); Isaac J. Luxmoore, Univ. of Exeter (United Kingdom)

12423-13 • 11:30 AM - 11:50 AM

Wavelength-tunable WSe₂ light sources enabled by optically controlled strain

Author(s): Yi Yu, Nanyang Technological Univ. (Singapore); John J. H. Eng, Institute of Materials Research and Engineering, Agency of Science, Technology and Research (Singapore), Nanyang Technological Univ. (Singapore); Kunze Lu, Manlin Luo, Bongkwon Son, Pratul Venkatesh, Wen Wei Lee, Yong Hao Tham, Weibo Gao, Donguk Nam, Nanyang Technological Univ. (Singapore)

12423-14 • 11:50 AM - 12:10 PM

Vacuum field engineering for 2D exciton decay dynamics control with plasmonic meta-mirror

Author(s): Sanghyeok Park, Dongha Kim, Yun-Seok Choi, Min-Kyo Seo, KAIST (Republic of Korea)

12423-15 • 12:10 PM - 12:40 PM

Novel mid-infrared photodetectors and emitters using black phosphorus-based heterostructures (Invited Paper)

Author(s): Chang-Hua Liu, National Tsing Hua Univ. (Taiwan); Tian-Yun Chang, Po-Liang Chen, Institute of Photonics Technologies, National Tsing Hua Univ. (Taiwan)

Lunch/Exhibition Break 12:40 PM - 2:10 PM

SESSION 5: SCALABLE GROWTH OF 2D MATERIAL FOR LARGE-SCALE INTEGRATION

1 February 2023 • 2:10 PM - 3:40 PM | Moscone Center, Room 155 (Upper Mezzanine South)

Session Chair: Hui Deng, Univ. of Michigan (United States)

12423-16 • 2:10 PM - 2:40 PM

Epitaxial growth of transition metal dichalcogenides for large area device applications (Invited Paper)

Author(s): Joan M. Redwing, The Pennsylvania State Univ. (United States)

12423-17 • 2:40 PM - 3:10 PM

Synthesis of two-dimensional metal dichalcogenides for photonics (Invited Paper)

Author(s): Zheng Liu, Nanyang Technological Univ. (Singapore)

12423-18 • 3:10 PM - 3:40 PM

Epitaxial growth of 2D van der Waals magnets and heterostructures with topological insulators (Invited Paper)

Author(s): Roland K. Kawakami, The Ohio State Univ. (United States)

Coffee Break 3:40 PM - 4:10 PM

SESSION 6: CHALCOGENIDES AND BORON NITRIDE MONOLAYER-BASED DEVICES

1 February 2023 • 4:10 PM - 5:10 PM | Moscone Center, Room 155 (Upper Mezzanine South)

Session Chair: Chang-Hua Liu, National Tsing Hua Univ. (Taiwan)

12423-19 • 4:10 PM - 4:30 PM

Room temperature valley polarization in transition metal dichalcogenide/chiral perovskite heterostructures

Author(s): Shreetu Shrestha, Mingxing Li, Mircea Cotlet, Brookhaven National Lab. (United States)

12423-20 • 4:30 PM - 4:50 PM

Self-driven broadband response photodetector based on Sb₂Te₃/Mos₂ heterostructure

Author(s): Chaobo Dong, Hao Wang, Yaliang Gui, The George Washington Univ. (United States); Behrouz Movahhed Nouri, Optelligence LLC (United States); Hamed Dalir, Volker Sorger, The George Washington Univ. (United States)

12423-21 • 4:50 PM - 5:10 PM

Tunable photoluminescence from WS₂ 2D nanostructures

Author(s): Frank Güell, Marc Reguant, Paulina R. Martínez-Alanis, Univ. Autònoma de Barcelona (Spain); Aanchal Alagh, Fatima Ezahra Annanouch, Eduard Llobet, Univ. Rovira i Virgili (Spain)

Conference 12423

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12423-46

Engineering of light-matter interaction in two-dimensional semiconductors using quasi-bound states in the continuum

Author(s): Brijesh Kumar, Anuj Kumar Singh, Kishor Kumar Mandal, Indian Institute of Technology Bombay (India); Lekshmi Eswaramoorthy, Indian Institute of Technology Bombay (India); IITB-Monash Research Academy (India); Parul Sharma, Anshuman Kumar, Indian Institute of Technology Bombay (India)

12423-43

Facile one-step Hydrothermal Synthesis of 3D Flowerlike nanosheets of MoS₂ for optoelectronic technology

Author(s): Anuprava Mandal, Nivedita Pandey, Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)

12423-44

One-step hydrothermal synthesis of WS₂ as efficient electrode material for energy storage application

Author(s): Anuprava Mandal, Nivedita Pandey, Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)

12423-45

Facile hydrothermal synthesis of vanadium disulfide nanomaterial for supercapacitor application

Author(s): Anuprava Mandal, Nivedita Pandey, Indian Institute of Technology Bombay (India); Sushil Kumar Pandey, Ashish K. Yadav, National Institute of Technology, Karnataka, Surathkal (India); Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)

THURSDAY 2 FEBRUARY

SESSION 7: 2D MATERIAL OPTOELECTRONICS AND INTEGRATED NANOPHOTONICS I

2 February 2023 • 8:00 AM - 9:50 AM | Moscone Center, Room 155 (Upper Mezzanine South)

Session Chair: Carlos M. Torres, Naval Information Warfare Ctr. Pacific (United States)

12423-22 • 8:00 AM - 8:30 AM

2D material-based functional optoelectronics (*Invited Paper*)

Author(s): Thomas Mueller, Technische Univ. Wien (Austria)

12423-23 • 8:30 AM - 9:00 AM

Spatially controlling interlayer excitons in 2D semiconductor heterostructures (*Invited Paper*)

Author(s): John R. Schaibley, The Univ. of Arizona (United States)

12423-24 • 9:00 AM - 9:30 AM

Electrically controllable chirality in a nanophotonic interface with a 2D semiconductor (*Invited Paper*)

Author(s): Robert Shreiner, Amy Butcher, Kai Hao, Andrew Kindseth, Alexander High, The Univ. of Chicago (United States)

12423-25 • 9:30 AM - 9:50 AM

Influence of Coulomb correlations on high harmonic generation in monolayer TMDCs

Author(s): Jörg Hader, Wyant College of Optical Sciences (United States); Josefine Neuhaus, Philipps-Univ. Marburg (Germany); Jerome V. Moloney, Wyant College of Optical Sciences (United States); Stephan W. Koch, Philipps-Univ. Marburg (Germany)

Coffee Break 9:50 AM - 10:10 AM

SESSION 8: 2D MATERIAL OPTOELECTRONICS AND INTEGRATED NANOPHOTONICS II

2 February 2023 • 10:10 AM - 12:10 PM | Moscone Center, Room 155 (Upper Mezzanine South)

Session Chair: John R. Schaibley, The Univ. of Arizona (United States)

12423-26 • 10:10 AM - 10:30 AM

Van der Waals materials for nanophotonic applications

Author(s): Panaiot G. Zotev, The Univ. of Sheffield (United Kingdom); Yue Wang, Univ. of York (United Kingdom); Toby Severs Millard, The Univ. of Sheffield (United Kingdom); Daniel Andres-Penares, Heriot-Watt Univ. (United Kingdom); Luca Sortino, Ludwig-Maximilians-Univ. München (Germany); Nic Mullin, The Univ. of Sheffield (United Kingdom); Donato Conteduca, Univ. of York (United Kingdom); Mauro Brotons-Gisbert, Heriot-Watt Univ. (United Kingdom); Sam Randerson, Jamie Hobbs, The Univ. of Sheffield (United Kingdom); Brian Gerardot, Heriot-Watt Univ. (United Kingdom); Thomas F. Krauss, Univ. of York (United Kingdom); Alexander I. Tartakovskii, The Univ. of Sheffield (United Kingdom)

12423-27 • 10:30 AM - 10:50 AM

Cryo-compatible strain tuning of nanophotonic structures coupled to Van der Waals materials

Author(s): Arnab Manna, Johannes Froech, Arka Majumdar, Univ. of Washington (United States)

12423-28 • 10:50 AM - 11:20 AM

Strong light-matter interaction in van der Waals magnets (*Invited Paper*)

Author(s): Vinod M. Menon, Biswajit Datta, The City College of New York (United States); Florian Dirnberger, The City Univ. of New York (United States); Rezlind Bushati, The City College of New York (United States)

12423-29 • 11:20 AM - 11:50 AM

Measurement of the out-of-plane optical constants of a two-dimensional crystal (*Invited Paper*)

Author(s): Michele Merano, Univ. degli Studi di Padova (Italy)

12423-30 • 11:50 AM - 12:10 PM

Generating and capturing secondary hot carriers in monolayer tungsten dichalcogenides

Author(s): Pan Adhikari, Clemson Univ. (United States); Peijian Wang, Univ. at Buffalo (United States); Hao Zeng, Univ. at Buffalo (United States); Jianbo Gao, Brock Univ. (Canada)

Lunch/Exhibition Break 12:10 PM - 1:10 PM

SESSION 9: 2D MATERIAL NONLINEAR OPTICAL DEVICES AND CAVITY-ENHANCED NONLINEAR OPTICS

2 February 2023 • 1:10 PM - 3:10 PM | Moscone Center, Room 155 (Upper Mezzanine South)

Session Chair: Alexander High, The Univ. of Chicago (United States)

12423-31 • 1:10 PM - 1:40 PM

Enhancement of Optical Nonlinearities in 2D Materials
(Invited Paper)

Author(s): Zhipei Sun, Aalto Univ. (Finland)

12423-32 • 1:40 PM - 2:10 PM

Giant effective Zeeman splitting in a monolayer semiconductor realised by spin selective strong light-matter coupling (Invited Paper)

Author(s): Daniel Gillard, The Univ. of Sheffield (United Kingdom); Thomas P. Lyons, RIKEN Ctr. for Emergent Matter Science (Japan), The Univ. of Sheffield (United Kingdom); Charly Leblanc, Univ. Clermont Auvergne (France); Jorge Puebla, RIKEN Ctr. for Emergent Matter Science (Japan); Dmitry D. Solnyshkov, Univ. Clermont Auvergne (France), Institut Univ. de France (France); Lars Klompmaker, Technische Univ. Dortmund (Germany); Ilya A. Akimov, Technische Univ. Dortmund (Germany), Ioffe Institute (Russian Federation); Charalambos Louca, The Univ. of Sheffield (United Kingdom); Pranaba Muduli, RIKEN Ctr. for Emergent Matter Science (Japan), Institute for Solid State Physics, The Univ. of Tokyo (Japan), Indian Institute of Technology Madras (India); Armando Genco, Politecnico di Milano (Italy), The Univ. of Sheffield (United Kingdom); Manfred Bayer, Technische Univ. Dortmund (Germany), Ioffe Institute (Russian Federation); Yoshichika Otani, RIKEN Ctr. for Emergent Matter Science (Japan), Institute for Solid State Physics, The Univ. of Tokyo (Japan); Guillaume Malpuech, Univ. Clermont Auvergne (France); Alexander I. Tartakovskii, The Univ. of Sheffield (United Kingdom)

12423-33 • 2:10 PM - 2:30 PM

Graphene-based metamaterial for on-demand spectral absorption shaping in the mid-infrared

Author(s): Romil Audhkhasi, Mashnoon A. Sakib, Michelle L. Povinelli, The Univ. of Southern California (United States)

12423-34 • 2:30 PM - 2:50 PM

Enhanced four wave mixing from MoS₂ disks supporting higher-order anapole resonance

Author(s): Rabindra Biswas, Asish Prosad, Lal Krishna A.S., Varun Raghunathan, Indian Institute of Science, Bengaluru (India)

12423-35 • 2:50 PM - 3:10 PM

Liquid metal fabrication of ultrathin Ga₂O₃ and GaN layers for integrated optics

Author(s): Panteha Pedram, Ecole Centrale de Lyon (France), RMIT Univ. (Australia); Ali Zavabeti, Nitu Syed, RMIT Univ. (Australia); Benjamin Fornacciar, Institut National des Sciences Appliquées de Lyon (France); Arrigo Calzolari, CNR-NANO Istituto Nanoscienze (Italy); Andreas Boes, The Univ. of Adelaide (Australia); Torben Daenke, RMIT Univ. (Australia); Sebastien Cueff, Ecole Centrale de Lyon (France); Arnan Mitchell, RMIT Univ. (Australia); Christelle Monat, Ecole Centrale de Lyon (France)

Coffee Break 3:10 PM - 3:30 PM

SESSION 10: EMERGING 2D MATERIALS

2 February 2023 • 3:30 PM - 4:50 PM | Moscone Center, Room 155 (Upper Mezzanine South)

Session Chair: Carlos M. Torres, Naval Information Warfare Ctr. Pacific (United States)

12423-36 • 3:30 PM - 3:50 PM

Levitating ultra-thin magnetodielectric materials using repulsive Casimir forces

Author(s): Calum Shelden, Benjamin Spreng, Jeremy N. Munday, Univ. of California, Davis (United States)

12423-38 • 3:50 PM - 4:10 PM

Chiral harmonic generation studies from partially etched amorphous silicon nanodisk arrays

Author(s): Jayanta Kumar Deka, Jyothsna K.M., Rabindra Biswas, Varun Raghunathan, Indian Institute of Science, Bengaluru (India)

12423-39 • 4:10 PM - 4:30 PM

Light emission and engineered carrier lifetime in strained 2D materials towards developing wavelength-tunable integrated emitters

Author(s): Wen Wei Lee, Yu Yi, Yong Hao Tham, Pratul Venkatesh, Jian Kwang Tan, Bongkwon Son, Manlin Luo, Kunze Lu, Yadong Wang, Donguk Nam, Nanyang Technological Univ. (Singapore)

12423-40 • 4:30 PM - 4:50 PM

Performance enhancement of surface plasmon resonance biosensor based on prism with Kretschmann configuration assisted by 2D materials

Author(s): Purnendu Shekhar Pandey, Sanjeev Kumar Raghuvanshi, Indian Institute of Technology (Indian School of Mines), Dhanbad (India); Santosh Kumar, Liaocheng Univ. (China)

Integrated Optics: Devices, Materials, and Technologies XXVII

30 January - 2 February 2023 | Moscone Center, Room 304 (Level 3 South)

Conference Chairs: **Sonia M. García-Blanco**, Univ. Twente (Netherlands); **Pavel Cheben**, National Research Council Canada (Canada)

Program Committee: **Carlos A. Alonso-Ramos**, Ctr. de Nanosciences et de Nanotechnologies (France); **Daniel Benedikovic**, Univ. of Žilina (Slovakia); **Pierre Berini**, Univ. of Ottawa (Canada); **Romeo Bernini**, Istituto per il Rilevamento Elettromagnetico dell'Ambiente (Italy); **Andrea Blanco-Redondo**, Nokia Bell Labs (United States); **Alexandra Boltasseva**, Purdue Univ. (United States); **Jean-Emmanuel Broquin**, Univ. Grenoble Alpes (France); **Florenta A. Costache**, Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany); **Xudong Fan**, Univ. of Michigan (United States); **Robert Halir**, Univ. de Málaga (Spain); **Gualtiero Nunzi Conti**, Istituto di Fisica Applicata "Nello Carrara" (Italy); **Alessia Pasquazi**, Univ. of Sussex (United Kingdom); **François Royer**, Univ. Jean Monnet Saint-Etienne (France); **Jens H. Schmid**, National Research Council Canada (Canada); **Yakov Sidorin**, Quarles & Brady LLP (United States); **Winnie N. Ye**, Carleton Univ. (Canada); **Avinoam Zadok**, Bar-Ilan Univ. (Israel)

MONDAY 30 JANUARY

OPTO PLENARY SESSION

30 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 207/215 (Level 2 South)

8:00 AM - 8:05 AM: **Welcome and Opening Remarks**
Sonia García-Blanco, Univ. Twente (Netherlands) and Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

8:05 AM - 8:15 AM: **Announcement of the OPTO AI/ML and Net Zero Best Paper Awards**

12424-501 • 8:15 AM - 8:50 AM

High-performance electronic-photonic interfaces: from AI to quantum (*Plenary Presentation*)

Author(s): Rajeev Ram, Massachusetts Institute of Technology (United States)

12416-501 • 8:50 AM - 9:25 AM

Tandem photovoltaic devices: more than one way to make a solar cell (*Plenary Presentation*)

Author(s): Emily L. Warren, National Renewable Energy Lab. (United States)

12421-501 • 9:25 AM - 10:00 AM

Are III-nitride semiconductors also suitable for red emission? (*Plenary Presentation*)

Author(s): Nicolas Grandjean, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 1: UV-VIS INTEGRATED PHOTONIC PLATFORMS

30 January 2023 • 10:30 AM - 12:30 PM | Moscone Center, Room 304 (Level 3 South)

Session Chair: Sonia M. García-Blanco, Univ. Twente (Netherlands)

12424-1 • 10:30 AM - 11:00 AM

Integrated photonics in the visible spectrum (*Invited Paper*)

Author(s): Joyce K. S. Poon, Max-Planck-Institut für Mikrostrukturphysik (Germany), Univ. of Toronto (Canada)

12424-2 • 11:00 AM - 11:30 AM

Low-loss photonic integrated circuits for UV applications (*Invited Paper*)

Author(s): Ward Hendriks, Meindert Dijkstra, Soheila Mardani, Ivo Hegeman, Sonia García-Blanco, Univ. Twente (Netherlands)

12424-3 • 11:30 AM - 11:50 AM

Low-loss sputter-coated aluminum nitride waveguides

Author(s): Soheila Mardani, Ward A. P. M. Hendriks, Meindert Dijkstra, Sonia García-Blanco, Univ. Twente (Netherlands)

12424-4 • 11:50 AM - 12:10 PM

Prototyping of silicon nitride photonic integrated circuits for visible and near-infrared applications

Author(s): Cameron Horvath, Jocelyn N. Westwood-Bachman, Kevin Setzer, Alexandria McKinlay, Applied NanoTools Inc. (Canada); Cameron M. Naraine, Hamidu M. Mbonde, Bruno L. Segat Frare, Pooya Torab Ahmadi, Peter Mascher, Jonathan D. B. Bradley, McMaster Univ. (Canada); Mirwais Aktary, Applied NanoTools Inc. (Canada)

12424-5 • 12:10 PM - 12:30 PM

Multipass lithography of HSQ etch masks for fabrication of low-loss alumina waveguides for blue light applications

Author(s): Elissa McKay, Natale Pruiti, Stuart May, Univ. of Glasgow (United Kingdom); Marc Sorel, Univ. of Glasgow (United Kingdom), Istituto di Tecnologie della Comunicazione, dell'Informazione e della Percezione (Italy)

Lunch Break 12:30 PM - 2:00 PM

SESSION 2: SUBWAVELENGTH INTEGRATED PHOTONICS

30 January 2023 • 2:00 PM - 3:30 PM | Moscone Center, Room 304 (Level 3 South)

Session Chair: Carlos Alonso-Ramos, Ctr. de Nanosciences et de Nanotechnologies (France)

12424-6 • 2:00 PM - 2:30 PM

Optomechanical cavities in silicon-on-insulator (*Invited Paper*)

Author(s): Jianhao Zhang, Paula Nuño-Ruano, Xavier Le Roux, Eric Cassan, Delphine Marris-Morini, Laurent Vivien, Daniel Lanzillotti-Kimura, Carlos Alonso-Ramos, Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France)

12424-7 • 2:30 PM - 3:00 PM

Near-zero refractive index nanophotonics (*Invited Paper*)

Author(s): Iñigo Liberal, Angel Ortega-Gomez, Osmerly Hernández, Douglas Oña-Valladares, Univ. Pública de Navarra (Spain)

30 January 2023 | Moscone Center, Room 304 (Level 3 South)

Show Abstract +

12424-8 • 3:00 PM - 3:30 PM

Bricked and evanescently-coupled topologies: expanding the portfolio of subwavelength metamaterial silicon photonic devices (*Invited Paper*)

Author(s): Juan Gonzalo Wangüemert-Pérez, Carlos Pérez-Armenta, Pablo Ginel-Moreno, José Manuel Luque-González, Abdelfettah Hadji-El Houati, Alejandro Sánchez Postigo, Jose de Oliva Rubio, Alejandro Ortega-Moñux, Robert Halir, Univ. de Málaga (Spain); Jens H. Schmid, Pavel Cheben, National Research Council Canada (Canada); Iñigo Molina-Fernández, Univ. de Málaga (Spain)

Coffee Break 3:30 PM - 4:00 PM**SESSION 3: COMPLEX PHOTONIC INTEGRATED CIRCUITS I**

30 January 2023 • 4:00 PM - 5:25 PM | Moscone Center, Room 304 (Level 3 South)

Session Chair: Winnie N. Ye, Carleton Univ. (Canada)

12424-9 • 4:00 PM - 4:45 PM

Fundamentals and applications of reconfigurable complex photonic circuits (*Keynote Presentation*)

Author(s): José Capmany Franco, Univ. Politècnica de València (Spain); Daniel Perez, iPrionics Programmable Photonics, S.L. (Spain)

12424-10 • 4:45 PM - 5:05 PM

Enabling advanced photonic architectures using state-of-the-art silica-on-silicon planar lightwave circuit platform

Author(s): Serge Bidnyk, Ksenia Yadav, Enablence Technologies, Inc. (Canada); Shang-Hung Liu, Enablence Technologies, Inc. (United States); Ashok Balakrishnan, Enablence Technologies, Inc. (Canada)

12424-11 • 5:05 PM - 5:25 PM

Cascaded directional coupler-based polarization splitter/combiner on commercial silicon photonics integration platform

Author(s): Kalliopi Spanidou, Univ. Carlos III de Madrid (Spain); Luis Orbe, Synopsys Canada (Canada); Luis Gonzalez-Guerrero, Univ. Carlos III de Madrid (Spain); Dan Herrmann, Synopsys, Inc. (United States); Guillermo Carpintero, Univ. Carlos III de Madrid (Spain)

TUESDAY 31 JANUARY**SESSION 5: COMPLEX PHOTONIC INTEGRATED CIRCUITS II**

31 January 2023 • 8:45 AM - 10:15 AM | Moscone Center, Room 304 (Level 3 South)

Session Chair: Florenta A. Costache, Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany)

12424-13 • 8:45 AM - 9:05 AM

Photo-thermal tuning of graphene oxide coated integrated optical waveguides

Author(s): Yang Qu, Yunyi Yang, Jiayang Wu, Yuning Zhang, Linnan Jia, Swinburne Univ. of Technology (Australia); Houssein El Dirani, STMicroelectronics (France); Romain Crochemore, CEA-LETI (France); Corrado Sciancalepore, Soitec (France); Pierre Demongodin, Christian Grillet, Christelle Monat, Ecole Centrale de Lyon (France); Baohua Jia, RMIT Univ. (Australia); David J. Moss, Swinburne Univ. of Technology (Australia)

12424-14 • 9:05 AM - 9:25 AM

On-chip silicon nitride optical phased array as a broadband near-infrared spectrometer

Author(s): Zuyang Liu, Nicolas Le Thomas, Roel Baets, Univ. Gent (Belgium)

12424-15 • 9:25 AM - 9:45 AM

Fully integrated Laser Doppler Vibrometer (LDV) based on hybrid 3D integration of silicon nitride and polymer photonic circuits with operation in the kHz regime

Author(s): Adam Raptakis, Lefteris Gounaridis, Institute of Communication and Computer Systems, National Technical Univ. of Athens (Greece); Moritz Kleinert, Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); Madeleine Weigel, Fraunhofer-Institut für Nachrichtentechnik (Germany); Jörn Epping, Erik Schreuder, LioniX International BV (Netherlands); Marco Wolfer, Alexander Draebenstedt, Polytec GmbH (Germany); Roberto Pessina, Cordon Electronics Italia Srl (Italy); Panos Groumas, Optagon Photonics (Greece); Thomas Aukes, SolMateS BV (Netherlands); Volker Seyfried, Polytec GmbH (Germany); Norbert Keil, Fraunhofer-Institut für Nachrichtentechnik (Germany); Rene Heideman, LioniX International BV (Netherlands); Hercules Avramopoulos, Institute of Communication and Computer Systems, National Technical Univ. of Athens (Greece); Christos Kouloumentas, Optagon Photonics (Greece)

12424-17 • 9:45 AM - 10:15 AM

Astrophotonics: photonic integrated circuits for astronomical instrumentation (*Invited Paper*)

Author(s): Martin M. Roth, Kalaga Madhav, Andreas Stoll, Daniel Bodenmüller, Aline Dinkelaker, Aashia Rahman, Leibniz-Institut für Astrophysik Potsdam (Germany)

Coffee Break 10:15 AM - 10:45 AM

Conference 12424

SESSION 6: INTEGRATED PHOTONIC DESIGN

31 January 2023 • 10:45 AM - 12:40 PM | Moscone Center, Room 304 (Level 3 South)

Session Chair: Daniele Melati, Ctr. de Nanosciences et de Nanotechnologies (France)

12424-18 • 10:45 AM - 11:30 AM

Self-configuring algorithms, topologies, and fundamental limits for photonic circuits and structures (*Keynote Presentation*)

Author(s): David A. B. Miller, Stanford Univ. (United States)

12424-19 • 11:30 AM - 12:00 PM

Inverse design of robust photonic components (*Invited Paper*)

Author(s): Yuri Grinberg, National Research Council Canada (Canada); Dusan Gostimirovic, Department of Electrical and Computer Engineering, McGill University (Canada); Guowu Zhang, Department of Electrical and Computer Engineering (Canada); Md Mahadi Masnad, Odile Liboiron-Ladouceur, Department of Electrical and Computer Engineering, McGill University (Canada); Dan-Xia Xu, National Research Council Canada (Canada)

12424-20 • 12:00 PM - 12:20 PM

Design enablement methodology for silicon photonics-based photonic integrated design

Author(s): Amit Dikshit, Jin Wallner, M. Rakib Uddin, M. Jobayer Hossain, AIM Photonics, The Research Foundation for the State Univ. of New York (United States); Javery Mann, AIM Photonics (United States); Amir Begovic, Rensselaer Polytechnic Institute (United States); Yukta Timalina, Lewis G. Carpenter, Gerald Leake, Christopher Baiocco, Colin McDonough, Nicholas Fahrenkopf, Chandra C. Cotter, Christopher Striemer, David Hareme, AIM Photonics, The Research Foundation for the State Univ. of New York (United States)

12424-96 • 12:20 PM - 12:40 PM

A nonlocal Transfer matrix and Fourier modal methods for analysing nonlocal plasmonic nanostructures

Author(s): Pavel Kwiecien, Milan Burda, Ivan Richter, Czech Technical Univ. in Prague (Czech Republic)

Lunch/Exhibition Break 12:40 PM - 2:10 PM

SESSION 7: INTEGRATED SOURCES I

31 January 2023 • 2:10 PM - 3:40 PM | Moscone Center, Room 304 (Level 3 South)

Session Chair: Sonia M. García-Blanco, Univ. Twente (Netherlands)

12424-21 • 2:10 PM - 2:40 PM

Photonic integrated circuit-based Erbium-doped devices (*Invited Paper*)

Author(s): Yang Liu, Zheru Qiu, Xinru Ji, Johann Riemensberger, Rui Ning Wang, Tobias J. Kippenberg, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12424-22 • 2:40 PM - 3:00 PM

First near-UV hybrid integrated laser in the Al₂O₃ platform

Author(s): Cornelis Franken, Ward Hendriks, Meindert Dijkstra, Univ. Twente (Netherlands); Adriano do Nascimento, PHIX Photonics Assembly (Netherlands); Lisa Winkler, Univ. Twente (Netherlands), TOPTICA Photonics AG (Germany); Albert van Rees, Soheila Mardani, Univ. Twente (Netherlands); Ronald Dekker, LioniX International BV (Netherlands); Joost van Kerkhof, PHIX Photonics Assembly (Netherlands); Peter van der Slot, Sonia García-Blanco, Klaus-J. Boller, Univ. Twente (Netherlands)

12424-23 • 3:00 PM - 3:20 PM

Erbium-doped tellurium oxide distributed Bragg reflector lasers on silicon nitride chips

Author(s): Bruno L. Segat Frare, Dawson B. Bonneville, Hamidu M. Mbonde, Pooya Torab Ahmadi, Batoul Hashemi, Henry C. Frankis, Peter Mascher, Jonathan D. B. Bradley, McMaster Univ. (Canada)

12424-24 • 3:20 PM - 3:40 PM

THz generation by beating of self-running Er-based ion-exchanged DFB lasers co-integrated on one single chip

Author(s): Léo Hétier, Julien Poëtte, Lionel Bastard, Grenoble INP, Univ. Grenoble Alpes (France); Jean-François Roux, Pierre-Baptiste Vigneron, Univ. Savoie Mont Blanc (France); Jean-Emmanuel Broquin, Grenoble INP, Univ. Grenoble Alpes (France)

Coffee Break 3:40 PM - 4:10 PM

SESSION 8: INTEGRATED SOURCES II

31 January 2023 • 4:10 PM - 6:00 PM | Moscone Center, Room 304 (Level 3 South)

Session Chair: Juan Gonzalo Wangüemert-Pérez, Univ. de Málaga (Spain)

12424-25 • 4:10 PM - 4:40 PM

Heterogeneously integrated III-V-on-SOI lasers for optical communications (*Invited Paper*)

Author(s): Joan Manel Ramirez, Pierre Fanneau, Nokia Bell Labs. (France); Claire Besancon, Delphine Néel, Alexandre Shen, III-V Lab. (France); Amin Souleiman, Télécom SudParis (France); Valentin Ramez, CEA-LETI (France); Nicolas Vaissiere, III-V Lab. (France); Stéphane Malhouitre, Karim Hassan, CEA-LETI (France); Jean Decobert, III-V Lab. (France); Kamel Merghem, Télécom SudParis (France); David Bitauld, III-V Lab. (France)

12424-26 • 4:40 PM - 5:00 PM

139 nm tuning range, high speed wavelength modulation, and high output power up to 60 mW from a single gain, two-ring vernier external cavity laser

Author(s): Wilson Tsong, Ian van den Vlekkert, Sami Musa, Chilas B.V. (Netherlands); Raimond N. Frentrop, Noor A. Schilder, Marcel Hoekman, Arjan Meijerink, Edwin J. Klein, LioniX International BV (Netherlands); Dimitri Gekus, Chilas B.V. (Netherlands)

12424-27 • 5:00 PM - 5:20 PM

Hybrid GaSb/Si₃N₄ widely tunable Vernier laser emitting around 2.55 μ m

Author(s): Samu-Pekka Ojanen, Jukka Viheriälä, Nouman Zia, Eero Koivusalo, Joonas Hilska, Heidi Tuorila, Mircea Guina, Tampere Univ. (Finland)

12424-28 • 5:20 PM - 5:40 PM

Characteristics of transfer printable GaSb laser diodes and gain devices for 2 to 3 μm integrated photonics

Author(s): Jukka Viheriälä, Heidi Tuorila, Helmer Piirilä, Eero Koivusalo, Joonas Hilska, Mircea Guina, Tampere Univ. (Finland); Yeasir Arafat, Fatih Atar, Brian Corbett, Tyndall National Institute (Ireland)

12424-29 • 5:40 PM - 6:00 PM

Using hybrid integrated InP-Si₃N₄ diode lasers for the generation of sub-GHz repetition rate frequency combs

Author(s): Anzal Memon, Albert van Rees, Jesse Mak, Youwen Fan, Peter J. M. van der Slot, Hubertus M. J. Bastiaens, Klaus-Jochen Boller, Univ. Twente (Netherlands)

WEDNESDAY 1 FEBRUARY**SESSION 9: QUANTUM INTEGRATED PHOTONICS**

1 February 2023 • 8:10 AM - 10:30 AM | Moscone Center, Room 304 (Level 3 South)

Session Chair: Juan Gonzalo Wangüemert-Pérez, Univ. de Málaga (Spain)

12424-30 • 8:10 AM - 8:30 AM

Fully on-chip photonic turnkey quantum light source of two- and high-dimensional entangled photons

Author(s): Hatam Mahmudlu, Raktim Halder, Robert Johanning, Anahita Khodadad Kashi, Institut für Photonik, Leibniz Univ. Hannover (Germany), Hannoversches Zentrum für Optische Technologien (Germany), Exzellenzcluster PhoenixD, Leibniz Univ. Hannover (Germany); Albert van Rees, MESA+ Institute, Univ. Twente (Netherlands); Jörn P. Epping, QuiX Quantum BV (Netherlands), LioniX International BV (Netherlands); Klaus-J. Boller, MESA+ Institute, Univ. Twente (Netherlands); Michael Kues, Institut für Photonik, Leibniz Univ. Hannover (Germany), Hannoversches Zentrum für Optische Technologien (Germany), Exzellenzcluster PhoenixD, Leibniz Univ. Hannover (Germany)

12424-31 • 8:30 AM - 9:00 AM

Mode coupling, localization, and renormalization in high quality factor photonic crystal microring resonators *(Invited Paper)*

Author(s): Kartik Srinivasan, National Institute of Standards and Technology (United States)

12424-32 • 9:00 AM - 9:30 AM

Fault-tolerant photonic quantum computing *(Invited Paper)*

Author(s): Zachary Vernon, Dominic J. Goodwill, Xanadu Quantum Technologies Inc. (Canada)

12424-33 • 9:30 AM - 10:00 AM

Ion trap quantum computing using integrated photonics *(Invited Paper)*

Author(s): Karan Mehta, Cornell University (United States); Alfredo Ricci-Vasquez, Carmelo Mordini, Gillenhaal Beck, ETH Zurich (Switzerland); Maciej Malinowski, Oxford Ionics (United Kingdom); Martin Stadler, ETH Zurich (Switzerland); Chi Zhang, Tsinghua (China); Daniel Kienzler, Jonathan Home, ETH Zurich (Switzerland)

• 10:00 AM - 10:30 AM 12424-34

Integrating large numbers of superconducting nanowire single-photon detectors with nanophotonic waveguides *(Invited Paper)*

Author(s): Carsten Schuck, Westfälische Wilhelms-Univ. Münster (Germany)

Coffee Break 10:30 AM - 11:00 AM

SESSION 10: INTEGRATED PHOTONICS FOR MACHINE LEARNING/AI

1 February 2023 • 11:00 AM - 12:20 PM | Moscone Center, Room 304 (Level 3 South)

Session Chair: Farshid Ashtiani, Nokia Bell Labs. (United States)

12424-35 • 11:00 AM - 11:30 AM

Ising model acceleration using integrated photonics circuits *(Invited Paper)*

Author(s): Zhan Su, Lightelligence, Inc. (United States)

12424-36 • 11:30 AM - 12:00 PM

Direct image classification using an on-chip photonic deep neural network *(Invited Paper)*

Author(s): Farshid Ashtiani, Nokia Bell Labs. (United States); Alexander J. Geers, Firooz Aflatouni, Univ. of Pennsylvania (United States)

12424-37 • 12:00 PM - 12:20 PM

Design and testing of silicon photonic 4F system for convolutional neural networks

Author(s): Nicola Peserico, Jiawei Meng, The George Washington Univ. (United States); Hangbo Yang, Univ. of California, Los Angeles (United States); Xiaoxuan Ma, The George Washington Univ. (United States); Shurui Li, Mostafa Hosseini, Univ. of California, Los Angeles (United States); Jonathan K. George, The George Washington Univ. (United States); Puneet Gupta, Chee Wei Wong, Univ. of California, Los Angeles (United States); Volker Sorger, The George Washington Univ. (United States)

Lunch/Exhibition Break 12:20 PM - 1:50 PM

SESSION 11: NON-LINEAR INTEGRATED PHOTONICS I

1 February 2023 • 1:50 PM - 3:40 PM | Moscone Center, Room 304 (Level 3 South)

Session Chair: Avinoam Zadok, Bar-Ilan Univ. (Israel)

12424-38 • 1:50 PM - 2:20 PM

III-V semiconductors as nonlinear photonics platforms *(Invited Paper)*

Author(s): Ksenia Dolgaleva, Univ. of Ottawa (Canada)

12424-39 • 2:20 PM - 2:50 PM

Photo-induced nonlinearities in silicon nitride microresonators *(Invited Paper)*

Author(s): Camille-Sophie Brès, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Conference 12424

12424-40 • 2:50 PM - 3:20 PM

Integrated optics for frequency-comb interferometry and spectroscopy (*Invited Paper*)

Author(s): Stephan Amann, Max-Planck-Institut für Quantenoptik (Germany); Lucas Deniel, Ctr. de Nanosciences et de Nanotechnologies (France); Theodor W. Hänsch, Ludwig-Maximilians-Univ. München (Germany); Nathalie Picqué, Max-Planck-Institut für Quantenoptik (Germany)

12424-41 • 3:20 PM - 3:40 PM

Hybrid lithium niobate-on-silicon nitride platform for mid-IR supercontinuum generation

Author(s): Christian Lafforgue, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Mikhail Churayev, Tobias J. Kippenberg, Institut de Physique, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Camille-Sophie Brès, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 3:40 PM - 4:10 PM

SESSION 12: NON-LINEAR INTEGRATED PHOTONICS II

1 February 2023 • 4:10 PM - 5:50 PM | Moscone Center, Room 304 (Level 3 South)

Session Chair: Carlos Alonso-Ramos, Ctr. de Nanosciences et de Nanotechnologies (France)

12424-42 • 4:10 PM - 4:40 PM

Ultrashort soliton pulses in integrated Fabry-Perot microresonators (*Invited Paper*)

Author(s): Tobias Herr, Deutsches Elektronen-Synchrotron (Germany), Univ. Hamburg (Germany); Thibault Wildi, Mahmoud A. Gaafar, Thibault Voumard, Markus Ludwig, Deutsches Elektronen-Synchrotron (Germany)

12424-43 • 4:40 PM - 5:10 PM

Power-efficient soliton microcombs in photonic molecules (*Invited Paper*)

Author(s): Victor Torres Company, Oskar Helgason, Fuchuan Lei, Marcello Girardi, Chalmers Univ. of Technology (Sweden)

12424-44 • 5:10 PM - 5:30 PM

Dispersion engineered SiON ring resonators for integrated photon sources

Author(s): Gioele Piccoli, Fondazione Bruno Kessler (Italy), Univ. degli Studi di Trento (Italy); Mher Ghulinyan, Fondazione Bruno Kessler (Italy)

12424-45 • 5:30 PM - 5:50 PM

Graphene oxide for enhanced self-phase modulation in silicon nitride waveguides

Author(s): Yuning Zhang, Jiayang Wu, Yunyi Yang, Yang Qu, Swinburne Univ. of Technology (Australia); Houssein El Dirani, STMicroelectronics (France); Romain Crochemore, CEA-LETI (France); Corrado Sciancalepore, Soitec (France); Pierre Demongodin, Christian Grillet, Christelle Monat, Ecole Centrale de Lyon (France); Baohua Jia, RMIT Univ. (Australia); David J. Moss, Swinburne Univ. of Technology (Australia)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12424-12

Cascaded ring resonator based wide stop-band filter fabricated in AIM photonics technology at Albany Nanotech Complex

Author(s): Mohammad Rakib Uddin, Jin Wallner, Amit Dikshit, M. Jobayer Hossain, Yukta Timalina, Nicholas M. Fahrenkopf, David L. Harnam, SUNY Polytechnic Institute (United States)

12424-57

Inverse design of optical response predictor enabled by a deep neural network

Author(s): Junhyeong Kim, Berkay Neseli, Jaeyong Kim, Jinhyeong Yoon, Hyeonho Yoon, Hyo-Hoon Park, Hamza Kurt, KAIST (Republic of Korea)

12424-58

More than optical interconnects: employing self-written waveguides to create optical networks and multi-functional sensing elements

Author(s): Axel Günther, Technische Univ. Braunschweig (Germany); Kunal Kushwaha, Roopanshu Garg, Hannoversches Zentrum für Optische Technologien (Germany); Anna Karoline Rüsseler, Florian Carstens, Laser Zentrum Hannover e.V. (Germany); Detlev Ristau, Leibniz Univ. Hannover (Germany); Kevin Tran, Institut für Anorganische Chemie, Leibniz Univ. Hannover (Germany); Yves Deja, Hannoversches Zentrum für Optische Technologien (Germany); Max Kilic, Franz Renz, Institut für Anorganische Chemie, Leibniz Univ. Hannover (Germany); Wolfgang Kowalsky, Technische Univ. Braunschweig (Germany); Bernhard Roth, Hannoversches Zentrum für Optische Technologien (Germany)

12424-59

Silicon-based polarization-insensitive optical antennas

Author(s): Xiaochen Xin, Carleton Univ. (Canada); Daniel Benedikovic, Univ. of Žilina (Slovakia); Winnie N. Ye, Carleton Univ. (Canada)

12424-60

Output beam engineering with 2-step ridge etching

Author(s): Riina Ulkuniemi, Ville Vilokinen, Petri Melanen, Petteri Uusimaa, Luukas Kuusela, Modulight Corp. (Finland)

12424-61

Monolithically integratable broad-band anti-reflection stacks for Si photonics platforms

Author(s): Fei Sun, Mikko Harjanne, Päivi Heimala, Markku Kapulainen, Timo Aalto, VTT Technical Research Ctr. of Finland Ltd. (Finland)

12424-62

Nonvolatile band switching using transparent phase-change materials on Bragg structures

Author(s): Nicholas A. Nobile, Univ. of Pittsburgh (United States); Chuanyu Lian, Hongyi Sun, Institute for Research in Electronics & Applied Physics, Univ. of Maryland, College Park (United States); Brian Mills, Cosmin Constantin Popescu, Juejun Hu, Massachusetts Institute of Technology (United States); Carlos Ríos, Institute for Research in Electronics & Applied Physics, Univ. of Maryland, College Park (United States); Nathan Youngblood, Univ. of Pittsburgh (United States)

12424-63

Characterization of mid-infrared optical loss and nonlinear refractive index in InP based waveguides

Author(s): Kevin Zhang, Gerhard Böhm, Mikhail A. Belkin, Technische Univ. München (Germany)

12424-64

In-situ beamforming method for optical phased array LiDAR

Author(s): Jinung Jin, Eun-Su Lee, Kwon-Wook Chun, Pusan National Univ. (Republic of Korea); Ji-Young Gwon, Jin-Moo Heo, Sang-Shin Lee, Kwangwoon Univ. (Republic of Korea); Min-Cheol Oh, Pusan National Univ. (Republic of Korea)

12424-65

Heterogeneous integration of polymer and silicon nitride waveguides for monolithic optical phased array

Author(s): Eun-Su Lee, Kwon-Wook Chun, Jinung Jin, Pusan National Univ. (Republic of Korea); Sang-Shin Lee, Kwangwoon Univ. (Republic of Korea); Min-Cheol Oh, Pusan National Univ. (Republic of Korea)

12424-66

Broadband high-efficient on-chip 3D optical phased arrays with a multi-layer Si₃N₄/SiO₂ platform beam engineering for light detection and ranging

Author(s): Dachuan Wu, Bowen Yu, Venus Kakdarvishi, Yasha Yi, Univ. of Michigan-Dearborn (United States)

12424-67

A low-loss 3D printed rib waveguide using stereolithography

Author(s): Dominic Gusman, Helio Ramollari, Philip Measor, Whitworth Univ. (United States)

12424-68

High-accuracy optical current sensors based on an optical waveguide chip integrating various components of phase modulators, power splitters, and optical polarizers

Author(s): Kwon-Wook Chun, Eun-Su Lee, Jinung Jin, Min-Cheol Oh, Pusan National Univ. (Republic of Korea)

12424-70

Amorphous germanium waveguides for medical diagnostics using mid-infrared spectroscopy

Author(s): Eleanor L. Osborne, Aneesh Vincent Veluthandath, Waseem Ahmed, Sirawit Boonsit, Vasileios Mourgelas, James S. Wilkinson, Ganapathy Senthil Murugan, Univ. of Southampton (United Kingdom)

12424-72

Compact atto-joule-per-bit bus-coupled photonic crystal nanobeam switches

Author(s): Jianhao Shen, Daniel Donnelly, Swapnajit Chakravarty, Univ. of Dayton (United States)

12424-74

Experimental observation of the exceptional point in a nanocylinder-loaded silicon microring

Author(s): Jiewen Li, Jinzhao Wang, Rui Li, Yang Feng, Yanmei Li, Lin Yu, Wanxin Li, Yunxu Sun, Yong Yao, Xiaochuan Xu, Harbin Institute of Technology Shenzhen Graduate School (China)

12424-75

Tuning of optical properties depends on the incident polarization on novel nanostructure-based metasurface

Author(s): Hyerin Song, Heesang Ahn, Taeyeon Kim, Seunghun Lee, Mihee Park, Kyujung Kim, Pusan National Univ. (Republic of Korea)

12424-77

Reduction of Ge-on-Si waveguide propagation loss by laser and hydrogen annealing

Author(s): Leh Woon Lim, Andrew Whye Keong Fong, Rachel Chen Fang Ang, Qin Gui Roth Voo, Justin Nian Hong Teh, Md Hazwani Khairy Md Husni, Hong Cai, Landobasa Y. M. Tobing, Nanxi Li, Surasit Chung, Lennon Yao Ting Lee, A*STAR Institute of Microelectronics (Singapore)

12424-78

Whispering gallery mode excitation in microresonator integrated in deep-seated negative axicon for volatile gas sensing

Author(s): Jasleen Kaur, Kaushal Vairagi, Pooja Gupta, Samir K. Mondal, CSIR - Central Scientific Instruments Organisation (India)

12424-79

Demonstration of photonic temperature sensor for RTM-6 composite manufacturing process (180°C) integrated with PMOC system

Author(s): Georgios Syriopoulos, National Technical Univ. of Athens (Greece); Aggelos Poulimenos, Engineering Technology Solutions (Greece); Giannis Pouloupoulos, National Technical Univ. of Athens (Greece); Maria Poulimenou, Engineering Technology Solutions (Greece); Jeroen Missinne, Ctr. for Microsystems Technology, Univ. Gent (Belgium); Michal Szaj, Argotech a.s. (Czech Republic); Charalampos Zervos, National Technical Univ. of Athens (Greece); Geert Van Steenberge, Ctr. for Microsystems Technology (Belgium); Hercules Avramopoulos, National Technical Univ. of Athens (Greece)

12424-80

3D shape-sensor based on integrated optics in ultra-thin glass

Author(s): Jannis Koch, Adrian Droste, Martin Angelmahr, Günter Flachenecker, Wolfgang Schade, Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany)

12424-81

Silicon nitride arrayed waveguide grating structures for sensing applications

Author(s): Muhammad A. Othman, Mohamed A. Swillam, The American Univ. in Cairo (Egypt)

Conference 12424

12424-82

Micro-ring resonator optimization for efficient integrated entangled photon sources

Author(s): Pablo Bedoya-Ríos, Univ. Nacional de Colombia Sede Medellín (Colombia); Samuel Bechtold, Samuel Serna, Bridgewater State Univ. (United States)

12424-83

Utilizing inverse design to create plasmonic waveguide devices

Author(s): Michael Efseaff, Kyle Wynne, Mark C. Harrison, Chapman Univ. (United States)

12424-84

Visible and near-Infrared photonic components library based on silicon nitride platform

Author(s): Raghi S. El Shamy, McMaster Univ. (Canada); Alaa Sultan, Mohamed A. Swillam, The American Univ. in Cairo (Egypt); Xun Li, McMaster Univ. (Canada)

12424-85

Integrated photonic slow light Michelson interferometer bio sensor

Author(s): Jianhao Shen, Daniel Donnelly, Swapnajit Chakravarty, Univ. of Dayton (United States)

12424-86

Fresnel zone plate metalens using silicon subwavelength gratings

Author(s): William Fraser, Winnie N. Ye, Carleton Univ. (Canada)

12424-87

FDTD simulation and analysis of the photonic crystal waveguide

Author(s): Yi-Hong Lee, Snow H. Tseng, National Taiwan Univ. (Taiwan)

12424-90

Optimized silicon antennas for optical phased arrays

Author(s): Henna Farheen, Andreas Strauch, J. Christoph Scheytt, Viktor Myroshnychenko, Jens Förstner, Univ. Paderborn (Germany)

12424-91

Tailoring the directive nature of optical waveguide antennas

Author(s): Henna Farheen, Univ. Paderborn (Germany); Lok-Yee Yan, Till Leuteritz, Siqi Qiao, Rheinische Friedrich-Wilhelms-Univ. Bonn (Germany); Florian Spreyer, Christian Schlickriede, Viktor Quiring, Christof Eigner, Christine Silberhorn, Thomas Zentgraf, Univ. Paderborn (Germany); Stefan Linden, Rheinische Friedrich-Wilhelms-Univ. Bonn (Germany); Viktor Myroshnychenko, Jens Förstner, Univ. Paderborn (Germany)

12424-93

Correction of phase errors in multimode interference couplers using rectangular surface relief grating

Author(s): Edyta Sroda, Andrzej Gawlik, Jacek Olszewski, Wacław Urbanczyk, Wrocław Univ. of Science and Technology (Poland)

12424-94

Silicon carbide photonic crystal optimized by artificial bee colony algorithm

Author(s): Gilliard N. Malheiros-Silveira, Univ. of Campinas (Brazil)

12424-95

Metamaterial cladding for bending loss reduction in silicon nitride waveguide

Author(s): Gilliard N. Malheiros-Silveira, Univ. of Campinas (Brazil)

12424-97

Monolithic integration of LED and two transistors fabricated on the p-GaN layer of a GaN LED epi wafer for micro-LED display

Author(s): Boseong Son, Huijin Kim, Young-Woong Lee, Si-Hyun Park, Yeungnam Univ. (Republic of Korea)

12424-98

Flexible polymer packaged high-Q WGM resonators for displacement detection

Author(s): Jie Liao, Washington Univ. in St. Louis (United States); Abraham Qavi, Washington Univ. School of Medicine in St. Louis (United States); Maxwell Adolphson, Lan Yang, Washington Univ. in St. Louis (United States)

12424-99

Production of dielectric filters with low defect levels for integrated optical devices

Author(s): Stephan Mingels, Navas Kutty, Bühler Alzenau GmbH (Germany); Klaas Tack, Dries Bangels, Elias Janssens, imec (Belgium); Harro Hagedorn, Bühler Alzenau GmbH (Germany)

12424-100

Silicon nitride hybrid-integrated diode laser at 637 nm

Author(s): Lisa Winkler, Univ. Twente (Netherlands), TOPTICA Photonics AG (Germany); Kirsten Gerritsma, Albert van Rees, Univ. Twente (Netherlands); Philip Schrinner, Marcel Hoekman, Ronald Dekker, LioniX International BV (Netherlands); Peter van der Slot, Univ. Twente (Netherlands); Christian Nölleke, TOPTICA Photonics AG (Germany); Klaus Boller, Univ. Twente (Netherlands)

12424-101

Numerical analysis of the propagation modes of photo-switching PDMS-arylazopyrazole optical waveguide and thin-film spectroscopic characterization

Author(s): Golsa Mirbagheri, Ikemefuna Uba, Kesete Ghebreyessus, Uwe Hömmerich, Hampton Univ. (United States); Seth Fraden, Michael Stehnach, Brandeis Univ. (United States); Demetris Geddis, Hampton Univ. (United States)

12424-102

Photonic packaging implications when driving superconducting electronics optically

Author(s): Giovanni Delrosso, Jaani Nissilä, Pranaav Selvasundaram, Matteo Cherchi, VTT Technical Research Ctr. of Finland Ltd. (Finland)

12424-103

Grism fabricated on the fiber-end face for coupling light into photonic integrated circuits

Author(s): Piotr Pala, Wrocław Univ. of Science and Technology (Poland); Andrea Szecht, Poznań Science and Technology Park (Poland); Katarzyna Komorowska, Tadeusz Martynkien, Wrocław Univ. of Science and Technology (Poland)

12424-105

Widely tunable C-band laser and module with nanosecond tuning and narrow linewidth

Author(s): Gaurav Jain, Pilot Photonics Ltd. (Ireland); Stefanos Andreou, SMART Photonics (Netherlands); Chris McGuinness, M. Deseada Gutierrez-Pascual, Pilot Photonics Ltd. (Ireland); Marcos Troncoso-Costas, Lakshmi Narayanan Venkatasubramani, Liam P. Barry, Dublin City University (Ireland); Luc Augustin, SMART Photonics (Netherlands); Frank Smyth, Shane Duggan, Pilot Photonics Ltd. (Ireland)

THURSDAY 2 FEBRUARY**SESSION 13: NOVEL FABRICATION TECHNOLOGIES**

2 February 2023 • 9:00 AM - 10:00 AM | Moscone Center, Room 304 (Level 3 South)

Session Chair: Florenta A. Costache, Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany)

12424-46 • 9:00 AM - 9:20 AM

Laser-based, on-chip fabrication of glass-based core-cladding waveguides

Author(s): Fabian Kranert, Laser Zentrum Hannover e.V. (Germany), Exzellenzcluster PhoenixD (Germany); Hussein Fawaz, Laser Zentrum Hannover e.V. (Germany); Moritz Hinkelmann, Jörg Neumann, Dietmar Kracht, Laser Zentrum Hannover e.V. (Germany), Exzellenzcluster PhoenixD (Germany)

12424-47 • 9:20 AM - 9:40 AM

Photonic wire bonding via two-photon polymerization laser lithography for hybrid integration

Author(s): Victoria Rosborough, Hannah Grant, Juergen Musolf, Henry Garrett, Jessica MacFarlane, Sabrina Wagner, Amal Shimamura, Gordon Morrison, Leif Johansson, Freedom Photonics, LLC (United States)

12424-48 • 9:40 AM - 10:00 AM

The effect of etched air cavities underneath the finite bottom oxide cladding of silicon nitride single-strip optical waveguides

Author(s): Sean F. Romanuik, Ramanand Tewari, L. Richard Williston, Kazem Zandi, One Silicon Chip Photonics (Canada)

Coffee Break 10:00 AM - 10:30 AM

SESSION 14: INTEGRATED OPTICAL SENSORS

2 February 2023 • 10:30 AM - 12:50 PM | Moscone Center, Room 304 (Level 3 South)

Session Chair: Romeo Bernini, Istituto per il Rilevamento Elettromagnetico dell'Ambiente (Italy)

12424-49 • 10:30 AM - 11:00 AM

Miniaturized photonic sensors based on micro-interferometers (Invited Paper)

Author(s): Claudio J. Oton, Stefano Faralli, Fabrizio Di Pasquale, Scuola Superiore Sant'Anna (Italy)

12424-50 • 11:00 AM - 11:30 AM

Spectral-domain optical coherence tomography on a silicon chip (Invited Paper)

Author(s): Imran Akca, Vrije Univ. Amsterdam (Netherlands); Steven Tan, Rapid Photonics (Netherlands)

12424-51 • 11:30 AM - 11:50 AM

The sensing application perspective on solutions based on integrated photonics

Author(s): Thijs van Leest, PhotonFirst International (Netherlands)

12424-52 • 11:50 AM - 12:10 PM

Sorting and sensing of dielectric microparticles by a multiphysics approach: integrated electro-opto-fluidic function for environmental application

Author(s): Mathilde Gardies, Davide Bucci, Elise Ghibaudo, IMEP-LAHC (France)

12424-53 • 12:10 PM - 12:30 PM

High performance and low cost polymeric Fabry-Perot resonators

Author(s): Genni Testa, Gianluca Persichetti, Romeo Bernini, Istituto per il Rilevamento Elettromagnetico dell'Ambiente, Consiglio Nazionale delle Ricerche (Italy)

12424-104 • 12:30 PM - 12:50 PM

Silicon nitride photonic biosensing platform for miRNAs biomarkers detection

Author(s): Florenta A. Costache, Ziyu Wang, Fraunhofer Institut für Photonische Mikrosysteme IPMS (Germany), Fraunhofer-Zentrum für Mikroelektronische und Optische Systeme für die Biomedizin MEOS (Germany); Meysam Namdari, Martin Blasl, Zhiqiu Lu, Fraunhofer Institut für Photonische Mikrosysteme IPMS (Germany); David Smith, Andreas Kölsch, Fraunhofer-Institut für Zelltherapie und Immunologie IZI (Germany); Juergen Hess, Fraunhofer-Zentrum für Mikroelektronische und Optische Systeme für die Biomedizin MEOS (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

Lunch/Exhibition Break 12:50 PM - 2:20 PM

SESSION 15: PLASMONICS

2 February 2023 • 2:20 PM - 3:00 PM | Moscone Center, Room 304 (Level 3 South)

Session Chair: Daniele Melati, Ctr. de Nanosciences et de Nanotechnologies (France)

12424-55 • 2:20 PM - 2:40 PM

Merging mid-IR QC technology with plasmonic interconnects: a monolithically integrated mid-infrared heterodyne receiver

Author(s): Mauro David, Georg Marschick, Elena Arigliani, Nikola Opacak, Dominik Koukola, Benedikt Schwarz, Gottfried Strasser, Borislav Hinkov, Technische Univ. Wien (Austria)

12424-56 • 2:40 PM - 3:00 PM

Plasmonic by design

Author(s): Arrigo Calzolari, Istituto Nanoscienze (Italy)

Conference 12424

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12424-71

Mid infrared polarization independent tapered waveguide based multianalyte sensor- a theoretical study

Author(s): Arpita Mishra, Indian Institute of Science, Bengaluru (India); Krishnakant Rana, National Institute of Technology, Warangal (India); Preetam Kumar, Srinivas Talabattula, Indian Institute of Science, Bengaluru (India)

12424-73

Reconfigurable resonator based on five times self-coupled photonic waveguide for versatile functionalities

Author(s): Fekadu Mihret Geremew, Preetam Kumar, Arpita Mishra, Srinivas Talabattula, Indian Institute of Science, Bengaluru (India)

12424-76

Polarization-independent dual-channel broadband wavelength demultiplexer design by inverse method

Author(s): Preetam Kumar, Arpita Mishra, Fekadu Mihret Geremew, E.S. Shivaleela, Srinivas Talabattula, Indian Institute of Science, Bengaluru (India)

12424-88

Long period waveguide grating filters on lithium niobate

Author(s): Ricky W. Chuang, Han-Lin Chen, Yu-Chun Chang, Yu-Shun Chiu, National Cheng Kung Univ. (Taiwan)

Conference 12425

Smart Photonic and Optoelectronic Integrated Circuits 2023

31 January - 2 February 2023 | Moscone Center, Room 312 (Level 3 South)

Conference Chairs: **Sailing He**, Zhejiang Univ. (China), KTH Royal Institute of Technology (Sweden); **Laurent Vivien**, Ctr. de Nanosciences et de Nanotechnologies (France)

Program Committee: **Timo Aalto**, VTT Technical Research Ctr. of Finland Ltd. (Finland); **Carlos A. Alonso-Ramos**, Ctr. de Nanosciences et de Nanotechnologies (France); **Pavel Cheben**, National Research Council Canada (Canada); **Ray T. Chen**, The Univ. of Texas at Austin (United States); **Jaime Gómez Rivas**, Technische Univ. Eindhoven (Netherlands); **Hugo Enrique Hernandez-Figueroa**, Univ. of Campinas (Brazil); **Chennupati Jagadish**, The Australian National Univ. (Australia); **Stefan A. Maier**, Imperial College London (United Kingdom); **Ashok Maliakal**, Acacia Communications, Inc. (United States); **Lorenzo Pavesi**, Univ. degli Studi di Trento (Italy); **David V. Plant**, McGill Univ. (Canada); **Ali Serpengüzel**, Koç Univ. (Turkey); **Bertrand Szelag**, CEA-LETI (France); **Augustine M. Urbas**, Air Force Research Lab. (United States); **Alan X. Wang**, Baylor Univ. (United States); **Jian Wang**, Huazhong Univ. of Science and Technology (China); **Qian Wang**, Huawei Technologies Co., Ltd. (China); **Lin Yang**, Institute of Semiconductors, Chinese Academy of Sciences (China); **Rui Q. Yang**, The Univ. of Oklahoma (United States)

TUESDAY 31 JANUARY

SESSION 1: NONLINEAR PHOTONIC STRUCTURES AND DEVICES

31 January 2023 • 8:30 AM - 10:30 AM | Moscone Center, Room 312 (Level 3 South)

Session Chair: Laurent Vivien, Ctr. de Nanosciences et de Nanotechnologies (France)

12425-1 • 8:30 AM - 9:15 AM

Advanced high-Q resonators for next-generation frequency microcombs (*Keynote Presentation*)

Author(s): Kerry J. Vahala, Zhiquan Yuan, Maodong Gao, QingXin Ji, Yan Yu, Leo Wu, Caltech (United States); Joel Guo, Univ. of California, Santa Barbara (United States); Mario J. Paniccia, Warren Jin, Anello Photonics, Inc. (United States); Heming Wang, John E. Bowers, Univ. of California, Santa Barbara (United States)

12425-2 • 9:15 AM - 9:30 AM

Supercontinuum generation in 800nm thick ultra-low loss silicon nitride waveguides

Author(s): Yijun Yang, Christian Lafforgue, Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France); Quentin Wilmart, CEA-LETI, Univ. Grenoble Alpes (France); Thibaut Sylvestre, FEMTO-ST, Univ. Bourgogne Franche-Comté, CNRS (France); Sylvain Guerber, CEA-LETI, Univ. Grenoble Alpes (France); Xavier Le Roux, Eric Cassan, Delphine Marris-Morini, Carlos Alonso-Ramos, Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France); Bertrand Szelag, CEA-LETI, Univ. Grenoble Alpes (France); Laurent Vivien, Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France)

12425-3 • 9:30 AM - 10:00 AM

Nonlinear optical functions in silicon nitride integrated photonics (*Invited Paper*)

Author(s): Camille-Sophie Brès, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12425-4 • 10:00 AM - 10:30 AM

Morphology changes during destruction of plasmonic nanoantennas at highly efficient THG generation (*Invited Paper*)

Author(s): Harald Giessen, Univ. Stuttgart (Germany)

Coffee Break 10:30 AM - 11:00 AM

SESSION 2: PHOTON-PHONON INTERACTION

31 January 2023 • 11:00 AM - 12:30 PM | Moscone Center, Room 312 (Level 3 South)

Session Chair: Laurent Vivien, Ctr. de Nanosciences et de Nanotechnologies (France)

12425-6 • 11:00 AM - 11:30 AM

Subwavelength silicon nanostructuring for nonlinear and optomechanic applications (*Invited Paper*)

Author(s): Thi Thuy Duong Dinh, Jianhao Zhang, Paula Nuño Ruano, David González-Andrade, Xavier Le Roux, Miguel Montesinos Ballester, Christian Lafforgue, David Medina Quiroz, Ctr. de Nanosciences et de Nanotechnologies (France); Daniel Benedikovic, Univ. of Žilina (Slovakia); Pavel Cheben, National Research Council Canada (Canada); David Bouville, Norberto Daniel Lanzillotti Kimura, Delphine Marris-Morini, Eric Cassan, Laurent Vivien, Carlos Alonso Ramos, Ctr. de Nanosciences et de Nanotechnologies (France)

12425-5 • 11:30 AM - 12:00 PM

New routes for light and sound interaction in nanophotonic cavities (*Invited Paper*)

Author(s): Gustavo Wiederhecker, Thiago Alegre, Univ. of Campinas (Brazil)

12425-7 • 12:00 PM - 12:30 PM

All-optical processing of microwave signals using cavity optomechanics (*Invited Paper*)

Author(s): Laura Mercadé Morales, Alejandro Martínez, Univ. Politècnica de València (Spain)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

SESSION 3: QUANTUM PHOTONIC DEVICES

31 January 2023 • 2:00 PM - 2:30 PM | Moscone Center, Room 312 (Level 3 South)

Session Chair: Bertrand Szelag, CEA-LETI (France)

12425-8 • 2:00 PM - 2:30 PM

Building a quantum-grade integrated photonics platform to address the technological challenges of quantum communications and computing (*Invited Paper*)

Author(s): Ségolène Olivier, CEA-LETI-DOPT (France)

Conference 12425

SESSION 4: PASSIVE PHOTONIC DEVICES AND CIRCUITS

31 January 2023 • 2:30 PM - 3:30 PM | Moscone Center, Room 312 (Level 3 South)

Session Chair: Bertrand Szlag, CEA-LETI (France)

12425-14 • 2:30 PM - 2:45 PM

Integrated-optic chromatic dispersion compensator composed of arrayed-waveguide gratings and delay lines

Author(s): Koichi Takiguchi, Ritsumeikan Univ. (Japan)

12425-15 • 2:45 PM - 3:15 PM

Low loss SiN photonic integrated circuits: from prototype to volume *(Invited Paper)*

Author(s): Michael Geiselmann, LiGenTec SA (Switzerland)

12425-16 • 3:15 PM - 3:30 PM

Silicon photonics micro-ring resonator-based SR latch for optical memory applications

Author(s): Dinmukhamedali Otyshy, Nazym Alipbayeva, Assylkhan Nurgali, Nazarbayev Univ. (Kazakhstan); Bikash Nakarmi, Nanjing Univ. of Aeronautics and Astronautics (China); Ikechi Augustine Ukaegbu, Nazarbayev Univ. (Kazakhstan)

Coffee Break 3:30 PM - 4:00 PM

SESSION 5: SUB-WAVELENGTH STRUCTURES AND METAMATERIALS

31 January 2023 • 4:00 PM - 6:00 PM | Moscone Center, Room 312 (Level 3 South)

Session Chair: Carlos Alonso-Ramos, Ctr. de Nanosciences et de Nanotechnologies (France)

12425-10 • 4:00 PM - 4:30 PM

Physics of resonant optical lattices: experimental leaky bands and symmetry-blocked radiant channels modeled by Rytov's formalism *(Invited Paper)*

Author(s): Robert Magnusson, Nasrin Razmjooei, Hafez Hemmati, Yeong Hwan Ko, The Univ. of Texas at Arlington (United States)

12425-11 • 4:30 PM - 5:00 PM

Subwavelength metamaterial devices with optimization and machine learning *(Invited Paper)*

Author(s): Daniele Melati, Zindine Mokkedem, Paula Nuño Ruano, Eric Cassan, Delphine Marris-Morini, Laurent Vivien, Carlos Alonso-Ramos, Ctr. de Nanosciences et de Nanotechnologies (France); Yuri Grinberg, Muhammad Al-Digeil, Dan-Xia Xu, Mazyar Milanizadeh, Jianhao Zhang, Jens H. Schmid, Pavel Cheben, National Research Council Canada (Canada); Shahrzad Khajavi, Winnie N. Ye, Carleton Univ. (Canada); Abi Waqas, Mehran Univ. of Engineering & Technology (Pakistan); Paolo Manfredi, Politecnico di Torino (Italy)

12425-12 • 5:00 PM - 5:30 PM

Controlling light with advanced subwavelength grating metamaterial topologies *(Invited Paper)*

Author(s): José Manuel Luque-González, Robert Halir, Alejandro Sánchez-Postigo, J. Gonzalo Wangüemert-Pérez, Univ. de Málaga (Spain); Pavel Cheben, Jens H. Schmid, National Research Council Canada (Canada); Aitor V. Velasco, Instituto de Óptica "Daza de Valdés", Consejo Superior de Investigaciones Científicas (Spain); Íñigo Molina-Fernández, Alejandro Ortega-Moñux, Univ. de Málaga (Spain)

12425-13 • 5:30 PM - 6:00 PM

Silicon photonic mode multiplexers based on subwavelength metamaterials and on-chip beamforming *(Invited Paper)*

Author(s): David González-Andrade, Ctr. de Nanosciences et de Nanotechnologies (France); Raquel Fernández de Cabo, Instituto de Óptica "Daza de Valdés", Consejo Superior de Investigaciones Científicas (Spain); Jaime Vilas, Alcyon Photonics S.L. (Spain); Thi Thuy Duong Dinh, Ctr. de Nanosciences et de Nanotechnologies (France); José Manuel Luque-González, Telecommunication Research Institute, Univ. de Málaga (Spain); Dorian Oser, QuTech, Kavli Institute of Nanoscience, Technische Univ. Delft (Netherlands); Guy Aubin, Farah Amar, Ctr. de Nanosciences et de Nanotechnologies (France); Diego Pérez-Galacho, ITEAM Research Institute, Univ. Politècnica de València (Spain); Irene Olivares, Antonio Dias, Alcyon Photonics S.L. (Spain); Robert Halir, Alejandro Ortega-Moñux, J. Gonzalo Wangüemert-Pérez, Íñigo Molina-Fernández, Telecommunication Research Institute, Univ. de Málaga (Spain); Eric Cassan, Delphine Marris-Morini, Ctr. de Nanosciences et de Nanotechnologies (France); Pavel Cheben, National Research Council Canada (Canada); Laurent Vivien, Ctr. de Nanosciences et de Nanotechnologies (France); Aitor V. Velasco, Instituto de Óptica "Daza de Valdés" (Spain); Carlos Alonso-Ramos, Ctr. de Nanosciences et de Nanotechnologies (France)

WEDNESDAY 1 FEBRUARY

SESSION 6: METASURFACES

1 February 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 312 (Level 3 South)

Session Chair: Daniele Melati, Ctr. de Nanosciences et de Nanotechnologies (France)

12425-17 • 8:00 AM - 8:30 AM

Advanced computational framework for the design of ultimate performance metasurfaces *(Invited Paper)*

Author(s): Mahmoud Elsayy, Alexis Gobé, Guillaume Leroy, Stéphane Lanteri, Institut National de Recherche en Informatique et en Automatique, Lab. Jean Alexandre Dieudonné, Univ. Côte d'Azur, CNRS (France); Patrice Genevet, CRHEA, Univ. Côte d'Azur, CNRS (France)

12425-20 • 8:30 AM - 9:00 AM

Metasurfaces for spatial division multiplexing *(Invited Paper)*

Author(s): Paulo C. Dainese, Corning Incorporated (United States)

12425-19 • 9:00 AM - 9:30 AM

Merging bound states in the continuum and van der Waals materials for hybrid nanophotonic devices *(Invited Paper)*

Author(s): Andreas Tittl, Ludwig-Maximilians-Univ. München (Germany)

12425-18 • 9:30 AM - 10:00 AM

Deep-learning enabled design of the flow of light in complex nanophotonic devices *(Invited Paper)*

Author(s): Otto L. Muskens, Tom Radford, Nicholas Dinsdale, Univ. of Southampton (United Kingdom); Peter Wiecha, Lab. d'Analyse et d'Architecture des Systèmes du CNRS (France); Alberto Politi, Univ. of Southampton (United Kingdom)

Coffee Break 10:00 AM - 10:30 AM

SESSION 7: NIR AND MIR PHOTONIC DEVICES

1 February 2023 • 10:30 AM - 12:30 PM | Moscone Center, Room 312 (Level 3 South)

Session Chair: Ashok Maliakal, Acacia Communications, Inc. (United States)

12425-21 • 10:30 AM - 11:00 AM

Monolithic mid-infrared GeSn photodetectors on silicon *(Invited Paper)*

Author(s): Oussama Moutanabbir, Polytechnique Montréal (Canada)

12425-22 • 11:00 AM - 11:30 AM

Nanophotonics-enabled mid-infrared microspectrometers for chemical identification and related topics *(Invited Paper)*

Author(s): Kenneth B. Crozier, The Univ. of Melbourne (Australia)

12425-23 • 11:30 AM - 12:00 PM

Antimonide-based linear mode avalanche photodiodes for Lidar applications *(Invited Paper)*

Author(s): Sanjay Krishna, The Ohio State Univ. (United States)

12425-24 • 12:00 PM - 12:30 PM

Towards compact fire infrared radiance spectral tracker (c-FIRST) *(Invited Paper)*

Author(s): Sarath D. Gunapala, David Ting, William Johnson, Alexander Soibel, Perry Ramsey, Olga Kalashnikova, Michael Garay, Ashley Davies, Yuki Maruyama, Jet Propulsion Lab. (United States); Jessica Fisher, University of Michigan (United States); Ashok Sood, John Zeller, Magnolia Optical Technologies, Inc. (United States); Christopher David, Anduril Industries (United States); Sachidananda Babu, Parminder Ghuman, NASA Earth Science Technology Office (United States)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

SESSION 8: OPTICAL PHASED ARRAY - LIDAR

1 February 2023 • 2:00 PM - 3:45 PM | Moscone Center, Room 312 (Level 3 South)

Session Chair: Bertrand Szlag, CEA-LETI (France)

12425-25 • 2:00 PM - 2:30 PM

FMCW chip-scale LiDARs for safer and smarter mobility of people and goods *(Invited Paper)*

Author(s): François Simoens, Cyrille Barrera, Matthias Colard, Dominique Cluzeau, Jérôme Meilhan, SteerLight (France)

12425-26 • 2:30 PM - 3:00 PM

Integrated silicon photonic optical phased arrays with large beam steering and high resolution *(Invited Paper)*

Author(s): Winnie N. Ye, Carleton Univ. (Canada); Daniel Benedikovic, Carleton Univ. (Canada); Univ. of Žilina (Slovakia); Qiankun Liu, Shahrzad Khajavi, Carleton Univ. (Canada); Daniele Melati, Univ. Paris-Saclay (France); Pavel Cheben, National Research Council Canada (Canada); Tom Smy, Carleton Univ. (Canada); Ahmad Atieh, Optiwave Systems Inc. (Canada); Alejandro Sánchez-Postigo, Univ. de Málaga (Spain); Jens H. Schmid, Dan-Xia Xu, National Research Council Canada (Canada); Xiaochen Xin, Carleton Univ. (Canada)

12425-28 • 3:00 PM - 3:15 PM

Array design using rotational symmetry for high performance optical phased arrays

Author(s): Ilyas Kandid, Winnie N. Ye, Carleton Univ. (Canada)

12425-29 • 3:15 PM - 3:45 PM

Design and analysis of on-chip optical phase array systems for satellite communications *(Invited Paper)*

Author(s): Hugh Podmore, Honeywell Aerospace (Canada); Akash Chauhan, York Univ. (Canada); Brett Poulsen, Michael Zylstra, Western Univ. (Canada); Xiaochen Xin, Carleton Univ. (Canada); Mackenzie Essington, Western Univ. (Canada); Ahmed Y. Elsharabasy, Univ. of Toronto (Canada); M. Ruhul Fatin, Carleton Univ. (Canada); Nicholas Zonta, York Univ. (Canada); Greg Iu, Univ. of Toronto (Canada); Alan Scott, Tamara Djokic, Honeywell Aerospace (Canada); Jayshri Sabarinathan, Western Univ. (Canada); Winnie N. Ye, Carleton Univ. (Canada); Amr S. Helmy, Univ. of Toronto (Canada); Regina Lee, York Univ. (Canada)

Coffee Break 3:45 PM - 4:15 PM

SESSION 9: ADVANCED CHARACTERIZATION TECHNIQUES

1 February 2023 • 4:15 PM - 5:15 PM | Moscone Center, Room 312 (Level 3 South)

Session Chair: Winnie N. Ye, Carleton Univ. (Canada)

12425-30 • 4:15 PM - 4:45 PM

Spatial tomography of light resolved in time, spectrum, and polarization *(Invited Paper)*

Author(s): Martin Ploschner, Marcos M. Morote, Daniel S. Dahl, Mickael Mounaix, The Univ. of Queensland (Australia); Greta Light, II-VI Incorporated (United States); Aleksandar D. Rakic, Joel Carpenter, The Univ. of Queensland (Australia)

12425-313 • 4:45 PM - 5:15 PM

CANCELED: Measuring photoexcited carrier dynamics on the nanoscale using microwave near-field microscopy *(Invited Paper)*

Author(s): Samuel Berweger, Pavel Kabos, Thomas M. Wallis, National Institute of Standards and Technology (United States)

SESSION 10: OPTICAL INTERCONNECTS AND COMMUNICATIONS

1 February 2023 • 5:15 PM - 6:15 PM | Moscone Center, Room 312 (Level 3 South)

Session Chair: Laurent Vivien, Ctr. de Nanosciences et de Nanotechnologies (France)

12425-32 • 5:15 PM - 5:45 PM

Silicon integrated devices for on-chip multi-mode interconnects *(Invited Paper)*

Author(s): Yaocheng Shi, Zhejiang Univ. (China)

12425-33 • 5:45 PM - 6:15 PM

Using spatial modes for optical communications *(Invited Paper)*

Author(s): Nicolas K. Fontaine, Nokia Bell Labs. (United States)

Conference 12425

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12425-27

Optimization and modeling for optical phased array

Author(s): Lei Yuan, Winnie Ye, Carleton Univ. (Canada)

12425-49

RF circuit design using Millimeter Wave Photonic CMOSFETs for nonlinear optical computing, modeling, and simulation

Author(s): James N. Pan, Northrop Grumman Corp. (United States), American Enterprise and License Co. (United States)

12425-50

A fully numerical method for designing efficient adiabatic mode evolution structures with ultra-broad optical bandwidth and high fabrication tolerance applicable to smart, arbitrarily complex 3D integrated photonic device structures including plasmonic devices

Author(s): Seng-Tiong Ho, Northwestern Univ. (United States); Tu-Lu Liang, Nantong Univ. (China); Max Huang, Yongming Tu, Xi Chen, Northwestern Univ. (United States); Yingyan Huang, OptoNet, Inc. (United States); Qiang Bai, Yaying Zhao, Junchi Zhang, Yutong Yuan, Northwestern Univ. (United States); Junyu Li, Huazhong Univ. of Science and Technology (United States); Fei Yi, Huazhong Univ. of Science and Technology (China); Wei Shao, Univ. of Electronic Science and Technology of China (China)

12425-51

Automated calibration of MZI-based Si optical switch matrix

Author(s): Hyun-Kyu Kim, Yongjin Ji, Min-Hyeok Seong, Kihun Kim, Woo-Young Choi, Yonsei Univ. (Republic of Korea)

12425-52

Whispering gallery modes of a triatomic photonic molecule

Author(s): Vladimir Shuvayev, Queens College (United States); Stanislav Kreps, Technion-Israel Institute of Technology (Israel); Tal Carmon, Tel Aviv Univ. (Israel); Lev I. Deych, Queens College (United States)

THURSDAY 2 FEBRUARY

SESSION 11: INTEGRATED OPTICAL SENSORS

2 February 2023 • 8:30 AM - 9:30 AM | Moscone Center, Room 312 (Level 3 South)

Session Chair: Ashok Maliakal, Acacia Communications, Inc. (United States)

12425-34 • 8:30 AM - 9:00 AM

Plasmonic solid-state nanopores: toward single-molecule protein and DNA identification (*Invited Paper*)

Author(s): Francesco De Angelis, Istituto Italiano di Tecnologia (Italy)

Conference 12426

Silicon Photonics XVIII

30 January - 1 February 2023 | Moscone Center, Room 301 (Level 3 South)

Conference Chairs: **Graham T. Reed**, Optoelectronics Research Ctr. (United Kingdom); **Andrew P. Knights**, McMaster Univ. (Canada)

Program Committee: **Delphine Marris-Morini**, Ctr. de Nanosciences et de Nanotechnologies (France); **Goran Z. Mashanovich**, Univ. of Southampton (United Kingdom); **Jurgen Michel**, Massachusetts Institute of Technology (United States); **Liam O'Faolain**, Munster Technological Univ. (Ireland); **Jason Ching Eng Png**, A*STAR Institute of High Performance Computing (Singapore); **Andrew W. Poon**, Hong Kong Univ. of Science and Technology (Hong Kong, China); **Haisheng Rong**, Intel Corp. (United States); **Bhavin J. Shastri**, Queen's Univ. (Canada); **Dries Van Thourhout**, Univ. Gent (Belgium); **Laurent Vivien**, Ctr. de Nanosciences et de Nanotechnologies (France); **Jeremy Witzens**, RWTH Aachen Univ. (Germany); **Winnie N. Ye**, Carleton Univ. (Canada); **Shui-Qing Yu**, Univ. of Arkansas (United States); **Zhiping Zhou**, Peking Univ. (China); **Aaron J. Zilkie**, Rockley Photonics (United States)

MONDAY 30 JANUARY

OPTO PLENARY SESSION

30 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 207/215 (Level 2 South)

8:00 AM - 8:05 AM: **Welcome and Opening Remarks**
Sonia García-Blanco, Univ. Twente (Netherlands) and Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

8:05 AM - 8:15 AM: **Announcement of the OPTO AI/ML and Net Zero Best Paper Awards**

12424-501 • 8:15 AM - 8:50 AM

High-performance electronic-photonic interfaces: from AI to quantum (*Plenary Presentation*)

Author(s): Rajeev Ram, Massachusetts Institute of Technology (United States)

12416-501 • 8:50 AM - 9:25 AM

Tandem photovoltaic devices: more than one way to make a solar cell (*Plenary Presentation*)

Author(s): Emily L. Warren, National Renewable Energy Lab. (United States)

12421-501 • 9:25 AM - 10:00 AM

Are III-nitride semiconductors also suitable for red emission? (*Plenary Presentation*)

Author(s): Nicolas Grandjean, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 1: OPTICAL COMPUTING AND OPTICAL PROCESSING

30 January 2023 • 10:50 AM - 12:10 PM | Moscone Center, Room 301 (Level 3 South)

Session Chair: Graham T. Reed, Optoelectronics Research Ctr. (United Kingdom)

12426-1 • 10:50 AM - 11:20 AM

Scaling programmable silicon photonics circuits (*Invited Paper*)

Author(s): Wim Bogaerts, K.P. Nagarjun, Lukas Van Iseghem, Xiangfeng Chen, Hong Deng, Iman Zand, Yu Zhang, Yichen Liu, Univ. Gent, imec (Belgium); Alain Yuji Takabayashi, Hamed Sattari, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Pierre Edinger, Gaehun Jo, Simon Bleiker, Kristinn B. Gylfason, Frank Niklaus, KTH Royal Institute of Technology (Sweden); Arun Kumar Mallik, Moises Jezzini, Cleitus Antony, Giuseppe Talli, Tyndall National Institute (Ireland); Peter Verheyen, imec (Belgium); Jeroen Beeckman, Univ. Gent (Belgium); Umar Khan, Univ. Gent, imec (Belgium)

12426-2 • 11:20 AM - 11:50 AM

Scalable architectures for CMOS and telecom-compatible quantum information processing (*Invited Paper*)

Author(s): Nicola Montaut, Piotr Roztock, Hao Yu, Mario Chemnitz, Stefania Sciara, Institut National de la Recherche Scientifique (Canada); Yoann Jestin, Ki3 Photonics Technologies Inc. (Canada); Benjamin MacLellan, Bennet Fischer, Institut National de la Recherche Scientifique (Canada); Michael Kues, Leibniz Univ. Hannover (Germany); Christian Reimer, Hyperlight Corp. (United States); Luis R. Cortes, Institut National de la Recherche Scientifique (Canada); Benjamin Wetzel, Univ. de Limoges (France); Yanbing Zhang, Institut National de la Recherche Scientifique (Canada); Sébastien Loranger, Raman Kashyap, Polytechnique Montréal (Canada); Alfonso C. Cino, Univ. degli Studi di Palermo (Italy); Sai T. Chu, City Univ. of Hong Kong (China); Brent E. Little, Chinese Academy of Sciences (China); David J. Moss, Swinburne Univ. of Technology (Australia); Lucia Caspani, Univ. of Strathclyde (United Kingdom); William J. Munro, NTT Basic Research Labs. (Japan); Jose Azana, Roberto Morandotti, Institut National de la Recherche Scientifique (Canada)

12426-3 • 11:50 AM - 12:10 PM

An integrated millimeter-wave and photonic system-on-chip solution with extended ft and fmax: Can optoelectronic RF CMOS completely replace silicon photonics?

Author(s): James N. Pan, Northrop Grumman Corp. (United States), American Enterprise and License Co. (United States)

Lunch Break 12:10 PM - 1:40 PM

Conference 12426

SESSION 2: QUANTUM PHOTONICS AND NANO-SCALE PROCESSING

30 January 2023 • 1:40 PM - 3:00 PM | Moscone Center, Room 301 (Level 3 South)

Session Chair: Wim Bogaerts, Univ. Gent (Belgium)

12426-4 • 1:40 PM - 2:10 PM

Computational, photonic crossbar arrays for scalable and efficient matrix operations *(Invited Paper)*

Author(s): Nathan Youngblood, Vivswan Shah, Sadra Rahimi Kari, Univ. of Pittsburgh (United States)

12426-6 • 2:10 PM - 2:40 PM

CANCELED: Integrated photonic neural networks for optical information processing *(Invited Paper)*

Author(s): Chaoran Huang, Benshan Wang, Dongliang Wang, The Chinese Univ. of Hong Kong (Hong Kong, China); Weipeng Zhang, Thomas Ferreira De Lima, Princeton Univ. (United States); Bhavin Shastri, Queen's Univ. (Canada); Paul Prucnal, Princeton Univ. (United States)

12426-7 • 2:40 PM - 3:00 PM

Hysteretic scattering-based, super-resolution mapping of silicon nanostructures

Author(s): Po-Hsueh Tseng, National Taiwan Univ. (Taiwan); Kentaro Nishida, Pang-Han Wu, Yu-Lung Tang, Yu-Chieh Chen, National Taiwan Univ. (Taiwan); Chi-Yin Yang, Jhen-Hong Yang, Wei-Ruei Chen, National Yang Ming Chiao Tung Univ. (Taiwan); Mihail Petrov, ITMO Univ. (Russian Federation); Kuo-Ping Chen, National Yang Ming Chiao Tung Univ. (Taiwan); Shi-Wei Chu, National Taiwan Univ. (Taiwan)

Coffee Break 3:00 PM - 3:30 PM

SESSION 3: WAVEGUIDE DESIGN AND APPLICATIONS I

30 January 2023 • 3:30 PM - 5:00 PM | Moscone Center, Room 301 (Level 3 South)

Session Chair: Andrew P. Knights, McMaster Univ. (Canada)

12426-8 • 3:30 PM - 4:00 PM

Deep learning discovery of silicon photonic components *(Invited Paper)*

Author(s): Alagappan Gandhi, Ching Eng Png, Thomas Ang, A*STAR Institute of High Performance Computing (Singapore)

12426-9 • 4:00 PM - 4:20 PM

Tapered MMI splitters with unconstrained splitting ratio on a thick SOI platform

Author(s): Matteo Cherchi, Mikko Harjanne, Katherine Bryant, Fei Sun, Päivi Heimälä, Timo Aalto, VTT Technical Research Ctr. of Finland Ltd. (Finland)

12426-11 • 4:20 PM - 4:40 PM

Design of MMI-based 1x4 power splitters with optimized parabolic input and output ports on SOI platform

Author(s): Seokjin Hong, Jinhyeong Yoon, Junhyeong Kim, Jaeyong Kim, Berkay Neseli, Hyeonho Yoon, Hyo-Hoon Park, Hamza Kurt, KAIST (Republic of Korea)

12426-12 • 4:40 PM - 5:00 PM

Silicon photonics packaging using engineered scattering elements

Author(s): Tyler V. Howard, Thomas G. Brown, Univ. of Rochester (United States)

TUESDAY 31 JANUARY

SESSION 4: ACTIVE DEVICE INTEGRATION I

31 January 2023 • 8:40 AM - 10:10 AM | Moscone Center, Room 301 (Level 3 South)

Session Chair: Andrew P. Knights, McMaster Univ. (Canada)

12426-13 • 8:40 AM - 9:10 AM

GeSnOI technology enabling room temperature lasing with GeSn alloys *(Invited Paper)*

Author(s): Moustafa El Kurdi, Andjelika Bjelajac, Maksym Gromovyi, Emilie Sakat, Ctr. de Nanosciences et de Nanotechnologies (France); Zoran Ikonc, Univ. of Leeds (United Kingdom); Vincent Reboud, Alexei Chelnokov, Nicolas Pauc, Vincent Calvo, Jean-Michel Hartmann, CEA (France); Dan Buca, Forschungszentrum Jülich GmbH (Germany)

12426-14 • 9:10 AM - 9:30 AM

Monolithic integration of InAs-based quantum cascade lasers on germanium

Author(s): Kumar Kinjalk, Institut d'Électronique et des Systèmes, Univ. de Montpellier, CNRS (France); Audrey Gilbert, Andres Remis, Institut d'Électronique et des Systèmes, Univ. de Montpellier, CNRS (France); Zeineb Lohmari, mirSense (France); Laurent Cerutti, Michael Bahriz, Institut d'Électronique et des Systèmes, Univ. de Montpellier, CNRS (France); Roland Teissier, mirSense (France); Alexei Baranov, Jean-Baptiste Rodriguez, Eric Tournié, Institut d'Électronique et des Systèmes, Univ. de Montpellier, CNRS (France)

12426-15 • 9:30 AM - 9:50 AM

Radiation-hardened silicon photonic modulators for detector readout

Author(s): Evan Chansky, Aaron Maharry, Univ. of California, Santa Barbara (United States); Thomas Dorch, Steven Estrella, Freedom Photonics, LLC (United States); Maurice Garcia-Sciveres, Lawrence Berkeley National Lab. (United States); Clint Schow, Univ. of California, Santa Barbara (United States)

12426-16 • 9:50 AM - 10:10 AM

10 m in-door high accuracy distance measurement using Si optical phased array for LiDAR application

Author(s): Jinhyeong Yoon, Hyeonho Yoon, Jaeyong Kim, Junhyeong Kim, Namhyun Kwon, Seokjin Hong, Hamza Kurt, Hyo-Hoon Park, KAIST (Republic of Korea)

Coffee Break 10:10 AM - 10:40 AM

SESSION 5: ACTIVE DEVICE INTEGRATION II

31 January 2023 • 10:40 AM - 12:10 PM | Moscone Center, Room 301 (Level 3 South)

Session Chairs: Jason Ching Eng Png, A*STAR Institute of High Performance Computing (Singapore), Ching Eng Png, A*STAR Institute of High Performance Computing (Singapore)

12426-17 • 10:40 AM - 11:10 AM

Butt-coupled mid-IR diode lasers grown on patterned Si photonic wafers *(Invited Paper)*

Author(s): Andres Remis, Univ. de Montpellier (France); Michele Paparella, Univ. de Montpellier (France), Polytechnic Univ. of Bari (Italy); Laura Monge-Bartolome, Audrey Gilbert, Marta Rio-Calvo, Guilhem Boissier, Univ. de Montpellier (France); Marco Grande, Politecnico di Bari (Italy); Laurent Cerutti, Univ. de Montpellier (France); Liam O'Faolain, Munster Technological Univ. (Ireland), Tyndall National Institute (Ireland); Jean-Baptiste Rodriguez, Eric Tournié, Univ. de Montpellier (France)

12426-19 • 11:10 AM - 11:30 AM

Hybrid laser integration in the mid-IR for silicon photonics sensing applications

Author(s): Colin J. Mitchell, Ahmed Osman, Ke Li, Jordi S. Panades, Milos Nedeljkovic, Univ. of Southampton (United Kingdom); Longqi Zhou, Kristian M. Groom, Jon Heffernan, The Univ. of Sheffield (United Kingdom); Goran Z. Mashanovich, Univ. of Southampton (United Kingdom)

12426-20 • 11:30 AM - 11:50 AM

Monolithic silicon avalanche photodetector utilizing surface state defects operating at 1550 nm

Author(s): Yuxuan Gao, Feng Guo, Peter Mascher, Andrew P. Knights, McMaster Univ. (Canada)

12426-49 • 11:50 AM - 12:10 PM

First O-band silicon coherent transmitter with integrated hybrid tunable laser and SOAs

Author(s): Junqian Liu, Aaron Maharry, Aaron Wissing, Hector Andrade, Stephen M. Misak, Univ. of California, Santa Barbara (United States); Giovanni Gilardi, Sean Liao, Ansheng Liu, Yuliya Akulova, Intel Corp. (United States); Larry A. Coldren, James F. Buckwalter, Clint L. Schow, Univ. of California, Santa Barbara (United States)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

SESSION 6: DEVICES USING EMERGING MATERIALS AND NOVEL PROCESSES

31 January 2023 • 1:40 PM - 3:10 PM | Moscone Center, Room 301 (Level 3 South)

Session Chair: Milos Nedeljkovic, Univ. of Southampton (United Kingdom)

12426-21 • 1:40 PM - 2:10 PM

Study of SiGeSn quantum well for photonics integrated circuits *(Invited Paper)*

Author(s): Oluwatobi Olorunsola, Abdulla Said, Solomon Ojo, Hryhorii Stanchu, Grey Abernathy, Sylvester Amoah, Samir Saha, Emmanuel Wangila, Joshua Grant, Sudip Acharya, Univ. of Arkansas (United States); Guo-En Chang, Yue-Tong Jheng, National Chung Cheng Univ. (Taiwan); Baohua Li, Arktonics, LLC (United States); Gregory Salamo, Shui-Qing Yu, Wei Du, Univ. of Arkansas (United States)

12426-22 • 2:10 PM - 2:30 PM

Ultra-large nonlinearity of silicon nanostructure excited via a super-continuum pulsed laser

Author(s): Te-Hsin Yen, Yu-Chieh Chen, Jhih-Jia Chen, National Taiwan Univ. (Taiwan); Junichi Takahara, Osaka Univ. (Japan); Shi-Wei Chu, Molecular Imaging Ctr., National Taiwan Univ. (Taiwan), Brain Research Ctr., National Tsing Hua Univ. (Taiwan)

12426-23 • 2:30 PM - 2:50 PM

Silicon optomechanical waveguide based on subwavelength engineering of photons and phonons

Author(s): Paula Nuño Ruano, Ctr. de Nanosciences et de Nanotechnologies (France); Jianhao Zhang, Ctr. de Nanosciences et de Nanotechnologies (France), National Research Council Canada (Canada); Xavier Le Roux, David González-Andrade, Eric Cassan, Ctr. de Nanosciences et de Nanotechnologies (France); Delphine Maris-Morini, Ctr. National de la Recherche Scientifique (France); Laurent Vivien, Norberto Daniel Lanzillotti-Kimura, Carlos Alonso-Ramos, Ctr. de Nanosciences et de Nanotechnologies (France)

12426-24 • 2:50 PM - 3:10 PM

Fabrication of silicon nanowire (SiNWs) with nanosphere lithography to manipulate their optical, electrical, and mechanical properties

Author(s): Amira Ahmed, Amany Khalifa, Ahmed Kreta, Muhammad A. Othman, Mohamed A. Swillam, The American Univ. in Cairo (Egypt)

Coffee Break 3:10 PM - 3:40 PM

SESSION 7: INTEGRATED SENSORS

31 January 2023 • 3:40 PM - 5:50 PM | Moscone Center, Room 301 (Level 3 South)

Session Chair: Wei Du, University of Arkansas (United States)

12426-25 • 3:40 PM - 4:10 PM

Building a platform for mid-infrared photonic sensors *(Invited Paper)*

Author(s): Anuradha M. Agarwal, Massachusetts Institute of Technology (United States)

12426-26 • 4:10 PM - 4:30 PM

Mid-infrared SOI waveguide thermo-optic Fourier-transform spectrometer

Author(s): Chen Wei, Han Du, Xingzhao Yan, Dhen T. Tran, Yangbo Wu, Goran Z. Mashanovich, Milos Nedeljkovic, Univ. of Southampton (United Kingdom)

12426-27 • 4:30 PM - 4:50 PM

A fully packaged silicon photonic Bragg grating temperature sensor with a compact back side interface based on a ball lens

Author(s): Jeroen Missinne, Viktor Geudens, Steven Van Put, Univ. Gent, imec (Belgium); Giannis Pouloupoulos, National Technical Univ. of Athens (Greece); Michal Szaj, Argotech a.s. (Czech Republic); George Syriopoulos, Charalampos Zervos, Hercules Avramopoulos, National Technical Univ. of Athens (Greece); Geert Van Steenberge, Univ. Gent, imec (Belgium)

Conference 12426

12426-28 • 4:50 PM - 5:10 PM

Improving tuberculosis treatment using mid-infrared spectroscopy for bedside therapeutic drug monitoring

Author(s): David J. Rowe, Univ. of Southampton (United Kingdom); Daniel R. Owens, Univ. of Southampton (United Kingdom), Univ. Hospital Southampton NHS Foundation Trust (United Kingdom); Milos Nedeljkovic, Callum J. Stirling, Univ. of Southampton (United Kingdom); Katrina Cathie, Univ. Hospital Southampton NHS Foundation Trust (United Kingdom); Suzanne L. Parker, The Univ. of Queensland (Australia); Saul N. Faust, Univ. of Southampton (United Kingdom), Univ. Hospital Southampton NHS Foundation Trust (United Kingdom); Goran Z. Mashanovich, James S. Wilkinson, Univ. of Southampton (United Kingdom)

12426-29 • 5:10 PM - 5:30 PM

On-chip CO₂ sensor integrated with MEMS emitter and pyroelectric detector

Author(s): Hong Cai, Md Hazwani Khairy, Rachel Ang, Linfang Xu, Doris Ng, Nanxi Li, Zhonghua Gu, Anmin Kong, Weiguo Chen, Wen Wei Seit, Eva Wai Leong Ching, Norhanani Jaafar, Huanhuan Wang, Landobasa Y.M. Tobing, Leh Woon Lim, Qingxin Zhang, Lennon Yao Ting Lee, A*STAR Institute of Microelectronics (Singapore)

12426-30 • 5:30 PM - 5:50 PM

Ge-on-Si waveguide device for self-referenced, fingerprint region absorption spectroscopy

Author(s): Milos Nedeljkovic, Callum J. Stirling, David J. Rowe, Mehdi Banakar, Yanli Qi, Xingzhao Yan, Callum G. Littlejohns, Goran Z. Mashanovich, Univ. of Southampton (United Kingdom)

WEDNESDAY 1 FEBRUARY

SESSION 8: SILICON NITRIDE PHOTONICS

1 February 2023 • 8:30 AM - 10:00 AM | Moscone Center, Room 301 (Level 3 South)

Session Chair: Jonathan Bradley, McMaster Univ. (Canada)

12426-31 • 8:30 AM - 9:00 AM

Kerr nonlinear optics in ultralow-loss silicon nitride waveguides (*Invited Paper*)

Author(s): Victor Torres Company, Marcello Girardi, Yi Sun, Zhichao Ye, Chalmers Univ. of Technology (Sweden)

12426-32 • 9:00 AM - 9:20 AM

Effects of ultraviolet exposure on silicon nitride and its application in tuning passive photonic devices

Author(s): Greta De Paoli, Alexander Flint, Thalía Domínguez Bucio, Graham Reed, James Gates, Frederic Gardes, Univ. of Southampton (United Kingdom)

12426-34 • 9:20 AM - 9:40 AM

Monolithic coupling between high- and mid-index, multi-micron waveguides for O-band applications

Author(s): Ilias Skandalos, Thalía Dominguez Bucio, Lorenzo Mastronardi, Yaonan Hou, Teerapat Rutirawut, Frederic Gardes, Univ. of Southampton (United Kingdom)

12426-35 • 9:40 AM - 10:00 AM

Characterization study of silicon nitride (SiN), thin-film hydrogen-bonding for waveguide applications

Author(s): Amira Ahmed, Ahmed Kreta, Muhammad A. Othman, Mohamed A. Swillam, The American Univ. in Cairo (Egypt)

Coffee Break 10:00 AM - 10:30 AM

SESSION 9: WAVEGUIDE DESIGN AND APPLICATIONS II

1 February 2023 • 10:30 AM - 11:50 AM | Moscone Center, Room 301 (Level 3 South)

Session Chair: Graham T. Reed, Optoelectronics Research Ctr. (United Kingdom)

12426-36 • 10:30 AM - 10:50 AM

Tunable Fabry-Pérot interferometer integrated in a silicon waveguide of an on-chip optical platform for long infrared wavelengths

Author(s): Julia Wecker, Fraunhofer-Institut für Elektronische Nanosysteme ENAS (Germany); Karla Hiller, Fraunhofer-Institut für Elektronische Nanosysteme ENAS (Germany), Technische Univ. Chemnitz (Germany); Toni Grossmann, Fraunhofer-Institut für Elektronische Nanosysteme ENAS (Germany); Susann Hahn, Technische Univ. Chemnitz (Germany); Steffen Kurth, Fraunhofer-Institut für Elektronische Nanosysteme ENAS (Germany); Christian Helke, Fraunhofer-Institut für Elektronische Nanosysteme ENAS (Germany), Technische Universität Chemnitz (Germany); Matthias Küchler, Fraunhofer-Institut für Elektronische Nanosysteme ENAS (Germany); Danny Reuter, Fraunhofer-Institut für Elektronische Nanosysteme ENAS (Germany), Technische Universität Chemnitz (Germany); Jörg Martin, Alexander Weiss, Fraunhofer-Institut für Elektronische Nanosysteme ENAS (Germany); Harald Kuhn, Fraunhofer-Institut für Elektronische Nanosysteme ENAS (Germany), Technische Univ Chemnitz (Germany)

12426-37 • 10:50 AM - 11:10 AM

High rejection filters based on cascaded ring resonators in a 300 mm silicon photonics platform

Author(s): Léopold Virost, CEA-LETI (France); Annalara Ferrara, CEA-LETI (France), Univ. degli Studi di Pavia (Italy); Quentin Wilmart, CEA-LETI (France); Mattéo Galli, Daniele Bajoni, Univ. degli Studi di Pavia (Italy); Ségolène Olivier, CEA-LETI (France)

12426-38 • 11:10 AM - 11:30 AM

Polarization splitter and rotator, and an optical demultiplexer for a polarization-diverse silicon photonic receiver

Author(s): Naoki Matsui, Hirotaka Uemura, Dan Maeda, Reona Motoji, Tomoya Sugita, KYOCERA Corp. (Japan)

12426-40 • 11:30 AM - 11:50 AM

Broadband and polarization independent waveguide-fiber coupling

Author(s): Timo Aalto, Tomi Hassinen, Markku Kapulainen, Aki Mäyrä, Hannu Vasama, Päivi Heimälä, VTT Technical Research Ctr. of Finland Ltd. (Finland)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12426-41

High-speed silicon waveguide 3-to-8 decoder based on electro-optic effects

Author(s): Alisher Akhmet, Almar Gaziz, Nazym Alipbayeva, Nazarbayev Univ. (Kazakhstan); Bikash Nakarmi, Nanjing Univ. of Aeronautics and Astronautics (China); Ikechi Augustine Ukaegbu, Nazarbayev Univ. (Kazakhstan)

12426-42

Wide-field-of-view optical detectors for deep ultraviolet optical communication using all-inorganic CsPbBr₃ perovskite nanocrystals

Author(s): Sultan Alshaibani, Omar Alkhazragi, Chunhong Kang, Mohammed Sait, Islam Ashry, Tien Khee Ng, Osman Bakr, Boon Ooi, King Abdullah Univ. of Science and Technology (Saudi Arabia)

12426-43

Design of infrared phototransistors based on silicon feedback field effect transistors

Author(s): Jayoung Kim, Jinyoung Hwang, Korea Aerospace Univ. (Republic of Korea)

12426-44

Engineering the PhC-slab waveguide for designing TM-pass polarization filter by restoring their polarization filtering property

Author(s): Chandra Prakash, Univ. of Engineering & Management Jaipur (India); Akash Kumar Pradhan, Indian Institute of Technology (Indian School of Mines) Dhanbad (India); Yadvendra Singh, Oregon State University (United States); Rashmi Pant, NIT Arunachal Pradesh (India)

12426-45

Simulation and design optimization of germanium-on-silicon single photon avalanche diodes

Author(s): Charles Smith, Jaroslaw Kirdoda, Derek Dumas, Univ. of Glasgow (United Kingdom); Xin Yi, Fiona Fleming, Heriot-Watt Univ. (United Kingdom); Conor Coughlan, Muhammad Mirza, Univ. of Glasgow (United Kingdom); Lisa Saalbach, Gerald Buller, Heriot-Watt Univ. (United Kingdom); Douglas Paul, Ross Millar, Univ. of Glasgow (United Kingdom)

12426-48

Silicon-based, fractal metamaterial structure for IR broadband absorption

Author(s): Alaa Mahmoud, Abdelrahman Ghanim, Muhammad A. Othman, Mohamed A. Swillam, The American Univ. in Cairo (Egypt)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12426-47

Enhanced coupling efficiency of optical fiber to green light waveguide by optical phased array

Author(s): Weiwei Liu, Peng Cheng Lab. (China); Binghui LI, Caiming Sun, The Chinese Univ. of Hong Kong (China)

Optical Interconnects XXIII

Wednesday 1 February 2023 • Proceedings of SPIE Vol. 12427 • Moscone Center, Room 303 (Level 3 South)

Conference Chairs: **Ray T. Chen**, The Univ. of Texas at Austin (United States); **Henning Schröder**, Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration IZM (Germany)

Program Committee: **Maggie Yihong Chen**, Texas State Univ. (United States); **Darrell Childers**, US Conec Ltd. (United States); **Douwe H. Geuzebroek**, LioniX International BV (Netherlands); **Ruth Houbertz**, ThinkMade Engineering & Consulting (Germany); **Marika P. Immonen**, TTM Technologies, Inc. (Finland); **Takaaki Ishigure**, Keio Univ. (Japan); **Wei Jiang**, Nanjing Univ. (China); **Mikko Karppinen**, VTT Technical Research Ctr. of Finland Ltd. (Finland); **Sanjay Krishna**, The Ohio State Univ. (United States); **Tobias Lamprecht**, Fachhochschule OST (Switzerland); **Matthias Lorenz**, AEMtec GmbH (Germany); **Christopher T. Middlebrook**, Michigan Technological Univ. (United States); **Peter O'Brien**, Tyndall National Institute (Ireland); **Bert Jan Offrein**, IBM Research – Zürich (Switzerland); **Hyo-Hoon Park**, KAIST (Republic of Korea); **Ignazio E. M. Piacentini**, IP Consulting (Italy); **Nikos Pleros**, Aristotle Univ. of Thessaloniki (Greece); **Richard C. A. Pitwon**, Resolute Photonics Ltd. (United Kingdom); **Jie Qiao**, Rochester Institute of Technology (United States); **Brandon W. Swatowski**, Dow Silicones Corp. (United States); **Michael Thiel**, Nanoscribe GmbH & Co. KG (Germany); **David J. Thomson**, Optoelectronics Research Ctr. (United Kingdom); **Alan X. Wang**, Baylor Univ. (United States); **Ian H. White**, Univ. of Cambridge (United Kingdom); **Chris Q. Wu**, Corning Incorporated (United States); **Xiaochuan Xu**, Harbin Institute of Technology Shenzhen Graduate School (China)

WEDNESDAY 1 FEBRUARY

SESSION 1: NOVEL OPTICAL INTERCONNECT AND NEURAL NETWORK SYSTEMS

1 February 2023 • 8:00 AM - 9:40 AM | Moscone Center, Room 303 (Level 3 South)

Session Chair: Ray T. Chen, The Univ. of Texas at Austin (United States)

12427-1 • 8:00 AM - 8:30 AM

Challenges in digital optical computing (*Invited Paper*)

Author(s): Michael Kissner, Leonardo Del Bino, Akhetonics GmbH (Germany)

12427-2 • 8:30 AM - 9:00 AM

Light-AI interaction: the convergence of photonic AI and cross-layer circuit-architecture-algorithm co-design (*Invited Paper*)

Author(s): Jiaqi Gu, Chenghao Feng, Hanqing Zhu, Ray T. Chen, David Z. Pan, The Univ. of Texas at Austin (United States)

12427-3 • 9:00 AM - 9:20 AM

Optically-interconnected, hardware-efficient, electronic-photonic neural network using compact multi-operand photonic devices

Author(s): Chenghao Feng, Rongxing Tang, Jiaqi Gu, Hanqing Zhu, David Z. Pan, Ray T. Chen, The Univ. of Texas at Austin (United States)

12427-4 • 9:20 AM - 9:40 AM

Hybrid-coherent reservoir computing for 200 km PAM-4 transmission links

Author(s): Lucas Talandier, Ingo Fischer, Apostolos Argyris, Instituto de Física Interdisciplinar y Sistemas Complejos (Spain)

Coffee Break 9:40 AM - 10:00 AM

SESSION 2: OPTICAL INTERCONNECT DEVICES AND COMPONENTS

1 February 2023 • 10:00 AM - 12:00 PM | Moscone Center, Room 303 (Level 3 South)

Session Chair: Ruth Houbertz, ThinkMade Engineering & Consulting (Germany)

12427-5 • 10:00 AM - 10:30 AM

Key technology enablers for co-packaged optics (*Invited Paper*)

Author(s): Karl Muth, Vivek Raghuraman, Broadcom, Inc. (United States)

12427-6 • 10:30 AM - 11:00 AM

Scaling challenges in watts level PCSELS (*Invited Paper*)

Author(s): Weidong Zhou, The Univ. of Texas at Arlington (United States)

12427-7 • 11:00 AM - 11:20 AM

A silicon-photonics optical transmitter for 12-port 1.6 Tbps co-packaged optics modules

Author(s): Hirotaka Uemura, Naoki Matsui, Reona Motoji, Dan Maeda, Tomoya Sugita, KYOCERA Corp. (Japan)

12427-8 • 11:20 AM - 11:40 AM

2-D non-periodic optical phased array in an InP-based platform for free space optical communication

Author(s): Jason Midkiff, Po-Yu Hsiao, Patrick T. Camp, The Univ. of Texas at Austin (United States); Ray T. Chen, The Univ. of Texas at Austin (United States), Omega Optics, Inc. (United States)

12427-9 • 11:40 AM - 12:00 PM

A 4×4 Si₃N₄ generalized Mach-Zehnder interferometer for variable power splitting applications

Author(s): Stefanos Kovaos, Konstantinos Fotiadis, Apostolos Tsakyridis, George Giamougiannis, Christos Pappas, Aristotle Univ. of Thessaloniki (Greece); Davide Sacchetto, Michael Zervas, Ligentec SA (Switzerland); Miltiadis Moralis-Pegios, Nikos Pleros, Aristotle Univ. of Thessaloniki (Greece)

Lunch/Exhibition Break 12:00 PM - 1:20 PM

SESSION 3: FIBER OPTICS, OPTICAL WAVEGUIDES AND MICRO-OPTICS INTEGRATION

1 February 2023 • 1:20 PM - 3:40 PM | Moscone Center, Room 303 (Level 3 South)

Session Chair: Henning Schröder, Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration IZM (Germany)

12427-11 • 1:20 PM - 1:40 PM

Few-mode fibers as optical dendrites for 40 Gbps computing

Author(s): Silvia Ortín, Miguel C. Soriano, Ingo Fischer, Claudio R. Mirasso, Apostolos Argyris, Instituto de Física Interdisciplinar y Sistemas Complejos (Spain)

12427-12 • 1:40 PM - 2:00 PM

A novel graded-index plastic optical fiber interconnect enabling stable data transmission without precise fiber alignment

Author(s): Kenta Muramoto, Keio Univ. (Japan); Yasuhiro Koike, Keio Photonics Research Institute (Japan), Keio Univ. (Japan)

12427-13 • 2:00 PM - 2:30 PM

Towards high-volume manufacturing of optoelectronic glass substrates for co-packaged optics *(Invited Paper)*

Author(s): Jason R. Grenier, Lars Brusberg, Chad C. Terwilliger, Corning Research & Development Corporation (United States); Juergen Matthies, Corning Optical Communications GmbH & Co. KG (Germany); Jeffrey S. Clark, Daniel W. Levesque, Kristopher A. Wieland, Corning Research & Development Corporation (United States)

12427-28 • 2:30 PM - 2:50 PM

Automatic assembly solutions for optical interconnecting integrated waveguides

Author(s): Alethea Vanessa Zamora, Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration IZM (Germany)

12427-24 • 2:50 PM - 3:20 PM

Reliable silicon photonics optical transceiver “IOCore™” in high temperature operation and immersion cooling systems *(Invited Paper)*

Author(s): Kazuhiko Kurata, Kenichiro Yashiki, Takashi Muto, Makoto Kuwata, Shigeru Kobayashi, AIO Core Co., Ltd. (Japan); Koichi Takemura, Photonics Electronics Technology Research Association (Japan), AIO Core Co., Ltd. (Japan)

12427-25 • 3:20 PM - 3:40 PM

Low cutoff optical fiber and cable slack management scheme for co-packaged optics in the O-band

Author(s): Scott R. Bickham, Martin Hempstead, Stephen Q. Smith, Corning Research & Development Corporation (United States); David Chiasson, Corning Optical Communications (United States); Riley S. Freeland, David Robinson, Lars Brusberg, Armis R. Zakharian, Pushkar Tandon, Corning Research & Development Corporation (United States); Snigdharaj K. Mishra, Corning Optical Communications (United States); Ming-Jun Li, Corning Research & Development Corporation (United States)

Coffee Break 3:40 PM - 4:00 PM

SESSION 4: PIC INTEGRATION AND OPTICAL COUPLING

1 February 2023 • 4:00 PM - 6:00 PM | Moscone Center, Room 303 (Level 3 South)

Session Chair: Richard C. A. Pitwon, Resolute Photonics Ltd. (United Kingdom)

12427-15 • 4:00 PM - 4:20 PM

High density vertical optical interconnects for passive assembly

Author(s): Drew Weninger, Massachusetts Institute of Technology (United States); Samuel Serna Otálvaro, Bridgewater State Univ. (United States); Achint Jain, Lionel Kimerling, Anuradha Agarwal, Massachusetts Institute of Technology (United States)

12427-17 • 4:20 PM - 4:40 PM

Compact, low-voltage, high-performance modulator based on micro-resonators far off critical coupling

Author(s): Zhaobang Zeng, Nanjing Univ. (China); Kaifei Tang, Nanjing Univ. (China), Key Lab. of Intelligent Optical Sensing and Manipulation (China), National Lab. of Solid State Microstructures (China); Yu Xin, Peiyan Zhao, Lemeng Leng, Chenbin Zhang, Ding Ding, Fuhao Yu, Nanjing Univ. (China); Wei Jiang, Nanjing Univ. (China), Key Lab. of Intelligent Optical Sensing and Manipulation (China), National Lab. of Solid State Microstructures (China); Chenchao Feng, The Univ. of Texas at Austin (United States)

12427-18 • 4:40 PM - 5:00 PM

Fiber optical coupling with engineered scattering elements

Author(s): Icel Z. Sukovaty, Tyler Howard, Thomas Brown, Univ. of Rochester (United States)

12427-19 • 5:00 PM - 5:20 PM

Low loss cryogenic optical interconnects using photonic wire bonds

Author(s): Thomas P. Dorch, Victoria Rosborough, Steven Estrella, Freedom Photonics, LLC (United States)

Show Abstract +

12427-20 • 5:20 PM - 5:40 PM

Design fiber-to-waveguide coupling for photonic integrated circuits

Author(s): Yi-Hao Chen, ANSYS, Inc. (Taiwan); Angel Morales, ANSYS, Inc. (United States); Federico Duque Gomez, Taylor Robertson, ANSYS, Inc. (Canada); Han-Hsiang Cheng, ANSYS, Inc. (Taiwan); Hui Chen, ANSYS, Inc. (United States); Sean Lin, ANSYS, Inc. (Taiwan); Kyle Johnson, ANSYS, Inc. (Canada)

12427-21 • 5:40 PM - 6:00 PM

Electrically tunable silicon microring resonator array for on-chip wavelength division multiplexing

Author(s): Wei-Che Hsu, Alan X. Wang, Baylor Univ. (United States)

Conference 12427

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12427-22

FSO link attenuation measurement in extreme winter conditions for secure 5G applications

Author(s): Abay Khamidullin, Refik Kizilirmak, Nazarbayev Univ. (Kazakhstan); Murat Uysal, Ozyegin Univ. (Turkey); Ikechi Augustine Ukaegbu, Nazarbayev Univ. (Kazakhstan)

12427-23

Tailored gas-absorbing materials for packaged optoelectronic devices

Author(s): Giovanni Zafarana, Enea Rizzi, Luca Mauri, Alessio Corazza, Mauro Riva, SAES Group (Italy)

12427-26

CANCELED: Adiabatically bent superlattice-waveguides for negligible insertion loss and ultra-low crosstalk interconnection solutions

Author(s): Mauro F. Pereira, Institute of Physics of the CAS, v.v.i. (Czech Republic), Khalifa Univ. (United Arab Emirates); Humaira Zafar, Khalifa Univ. (United Arab Emirates)

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12427-14

Study of optical coupling efficiency of passive optical alignment technologies applicable for high volume manufacturing

Author(s): Do-Won Kim, Jianbing Zhao, INTEL Technology Asia Pte Ltd. (Singapore); Young-Seok Oh, Intel Corp. (United States); Waiyapot Suttawassuntorn, Intel Microelectronics (Thailand) Ltd. (Thailand); Wendy Lau, INTEL Technology Asia Pte Ltd. (Singapore); Archana Ashok, Suohai Mei, Intel Corp. (United States)

DIGITAL POSTERS

Photonic Instrumentation Engineering X

30 January - 1 February 2023 | Moscone Center, Room 311 (Level 3 South)

Conference Chairs: **Lynda E. Busse**, U.S. Naval Research Lab. (United States); **Yakov Soskind**, Meta (United States)

Program Committee: **Ishwar D. Aggarwal**, The Univ. of North Carolina at Charlotte (United States); **James T. A. Carriere**, Coherent, Inc. (United States); **Christy Fernandez-Cull**, Lyft Level 5 (United States); **Catalin Florea**, Honeywell International Inc. (United States); **Sanjay Gangadhara**, Ansys (United States); **Groot Gregory**, Synopsys, Inc. (United States); **Daniel C. Herrmann**, Synopsys, Inc. (United States); **Kristen Hill**, Synrad, a Novanta Co. (United States); **Gary B. Hughes**, Univ. of California, Santa Barbara (United States); **Jacob B. Khurgin**, Johns Hopkins Univ. (United States); **Woei Ming Lee**, The Australian National Univ. (Australia); **Patrick C. Mock**, RAM Photonics, LLC (United States); **Nada A. O'Brien**, Meta (United States); **S. Craig Olson**, L3Harris Technologies, Inc. (United States); **Lucas Redlarski**, Mitutoyo Research Ctr. Europe B.V. (Netherlands)

MONDAY 30 JANUARY

OPTO PLENARY SESSION

30 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 207/215 (Level 2 South)

8:00 AM - 8:05 AM: **Welcome and Opening Remarks**
Sonia García-Blanco, Univ. Twente (Netherlands) and Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

8:05 AM - 8:15 AM: **Announcement of the OPTO AI/ML and Net Zero Best Paper Awards**

12424-501 • 8:15 AM - 8:50 AM

High-performance electronic-photonic interfaces: from AI to quantum (*Plenary Presentation*)

Author(s): Rajeev Ram, Massachusetts Institute of Technology (United States)

12416-501 • 8:50 AM - 9:25 AM

Tandem photovoltaic devices: more than one way to make a solar cell (*Plenary Presentation*)

Author(s): Emily L. Warren, National Renewable Energy Lab. (United States)

12421-501 • 9:25 AM - 10:00 AM

Are III-nitride semiconductors also suitable for red emission? (*Plenary Presentation*)

Author(s): Nicolas Grandjean, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 1: DESIGN, DEVELOPMENT, AND FABRICATION OF PHOTONIC INSTRUMENTS I

30 January 2023 • 10:30 AM - 12:20 PM | Moscone Center, Room 311 (Level 3 South)

Session Chair: Yakov Soskind, Meta (United States)

12428-1 • 10:30 AM - 11:00 AM

Fully automated inverse design solution for metalenses/metasurfaces (*Invited Paper*)

Author(s): Chenglin Xu, Evan Heller, Synopsys, Inc. (United States); Jan Bos, Synopsys, Inc. (Netherlands); Robert Scarmozzino, Mayank Bahl, Synopsys, Inc. (United States); Li-Ce Hu, Synopsys, Inc. (Taiwan); Nicholas Achuthan, University of Rochester (United States)

12428-2 • 11:00 AM - 11:20 AM

Design and analysis of the light field camera for SurfCam

Author(s): Jihun Kim, Minsup Jeong, Min Bae Kim, Korea Astronomy and Space Science Institute (Republic of Korea); Youngju Kim, YunamOptics Inc. (Republic of Korea); Young-Jun Choi, Korea Astronomy and Space Science Institute (Republic of Korea); Sungsoo S. Kim, Kyung Hee Univ. (Republic of Korea); Dukhang Lee, Bongkon Moon, Dae-Hee Lee, Seonghwan Choi, Chae Kyung Sim, Mingyeong Lee, Jehyuck Shin, Korea Astronomy and Space Science Institute (Republic of Korea)

12428-3 • 11:20 AM - 11:40 AM

Development and evaluation of a photonics instrument for precise beam profile measurements by a XY-stage

Author(s): Steffen Reichel, Karlheinz Blankenbach, Andreas Reber, Evrim Erel, Hochschule Pforzheim (Germany)

12428-4 • 11:40 AM - 12:00 PM

Switchable pattern illuminator via liquid crystal geometric phase microlens array

Author(s): Hung-Shan Chen, Ming-Shuan Chen, Sung-Nan Chen, Chien-Chung Chen, Yi Hung, Guo-Lin Hu, Chia-Ming Chang, Liqxtal Technology Inc. (Taiwan)

12428-5 • 12:00 PM - 12:20 PM

Line-field white light interferometer with tunable-path-difference source controlled by fiber stretcher

Author(s): Sunwoo Woo, Jaeheung Kim, Chang-Seok Kim, Pusan National Univ. (Republic of Korea)

Lunch Break 12:20 PM - 1:50 PM

SESSION 2: DESIGN, DEVELOPMENT, AND FABRICATION OF PHOTONIC INSTRUMENTS II

30 January 2023 • 1:50 PM - 3:10 PM | Moscone Center, Room 311 (Level 3 South)

Session Chair: Sanjay Gangadhara, Ansys, Inc. (United States)

12428-6 • 1:50 PM - 2:10 PM

Short mode-selective photonic lanterns using double-clad fibers

Author(s): Rodrigo Itzamna Becerra Deana, Martin Poinset de Sivry, Polytechnique Montréal (Canada); Simon Bolduc Beaudoin, Univ. de Sherbrooke (Canada); Caroline Boudoux, Polytechnique Montréal (Canada); Castor Optics, Inc. (Canada); Stéphane Virally, Polytechnique Montréal (Canada); Nicolas Godbout, Polytechnique Montréal (Canada); Castor Optics, Inc. (Canada)

Conference 12428

12428-7 • 2:10 PM - 2:30 PM

Highly uniform TIRF illumination using a photonic lantern for super-resolution fluorescence microscopy

Author(s): Abdullah Husain, Stephanos Yerolatsitis, Rodrigo Amezcua Correa, Kyu Young Han, Univ. of Central Florida (United States)

12428-8 • 2:30 PM - 2:50 PM

Curved CMOS image sensors for enhanced imaging systems: focus on smartphone camera lens

Author(s): Wilfried Jahn, Tahar Mehri, SILINA (France)

12428-9 • 2:50 PM - 3:10 PM

Optical simulation supported development of a dual channel photoelectric smoke detector

Author(s): Sven Stöttinger, Excelitas Technologies GmbH & Co. KG (Germany); Jin Han Ju, Excelitas Canada Inc. (Canada); Yvette Marie De Guzman, Glaiza Rose Ocampo, Ken Ryner So, Marvin Sarrate, Julius Cemine, Excelitas Technologies Philippines, Inc. (Philippines)

Coffee Break 3:10 PM - 3:40 PM

SESSION 3: METROLOGY, CHARACTERIZATION, AND FABRICATION OF PHOTONIC INSTRUMENTS I

30 January 2023 • 3:40 PM - 5:20 PM | Moscone Center, Room 311 (Level 3 South)

Session Chair: James T. A. Carriere, Coherent Corp. (United States)

12428-10 • 3:40 PM - 4:00 PM

A high-sensitivity, quantitative method to detect micro-scale optics' internal defects and impurity

Author(s): Jiang He, Teresa Zhang, Wei Zhou, MLOPTIC Corp. (United States)

12428-11 • 4:00 PM - 4:20 PM

Imaging system for leak detection using collimated white/color LED light

Author(s): Sangtaek Kim, Rueben Xu, Le Duy, Leon Yuan, Samsheerali P.T., Global Equipment Services and Manufacturing Inc. (United States)

12428-12 • 4:20 PM - 4:40 PM

An upgradable testing platform designed to characterize and test optical components of FMCW LiDARs, particularly optical phased arrays

Author(s): Jean B. Hue, Vincent Moulin, Kim Abdoul-Carime, Vincent Berg, Baptiste Delplanque, Bertrand Dupont, David Fowler, Sylvain Guerber, Jérôme Meilhan, Sébastien Martin, Laurent Mendizabal, Thierry Mourier, Lea Oxaran, Florence Rigal, Fredertic Sermet, Sylvain Stanchina, Vancelass Rat, Leopold Viro, Francois Simoens, CEA-LETI (France)

12428-13 • 4:40 PM - 5:00 PM

Photonic Doppler velocimetry with 62.5 μm graded index multimode fiber at 1550 and 532 nm

Author(s): Yohan Barbarin, Grégory Lefrère, Germain Bourcier, Damien Plouhinec, Thibaut Paccou, Gaël Le Blanc, CEA-Gramat (France)

12428-14 • 5:00 PM - 5:20 PM

Polarization-based, transmissive-reflective beam scanner operating around 1550 nm using off-the-shelf components

Author(s): Jordan Baker, Kenneth Lang, David L. Dickensheets, Wataru Nakagawa, Montana State Univ. (United States)

TUESDAY 31 JANUARY

SESSION 4: DESIGN, DEVELOPMENT, AND FABRICATION OF PHOTONIC INSTRUMENTS III

31 January 2023 • 8:30 AM - 10:30 AM | Moscone Center, Room 311 (Level 3 South)

Session Chair: Groot Gregory, Synopsys, Inc. (United States)

12428-15 • 8:30 AM - 8:50 AM

Accuracy evaluation of a new 3D photogrammetric position measurement system for 6D Printing

Author(s): Luis Garcia-Barth, Uwe Bielke, Rainer Börret, Hochschule Aalen - Technik und Wirtschaft (Germany)

12428-16 • 8:50 AM - 9:10 AM

Optomechanical system for photonic chip characterization

Author(s): Alessandro Fantoni, Miguel Fernandes, Jorge Fidalgo, Manuela P. Vieira, Instituto Superior de Engenharia de Lisboa (Portugal)

12428-17 • 9:10 AM - 9:30 AM

DiffuserSpec: a simple computational spectrometer using off-the-shelf diffusers

Author(s): Neerja Aggarwal, Univ. of California, Berkeley (United States); Joseph D. Malone, Vanderbilt Univ. (United States); Laura Waller, Univ. of California, Berkeley (United States); Audrey Bowden, Vanderbilt Univ. (United States)

12428-18 • 9:30 AM - 9:50 AM

High-sensitivity hyperspectral Fourier-plane microscopy by an innovative common-path interferometer

Author(s): Armando Genco, Cristina Cruciano, Matteo Corti, Politecnico di Milano (Italy); Kirsty McGhee, The Univ. of Sheffield (United Kingdom); Benedetto Ardini, Politecnico di Milano (Italy); Tersilla Virgili, CNR-Istituto di Fotonica e Nanotecnologie (Italy); David G. Lidzey, The Univ. of Sheffield (United Kingdom); Andrea Bassi, Gianluca Valentini, Giulio Cerullo, Politecnico di Milano (Italy); Cristian Manzoni, CNR-Istituto di Fotonica e Nanotecnologie (Italy)

12428-19 • 9:50 AM - 10:10 AM

A novel hyperspectral camera based on a Fourier-transform approach

Author(s): Marta Provera, Alex Barker, NIREOS SRL (Italy); Dario Polli, Politecnico di Milano (Italy), NIREOS SRL (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy); Renzo Vanna, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Antonio Perri, Fabrizio Preda, NIREOS SRL (Italy)

12428-20 • 10:10 AM - 10:30 AM

Intermediate image free computed tomography imaging spectrometer

Author(s): Simon Amann, Tobias Haist, Univ. Stuttgart (Germany); Alexander Gatto, Markus Kamm, Sony Europe B.V. (Germany); Alois Herkommer, Univ. Stuttgart (Germany)

Coffee Break 10:30 AM - 11:00 AM

SESSION 5: APPLICATIONS OF PHOTONIC INSTRUMENTS I

31 January 2023 • 11:00 AM - 12:00 PM | Moscone Center, Room 311 (Level 3 South)

Session Chair: Groot Gregory, Synopsys, Inc. (United States)

12428-22 • 11:00 AM - 11:20 AM

Hyperspectral imaging technique for measurement of variations in anthocyanin accumulations in 'bok choy'

Author(s): Hyo-suk Kim, Ji Hye Yoo, Byeongho Park, Subeen Park, Hyoung Seok Kim, Jae Hun Kim, Korea Institute of Science and Technology (Republic of Korea)

12428-23 • 11:20 AM - 11:40 AM

Through the looking glass: Raman spectroscopy of concealed samples in sealed containers using shaped laser light

Author(s): Graham D. Bruce, Georgina E. Shillito, Lewis McMillan, George Dwapanyin, Mingzhou Chen, Univ. of St. Andrews (United Kingdom); Kishan Dholakia, Univ. of St. Andrews (United Kingdom), The Univ. of Adelaide (Australia), Yonsei Univ. (Republic of Korea)

12428-24 • 11:40 AM - 12:00 PM

Multi-color ellipsometric mapping tool from cheap parts

Author(s): Berhane Nugusse, Óbuda Univ. (Hungary); György Juhász, Csaba Major, Peter Petrik, Sandor Kalvin, Ctr. for Energy Research (Hungary); Zoltán G. Horváth, Wigner Research Ctr. for Physics (Hungary); Miklos Fried, Ctr. for Energy Research (Hungary)

Lunch/Exhibition Break 12:00 PM - 1:50 PM

SESSION 6: APPLICATIONS OF PHOTONIC INSTRUMENTS II

31 January 2023 • 1:50 PM - 3:30 PM | Moscone Center, Room 311 (Level 3 South)

Session Chair: Sanjay Gangadhara, Ansys, Inc. (United States)

12428-25 • 1:50 PM - 2:10 PM

Extended field-of-view in solid-state FMCW LiDAR using optical relay system

Author(s): Dahun Jung, Dawoon Jeong, Chang-Seok Kim, Pusan National Univ. (Republic of Korea)

12428-26 • 2:10 PM - 2:30 PM

Machine-learning-enhanced, phase-based multi-tone continuous-wave lidar

Author(s): Mert Bayer, Berken Utku Demirel, Ataberk Atalar, Xun Li, Haoyu Xie, Ozdal Boyraz, Univ. of California, Irvine (United States)

12428-27 • 2:30 PM - 2:50 PM

Data-efficient FMCW-LiDAR using electrical-frequency mixing

Author(s): Chang-Seok Kim, Nayoung Kim, Hansol Jang, Pusan National Univ. (Republic of Korea)

12428-28 • 2:50 PM - 3:10 PM

Enhancing detecting ammonia from 1 to 10,000's PPM using laser-induced fluorescence of tuned vapochromic coordination polymers

Author(s): Glenn H. Chapman, Dawei Yin, Viraj A. Patel, Bonnie Gray, Daniel Leznoff, Simon Fraser Univ. (Canada)

12428-29 • 3:10 PM - 3:30 PM

Mid-infrared broadband sensing and temperature dependence of trace gas molecular transitions

Author(s): Al R. Alexis, Zakaria Juracka, Ibrahim ElKholi, Mohammad A. Khan, Delaware State Univ. (United States)

Coffee Break 3:30 PM - 4:00 PM

SESSION 7: SENSORS AND RUGGEDIZED SYSTEMS I

31 January 2023 • 4:00 PM - 5:40 PM | Moscone Center, Room 311 (Level 3 South)

Session Chair: James T. A. Carriere, Coherent Corp. (United States)

12428-30 • 4:00 PM - 4:20 PM

Highly sensitive and rugged gas optical detection via interferometric cavity-assisted photothermal spectroscopy

Author(s): Davide Pinto, J.P. Wacławek, Stefan Lindner, Harald Moser, Giovanna Ricchiuti, Bernhard Lendl, Technische Univ. Wien (Austria)

12428-31 • 4:20 PM - 4:40 PM

Non-invasive continuous hypoxia assessment in intra-partum fetus through long wavelength near infrared spectroscopy

Author(s): Shree Krishnamoorthy, Irish Photonic Integration Ctr. (IPIC) (Ireland), Tyndall National Institute (Ireland); Urbashi Basu, National Ctr. for Biological Sciences (India); Kiang Wei Kho, Rekha Gautam, Irish Photonic Integration Ctr. (IPIC) (Ireland), Tyndall National Institute (Ireland); Francesca Di Croce, Univ. degli Studi di Pavia (Italy); Walter Messina, Cleitus Antony, Irish Photonic Integration Ctr. (IPIC) (Ireland), Tyndall National Institute (Ireland); Paul Townsend, Tyndall National Institute (Ireland); Fergus P. McCarthy, Cork Univ. Maternity Hospital (Ireland), The INFANT Research Ctr., Univ. College Cork (Ireland); Stefan Andersson-Engels, Irish Photonic Integration Ctr. (IPIC) (Ireland), Tyndall National Institute (Ireland), Univ. College Cork (Ireland); Ray Burke, Irish Photonic Integration Ctr. (IPIC) (Ireland), Tyndall National Institute (Ireland)

12428-32 • 4:40 PM - 5:00 PM

Mid-IR photothermal sensing of liquids for trace analysis

Author(s): Giovanna Ricchiuti, Alicja Dabrowska, Davide Pinto, Georg Ramer, Bernhard Lendl, Technische Univ. Wien (Austria)

12428-33 • 5:00 PM - 5:20 PM

CANCELED: Portable, automated laser speckle analyzer

Author(s): Renju P.B., Mayank Paswan, Beena Rai, Parama Pal, Tata Consultancy Services, Ltd. (India)

12428-34 • 5:20 PM - 5:40 PM

Energy harvesting over a fiber-optic distributed acoustic sensor

Author(s): Juan Manuel Marin Mosquera, Islam Ashry, Abderrahmen Trichili, Chun Hong Kang, Omar Alkhazragi, Tien Khee Ng, Boon Siew Ooi, King Abdullah Univ. of Science and Technology (Saudi Arabia)

Conference 12428

WEDNESDAY 1 FEBRUARY

SESSION 8: METROLOGY, CHARACTERIZATION, AND FABRICATION OF PHOTONIC INSTRUMENTS II

1 February 2023 • 8:40 AM - 10:00 AM | Moscone Center, Room 311 (Level 3 South)

Session Chair: Nada A. O'Brien, Meta (United States)

12428-35 • 8:40 AM - 9:00 AM

Virtual metrology scheme for predictive plasma uniformity diagnosis of plasma-enhanced atomic layer deposition process using optical emission spectroscopy

Author(s): Dongyoun Kim, Seunggyu Na, Hyungjun Kim, Ilgu Yun, Yonsei Univ. (Republic of Korea)

12428-36 • 9:00 AM - 9:20 AM

Characterization and digital aberration correction of a hyperspectral imaging system for plant disease detection

Author(s): Miroslav Zabic, Lijin Jose, Timm Landes, Jan-Michael Fritz, Inga Weisheit, Dag Heinemann, Leibniz Univ. Hannover (Germany)

12428-37 • 9:20 AM - 9:40 AM

Nanostructures for in-situ surface-enhanced Kretschmann-Raether ellipsometry

Author(s): Deshabrato Mukherjee, Ctr. for Energy Research (Hungary); Benjamin Kalas, Institute of Technical Physics and Materials Science (Hungary); Sven Burger, JCMwave GmbH (Germany), Zuse Institute Berlin (Germany); G. Safran, Institute of Technical Physics and Materials Science (Hungary); M. Serenyi, Miklos Fried, Peter Petrik, Ctr. for Energy Research (Hungary)

12428-38 • 9:40 AM - 10:00 AM

Investigation of reconstruction stability and limitations for combined dithering-compressed-sensing processing of spectral imaging interferometric data in white-light interferometric surface profiling

Author(s): Christopher Taudt, Westsächsische Hochschule Zwickau (Germany), Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany), Forschungs- und Transferzentrum Zwickau (Germany); Sophie Gruner, Westsächsische Hochschule Zwickau (Germany); Peter Hartmann, Westsächsische Hochschule Zwickau (Germany), Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany), Forschungs- und Transferzentrum Zwickau (Germany)

Coffee Break 10:00 AM - 10:30 AM

SESSION 9: METROLOGY, CHARACTERIZATION, AND FABRICATION OF PHOTONIC INSTRUMENTS III

1 February 2023 • 10:30 AM - 12:10 PM | Moscone Center, Room 311 (Level 3 South)

Session Chair: Nada A. O'Brien, Meta (United States)

12428-39 • 10:30 AM - 10:50 AM

Effect of a spatial polarization converter placed on the pupil plane behind the objective lens in a telecentric imaging system

Author(s): Keisuke Yoshiki, Univ. of Hyogo (Japan)

12428-40 • 10:50 AM - 11:10 AM

Frequency decoding using a dual interferometer for extending the measurable range

Author(s): Ji Hyeok Lee, Min Uk Jung, Gyeong Hun Kim, Chang-Seok Kim, Pusan National Univ. (Republic of Korea)

12428-41 • 11:10 AM - 11:30 AM

Coherent ranging beyond coherence length using multiple delay lines

Author(s): Min Uk Jung, Gyeong Hun Kim, Chang-Seok Kim, Pusan National Univ. (Republic of Korea)

12428-42 • 11:30 AM - 11:50 AM

New wafer shape measurement technique for 300mm blank vertically held silicon wafer

Author(s): Juan M. Trujillo-Sevilla, Óscar Casanova-González, Alex Roqué-Velasco, Javier González Pardo, José Manuel Ramos-Rodríguez, Jan O. Gaudestad, Wootpix, S.L. (Spain)

12428-43 • 11:50 AM - 12:10 PM

NASA SAGE SBIR structural, thermal, optical performance (STOP) analysis correlation to wavefront error testing

Author(s): Christine Buleri, Cameryn Yow, Janak Carey, Quartus Engineering Incorporated (United States); Robert Damadeo, NASA Langley Research Ctr. (United States); Alexander Halterman, Quartus Engineering Incorporated (United States); Charles Hill, John Leckey, NASA Langley Research Ctr. (United States); Alicia Maccarrone, Samantha Weiner, Shimshone Yacoby, Quartus Engineering Incorporated (United States)

Lunch/Exhibition Break 12:10 PM - 2:00 PM

SESSION 10: SENSORS AND RUGGEDIZED SYSTEMS II

1 February 2023 • 2:00 PM - 3:20 PM | Moscone Center, Room 311 (Level 3 South)

Session Chair: Lynda E. Busse, U.S. Naval Research Lab. (United States)

12428-45 • 2:00 PM - 2:20 PM

QEPAS Spectroscopy with fully tunable IC-ECDL with high bandwidth for the MIR range

Author(s): Hervé Tatenguem, Morten Hoppe, Christian Assmann, Sacher Lasertechnik GmbH (Germany); Sebastian Schmidtman, Martin Honsberg, Sensor Photonics GmbH (Germany); Joachim Sacher, Sacher Lasertechnik GmbH (Germany), Sensor Photonics GmbH (Germany)

12428-46 • 2:20 PM - 2:40 PM

Fully distributed Brillouin fiber laser sensor

Author(s): Joseph Murray, U.S. Naval Research Lab. (United States); Alex Cerjan, The Ctr. for Integrated Nanotechnologies (United States), Sandia National Labs. (United States); Brandon Redding, U.S. Naval Research Lab. (United States)

12428-47 • 2:40 PM - 3:00 PM

Simultaneous sensing of strain and temperature based on quasi-distributed, identical weak PM-FBG array

Author(s): Won Tae Choe, Gyeong Hun Kim, Chang-Seok Kim, Pusan National Univ. (Republic of Korea)

12428-48 • 3:00 PM - 3:20 PM

Light-diffusing glass fibers for distributed optical spectral sensing

Author(s): Gianluca Persichetti, Genni Testa, Pasquale Imperatore, Romeo Bernini, Istituto per il Rilevamento Elettromagnetico dell'Ambiente (Italy)

Coffee Break 3:20 PM - 3:50 PM

SESSION 11: APPLICATIONS OF PHOTONIC INSTRUMENTS III

1 February 2023 • 3:50 PM - 5:30 PM | Moscone Center, Room 311 (Level 3 South)

Session Chair: Lynda E. Busse, U.S. Naval Research Lab. (United States)

12428-49 • 3:50 PM - 4:10 PM

High-resolution LiDAR and spectroscopy enabled by coherent sensing with single-cavity dual-comb laser

Author(s): Christopher R. Phillips, Sandro L. Camenzind, Benjamin Willenberg, Justinas Pupeikis, Ursula Keller, ETH Zurich (Switzerland)

12428-50 • 4:10 PM - 4:30 PM

Optimizing of laser source parameters for FMCW automotive LiDARs

Author(s): Stanislav Aksarin, Denis Ganin, Cheng Feng, Mikhail Smolovik, Andy Zott, Vladimir Davydenko, Scantinel Photonics GmbH (Germany)

12428-51 • 4:30 PM - 4:50 PM

On-the-fly time walk error correction under high-dynamic-range pulsed light intensity for SiPM arrays

Author(s): Ximing Ren, Wan Kuang, Boise State Univ. (United States)

12428-52 • 4:50 PM - 5:10 PM

Enantiomeric excess determination by quantum cascade laser vibrational circular dichroism: a chemometric approach

Author(s): Bernhard Lendl, Daniel-Ralph Hermann, Georg Ramer, Markus Zeiler, Technische Univ. Wien (Austria)

12428-53 • 5:10 PM - 5:30 PM

Multiaxis applications of a cryogenic range-resolved laser interferometer

Author(s): Adam J. Christiansen, Univ. of Lethbridge (Canada), Blue Sky Spectroscopy Inc. (Canada); David A. Naylor, Univ. of Lethbridge (Canada); Brad G. Gom, Univ. of Lethbridge (Canada), Blue Sky Spectroscopy Inc. (Canada)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12428-21

Investigation of craquelure in oil paintings using 3D morphological analysis based on optical coherence tomography for art authentication

Author(s): Soojung Kim, Kyujung Kim, Pusan National Univ. (Republic of Korea)

12428-55

On-site spectroscopy as a tool for monitoring phytoremediation by ferns of arsenic contaminated water

Author(s): Giuseppe Bonifazi, Giuseppe Capobianco, Roberta Palmieri, Silvia Serranti, Sapienza Univ. di Roma (Italy); Maria Luisa Antenzio, CNR-Istituto di Biologia e Patologia Molecolari (Italy), Sapienza Univ. di Roma (Italy); Patrizia Brunetti, Maura Cardarelli, CNR-Istituto di Biologia e Patologia Molecolari (Italy)

12428-56

An innovative approach based on hyperspectral imaging for an automatic characterization of post-earthquake building waste

Author(s): Giuseppe Bonifazi, Giuseppe Capobianco, Silvia Serranti, Oriana Trotta, Sapienza Univ. di Roma (Italy)

12428-58

Direct defocus measurement using single astigmatic lens: a theoretical study

Author(s): Santanu Konwar, Indian Institute of Technology Guwahati (India); Nagendra Kumar, Byers Eye Institute, Stanford Univ. (United States); Satya Siddharta Goutam Buddha, Tata Institute of Fundamental Research (India)

12428-59

A novel platform for high-speed, high-resolution LIBS imaging

Author(s): Shayne M. Harrel, Jean-Michel Laurent, Antoine Varagnat, Andor Technology Ltd. (United Kingdom); Adrian Tercier, Vincent Motto-Ros, Univ. Claude Bernard Lyon 1 (France)

12428-60

Non-contact surface profiling using optical interferometric microscopy

Author(s): Diego Palacios, Bowen Zhai, Zihao Liu, Michael R. Wang, Univ. of Miami (United States)

Conference 12428

12428-61

Aircraft and cloud detection software for autonomous observation system operation

Author(s): Mitchell T. Larscheid, Florida Institute of Technology (United States); Jens Lautenbach, Arecibo Observatory (United States), Univ. of Central Florida (United States)

12428-63

Reinforcement learning wavefront sensorless adaptive optics for coherent optical satellite communication receivers

Author(s): Runnan Zou, Univ. of Ottawa (Canada)

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12428-62

Camera optics in the ultraviolet region of the Next Generation Palomar Spectrograph

Author(s): Lifeng Tang, National Astronomical Observatories (China), Nanjing Institute of Astronomical Optics & Technology (China), Univ. of Chinese Academy of Sciences (China); Zhongwen Hu, Hangxin Ji, National Astronomical Observatories (China), Nanjing Institute of Astronomical Optics & Technology (China)

Next-Generation Optical Communication: Components, Sub-Systems, and Systems XII

31 January - 2 February 2023 | Moscone Center, Room 216 (Level 2 South)

Conference Chairs: **Guifang Li**, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Kazuhide Nakajima**, NTT - Tsukuba R&D Ctr. (Japan); **Atul K. Srivastava**, NTT Electronics America, Inc. (United States)

Program Committee: **Kazi S. Abedin**, CACI International Inc. (United States); **Youichi Akasaka**, Fujitsu Network Communications Inc. (United States); **Jean-Christophe Antona**, Alcatel Submarine Networks S.A. (France); **Nicola Calabretta**, Technische Univ. Eindhoven (Netherlands); **Neil Caranto**, Intel Corp. (United States); **Adolfo V. T. Cartaxo**, Instituto de Telecomunicações (Portugal); **Qixiang Cheng**, Univ. of Cambridge (United Kingdom); **Benjamin B. Dingel**, Nasfina Photonics, Inc. (United States); **Marija Furdek**, Chalmers Univ. of Technology (Sweden); **Fumio Futami**, Tamagawa Univ. (Japan); **Madeleine Glick**, Columbia Univ. (United States); **Ezra Ip**, NEC Labs. America, Inc. (United States); **Hideki Isono**, Fujitsu Optical Components Ltd. (Japan); **Yongmin Jung**, Optoelectronics Research Ctr. (United Kingdom); **Atsushi Kanno**, Nagoya Institute of Technology (Japan); **Tsuyoshi Konishi**, Osaka Univ. (Japan); **Caroline P. Lai**, Rockley Photonics Ltd. (United States); **Ming-Jun Li**, Corning Incorporated (United States); **Nathaniel Joseph C. Libatique**, Ateneo de Manila Univ. (Philippines); **Roberto Llorente**, Univ. Politècnica de València (Spain); **Chao Lu**, The Hong Kong Polytechnic Univ. (Hong Kong, China); **Nicholas Madamopoulos**, The City College of New York (United States); **Akihiro Maruta**, Osaka Univ. (Japan); **Spiros Mikroulis**, SMART Photonics (Netherlands); **Yojiro Mori**, Nagoya Univ. (Japan); **Takashi Sasaki**, Innovation Core SEI, Inc. (United States); **Salvatore Spadaro**, Univ. Politècnica de Catalunya (Spain); **Ryuichi Sugizaki**, Furukawa Electric Co., Ltd. (Japan); **Michela Svaluto Moreolo**, Ctr. Tecnològic de Telecomunicacions de Catalunya (Spain); **Eduward Tangdionga**, Technische Univ. Eindhoven (Netherlands); **Manoj Thakur**, Univ. of Essex (United Kingdom); **Ryohei Urata**, Google (United States); **Siyuan Yu**, Univ. of Bristol (United Kingdom); **Junwen Zhang**, Fudan Univ. (China); **Xiang Zhou**, Google (United States); **YanJun Zhu**, Hisense Broadband, Inc. (United States)

TUESDAY 31 JANUARY

SESSION 1: ADVANCED COMPONENTS I

31 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 216 (Level 2 South)

Session Chair: Atul K. Srivastava, NTT Electronics America, Inc. (United States)

12429-1 • 8:00 AM - 8:30 AM

High speed and low-drive-voltage thin-film lithium niobate devices (*Invited Paper*)

Author(s): Xinlun Cai, Sun Yat-Sen Univ. (China)

12429-2 • 8:30 AM - 8:45 AM

Data aggregation technique for millimeter wave and terahertz band high frequency migration technology for beyond 5G

Author(s): Masayuki Makino, Tomoki Tsuji, Osaka Univ. (Japan); Junya Nishioka, Takatoshi Akamatsu, Seiki Nakamura, Yoshiaki Konishi, Naoki Suzuki, Mitsubishi Electric Corp. (Japan); Tsuyoshi Konishi, Osaka Univ. (Japan)

12429-3 • 8:45 AM - 9:00 AM

Photonic integrated circuits for 5G-and-beyond networks: enabling the mmWave band and beyond with InP-based photomixers in integrated transceivers

Author(s): Efsthios Andrianopoulos, Institute of Communication and Computer Systems (Greece), National Technical Univ. of Athens (Greece); Milan Deumer, Tianwen Qian, Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); Nikolaos Lyras, Institute of Communication and Computer Systems (Greece), National Technical Univ. of Athens (Greece); Simon Nellen, Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); Evangelos Pikasis, Georgia Ntouni, Eleftherios Loghis, Elias Tsirbas, Intracom Telecom (Greece); David de Felipe Mesquida, Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); Panos Groumas, Optagon Photonics (Greece), National Technical Univ. of Athens (Greece); Christos Tsokos, Institute of Communication and Computer Systems (Greece); Maria Massaouti, Institute of Communication and Computer Systems (Greece), National Technical Univ. of Athens (Greece); Christos Kouloumentas, Optagon Photonics (Greece), National Technical Univ. of Athens (Greece); Dimitrios Kritharidis, Intracom Telecom (Greece); Robert B. Kohlhaas, Norbert Keil, Martin Schell, Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); Hercules Avramopoulos, Institute of Communication and Computer Systems (Greece), National Technical Univ. of Athens (Greece)

12429-4 • 9:00 AM - 9:30 AM

800Gbps data center interconnection employing silicon photonics (*Invited Paper*)

Author(s): Jian Wang, Wen-Jr Jiang, Mustafa Al-Qadi, Kangmei Li, Xu Liu, Weidong Tang, Gary Fang, Jason Ackert, Chengkun Chen, Yan Yang Zhao, Konstantin Kuzmin, Calvin Ho, NeoPhotonics Corp. (United States); Brian R. West, Luminous Computing, Inc. (United States); David Dougherty, Weilin Liu, Hiroaki Yamada, Ping Wang, Yifeng Zhou, Kevin Schmidt, Jocelyn Nee, Kenneth A. McGreer, Marcel Boudreau, Jibin Sun, Winston Way, Hui Xu, NeoPhotonics Corp. (United States)

Conference 12429

12429-5 • 9:30 AM - 10:00 AM

Inverse-designed on-chip couplers for spatial division multiplexing *(Invited Paper)*

Author(s): Paulo C. Dainese, Jun Yang, Ming-Jun Li, Corning Incorporated (United States); Julian L. Pita, Lucas H. Gabrielli, Univ. of Campinas (Brazil)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: ADVANCED COMPONENTS II

31 January 2023 • 10:30 AM - 11:45 AM | Moscone Center, Room 216 (Level 2 South)

Session Chair: Paulo C. Dainese, Corning Incorporated (United States)

12429-6 • 10:30 AM - 11:00 AM

Enabling technologies for flexible and scalable spatial cross-connects *(Invited Paper)*

Author(s): Masahiko Jinno, Kagawa Univ. (Japan)

12429-8 • 11:00 AM - 11:15 AM

CANCELED: Robust and compact non-imaging angle diversity receiver design for 6G optical wireless access networks

Author(s): Elham Sarbazi, Hossein Kazemi, Univ. of Strathclyde (United Kingdom); Majid Safari, The Univ. of Edinburgh (United Kingdom); Harald Haas, Univ. of Strathclyde (United Kingdom)

12429-9 • 11:15 AM - 11:45 AM

imec Silicon Photonics Platforms: Performance Overview and Roadmap *(Invited Paper)*

Author(s): Filippo Ferraro, Minkyu Kim, Natarajan Rajasekaran, Mathias Berciano, Grigorij Muliuk, Dieter Bode, Guy Lepage, Sofie Janssen, Rafal Magdziak, Jeroen De Coster, Sebastien Lardenois, Negin Golshani, Wei Guo, Leili Shiramin, Chiara Marchese, Selva Rajmohan, Shankr Nadarajan, Didit Yudistira, Neha Singh, Pengfei Xu, Marco Martire, Abdul H. Shahar, Maumita Chakrabarti, Dimitrios Velenis, Andy Miller, Sadhishkumar Balakrishnan, Peter De Heyn, Peter Verheyen, Yoojin Ban, Joris Van Campenhout, Philippe P. Absil, imec (Belgium)

Lunch/Exhibition Break 11:45 AM - 1:15 PM

SESSION 3: LARGE CAPACITY TRANSMISSION I

31 January 2023 • 1:15 PM - 3:00 PM | Moscone Center, Room 216 (Level 2 South)

Session Chair: Leo Spiekman, Aeon Corp. (United States)

12429-11 • 1:15 PM - 1:45 PM

Power-efficient undersea SDM systems *(Invited Paper)*

Author(s): John D. Downie, Corning Research & Development Corporation (United States)

12429-12 • 1:45 PM - 2:00 PM

Crosstalk variation in a standard cladding diameter multicore fiber during the cabling and installation processes

Author(s): Takayoshi Mori, Yusuke Yamada, Masashi Kikuchi, Yuto Sagae, Takashi Matsui, Kazuhide Nakajima, Nippon Telegraph and Telephone Corp. (Japan)

12429-13 • 2:00 PM - 2:30 PM

Field transmission performance of coupled/uncoupled multicore fiber *(Invited Paper)*

Author(s): Mikael Mazur, Roland Ryf, Nicolas Fontaine, Haoshuo Chen, Lauren Dallachiesa, David Neilson, Nokia Bell Labs. (United States); Tetsuya Hayashi, Sumitomo Electric Industries, Ltd. (Japan); Antonio Mecozzi, Cristian Antonelli, Andrea Marotta, Univ. degli Studi dell'Aquila (Italy)

12429-14 • 2:30 PM - 3:00 PM

Latest standardization trend and future prospects for 800G/1.6T optical transceivers *(Invited Paper)*

Author(s): Hideki Isono, IGS Consulting (Japan)

Coffee Break 3:00 PM - 3:30 PM

SESSION 4: LARGE CAPACITY TRANSMISSION II

31 January 2023 • 3:30 PM - 4:45 PM | Moscone Center, Room 216 (Level 2 South)

Session Chair: Kazuhide Nakajima, NTT - Tsukuba R&D Ctr. (Japan)

12429-15 • 3:30 PM - 3:45 PM

Breaking the trade-off between DMD and crosstalk in SDM using graded-index FMF

Author(s): Komal Ojha, Darpan Mishra, Kumar Appaiah, Deepak Jain, Indian Institute of Technology Bombay (India)

12429-16 • 3:45 PM - 4:00 PM

Design of three-mode, dual-step index pure silica core fiber with low differential mode delay and low loss characteristics

Author(s): Taro Iwaya, Yuto Sagae, Takayoshi Mori, Taiji Sakamoto, Takashi Matsui, NTT Access Network Service Systems Labs. (Japan); Takanori Sato, Kunimasa Saitoh, Hokkaido Univ. (Japan); Kazuhide Nakajima, NTT Access Network Service Systems Labs. (Japan)

12429-17 • 4:00 PM - 4:15 PM

Erbium-doped fiber amplifiers design strategies to optimize capacity in submarine systems

Author(s): Juliana Tiburcio de Araujo, Alcatel Submarine Networks S.A. (France); Alberto Bononi, Univ. degli Studi di Parma (Italy); Jean-Christophe Antona, Alexis Carbo Meseguer, Christian Simonneau, Alcatel Submarine Networks S.A. (France)

12429-18 • 4:15 PM - 4:45 PM

Transmission capacity of SOA-amplified links *(Invited Paper)*

Author(s): Leo Spiekman, Aeon Corp. (United States)

WEDNESDAY 1 FEBRUARY

SESSION 5: NETWORKING AND ADVANCED DEVICES I

1 February 2023 • 8:00 AM - 9:45 AM | Moscone Center, Room 216 (Level 2 South)

Session Chair: Guifang Li, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

12429-19 • 8:00 AM - 8:30 AM

Distributed fiber optic sensing over readily available telecom fiber networks *(Invited Paper)*

Author(s): Sarper Ozharar, Yue Tian, Ming-Fang Huang, Philip Ji, Yangmin Ding, Ting Wang, NEC Labs. America, Inc. (United States)

12429-20 • 8:30 AM - 8:45 AM

Network performance analysis of a PIC-based reconfigurable add-drop multiplexer for multiband applications

Author(s): Muhammad Umar Masood, Lorenzo Tunesi, Ihtesham Khan, Bruno Correia, Politecnico di Torino (Italy); Enrico Ghillino, Synopsys, Inc. (United States); Paolo Bardella, Andrea Carena, Vittorio Curri, Politecnico di Torino (Italy)

12429-21 • 8:45 AM - 9:00 AM

Quasi-real-time high resolution spectrum analyzer by two-step spectroscopy

Author(s): Hideto Takayasu, Shuhei Otsuka, Yuma Sato, Takahide Sakamoto, Tokyo Metropolitan Univ. (Japan)

12429-22 • 9:00 AM - 9:15 AM

Accurate prediction of performance for a submarine open cable

Author(s): Joana Girard-Jollet, Jean-Christophe Antona, Alexis Carbo Meseguer, Alcatel Submarine Networks S.A. (France); Matteo Lonardi, Nokia Corp. (Italy); Petros Ramantanis, Nokia Bell Labs. (France); Ghaya Rekaya, Télécom Paris (France); Gaëlle Le Meur, Florence Leplingard, Edmond Lenne, Alcatel Submarine Networks S.A. (France); Samuel Olsson, Nokia Bell Labs. (United States)

12429-23 • 9:15 AM - 9:45 AM

Optical path management based on machine learning for optical networks *(Invited Paper)*

Author(s): Ryuta Shiraki, Yojiro Mori, Hiroshi Hasegawa, Nagoya Univ. (Japan)

Coffee Break 9:45 AM - 10:15 AM

SESSION 6: NETWORKING AND ADVANCED DEVICES II

1 February 2023 • 10:15 AM - 11:45 AM | Moscone Center, Room 216 (Level 2 South)

Session Chair: Sarper Ozharar, NEC Labs. America, Inc. (United States)

12429-24 • 10:15 AM - 10:30 AM

Modeling of quad ring resonator for tunable delay line in z-domain analysis

Author(s): Md Danish Nadeem, Sanjeev Kumar Raghuvanshi, Indian Institute of Technology (Indian School of Mines), Dhanbad (India); Ritesh Kumar, Shri Phaneshwar Nath Renu Engineering College (India); Santosh Kumar, Liaocheng Univ. (China)

12429-25 • 10:30 AM - 10:45 AM

Dynamic vehicular visible light communication for traffic management

Author(s): Manuel A. Vieira, Manuela Vieira, Ctr. of Technology and Systems, UNINOVA (Portugal), Instituto Superior de Engenharia de Lisboa (Portugal); Pedro Vieira, Instituto Superior de Engenharia de Lisboa (Portugal), Instituto de Telecomunicações (Portugal); Rafael Fernandes, Instituto Superior de Engenharia de Lisboa (Portugal), Instituto Politécnico de Lisboa (Portugal); Paula Louro, UNINOVA (Portugal), Instituto Superior de Engenharia de Lisboa (Portugal), Instituto de Telecomunicações (Portugal)

12429-26 • 10:45 AM - 11:00 AM

Global insights into the key photonics technologies enabling transceivers with terabit capacities

Author(s): Martin Vallo, Eric Mounier, Yole Développement SA (France)

12429-27 • 11:00 AM - 11:15 AM

Simplification of etalon spectrometer using inverse matrix data processing algorithm for optical comb spectrum evaluation

Author(s): Takumi Hidaka, Shun Harada, Tatsuki Ishijima, Hideto Takayasu, Takahide Sakamoto, Tokyo Metropolitan Univ. (Japan)

12429-28 • 11:15 AM - 11:45 AM

Recent advances in wideband Raman amplifiers *(Invited Paper)*

Author(s): Pratim Hazarika, Mingming Tan, Wlodek Forysiak, Aston Univ. (United Kingdom)

Lunch/Exhibition Break 11:45 AM - 1:30 PM

SESSION 7: WIRELESS AND VISIBLE LIGHT COMMUNICATIONS I

1 February 2023 • 1:30 PM - 2:45 PM | Moscone Center, Room 216 (Level 2 South)

Session Chair: Hideki Isono, Fujitsu Optical Components Ltd. (Japan)

12429-30 • 1:30 PM - 1:45 PM

Design and analysis of photonic beam forming system using ring resonator for 1×4 phase array antenna in Ka-Band

Author(s): Mohammad Danish Nadeem, Sanjeev Kumar Raghuvanshi, Indian Institute of Technology (Indian School of Mines), Dhanbad (India); Ritesh Kumar, Shri Phaneshwar Nath Renu Engineering College (India); Santosh Kumar, Liaocheng Univ. (China)

12429-31 • 1:45 PM - 2:00 PM

CANCELED: Terabit optical wireless link design for inter-rack communication in 6G data center networks

Author(s): Hossein Kazemi, Elham Sarbazi, Univ. of Strathclyde (United Kingdom); Majid Safari, The Univ. of Edinburgh (United Kingdom); Harald Haas, Univ. of Strathclyde (United Kingdom)

12429-32 • 2:00 PM - 2:15 PM

Reconfigurable multi-beam steering using segmented spatial light modulator for indoor optical wireless communication

Author(s): Faheem Ahmad, Varun Raghunathan, Indian Institute of Science, Bengaluru (India)

Conference 12429

12429-33 • 2:15 PM - 2:30 PM

Design requirements for mm-wave integrated optical beamforming networks

Author(s): Vicente Fito, Maria Morant, Roberto Llorente, Nanophotonics Technology Center, Universitat Politècnica de València (UPV) (Spain)

12429-34 • 2:30 PM - 2:45 PM

A 4λ×112 Gbps integrated wavelength-polarization division multiplexing based hybrid PON-FSO link for last mile access networks

Author(s): Mehtab Singh, Chandigarh Univ. (India); Rohit Sharma, Satyam Institute of Engineering & Technology (India); Amit Grover, Shaheed Bhagat Singh State Univ. (India)

Coffee Break 2:45 PM - 3:15 PM

SESSION 8: WIRELESS AND VISIBLE LIGHT COMMUNICATIONS II

1 February 2023 • 3:15 PM - 4:15 PM | Moscone Center, Room 216 (Level 2 South)

Session Chair: Kazuhide Nakajima, NTT - Tsukuba R&D Ctr. (Japan)

12429-35 • 3:15 PM - 3:30 PM

Exploiting polarization state for beyond 10 Gbps underwater optical wireless data transmission in hostile channel conditions

Author(s): Callum T. Geldard, Egecan Guler, The Univ. of Edinburgh (United Kingdom); Iain M. E. Butler, Alexander Hamilton, Defence Science and Technology Lab. (United Kingdom); Wasiiu O. Popoola, The Univ. of Edinburgh (United Kingdom)

12429-36 • 3:30 PM - 3:45 PM

Cooperative guidance system for mobile users inside large buildings based on visible light communication

Author(s): Manuela Vieira, Manuel Augusto Vieira, UNINOVIA (Portugal), Instituto Superior de Engenharia de Lisboa (Portugal); Pedro Vieira, Instituto Superior de Engenharia de Lisboa (Portugal), Instituto Superior Técnico (Portugal); Alessandro Fantoni, Paula Louro, Instituto Superior de Engenharia de Lisboa (Portugal), UNINOVIA (Portugal)

12429-37 • 3:45 PM - 4:00 PM

Hybrid LED-laser transmitter for color-tunable gigabit-per-second class indoor visible light communication

Author(s): Faheem Ahmad, Varun Raghunathan, Indian Institute of Science, Bengaluru (India)

12429-38 • 4:00 PM - 4:15 PM

On-off keying and Manchester coding in a visible light communication link

Author(s): Paula Louro, Instituto Superior de Engenharia de Lisboa (Portugal), UNINOVIA (Portugal); João Rocha, Instituto Superior de Engenharia de Lisboa (Portugal); Manuela Vieira, Instituto Superior de Engenharia de Lisboa (Portugal), UNINOVIA (Portugal); Manuel Augusto Vieira, UNINOVIA (Portugal)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12429-60

A novel approach in passive photonic alignment

Author(s): Misuk Saha, Benchmark Electronics, Inc. (United States)

12429-61

Wavefront sensorless adaptive optics for free-space satellite-to-ground communication using reinforcement learning

Author(s): Payam Parvizi, Runnan Zou, University of Ottawa (Canada); Ross Cheriton, Colin Bellinger, National Research Council of Canada (Canada); Davide Spinello, University of Ottawa (Canada)

THURSDAY 2 FEBRUARY

SESSION 9: ACCESS AND SHORT REACH TRANSMISSION I

2 February 2023 • 8:00 AM - 9:45 AM | Moscone Center, Room 216 (Level 2 South)

Session Chair: Federico Tonini, Chalmers Univ. of Technology (Sweden)

12429-40 • 8:00 AM - 8:30 AM

Photonic networking across metro and access for future super-broadband services and 6G mobile networks (*Invited Paper*)

Author(s): Jun-ichi Kani, Shin Kaneko, Naotaka Shibata, Yasutaka Kimura, Manabu Yoshino, Kazutaka Hara, Ryo Koma, Tomoaki Yoshida, NTT Access Network Service Systems Labs. (Japan)

12429-41 • 8:30 AM - 8:45 AM

Asymmetric heterodyne downconversion for fading-free radio-over-fiber systems

Author(s): Takahide Sakamoto, Tatsuki Ishijima, Syuhei Otsuka, Hideto Takayasu, Tokyo Metropolitan Univ. (Japan)

12429-42 • 8:45 AM - 9:00 AM

Single PD optical detection of optical intensity and polarization-modulated signals in multidimensional optical transmission

Author(s): Inho Ha, Joungmoon Lee, Jinwoo Park, Sang-Kook Han, Yonsei Univ. (Republic of Korea)

12429-43 • 9:00 AM - 9:15 AM

A wide temperature operation of EML on high bandwidth sub-mount for 200 Gbps PAM4

Author(s): Mizuki Shirao, Hiroshi Miura, Takuma Fujita, Shinya Okuda, Asami Uchiyama, Nobuo Ohata, Mitsubishi Electric Corp. (Japan)

12429-44 • 9:15 AM - 9:30 AM

Near-packaged optics module with 32Gbps x 16lanes for short reach interconnect

Author(s): Tomoyuki Akahoshi, Takahiro Matsubara, KYOCERA Corp. (Japan)

12429-45 • 9:30 AM - 9:45 AM

CANCELED: Multi-beam optical wireless access point design for 6G LiFi networks: eye safety-coverage tradeoff

Author(s): Hossein Kazemi, Elham Sarbazi, Univ. of Strathclyde (United Kingdom); Majid Safari, The Univ. of Edinburgh (United Kingdom); Harald Haas, Univ. of Strathclyde (United Kingdom)

Coffee Break 9:45 AM - 10:15 AM

SESSION 10: ACCESS AND SHORT REACH TRANSMISSION II

2 February 2023 • 10:15 AM - 12:00 PM | Moscone Center, Room 216 (Level 2 South)

Session Chair: Jun-ichi Kani, NTT Access Network Service Systems Labs. (Japan)

12429-46 • 10:15 AM - 10:45 AM

Datacenter optics: key component technologies for the next decade *(Invited Paper)*

Author(s): Ryohei Urata, Google (United States)

12429-47 • 10:45 AM - 11:15 AM

Dual-polarization direct-detection for data-center optical communications *(Invited Paper)*

Author(s): Christopher R. Doerr, Aloe Semiconductor Inc. (United States)

12429-48 • 11:15 AM - 11:30 AM

Practical decoy-state sender implemented over analog RoF transmitters for secure 5G and beyond X-haul connections

Author(s): Giannis Giannoulis, Argiris Ntanos, Institute of Communication and Computer Systems (Greece), National Technical Univ. of Athens (Greece); Aristidis Stathis, NTUA (Greece); Konstantina Kanta, Panagiotis Toumasis, Dimitris Zavitsanos, Nikolaos K. Lyras, Dimitrios Apostolopoulos, Hercules Avramopoulos, Institute of Communication and Computer Systems (Greece), National Technical Univ. of Athens (Greece)

12429-49 • 11:30 AM - 12:00 PM

Techno-economics of 5G transport deployments *(Invited Paper)*

Author(s): Maryam Lashgari, Federico Tonini, Chalmers Univ. of Technology (Sweden); Massimiliano Capacchione, SIAE MICROELETTRONICA S.p.A. (Italy); Lena Wosinska, Chalmers Univ. of Technology (Sweden); Gabriele Rigamonti, SIAE MICROELETTRONICA S.p.A. (Italy); Paolo Monti, Chalmers Univ. of Technology (Sweden)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 11: ADVANCED TRANSMISSION TECHNOLOGY I

2 February 2023 • 1:30 PM - 3:15 PM | Moscone Center, Room 216 (Level 2 South)

Session Chair: Atul K. Srivastava, NTT Electronics America, Inc. (United States)

12429-50 • 1:30 PM - 2:00 PM

Power-over-fiber technologies using double-clad fibers for remote antenna units in mobile networks *(Invited Paper)*

Author(s): Motoharu Matsuura, The Univ. of Electro-Communications (Japan)

12429-51 • 2:00 PM - 2:15 PM

Toward future generation digital avionics fiber optic communication

Author(s): Obidon Bassinan, Naval Air Warfare Ctr. Aircraft Div. (United States); Joe Ahadian, Ultra Communications, Inc. (United States); Mark Beranek, Naval Air Warfare Ctr. Aircraft Div. (United States); Anthony Campillo, U.S. Naval Research Lab. (United States); Steven B. Estrella, Hannah R. Grant, Don Kebort, Freedom Photonics, LLC (United States); Charlie Kuznia, Ultra Communications, Inc. (United States); Milan Mashanovitch, Freedom Photonics, LLC (United States); Sandra Skendzic, Ultra Communications, Inc. (United States); Jim Tatum, Photon Sciences Inc. (United States); Madison Woodson, Freedom Photonics, LLC (United States)

12429-53 • 2:15 PM - 2:30 PM

Geometric and probabilistic constellation-shaping in high spectral efficiency multi-dimensional optical QAM-DPSK-PIRFSK transmission

Author(s): Jinwoo Park, Joungmoon Lee, Sang-Kook Han, Yonsei Univ. (Republic of Korea)

12429-54 • 2:30 PM - 2:45 PM

Investigating probabilistic constellation shaping for dual-polarization PAM8 signals at different data rates

Author(s): Kayden Kaller, Mihail Raytchev, Optiwave Systems Inc. (Canada); Ahmed Galib Reza, Marcos Costas Troncoso Costas, Liam Barry, Dublin City University (Ireland); Ahmad K. Atieh, Optiwave Systems Inc. (Canada)

12429-55 • 2:45 PM - 3:15 PM

Scalable architecture for sub-pJ/b multi-Tbps comb-driven DWDM silicon photonic transceiver *(Invited Paper)*

Author(s): Yuyang Wang, Columbia Univ. (United States); Asher Novick, Robert Parsons, Songli Wang, Kaylx Jang, Aneek James, Maarten Hattink, Vignesh Gopal, Columbia University (United States); Anthony Rizzo, Air Force Research Laboratory (United States); Chia-Pin Chiu, Kaveh Hosseini, Tim Tri Hoang, Intel Corporation (United States); Keren Bergman, Columbia Univ. (United States)

Coffee Break 3:15 PM - 3:45 PM

Conference 12429

SESSION 12: ADVANCED TRANSMISSION TECHNOLOGY II

2 February 2023 • 3:45 PM - 5:15 PM | Moscone Center, Room 216 (Level 2 South)

Session Chair: Guifang Li, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

12429-56 • 3:45 PM - 4:15 PM

Photonic-assisted microwave quantum-noise randomized cipher generation for signal security of wireless communications *(Invited Paper)*

Author(s): Ken Tanizawa, Fumio Futami, Tamagawa Univ. (Japan)

12429-57 • 4:15 PM - 4:30 PM

Multi-channel encryption scheme for secure optical communication

Author(s): Romil Audhkhasi, Michelle L. Povinelli, The Univ. of Southern California (United States)

12429-58 • 4:30 PM - 4:45 PM

CANCELED: Physical layer encryption via photonic lantern architecture for optical communications systems

Author(s): Matthew A. Cooper, Stephanos Yerolatsitis, Daniel C. Delgado, Jose-Antonio Lopez, Stephen Eikenberry, Guifang Li, Rodrigo Amezcua Correa, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

12429-59 • 4:45 PM - 5:15 PM

Field-installed fiber transmission of Y-00 quantum noise stream cipher with quantum deliberate signal randomization *(Invited Paper)*

Author(s): Fumio Futami, Ken Tanizawa, Kentaro Kato, Tamagawa Univ. (Japan)

Conference 12430

Quantum Sensing and Nano Electronics and Photonics XIX

29 January - 2 February 2023 | Moscone Center, Room 70 (Lower Mezzanine South)

Conference Chair: **Manijeh Razeghi**, Northwestern Univ. (United States)

Conference Co-Chairs: **Giti A. Khodaparast**, Virginia Polytechnic Institute and State Univ. (United States); **Miriam S. Vitiello**, Istituto Nanoscienze (Italy)

Program Committee: **Amir H. Atabaki**, Percepra Technologies, Inc. (United States); **Jason M. Auxier**, U.S. Naval Research Lab. (United States); **Henri-Jean M. Drouhin**, Lab. des Solides Irradiés (France); **Jérôme Faist**, ETH Zurich (Switzerland); **Sumit Kumar Gupta**, Parishkar College of Global Excellence (India); **Riad Haïdar**, ONERA (France); **Amr S. Helmy**, Univ. of Toronto (Canada); **Sven Höfling**, Julius-Maximilians-Univ. Würzburg (Germany); **John E. Hubbs**, Ball Aerospace (United States); **Jean-Pierre Huignard**, Jphopto (France); **M. Saif Islam**, Univ. of California, Davis (United States); **Chennupati Jagadish**, The Australian National Univ. (Australia); **Mona Jarrahi**, UCLA Samueli School of Engineering (United States); **Woo-Gwang Jung**, Kookmin Univ. (Republic of Korea); **Tsukuru Katsuyama**, Tokyo Institute of Technology (Japan); **Pedram Khalili**, Northwestern Univ. (United States); **Philip C. Klipstein**, SCD Semiconductor Devices (Israel); **Kwok Keung Law**, Naval Air Warfare Ctr. Weapons Div. (United States); **Giuseppe Leo**, Lab. Matériaux et Phénomènes Quantiques (France); **Jay S. Lewis**, Microsoft Corp. (United States); **Amy W. K. Liu**, IQE Inc. (United States); **Quanyong Lu**, Beijing Academy of Quantum Information Sciences (United States); **Tariq Manzur**, Naval Undersea Warfare Ctr. (United States); **Paul-Louis Meunier**, ESTP-Paris (France); **Jerry R. Meyer**, U.S. Naval Research Lab. (United States); **Zetian Mi**, Univ. of Michigan (United States); **Maya P. Mikhailova**, Ioffe Institute (Russian Federation); **Carolynn A. Moore**, DEVCOM C5ISR (United States); **Jill A. Nolde**, U.S. Naval Research Lab. (United States); **Shanee Pacley**, Air Force Research Lab. (United States); **Jean-Luc Pelouard**, Ctr. de Nanosciences et de Nanotechnologies (France); **Håkan Pettersson**, Halmstad Univ. (Sweden); **Narasimha S. Prasad**, NASA Langley Research Ctr. (United States); **Edik U. Rafailov**, Aston Univ. (United Kingdom); **Fengbo Ren**, Arizona State Univ. (United States); **Isabelle Ribet-Mohamed**, ONERA (France); **Edward H. Sargent**, Univ. of Toronto (Canada); **James P. Shaffer**, Quantum Valley Ideas Lab. (Canada); **Meimei Z. Tidrow**, U.S. Army CCDC C5ISR Ctr. Night Vision & Electronic Sensors Directorate (United States); **Joseph G. Tischler**, The Univ. of Oklahoma (United States); **Cunzhu Tong**, Changchun Institute of Optics, Fine Mechanics and Physics (China); **Eric Tournié**, Univ. de Montpellier (France); **Donghai Wu**, Northwestern Univ. (China)

SUNDAY 29 JANUARY

SESSION 1: PROGRESS IN NITRIDE BASED SYSTEMS I

29 January 2023 • 8:45 AM - 10:00 AM | Moscone Center, Room 70 (Lower Mezzanine South)

Session Chair: Giti A. Khodaparast, Virginia Polytechnic Institute and State Univ. (United States)

12430-1 • 8:45 AM - 9:10 AM

ScAlN integrated quantum photonics (*Invited Paper*)

Author(s): Zetian Mi, Univ. of Michigan (United States)

12430-2 • 9:10 AM - 9:35 AM

Erasing the efficiency droop in cubic phase InGaAlN QW light-emitting diode (*Invited Paper*)

Author(s): Jean-Pierre Leburton, Univ. of Illinois (United States)

12430-3 • 9:35 AM - 10:00 AM

Engineering the light extraction efficiency of AlInN nanowire ultraviolet light-emitting diodes with surface passivation and photonic crystal structures (*Invited Paper*)

Author(s): Hieu Pham Trung Nguyen, Ravi Teja Velpula, Barsha Jain, Moulik Patel, Addressa Marangon, New Jersey Institute of Technology (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: PROGRESS IN NITRIDE BASED SYSTEMS II

29 January 2023 • 10:30 AM - 12:25 PM | Moscone Center, Room 70 (Lower Mezzanine South)

Session Chairs: Jean-Pierre Leburton, Univ. of Illinois (United States), John P. Prineas, The Univ. of Iowa (United States)

12430-4 • 10:30 AM - 10:55 AM

CANCELED: Group III-nitride nanowires: from classical optoelectronics to quantum photonics to energy harvesting (*Invited Paper*)

Author(s): Sharif M. Sadaf, Institut National de la Recherche Scientifique (Canada)

12430-5 • 10:55 AM - 11:20 AM

Avalanche in III-nitrides and their applications (*Invited Paper*)

Author(s): Srabanti Chowdhury, Stanford Univ. (United States)

12430-6 • 11:20 AM - 11:45 AM

Integration of ferroelectrics with III-N transistors for high performance millimeter-wave applications (*Invited Paper*)

Author(s): Hansheng Ye, Yu-En Jeng, Adam Jonsson, Chunlei Wu, Nivedhita Venkatesan, Jingshan Wang, Univ. of Notre Dame (United States); Yu Cao, Andy Xie, Ed Beam, Qorvo, Inc. (United States); Patrick Fay, Univ. of Notre Dame (United States)

12430-7 • 11:45 AM - 12:10 PM

GaN nanostructures for photonic applications (*Invited Paper*)

Author(s): Kristine A. Bertness, Matt D. Brubaker, Alexana Roshko, National Institute of Standards and Technology (United States)

Conference 12430

12430-8 • 12:10 PM - 12:25 PM

N-Polar InGaN nanowires for high efficiency red micro-LEDs

Author(s): Yakshita Malhotra, Ayush Pandey, Ping Wang, Kai Sun, Xianhe Liu, Zetian Mi, Univ. of Michigan (United States)

Lunch/Exhibition Break 12:25 PM - 1:35 PM

SESSION 3: QUANTUM CASCADE LASERS & FREQUENCY COMBS I

29 January 2023 • 1:35 PM - 3:00 PM | Moscone Center, Room 70 (Lower Mezzanine South)

Session Chairs: George T. Wang, Sandia National Labs. (United States), Miriam S. Vitiello, Istituto Nanoscienze (Italy)

12430-9 • 1:35 PM - 2:00 PM

Progress in passively mode-locked interband cascade laser frequency combs for on-chip mid-infrared spectroscopy *(Invited Paper)*

Author(s): Alex J. Grede, Chadwick L. Canedy, U.S. Naval Research Lab. (United States); Michael Povolotskyi, Mijin Kim, Jacobs Engineering Group Inc. (United States); Chul Soo Kim, Charles D. Merritt, William W. Bewley, Jerry R. Meyer, U.S. Naval Research Lab. (United States); Lukasz A. Sterczewski, Wroclaw Univ. of Science and Technology (Poland); Mahmood Bagheri, Jet Propulsion Lab. (United States), Caltech (United States); Clifford Frez, Jet Propulsion Lab. (United States); Igor Vurgaftman, U.S. Naval Research Lab. (United States)

12430-10 • 2:00 PM - 2:15 PM

Standoff hyperspectral imaging using a mid-IR quantum cascade laser dual-comb spectrometer

Author(s): Jie Liu, Baichuan Huang, Michael G. Soskind, Gerard Wysocki, Princeton Univ. (United States)

12430-11 • 2:15 PM - 2:30 PM

Surface-emitting planarized THz quantum cascade laser frequency combs with inverse-designed waveguide facets

Author(s): Urban Senica, Sebastian Gloor, Paolo Micheletti, Mattias Beck, Jérôme Faist, Giacomo Scalari, ETH Zurich (Switzerland)

12430-12 • 2:30 PM - 2:45 PM

Frequency comb operation of antenna coupled terahertz quantum cascade ring lasers

Author(s): Paolo Micheletti, Urban Senica, Andres Forrer, ETH Zurich (Switzerland); Sara Cibella, Guido Torrioli, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Mattias Beck, Jérôme Faist, Giacomo Scalari, ETH Zurich (Switzerland)

12430-13 • 2:45 PM - 3:00 PM

Phase-locked low spatial coherence emission in random quantum cascade lasers for hyperspectral nano-imaging in the THz range

Author(s): Alessandra Di Gaspare, Eva A. A. Pogna, Valentino Pistore, Elisa Riccardi, NEST, the National Enterprise for nanoScience and nanoTechnology (Italy), Istituto Nanoscienze (Italy), Scuola Normale Superiore (Italy); Harvey E. Beere, David A. Ritchie, Univ. of Cambridge (United Kingdom); Lianhe Li, Giles A. Davies, Edmund H. Linfield, Univ. of Leeds (United Kingdom); Andrea C. Ferrari, Univ. of Cambridge (United Kingdom); Miriam S. Vitiello, NEST, the National Enterprise for nanoScience and nanoTechnology (Italy), Istituto Nanoscienze (Italy), Scuola Normale Superiore (Italy)

Coffee Break 3:00 PM - 3:30 PM

SESSION 4: QUANTUM CASCADE LASERS & FREQUENCY COMBS II

29 January 2023 • 3:30 PM - 5:35 PM | Moscone Center, Room 70 (Lower Mezzanine South)

Session Chairs: Michael B. Johnston, Univ. of Oxford (United Kingdom), Zetian Mi, Univ. of Michigan (United States)

12430-14 • 3:30 PM - 3:55 PM

CANCELED: Steady state and time domain control of giant nonlinearities in semiconductor superlattices *(Invited Paper)*

Author(s): Mauro F. Pereira, Khalifa Univ. (United Arab Emirates), Institute of Physics of the CAS, v.v.i. (Czech Republic); Apostolos Apostolakis, Institute of Physics of the CAS, v.v.i. (Czech Republic)

12430-15 • 3:55 PM - 4:20 PM

Dynamic and nonlinear properties of mid infrared interband quantum cascade lasers *(Invited Paper)*

Author(s): Frédéric Grillot, Télécom Paris (France); Olivier Spitz, Univ. of Central Florida (United States); Shiyuan Zhao, Pierre Didier, Télécom Paris (France)

12430-16 • 4:20 PM - 4:35 PM

Terahertz detectorless hyperspectral near-field imaging and spectroscopy exploiting QCL frequency combs

Author(s): Valentino Pistore, Eva A. A. Pogna, Leonardo Viti, Istituto Nanoscienze (Italy); Lianhe Li, Giles A. Davies, Edmund H. Linfield, Univ. of Leeds (United Kingdom); Miriam S. Vitiello, Istituto Nanoscienze (Italy)

12430-17 • 4:35 PM - 4:50 PM

Low threshold quantum cascade surface emitting lasers

Author(s): David Stark, Filippas Kapsalidis, Zhixin Wang, Mathieu Bertrand, Ruijun Wang, Bo Meng, ETH Zurich (Switzerland); Emilio Gini, FIRST Ctr. for Micro- and Nanoscience, ETH Zurich (Switzerland); Mattias Beck, Jérôme Faist, ETH Zurich (Switzerland)

12430-18 • 4:50 PM - 5:05 PM

Broadly tunable external cavity interband cascade laser (EC-ICL) for hydrocarbon analysis

Author(s): Ilya Dunayevskiy, Jason Kriesel, Opto-Knowledge Systems, Inc. (United States); Ryan Briggs, Jet Propulsion Lab. (United States), NASA (United States); Chul Soo Kim, U.S. Naval Research Lab. (United States); Mijin Kim, Jacobs Engineering Group Inc. (United States); Chadwick L. Canedy, William W. Bewley, Igor Vurgaftman, Jerry R. Meyer, U.S. Naval Research Lab. (United States)

12430-19 • 5:05 PM - 5:20 PM

Lens-coupled sub-THz and THz quantum cascade laser sources based on intra-cavity frequency mixing

Author(s): Shohei Hayashi, Akio Ito, Tatsuo Dougakiuchi, Masahiro Hitaka, Atsushi Nakanishi, Kazuue Fujita, Hamamatsu Photonics K.K. (Japan)

12430-20 • 5:20 PM - 5:35 PM

Broadband mid-infrared milk protein analysis based on quantum cascade technology

Author(s): Borislav Hinkov, Alicja Dabrowska, Mauro David, Andreas Schwaighofer, Stephan Freitag, Aaron M. Andrews, Gottfried Strasser, Bernhard Lendl, Technische Univ. Wien (Austria)

MONDAY 30 JANUARY

OPTO PLENARY SESSION

30 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 207/215 (Level 2 South)

8:00 AM - 8:05 AM: **Welcome and Opening Remarks**

Sonia García-Blanco, Univ. Twente (Netherlands) and Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

8:05 AM - 8:15 AM: **Announcement of the OPTO AI/ML and Net Zero Best Paper Awards**

12424-501 • 8:15 AM - 8:50 AM

High-performance electronic-photonic interfaces: from AI to quantum (*Plenary Presentation*)

Author(s): Rajeev Ram, Massachusetts Institute of Technology (United States)

12416-501 • 8:50 AM - 9:25 AM

Tandem photovoltaic devices: more than one way to make a solar cell (*Plenary Presentation*)

Author(s): Emily L. Warren, National Renewable Energy Lab. (United States)

12421-501 • 9:25 AM - 10:00 AM

Are III-nitride semiconductors also suitable for red emission? (*Plenary Presentation*)

Author(s): Nicolas Grandjean, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 5: QUANTUM PHOTONICS AND ELECTRONICS DEVICES I

30 January 2023 • 10:20 AM - 12:40 PM | Moscone Center, Room 70 (Lower Mezzanine South)

Session Chairs: Steven K. Clowes, Univ. of Surrey (United Kingdom), Simeon Bogdanov, Univ. of Illinois (United States)

12430-21 • 10:20 AM - 10:45 AM

On-chip, ultra-low voltage GaN vacuum nanoelectronics (*Invited Paper*)

Author(s): George T. Wang, Keshab R. Sapkota, A. Alec Talin, Francois Leonard, Brendan P. Gunning, Gyorgy Vizkelethy, Sandia National Labs. (United States)

12430-22 • 10:45 AM - 11:10 AM

Novel III-V materials and heterostructures for thermally stable near-IR lasers (*Invited Paper*)

Author(s): Dominic A. Duffy, Igor P. Marko, Stephen J. Sweeney, Univ. of Surrey (United Kingdom)

12430-23 • 11:10 AM - 11:35 AM

Hybrid quantum photonic integrated circuits (*Invited Paper*)

Author(s): Khaled Mnaymneh, National Research Council Canada (Canada); Edith Yeung, Univ. of Ottawa (Canada); David B. Northeast, Jeongwan Jin, National Research Council Canada (Canada); Patrick Laferrière, National Research Council Canada (Canada), Univ. of Ottawa (Canada); Sofiane Haffouz, Robin L. Williams, Philip J. Poole, National Research Council Canada (Canada); Dan Dalacu, National Research Council Canada (Canada), Univ. of Ottawa (Canada)

12430-24 • 11:35 AM - 12:00 PM

New paradigms in manifold learning for knowledge discovery and inverse design of photonic nanostructures (*Invited Paper*)

Author(s): Mohammadreza Zandehshahvar, Mohammad Hadighehjavani, Yashar Kiarashi, Muliang Zhu, Tyler Brown, Daqian Bao, Mahmoodreza Marzban, Georgia Institute of Technology (United States); Reza Pourabolghasem, NA (United States); Ali Adibi, Georgia Institute of Technology (United States)

12430-26 • 12:00 PM - 12:25 PM

Degradation mechanisms of laser diodes for silicon photonics applications (*Invited Paper*)

Author(s): Carlo De Santi, Matteo Buffolo, Michele Zenari, Univ. degli Studi di Padova (Italy); Chen Shang, John E. Bowers, Univ. of California, Santa Barbara (United States); Gaudenzio Meneghesso, Enrico Zanoni, Matteo Meneghini, Univ. degli Studi di Padova (Italy)

12430-25 • 12:25 PM - 12:40 PM

Heterogeneous III-V nanowire quantum emitters on silicon photonic circuits

Author(s): Hyowon Jeong, Akhil Ajay, Nitin Mukhundhan, Walter Schottky Institut (Germany), Technische Univ. München (Germany); Markus Döblinger, Ludwig-Maximilians-Univ. München (Germany); Jonathan J. Finley, Gregor Koblmüller, Walter Schottky Institut (Germany), Technische Univ. München (Germany)

Lunch Break 12:40 PM - 1:40 PM

SESSION 6: QUANTUM PHOTONICS AND ELECTRONICS DEVICES II

30 January 2023 • 1:40 PM - 3:10 PM | Moscone Center, Room 70 (Lower Mezzanine South)

Session Chairs: Srabanti Chowdhury, Stanford Univ. (United States), Kristine A. Bertness, National Institute of Standards and Technology (United States)

12430-27 • 1:40 PM - 2:05 PM

Photon-pair sources for chip-scale quantum technology (*Invited Paper*)

Author(s): Imad Faruque, Ben M. Burrage, Siddarth K. Joshi, John G. Rarity, Jorge Barreto, Univ. of Bristol (United Kingdom)

12430-28 • 2:05 PM - 2:30 PM

Progress and perspectives of nonvolatile memory devices based on antiferromagnetic metals (*Invited Paper*)

Author(s): Pedram Khalili, Northwestern Univ. (United States)

Conference 12430

12430-29 • 2:30 PM - 2:55 PM

Revealing nanoscale transport mechanisms with scanning probe methods (*Invited Paper*)

Author(s): Georges Pavlidis, Univ. of Connecticut (United States)

12430-30 • 2:55 PM - 3:10 PM

UV-replicated microlenses for quantum devices

Author(s): Frédéric Zanella, Christian Schneider, Luka Ciric, Guillaume Basset, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland)

Coffee Break 3:10 PM - 3:40 PM

SESSION 7: QUANTUM PHOTONICS AND ELECTRONICS DEVICES III

30 January 2023 • 3:40 PM - 5:20 PM | Moscone Center, Room 70 (Lower Mezzanine South)

Session Chair: Hieu Pham Trung Nguyen, New Jersey Institute of Technology (United States)

12430-31 • 3:40 PM - 4:05 PM

On-chip quantum secure communications (*Invited Paper*)

Author(s): Taofiq K. Paraiso, Joseph A. Dolphin, Thomas Roger, Davide G. Marangon, Mirko Sanzaro, Robert I. Woodward, James F. Dynes, Andrew J. Shields, Toshiba Research Europe Ltd. (United Kingdom)

12430-32 • 4:05 PM - 4:30 PM

Electro-Optic Arbitrary Millimeter-Wave Sources for THz Electronics (*Invited Paper*)

Author(s): Bryan Bosworth, Nicholas Jungwirth, National Institute of Standards and Technology (United States); Jerome Cheron, National Institute of Standards and Technology (United States); Univ. of Colorado Boulder (United States); Anna Osella, National Institute of Standards and Technology (United States), Colorado School of Mines (United States); Franklyn Quinlan, National Institute of Standards and Technology (United States); Madison Woodson, Freedom Photonics, LLC (United States); Jesse Morgan, Andreas Beling, Univ. of Virginia (United States); Ari Feldman, Dylan Williams, Nathan Orloff, Chris Long, National Institute of Standards and Technology (United States)

12430-33 • 4:30 PM - 4:55 PM

Period doubling perturbations for absorptive and emissive switching (*Invited Paper*)

Author(s): Michelle L. Povinelli, Alok Ghanekar, The Univ. of Southern California (United States); Abhishek Mukherjee, The Univ. of Southern California (United States), Birla Institute of Technology and Science, Pilani (India)

12430-34 • 4:55 PM - 5:20 PM

Cascaded mid-infrared LEDs in resonant structures (*Invited Paper*)

Author(s): John P. Prineas, David A. Montealegre, Weitao Dai, Katrina N. Schrock, The Univ. of Iowa (United States); Logan M. Nichols, Matthew Z. Bellus, Alex C. Walhof, Firefly Photonics, LLC (United States)

TUESDAY 31 JANUARY

SESSION 8: DETECTORS AND SENSORS I

31 January 2023 • 8:30 AM - 10:00 AM | Moscone Center, Room 70 (Lower Mezzanine South)

Session Chairs: Pedram Khalili, Northwestern Univ. (United States), Imad Faruque, Univ. of Bristol (United Kingdom)

12430-36 • 8:30 AM - 8:55 AM

Signal, noises, and detectivities in multi-stage infrared photodetectors (*Invited Paper*)

Author(s): Rui Q. Yang, The Univ. of Oklahoma (United States)

12430-37 • 8:55 AM - 9:20 AM

Probing performance limiting factors in uncooled quantum dots/graphene SWIR-MWIR detectors (*Invited Paper*)

Author(s): Judy Z. Wu, The Univ. of Kansas (United States)

12430-38 • 9:20 AM - 9:45 AM

Beyond lighting: gallium nitride for augmented reality, robotics, spectroscopy, and quantum information (*Invited Paper*)

Author(s): Pei-Cheng Ku, Univ. of Michigan (United States)

12430-39 • 9:45 AM - 10:00 AM

Ga-free superlattice nBn structure on Si (100): high performance MWIR Photodetector

Author(s): Maxime Bouschet, Audrey Gilbert, Jean-Philippe Perez, Laurent Cerutti, Institut d'Electronique et des Systèmes (France); Cyril Cervera, Olivier Gravrand, CEA-LETI (France); Anthony Ramiandrasoa, Isabelle Ribet, ONERA (France); Nicolas Péré-Laperne, LYNRED (France); Philippe Christol, Jean-Baptiste Rodriguez, Eric Tournié, Institut d'Électronique et des Systèmes (France)

Coffee Break 10:00 AM - 10:30 AM

SESSION 9: DETECTORS AND SENSORS II

31 January 2023 • 10:30 AM - 12:10 PM | Moscone Center, Room 70 (Lower Mezzanine South)

Session Chairs: Koray Aydin, Northwestern Univ. (United States), Stephanie Law, The Pennsylvania State Univ. (United States)

12430-40 • 10:30 AM - 10:55 AM

Nanowire-based sensors reveal the full polarisation state of THz photons (*Invited Paper*)

Author(s): Michael B. Johnston, Univ. of Oxford (United Kingdom)

12430-41 • 10:55 AM - 11:20 AM

Material optimization for extended short-wavelength and mid-wavelength infrared avalanche photodiodes (*Invited Paper*)

Author(s): Sam Tempel, Martin Winslow, Univ. of Illinois at Chicago (United States); Sri Harsha Kodati, Theodore J. Ronningen, The Ohio State Univ. (United States); Joe C. Campbell, Univ. of Virginia (United States); Sanjay Krishna, The Ohio State Univ. (United States); Srini Krishnamurthy, Christoph H. Grein, Univ. of Illinois at Chicago (United States); SeungHyun Lee, The Ohio State Univ. (United States)

12430-42 • 11:20 AM - 11:45 AM

Real-time hyperspectral video processing via artificial intelligent optoelectronic hardware *(Invited Paper)*

Author(s): Andrea Fratalocchi, King Abdullah Univ. of Science and Technology (Saudi Arabia)

12430-43 • 11:45 AM - 12:10 PM

Frequency response of patch-array QWIP photodetectors up to 220 GHz via mid-infrared photomixing *(Invited Paper)*

Author(s): Quyang Lin, Michael Hakl, Jean-François Lampin, Institut d'Electronique de Microélectronique et de Nanotechnologie, CNRS (France), Univ. de Lille (France); Wenjian Wan, J. C. Cao, Hua Li, Key Lab. of Terahertz Solid State Technology (China); Emilien Peytavit, Stefano Barbieri, Institut d'Electronique de Microélectronique et de Nanotechnologie, CNRS (France), Univ. de Lille (France)

Lunch/Exhibition Break 12:10 PM - 1:10 PM

SESSION 10: QUANTUM INFORMATION AND OPTICAL SENSING I

31 January 2023 • 1:10 PM - 2:50 PM | Moscone Center, Room 70 (Lower Mezzanine South)

Session Chairs: Yannick De Wilde, Institut Langevin (France), Sezai Elagoz, ASELSAN A.S. (Turkey)

12430-44 • 1:10 PM - 1:35 PM

Photonic quantum computing *(Invited Paper)*

Author(s): Olivier Pfister, Univ. of Virginia (United States)

12430-45 • 1:35 PM - 2:00 PM

Materials exploration toward quantum control and manipulation of phonons *(Invited Paper)*

Author(s): Giti A. Khodaparast, Virginia Polytechnic Institute and State Univ. (United States)

12430-46 • 2:00 PM - 2:25 PM

Visualizing ultrafast lattice dynamics at 2D van der Waals interfaces using femtosecond electron diffraction *(Invited Paper)*

Author(s): Archana Raja, Lawrence Berkeley National Lab. (United States)

12430-47 • 2:25 PM - 2:50 PM

Hetero-nanostructures for chiral and nonlinear nanophotonics *(Invited Paper)*

Author(s): Anatoly V. Zayats, King's College London (United Kingdom)

Coffee Break 2:50 PM - 3:20 PM

SESSION 11: QUANTUM INFORMATION AND OPTICAL SENSING II

31 January 2023 • 3:20 PM - 5:30 PM | Moscone Center, Room 70 (Lower Mezzanine South)

Session Chairs: Georges Pavlidis, Univ. of Connecticut (United States), Giti A. Khodaparast, Virginia Polytechnic Institute and State Univ. (United States)

12430-48 • 3:20 PM - 3:45 PM

Optical studies of implanted bismuth impurities in silicon towards single/few impurity devices *(Invited Paper)*

Author(s): Steven K. Clowes, Benedict N. Murdin, Kristian Stockbridge, Tomas Peach, Univ. of Surrey (United Kingdom); Nils Dressman, Radboud Univ. Nijmegen (Netherlands)

12430-49 • 3:45 PM - 4:10 PM

Rapid optical screening of color centers in nanodiamonds *(Invited Paper)*

Author(s): Simeon Bogdanov, Swetapadma Sahoo, Yichen Liu, Univ. of Illinois (United States)

12430-50 • 4:10 PM - 4:35 PM

A compact radiofrequency spectrum analyzer based on nitrogen-vacancy centers in diamond *(Invited Paper)*

Author(s): Ludovic Mayer, Simone Magaletti, Thales Research & Technology (France); Ovidiu Brinza, Lab. des Sciences des Procédés et des Matériaux, CNRS (France), Univ. Sorbonne Paris-Nord (France); Alexandre Tallaie, Institut de Recherche de Chimie Paris, CNRS (France); Jocelyn Achard, Lab. des Sciences des Procédés et des Matériaux, CNRS (France), Univ. Sorbonne Paris-Nord (France); Jean-François Roch, Univ. Paris-Saclay, CNRS (France), École normale supérieure Paris-Saclay (France), CentraleSupélec (France); Thierry Debuisschert, Thales Research & Technology (France)

12430-51 • 4:35 PM - 5:00 PM

Color centers in AlN as qubit candidates: point defect management *(Invited Paper)*

Author(s): Ramon Collazo, Pegah Bagheri, North Carolina State Univ. (United States); Ronny Kirste, Pramod Reddy, Seiji Mita, Adroit Materials Inc. (United States); Zlatko Sitar, North Carolina State Univ. (United States)

12430-52 • 5:00 PM - 5:15 PM

Formation and characterization of Ti-Vacancy complex in AlN as a candidate for qubit

Author(s): Pegah Bagheri, North Carolina State Univ. (United States); Ronny Kirste, Pramod Reddy, Seiji Mita, Adroit Materials Inc. (United States); Ramon Collazo, Zlatko Sitar, North Carolina State Univ. (United States)

12430-110 • 5:15 PM - 5:30 PM

Helmholtz-type optical resonators for molecular sensing and SWIR detection

Author(s): Laura Paggi, ONERA (France); Claire Abadie, ONERA (France), Institut des nanosciences de Paris (France); Alice Fabas, Hasnaa El Ouazzani, ONERA (France); Jean-Paul Hugonin, Lab. Charles Fabry (France); Nathalie Bardou, Christophe Dupuis, Ctr. de Nanosciences et de Nanotechnologies (France); Grégory Vincent, Baptiste Fix, ONERA (France); Jean-Jacques Greffet, Lab. Charles Fabry (France); Emmanuel P. Lhuillier, Institut des nanosciences de Paris (France); Patrick Bouchon, ONERA (France)

Conference 12430

WEDNESDAY 1 FEBRUARY

SESSION 12: IMAGING AND BIOPHOTONICS I

1 February 2023 • 8:30 AM - 10:00 AM | Moscone Center, Room 70 (Lower Mezzanine South)

Session Chairs: Giti A. Khodaparast, Virginia Polytechnic Institute and State Univ. (United States), Tariq Manzur, Naval Undersea Warfare Ctr. (United States)

12430-53 • 8:30 AM - 8:55 AM

Nano-photonics for compact all-optical image processing with asymmetric transfer functions (*Invited Paper*)

Author(s): Ann Roberts, The Univ. of Melbourne (Australia)

12430-54 • 8:55 AM - 9:20 AM

Photonics through biological lenses (*Invited Paper*)

Author(s): Marika Valentino, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); Jaromir Behal, Giusy Giugliano, CNR-ISASI (Italy); Daniele Pirone, Pasquale Memmolo, Vittorio Bianco, Lisa Miccio, Pietro Ferraro, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

12430-55 • 9:20 AM - 9:45 AM

Quantitative deep tissue diffuse optical spectroscopy and imaging (*Invited Paper*)

Author(s): Thomas D. O'Sullivan, Univ. of Notre Dame (United States)

12430-56 • 9:45 AM - 10:00 AM

Time-resolved photothermal breath analysis

Author(s): Sebastian Wolf, Chiara Lindner, Tobias Trendle, Jens Kießling, Frank Kühnemann, Fraunhofer-Institut für Physikalische Messtechnik IPM (Germany)

Coffee Break 10:00 AM - 10:30 AM

SESSION 13: IMAGING AND BIOPHOTONICS II

1 February 2023 • 10:30 AM - 12:00 PM | Moscone Center, Room 70 (Lower Mezzanine South)

Session Chairs: Shamsul Arafin, The Ohio State Univ. (United States), Tariq Manzur, Naval Undersea Warfare Ctr. (United States)

12430-57 • 10:30 AM - 10:55 AM

Studying light-matter interaction at the nanoscale by single-molecule fluorescence lifetime imaging (smFLIM) (*Invited Paper*)

Author(s): Margoth Córdova-Castro, Clément Gabriel, Yannick De Wilde, Valentina Krachmalnicoff, Ignacio Izeddin, Institut Langevin, CNRS (France), Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (France), Univ. PSL (France)

12430-58 • 10:55 AM - 11:20 AM

LinoSPAD2: a 512×1 linear SPAD camera with system-level 135-ps SPTR and a reconfigurable computational engine for time-resolved single-photon imaging (*Invited Paper*)

Author(s): Claudio E. Bruschini, Samuel Burri, Ermanno Bernasconi, Tommaso Milanese, Arin C. Ulku, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Harald A. R. Homulle, Delft University of Technology (TU Delft) (Netherlands); Edoardo Charbon, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12430-59 • 11:20 AM - 11:45 AM

Sensitivity enhancement of terahertz microfluidic chip using natural evolutionary resonance in a few arrays of meta-atoms (*Invited Paper*)

Author(s): Kazunori Serita, Masayoshi Tonouchi, Osaka Univ. (Japan)

12430-60 • 11:45 AM - 12:00 PM

Sensor for non-invasive detection of SARS-CoV-2 at an early stage of infection

Author(s): Joanna Jankowska-Śliwińska, Lukaszewicz Research Network - Institute of Microelectronics and Photonics (Poland); Kamil Kosiel, Lukaszewicz Research Network - Institute of Microelectronics and Photonics (Poland), Warsaw Univ. of Technology (Poland); Maciej Kozubal, Anna Szerling, Krzysztof Zaraska, Krzysztof Grabczewski, Piotr Polak, Renata Kruska, Laura Stanco, Lukaszewicz Research Network - Institute of Microelectronics and Photonics (Poland); Anna Niedzwiecka, Institute of Physics, Polish Academy of Sciences (Poland); Antonina Naskalska, Agnieszka Dabrowska, Krzysztof Pyrc, Malopolska Ctr. of Biotechnology (Poland)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 14: NANO-OPTICS I

1 February 2023 • 1:30 PM - 3:00 PM | Moscone Center, Room 70 (Lower Mezzanine South)

Session Chairs: Parag B. Deotare, Univ. of Michigan (United States), Ekmel Özbay, Bilkent Univ. (Turkey)

12430-61 • 1:30 PM - 1:55 PM

Dynamic optical metasurfaces and self-assembled metamaterials using plasmonic nanoparticle superlattices (*Invited Paper*)

Author(s): Koray Aydin, Northwestern Univ. (United States)

12430-62 • 1:55 PM - 2:20 PM

Development of arsenide and antimonide based epitaxial quantum dots for single photon emitter applications (*Invited Paper*)

Author(s): Ganesh Balakrishnan, The Univ. of New Mexico (United States)

12430-63 • 2:20 PM - 2:45 PM

Semiconductors for infrared plasmonics and hyperbolic metamaterials (*Invited Paper*)

Author(s): Stephanie Law, The Pennsylvania State Univ. (United States)

12430-64 • 2:45 PM - 3:00 PM

III-V semiconductor plasmonics for gas sensing of organophosphorous compounds

Author(s): Pierre Fehlen, Institut Franco-Allemand de Recherches de Saint-Louis (France), Institut d'Électronique et des Systèmes (France); Guillaume Thomas, Institut Franco-Allemand de Recherches de Saint-Louis (France); Fernando Gonzalez Posada, Julien Guise, Institut d'Électronique et des Systèmes (France); Francesco Rusconi, Politecnico di Milano (Italy); Laurent Cerutti, Thierry Taliercio, Institut d'Électronique et des Systèmes (France); Denis Spitzer, Institut Franco-Allemand de Recherches de Saint-Louis (France)

Coffee Break 3:00 PM - 3:30 PM

SESSION 15: NANO-OPTICS II

1 February 2023 • 3:30 PM - 5:25 PM | Moscone Center, Room 70 (Lower Mezzanine South)

Session Chairs: Tariq Manzur, Naval Undersea Warfare Ctr. (United States), Parag B. Deotare, Univ. of Michigan (United States)

12430-65 • 3:30 PM - 3:55 PM

Recent results on epitaxial quantum dots as efficient single photon sources at the telecommunication wavelengths (*Invited Paper*)

Author(s): Grzegorz Sek, Marcin Syperek, Wrocław Univ. of Science and Technology (Poland)

12430-66 • 3:55 PM - 4:20 PM

Extremely large broadband emission of CdSe/CdS nanocrystals under high excitation (*Invited Paper*)

Author(s): Agnès Maître, Institut des nanosciences de Paris (France), Sorbonne Univ. (France); Damien Simonot, Lina Amrane, Poncia Nyembo, Institut des nanosciences de Paris (France); Celine Roux-Byl, Thomas Pons, Lab. de Physique et d'Etude des Matériaux (France), Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (France); Simon Huppert, Institut des nanosciences de Paris (France)

12430-67 • 4:20 PM - 4:45 PM

Scalable and efficient photonic designs using disordered metamaterial nanounits (*Invited Paper*)

Author(s): Ekmel Özbay, Bilkent Univ. (Turkey)

12430-68 • 4:45 PM - 5:10 PM

Excitronics at organic/2D-inorganic hybrid interface (*Invited Paper*)

Author(s): Parag B. Deotare, Univ. of Michigan (United States)

12430-111 • 5:10 PM - 5:25 PM

Second-order nonlinear optical amplification in CMOS silicon

Author(s): David Heydari, Stanford Univ. (United States); Mircea Catuneanu, TU Dresden (Germany); Edwin Ng, Stanford Univ. (United States), NTT Research Inc. (United States); Jatadhari Mishra, Stanford Univ. (United States); Ryan Hamerly, NTT Research, Inc. (United States), MIT (United States); Dodd Gray, MIT (United States); Marc Jankowski, Stanford Univ. (United States), NTT Research Inc. (United States); Martin M. Fejer, Hideo Mabuchi, Stanford Univ. (United States); Kambiz Jamshidi, TU Dresden (Germany)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12430-87 • 6:00 PM - 8:00 PM

Far-field molecular sensing platform using biaxial hyperbolic polaritons in van der Waals crystals

Author(s): Nihar Ranjan Sahoo, Saurabh Dixit, Anshuman Kumar, Indian Institute of Technology Bombay (India)

12430-88

Robust nano-antenna metrology for metasurface design

Author(s): Cécile Le Gall, Bastien Rouzé, Cindy Bellanger, Jérôme Primot, Julien Jaeck, ONERA (France)

12430-90

Tapered quantum cascade lasers in the long-wavelength mid-infrared region

Author(s): Davide Pinto, Technische Univ. Wien (Austria), Institut d'Électronique et des Systèmes (France), Univ. de Montpellier (France); Kumar Kinjalk, Ariane Meguekam, Michael Bahriz, Alexei N. Baranov, Institut d'Électronique et des Systèmes (France), Univ. de Montpellier (France)

12430-91

Combining single-photon signals by deterministic coupling of CdSe/CdS quantum dots into submicropillars structures

Author(s): Gia Long Ngo, École normale supérieure Paris-Saclay (France); Jean-Pierre Hermier, Univ. de Versailles Saint-Quentin-en Yvelines (France); Ngoc Diep Lai, École normale supérieure Paris-Saclay (France)

12430-92

Coregistration of multiphoton fluorescence with nanoscopic resolution atomic force microscopy

Author(s): Adam Baker, Zhi Gao, Clemson Univ. (United States); Thomas K. Borg, Medical Univ. of South Carolina (United States); Qi Wang, Univ. of South Carolina (United States); Tong Ye, Arman Kilic, Medical Univ. of South Carolina (United States); Reece Fratus, Lucas Schmidt, Clemson Univ. (United States)

12430-93

Salt-induced aggregation of gold nanoparticles for sensitive SERS-based detection of nanoplastics in water

Author(s): Aisha Bibi, Aston Univ. (United Kingdom); Udit Pant, James Tate, Institute for Global Food Security (United Kingdom); Daniel Hill, Aston Univ. (United Kingdom); Cuong Cao, Institute for Global Food Security (United Kingdom), Material and Advanced Technologies for Healthcare (United Kingdom)

12430-95

Over-coupled Helmholtz-like optical resonator for broadband surface enhanced infrared absorption (SEIRA) spectroscopy

Author(s): Laura Paggi, Alice Fabas, Hasnaa El Ouazzani, ONERA (France); Jean-Paul Hugonin, Lab. Charles Fabry, CNRS (France), Institut d'Optique Graduate School (France), Univ. Paris-Saclay (France); Nathalie Bardou, Ctr. de Nanosciences et de Nanotechnologies, CNRS (France), Univ. Paris-Saclay (France); Christophe Dupuis, Ctr. de Nanosciences et de Nanotechnologies (France); Jean-Jacques Greffet, Lab. Charles Fabry, CNRS (France), Institut d'Optique Graduate School (France), Univ. Paris-Saclay (France); Patrick Bouchon, ONERA (France)

Conference 12430

12430-96

Femtosecond time-bin pulse transfer and retrieval on photon-echo-based quantum memory using quantum dots

Author(s): Yuta Kochi, Yutaro Kinoshita, Keio Univ. (Japan); Sunao Kurimura, National Institute for Materials Science (Japan); Kouichi Akahane, National Institute of Information and Communications Technology (Japan); Junko Ishi-Hayase, Keio Univ. (Japan)

12430-97

Characteristics of oxidized graphene using KMnO₄/H₂SO₄ solution

Author(s): Yeojin Choi, SeungMun Back, YuNa Lee, SunJin An, Kumoh National Institute of Technology (Republic of Korea)

12430-98

Cobalt Copper sulphide /Tungsten Disulphide Nanowire Heterostructure as an Excellent Bifunctional Electrocatalyst for Overall Water Splitting

Author(s): Jagadis Gautam, Karthik Kannan, Debabrata Chanda, Mikiyas Mekete Meshesha, Jang Seok Gwon, Bee Lyong Yang, Kumoh National Institute of Technology (Republic of Korea)

12430-99

Room temperature ferromagnetic skyrmion based artificial neuron device

Author(s): Ravish Kumar Raj, Namita Bindal, Sandeep Soni, Brajesh Kumar Kaushik, Indian Institute of Technology Roorkee (India)

12430-100

All-optical switching in Ho-Fe-Co nanostructures

Author(s): Surya Narain Dikshit, Shipra Saini, Arshid Nisar, Brajesh Kumar Kaushik, Indian Institute of Technology Roorkee (India)

12430-101

High-resolution and real-time hyperspectral imaging with universal light encoders

Author(s): Andrea Fratalocchi, King Abdullah Univ. of Science and Technology (Saudi Arabia)

12430-102

Random nanostructured infrared window scatter analysis using the Harvey-Shack transfer function method

Author(s): David A. Gonzalez, The Univ. of North Carolina at Charlotte (United States); Karun Vijayraghavan, Nanohmics, Inc. (United States); Menelaos K. Poutous, The Univ. of North Carolina at Charlotte (United States)

12430-103

Sensitivity enhancement of the surface plasmon resonance sensor with nobel structure based on PtSe₂ and 2D materials

Author(s): Purnendu Shekhar Pandey, Sanjeev Kumar Raghuwanshi, Azhar Shadab, Indian Institute of Technology (Indian School of Mines), Dhanbad (India); Md Tauseef Iqbal Ansari, Indian Institute of Technology (Indian School of Mines) (India); Santosh Kumar, Liaocheng Univ. (China)

12430-104

2D MAX-Supported CuO/NiO/Ti₃AlC₂ as an Efficient and Novel Photocatalyst for Hydrogen Evolution

Author(s): Karthik Kannan, Debabrata Chanda, Jagadis Gautam, Mikiyas Mekete Meshesha, Jang Seok Gwon, Kumoh National Institute of Technology (Republic of Korea), GHS (Green H₂ System) Co., Ltd. (Republic of Korea); Myungsik Choi, SJ Tech. Co., Ltd. (Republic of Korea), GHS (Green H₂ System) Co., Ltd. (Republic of Korea); BeeLyong Yang, Kumoh National Institute of Technology (Republic of Korea), GHS (Green H₂ System) Co., Ltd. (Republic of Korea)

12430-106

Giant increase of absorption cross section of CdSe/CdS singe nanocrystals within a plasmonic antenna

Author(s): Agnès Maître, Institut des nanosciences de Paris (France), Sorbonne Univ. (France); Amit Raj Dhawan, Institut des nanosciences de Paris (France), Sorbonne Univ. (France), Univ. of Oxford (United Kingdom); Michel Nasilowski, Benoît Dubertret, Lab. de Physique et d'Etude des Matériaux (France), Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (France)

12430-107

Advanced detector performance from UV to IR with nanostructured antireflection coatings

Author(s): Ashok K. Sood, John W. Zeller, Adam W. Sood, Magnolia Optical Technologies, Inc. (United States); Parminder Ghuman, Sachidananda Babu, NASA Earth Science Technology Office (United States); Sarath Gunapala, Alexander Soibel, David Z. Ting, Ctr. for Infrared Detectors, Jet Propulsion Lab. (United States); Latika S. Chaudhary, Harry Efstathiadis, SUNY Polytechnic Institute (United States)

12430-109

Barrier infrared detectors integrated with metasurface-based optical concentrators

Author(s): Alexander Soibel, Tobias Wenger, Richard Muller, Cory J. Hill, Anita Fisher, David Z. Ting, Daniel W. Wilson, Sarath D. Gunapala, Jet Propulsion Lab. (United States)

THURSDAY 2 FEBRUARY

SESSION 16: ADVANCES IN LASERS, RESONATORS, AND SENSORS I

2 February 2023 • 8:30 AM - 10:00 AM | Moscone Center, Room 70 (Lower Mezzanine South)

Session Chairs: Agnès Maître, Institut des nanosciences de Paris (France), Tariq Manzur, Naval Undersea Warfare Ctr. (United States)

12430-70 • 8:30 AM - 8:55 AM

R&D activities at ASELSAN (Invited Paper)

Author(s): Sezai Elagoz, ASELSAN A.S. (Turkey)

12430-71 • 8:55 AM - 9:20 AM

Recent progress of continuous-wave electrically-pumped InP-based topological insulator lasers (Invited Paper)

Author(s): Shamsul Arafin, Weicheng You, The Ohio State Univ. (United States); Bradley J. Thompson, KBR, Inc. (United States)

12430-72 • 9:20 AM - 9:45 AM

From the thermal radiation of sub-lambda resonators to the electroluminescence of graphene *(Invited Paper)*

Author(s): Loubnan Abou-Hamdan, Institut Langevin (France); Aurélien Schmitt, Lab. de Physique de l'Ecole Normale Supérieure (France); Valentina Krachmalnicoff, Sébastien Bidault, Institut Langevin (France); Christophe Voisin, Bernard Plaçais, Lab. de Physique de l'Ecole Normale Supérieure (France); Jean-Paul Hugonin, Lab. Charles Fabry (France); Riad Haïdar, ONERA (France); Jean-Jacques Greffet, Lab. Charles Fabry (France); Patrick Bouchon, ONERA (France); Emmanuel Baudin, Lab. de Physique de l'Ecole Normale Supérieure (France); Yannick De Wilde, Institut Langevin (France)

12430-73 • 9:45 AM - 10:00 AM

InGaAsSb for cut-off tuned SWIR detectors

Author(s): Katarina Mamic, Andrew Bainbridge, Laura Hanks, Adam Craig, Andrew Marshall, Lancaster Univ. (United Kingdom)

Coffee Break 10:00 AM - 10:30 AM

SESSION 17: ADVANCES IN LASERS, RESONATORS, AND SENSORS II

2 February 2023 • 10:30 AM - 12:05 PM | Moscone Center, Room 70 (Lower Mezzanine South)

Session Chairs: Ann Roberts, The Univ. of Melbourne (Australia); Giti A. Khodaparast, Virginia Polytechnic Institute and State Univ. (United States)

12430-74 • 10:30 AM - 10:55 AM

Inverted refractive-index-contrast grating mirror for microresonators *(Invited Paper)*

Author(s): Daniel Jandura, Univ. of Žilina (Slovakia); Emilia Pruszyńska-Karbownik, Maciej Dems, Lodz Univ. of Technology (Poland); Jan Muszalski, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); Jan Suffczynski, Univ. of Warsaw (Poland); Dusan Pudis, Univ. of Žilina (Slovakia); Tomasz G. Czystanowski, Lodz Univ. of Technology (Poland)

12430-75 • 10:55 AM - 11:10 AM

512-element linear InGaAs APD array sensor for scanned time-of-flight lidar at 1550 nm

Author(s): Andrew S. Huntington, Sapna Mukherjee, Allegro MicroSystems, Inc. (United States); Colin Moffitt, Devin Wolfe, Logan Stewart, Allegro MicroSystems (United States); Adam O. Lee, Allegro MicroSystems, Inc. (United States)

12430-76 • 11:10 AM - 11:35 AM

Tunable polar films for infrared radiation management *(Invited Paper)*

Author(s): Maria Cristina Larciprete, Sapienza Univ. di Roma (Italy); Sina Abedini Dereshgi, Northwestern Univ. (United States); Marco Centini, Sapienza Univ. di Roma (Italy); Roberto Macaluso, Univ. degli Studi di Palermo (Italy); Koray Aydin, Northwestern Univ. (United States)

12430-77 • 11:35 AM - 11:50 AM

Highly sensitive and selective detection of eight air pollutants with quartz-enhanced photoacoustic sensors

Author(s): Pietro Patimisco, Univ. degli Studi di Bari Aldo Moro (Italy); Arianna Elefante, Agenzia Spaziale Italiana (Italy); Raffaele De Palo, Univ. degli Studi di Bari Aldo Moro (Italy); Francesco Paciolla, Politecnico di Bari (Italy); Gabriele Biagi, Munster Technological Univ. (Ireland); Robert Weih, Josephine Nauschütz, Johannes Koeth, nanoplus Nanosystems and Technologies GmbH (Germany); Angelo Sampaolo, Marilena Giglio, Vincenzo Spagnolo, Politecnico di Bari (Italy)

12430-78 • 11:50 AM - 12:05 PM

Dark current reduction with all-semiconductors nanostructured Type-II superlattice LWIR photodetector

Author(s): Clement Gureghian, Grégory Vincent, ONERA (France); Jean-Baptiste Rodriguez, Guilhermo Sombrio, Fernando Gonzalez Posada, Institut d'Électronique et des Systèmes (France); Isabelle Ribet-Mohamed, ONERA (France); Thierry Taliercio, Institut d'Électronique et des Systèmes (France)

Lunch/Exhibition Break 12:05 PM - 1:25 PM

SESSION 18: DETECTORS AND SENSORS III

2 February 2023 • 1:25 PM - 3:20 PM | Moscone Center, Room 70 (Lower Mezzanine South)

Session Chairs: Judy Z. Wu, The Univ. of Kansas (United States); Tariq Manzur, Naval Undersea Warfare Ctr. (United States)

12430-80 • 1:25 PM - 1:40 PM

Development of room-temperature-operated InAsSb linear sensors with ROIC for 7-10 μm detection

Author(s): Chihiro Suzuki, Hiroo Yamamoto, Hamamatsu Photonics K.K. (Japan); Daisuke Iida, NTT Access Network Service Systems Labs. (Japan); Takayuki Kurashina, Yoshihisa Warashina, Hamamatsu Photonics K.K. (Japan)

12430-81 • 1:40 PM - 1:55 PM

Inter-pixel crosstalk improvement based on a thin crosstalk-block layer for mesa-based InGaAs photodetectors

Author(s): Kubra Circir, Serdar Kocaman, Middle East Technical Univ. (Turkey)

12430-82 • 1:55 PM - 2:10 PM

High-performance graphene-enhanced HgCdTe photodetectors for uncooled mid-wave infrared sensing

Author(s): Ashok K. Sood, John W. Zeller, Magnolia Optical Technologies, Inc. (United States); Parminder Ghuman, Sachidananda R. Babu, NASA Earth Science Technology Office (United States); Nibir K. Dhar, Samiran Ganguly, Virginia Commonwealth Univ. (United States); Latika S. Chaudhary, Harry Efstathiadis, SUNY Polytechnic Institute (United States)

Conference 12430

12430-83 • 2:10 PM - 2:25 PM

Study of the effect of the low-pass filter time constant on the noise level of quartz enhanced photoacoustic spectroscopy sensors

Author(s): Michele Di Gioia, PolySense Lab. (Italy), Politecnico di Bari (Italy); Giansergio Menduni, Andrea Zifarelli, PolySense Lab. (Italy); Angelo Sampaolo, Univ. degli Studi di Bari Aldo Moro (Italy), PolySenSe Innovations s.r.l. (Italy); Pietro Patimisco, PolySense Lab. (Italy), PolySenSe Innovations s.r.l. (Italy); Marilena Giglio, PolySense Lab. (Italy); Cristoforo Marzocca, PolySense Lab. (Italy), Politecnico di Bari (Italy); Vincenzo Spagnolo, PolySense Lab. (Italy), PolySenSe Innovations s.r.l. (Italy)

12430-84 • 2:25 PM - 2:40 PM

Multivariate spectral analysis in quartz-enhanced photoacoustic spectroscopy

Author(s): Andrea Zifarelli, Univ. degli Studi di Bari Aldo Moro (Italy); Giansergio Menduni, Politecnico di Bari (Italy); Aldo F. P. Cantatore, Pietro Patimisco, Univ. degli Studi di Bari Aldo Moro (Italy); Christine Holzl, Thorlabs GmbH (Germany); Vincenzo Spagnolo, Politecnico di Bari (Italy)

12430-85 • 2:40 PM - 2:55 PM

H2S near-IR QEPAS detection in complex gas matrices

Author(s): Mariagrazia Olivieri, Giansergio Menduni, Andrea Zifarelli, PolySense Lab. (Italy); Marilena Giglio, PolySense Lab. (Italy), Univ. degli Studi di Bari Aldo Moro (Italy); Pietro Patimisco, PolySense Lab. (Italy), PolySenSe Innovations s.r.l. (Italy); Angelo Sampaolo, Univ. degli Studi di Bari Aldo Moro (Italy), PolySenSe Innovations s.r.l. (Italy); Vincenzo Spagnolo, PolySense Lab. (Italy), PolySenSe Innovations s.r.l. (Italy)

12430-108 • 2:55 PM - 3:20 PM

Electrically pumped topological quantum cascade lasers with topological protection and polarization control (*Invited Paper*)

Author(s): Qi Jie Wang, Nanyang Technological Univ. (Singapore)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12430-35

Constructive emission from terahertz quantum cascade laser array integrated with Talbot cavity (*Invited Paper*)

Author(s): Yunfei Xu, Institute of Semiconductors, Chinese Academy of Sciences (China); Quan-Yong Lu, Beijing Academy of Quantum Information Sciences (China); Wei-Jiang Li, Institute of Semiconductors, Chinese Academy of Sciences (China); Yu Ma, Ning Zhuo, Jun-Qi Liu, Jin-Chuan Zhang, Shen-Qiang Zhai, Shu-Man Liu, Li-Jun Wang, Feng-Qi Liu, Institute of Semiconductors (China)

Photonic and Phononic Properties of Engineered Nanostructures XIII

30 January - 2 February 2023 | Moscone Center, Room 50 (Lower Mezzanine South)

Conference Chairs: **Ali Adibi**, Georgia Institute of Technology (United States); **Shawn-Yu Lin**, Rensselaer Polytechnic Institute (United States); **Axel Scherer**, Caltech (United States)

Program Committee: **Andrea Alù**, The City Univ. of New York Advanced Science Research Ctr. (United States); **Amir Arbabi**, Univ. of Massachusetts Amherst (United States); **Ali A. Eftekhar**, Intel Corp. (United States); **Mercedeh Khajavikhan**, The Univ. of Southern California (United States); **Reginald K. Lee**, Caltech (United States); **Marko Loncar**, Harvard John A. Paulson School of Engineering and Applied Sciences (United States); **Arka Majumdar**, Univ. of Washington (United States); **Susumu Noda**, Kyoto Univ. (Japan); **Masaya Notomi**, NTT Basic Research Labs. (Japan); **Ekmel Özbay**, Bilkent Univ. (Turkey); **Yong Xu**, Virginia Polytechnic Institute and State Univ. (United States); **Eli Yablonovitch**, Univ. of California, Berkeley (United States); **Rashid Zia**, Brown Univ. (United States)

MONDAY 30 JANUARY

OPTO PLENARY SESSION

30 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 207/215 (Level 2 South)

8:00 AM - 8:05 AM: **Welcome and Opening Remarks**
Sonia García-Blanco, Univ. Twente (Netherlands) and Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

8:05 AM - 8:15 AM: **Announcement of the OPTO AI/ML and Net Zero Best Paper Awards**

12424-501 • 8:15 AM - 8:50 AM

High-performance electronic-photonic interfaces: from AI to quantum (*Plenary Presentation*)

Author(s): Rajeev Ram, Massachusetts Institute of Technology (United States)

12416-501 • 8:50 AM - 9:25 AM

Tandem photovoltaic devices: more than one way to make a solar cell (*Plenary Presentation*)

Author(s): Emily L. Warren, National Renewable Energy Lab. (United States)

12421-501 • 9:25 AM - 10:00 AM

Are III-nitride semiconductors also suitable for red emission? (*Plenary Presentation*)

Author(s): Nicolas Grandjean, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 1: RECENT ADVANCES IN ENGINEERED NANOSTRUCTURES

30 January 2023 • 10:30 AM - 12:00 PM | Moscone Center, Room 50 (Lower Mezzanine South)

Session Chair: Ali Adibi, Georgia Institute of Technology (United States)

12431-1 • 10:30 AM - 11:00 AM

Nonlinear metasurfaces for exotic control of light (*Invited Paper*)

Author(s): Michele Cotrufo, Andrea Alù, The City Univ. of New York Advanced Science Research Ctr. (United States)

12431-2 • 11:00 AM - 11:30 AM

Active metasurfaces in meta-imaging systems (*Invited Paper*)

Author(s): Harry A. Atwater, Caltech (United States)

12431-42 • 11:30 AM - 12:00 PM

Inverse designed densely integrated photonics (*Invited Paper*)

Author(s): Jelena Vuckovic, Stanford Univ. (United States)

Lunch Break 12:00 PM - 1:30 PM

SESSION 2: NOVEL MATERIALS AND PHENOMENA IN ENGINEERED NANOSTRUCTURES

30 January 2023 • 1:30 PM - 2:50 PM | Moscone Center, Room 50 (Lower Mezzanine South)

Session Chairs: Aaron Sternbach, Columbia Univ. (United States), Ali Adibi, Georgia Institute of Technology (United States)

12431-4 • 1:30 PM - 2:00 PM

Nano-architected-materials-on-demand for versatile light control (*Invited Paper*)

Author(s): Yuebing Zheng, The Univ. of Texas at Austin (United States)

12431-5 • 2:00 PM - 2:30 PM

Vibration localization in elastic hyperbolic lattices (*Invited Paper*)

Author(s): Nicholas H. Patino, Curtis Rasmussen, Massimo P. Ruzzene, Univ. of Colorado Boulder (United States)

12431-7 • 2:30 PM - 2:50 PM

Using zinc-oxide nanowires: sun would cure ulcerating cancer wounds

Author(s): Ashkan Zandi, Ali Adibi, Georgia Institute of Technology (United States)

Coffee Break 2:50 PM - 3:10 PM

Conference 12431

SESSION 3: NANOPHOTONIC STRUCTURES FOR SENSING AND SPECTROSCOPY

30 January 2023 • 3:10 PM - 5:00 PM | Moscone Center, Room 50 (Lower Mezzanine South)

Session Chair: Yuebing Zheng, The Univ. of Texas at Austin (United States)

12431-8 • 3:10 PM - 3:40 PM

Hyperbolic heterobiscrystals (*Invited Paper*)

Author(s): Aaron Sternbach, Sam Moore, Columbia Univ. (United States); Andrey Rikhter, Univ. of California, San Diego (United States); Shuai Zhang, Ran Jing, Yinming Shao, Brian Kim, Suheng Xu, Columbia Univ. (United States); Angel Rubio, Max-Planck-Institut für Struktur und Dynamik der Materie (Germany); Cory Dean, James Hone, Columbia Univ. (United States); Michael Fogler, Univ. of California, San Diego (United States); D. N. Basov, Columbia Univ. (United States)

12431-9 • 3:40 PM - 4:00 PM

Ultra-wideband silicon nitride AWG design

Author(s): Ashkan Zandi, Mohammad Hossein Enjavi, Georgia Institute of Technology (United States); Christopher Evans, Kyle Dorsey, Sasha Subotic, Michal Cwik, Joel Hensley, Physical Sciences Inc. (United States); Ali Adibi, Georgia Institute of Technology (United States)

12431-10 • 4:00 PM - 4:20 PM

Photonic thermal sensor by phase interrogation around the critical coupling in hybrid metal-dielectric photonic structures

Author(s): Théo Girerd, Lydie Ferrier, Lotfi Berguiga, Fabien Mandorlo, Taha Benyattou, Cécile Jamois, Xavier Letartre, Institut des Nanotechnologies de Lyon (France)

12431-11 • 4:20 PM - 4:40 PM

Combined Brillouin and Raman scattering spectroscopy in 2PP printed structures

Author(s): Timm Landes, Hannoversches Zentrum für Optische Technologien (Germany), Institut für Gartenbauliche Produktionssysteme (Germany), Leibniz Univ. Hannover (Germany); Lei Zheng, Bernhard Roth, Hannoversches Zentrum für Optische Technologien (Germany), Leibniz Univ. Hannover (Germany); Dag Heinemann, Hannoversches Zentrum für Optische Technologien (Germany), Institut für Gartenbauliche Produktionssysteme (Germany), Leibniz Univ. Hannover (Germany)

12431-12 • 4:40 PM - 5:00 PM

Integrated optical sensing system on glass substrate

Author(s): Mulan E. Mohamed, Hesham A. Ahmed, The American Univ. in Cairo (Egypt); Adel Shaaban, The American Univ. in Cairo (Egypt), National Ctr. for Radiation Research (Egypt); Mohamed A. Swillam, The American Univ. in Cairo (Egypt)

TUESDAY 31 JANUARY

SESSION 4: PHOTONIC CRYSTAL STRUCTURES

31 January 2023 • 8:00 AM - 9:50 AM | Moscone Center, Room 50 (Lower Mezzanine South)

Session Chair: Ekmel Özbay, Bilkent Univ. (Turkey)

12431-65 • 8:00 AM - 8:20 AM

Electrically switchable metallic polymer metasurfaces for beam switching and multi-focal metaobjectives

Author(s): Julian Karst, Univ. Stuttgart (Germany); Derek de Jong, Univ. Stuttgart (Germany), Univ. of Illinois (United States); Moritz Floess, Dominik Ludescher, Yohan Lee, Monika Ubl, Sabine Ludwigs, Univ. Stuttgart (Germany); Paul V. Braun, Univ. of Illinois (United States); Mario Hentschel, Harald Giessen, Univ. Stuttgart (Germany)

12431-13 • 8:20 AM - 8:50 AM

Creating structured space-time light with nanophotonics (*Invited Paper*)

Author(s): Cheng Guo, Haiwen Wang, Shanhui Fan, Stanford Univ. (United States)

12431-14 • 8:50 AM - 9:10 AM

H1 hexapole photonic crystal nanocavities with theoretical and measured quality factors exceeding 108 and 106

Author(s): Kenta Takata, Eiichi Kuramochi, Akihiko Shinya, NTT Basic Research Labs. (Japan), NTT Nanophotonics Ctr. (Japan); Masaya Notomi, NTT Basic Research Labs. (Japan), NTT Nanophotonics Ctr. (Japan), Tokyo Institute of Technology (Japan)

12431-15 • 9:10 AM - 9:30 AM

Four-wave mixing to measure the pulse duration of photonic crystal nanolasers

Author(s): Federico Monti, Alejandro Giacomotti, Ctr. de Nanosciences et de Nanotechnologies, CNRS (France), Univ. Paris-Saclay (France); Fabrice Raineri, Univ. Côte d'Azur (France), Institut de Physique de Nice (France); Giuseppe Modica, Ctr. de Nanosciences et de Nanotechnologies, CNRS (France), Univ. Paris-Saclay (France)

12431-16 • 9:30 AM - 9:50 AM

Two-dimensional photonic crystal phosphor with TiO₂ backbone for efficient and polarization-insensitive absorption of excitation photons

Author(s): Hansol Lee, Tae-Yun Lee, Seoul National Univ. (Republic of Korea), Inter-Univ. Semiconductor Research Ctr. (Republic of Korea); Yeonsang Park, Chungnam National Univ. (Republic of Korea), Institute of Quantum Systems (Republic of Korea); Kyung-Sang Cho, Young-Geun Roh, Hyuck Choo, SAMSUNG Advanced Institute of Technology (Republic of Korea); Heonsu Jeon, Seoul National Univ. (Republic of Korea), Inter-Univ. Semiconductor Research Ctr. (Republic of Korea)

Coffee Break 9:50 AM - 10:30 AM

SESSION 5: QUANTUM NANOSTRUCTURES

31 January 2023 • 10:30 AM - 12:00 PM | Moscone Center, Room 50 (Lower Mezzanine South)

Session Chair: Ali Adibi, Georgia Institute of Technology (United States)

12431-18 • 10:30 AM - 11:00 AM

Quantum meta-photonics (*Invited Paper*)

Author(s): Alexander Senichev, Xiaohui Xu, Zachariah O. Martin, Samuel Peana, Omer Yesilyurt, Demid Sychev, Alexei S. Lagutchev, Alexandra Boltasseva, Vladimir M. Shalae, Purdue Univ. (United States)

12431-19 • 11:00 AM - 11:30 AM

Lateral confinement in 2D materials: serving the emerging needs of quantum era (*Invited Paper*)

Author(s): Hossein Taghinejad, Univ. of California, Berkeley (United States)

12431-20 • 11:30 AM - 12:00 PM

Interacting opto-moiré quantum matter (*Invited Paper*)

Author(s): Xi Wang, Xiaodong Xu, Univ. of Washington (United States)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 6: METAPHOTONIC STRUCTURES: MATERIALS AND DEVICES I

31 January 2023 • 1:30 PM - 2:40 PM | Moscone Center, Room 50 (Lower Mezzanine South)

Session Chair: Shoufeng Lan, Texas A&M Univ. (United States)

12431-21 • 1:30 PM - 2:00 PM

Reconfigurable thermal emissivity using infrared metamaterials (*Invited Paper*)

Author(s): Michelle L. Povinelli, Rehan Kapadia, Alok Ghanekar, Hyun Uk Chae, Romil Audhkhasi, Bo K. Shrewsbury, Ragib Ahsan, The Univ. of Southern California (United States)

12431-22 • 2:00 PM - 2:20 PM

Mid-infrared power limiters and saturable-absorber mirrors based on GaAsSb/InGaAs intersubband polaritonic metasurfaces

Author(s): Jonas Heiko Krakofsky, Technische Univ. München (Germany); Michele Cotrufo, Sander Mann, The City Univ. of New York (United States); Gerhard Böhm, Anna Königer, Technische Univ. München (Germany); Andrea Alù, The City Univ. of New York (United States); Mikhail A. Belkin, Technische Univ. München (Germany)

12431-23 • 2:20 PM - 2:40 PM

Overcoming intensity saturation in second harmonic nonlinear intersubband polaritonic metasurfaces using two-level systems

Author(s): Jonas Heiko Krakofsky, Simon Stich, Technische Univ. München (Germany); Michele Cotrufo, Ahmed Mekawy, Sander Mann, The City Univ. of New York (United States); Anna Königer, Gerhard Böhm, Technische Univ. München (Germany); Andrea Alù, The City Univ. of New York (United States); Mikhail A. Belkin, Technische Univ. München (Germany)

Coffee Break 2:40 PM - 3:30 PM

SESSION 7: METAPHOTONIC STRUCTURES: MATERIALS AND DEVICES II

31 January 2023 • 3:30 PM - 5:30 PM | Moscone Center, Room 50 (Lower Mezzanine South)

Session Chair: Michelle L. Povinelli, The Univ. of Southern California (United States)

12431-25 • 3:30 PM - 4:00 PM

K-space metaphotonics with the bound states in the continuum (*Invited Paper*)

Author(s): Shoufeng Lan, Texas A&M Univ. (United States)

12431-26 • 4:00 PM - 4:30 PM

Centimeter scale nanostructures: lithography-free metamaterials for photoconversion, photodetection, light emission, sensing, and filtering (*Invited Paper*)

Author(s): Ekmel Ozbay, Bilkent Univ. (Turkey)

12431-27 • 4:30 PM - 4:50 PM

High transmission efficiency colour filters based on hybrid metal-dielectric metasurfaces

Author(s): Amr Soliman, Calum Williams, Tim Wilkinson, Univ. of Cambridge (United Kingdom)

12431-28 • 4:50 PM - 5:10 PM

Analyzing dipolar nano-emitters by tailored non-paraxial light fields

Author(s): Eileen Otte, Hyoungnan Kwon, Nicholas A. Gösken, Stanford Univ. (United States); Niklas Arndt, Westfälische Wilhelms-Univ. Münster (Germany); Jelena Vuckovic, Stanford Univ. (United States); Bart Jan Ravoo, Westfälische Wilhelms-Univ. Münster (Germany); Mark L. Brongersma, Stanford Univ. (United States)

12431-29 • 5:10 PM - 5:30 PM

Fourier techniques for sidelobe reduction in dielectric metalenses

Author(s): Tyler Brown, Ashkan Zandi, Sajjad Abdollahramezani, Spencer Fallek, Ali Adibi, Georgia Institute of Technology (United States)

WEDNESDAY 1 FEBRUARY**SESSION 8: DYNAMICALLY RECONFIGURABLE METAPHOTONIC DEVICES**

1 February 2023 • 8:00 AM - 11:40 AM | Moscone Center, Room 50 (Lower Mezzanine South)

Session Chair: Matthias Wuttig, RWTH Aachen Univ. (Germany)

12431-30 • 8:00 AM - 8:30 AM

Programmable and switchable nanophotonics using ultralow-loss phase change materials (*Invited Paper*)

Author(s): Otto L. Muskens, Daniel Lawson, Sophie Blundell, Matthew Delaney, Dan Hewak, Ioannis Zeimpekis, Univ. of Southampton (United Kingdom)

12431-31 • 8:30 AM - 9:00 AM

Electrically reconfigurable nanophotonics using nonvolatile chalcogenide phase-change materials (*Invited Paper*)

Author(s): Sajjad Abdollahramezani, Georgia Institute of Technology (United States)

Conference 12431

12431-32 • 9:00 AM - 9:20 AM

Tunable non-reciprocal thermal radiation with dynamic modulation of graphene

Author(s): Alok Ghanekar, The Univ. of Southern California (United States); Jiahui Wang, Shanhui Fan, Stanford Univ. (United States); Michelle L. Povinelli, The Univ. of Southern California (United States)

Moved to Posters: Paper 12431-63 9:20 AM - 9:40 AM

12431-34 • 9:40 AM - 10:00 AM

Creating fluororous coated nanoparticles for reversible interactions

Author(s): Hammed Onilude, Marina Santana Vega, Alasdair W. Clark, Univ. of Glasgow (United Kingdom)

Coffee Break 10:00 AM - 10:30 AM

SESSION 9: RECONFIGURABLE NANOPHOTONICS USING PHASE-CHANGE MATERIALS

1 February 2023 • 10:30 AM - 11:30 AM | Moscone Center, Room 50 (Lower Mezzanine South)

Session Chair: Sajjad Abdollahramezani, Stanford Univ. (United States)

12431-35 • 10:30 AM - 11:00 AM

Tailoring phase change materials for nanophotonic applications (*Invited Paper*)

Author(s): Matthias Wuttig, RWTH Aachen Univ. (Germany)

12431-36 • 11:00 AM - 11:30 AM

Learning from failure: boosting cycling endurance of optical phase change materials (*Invited Paper*)

Author(s): Cosmin Constantin-Popescu, Massachusetts Institute of Technology (United States); Steven Vitale, Lincoln Laboratory, Massachusetts Institute of Technology (United States); Christopher Roberts, Paul Miller, Lincoln Laboratory (United States); Kiumars Aryana, NASA Langley Research Center (United States); Myungkoo Kang, Kathleen Richardson, University of Central Florida (United States); Hyun Jung Kim, William Humphreys, NASA Langley Research Center (United States); Tian Gu, Juejun Hu, Massachusetts Institute of Technology (United States)

Lunch/Exhibition Break 11:30 AM - 1:30 PM

SESSION 10: NANOPHOTONIC DESIGN APPROACHES BASED ON ARTIFICIAL INTELLIGENCE

1 February 2023 • 1:30 PM - 3:00 PM | Moscone Center, Room 50 (Lower Mezzanine South)

Session Chair: Otto L. Muskens, Univ. of Southampton (United Kingdom)

12431-38 • 1:30 PM - 2:00 PM

Metamaterial design with physics informed neural networks (*Invited Paper*)

Author(s): Omar Khatib, Simiao Ren, Duke Univ. (United States); Jordan Malof, The Univ. of Montana (United States); Willie J. Padilla, Duke Univ. (United States)

12431-39 • 2:00 PM - 2:20 PM

Metric learning: a new approach for defining similarity measures for nanophotonics

Author(s): Mohammadreza Zandehshahvar, Georgia Institute of Technology (United States); Yashar Kiarashi, NA (United States); Muliang Zhu, Daqian Bao, Mohammad Hadigheh Javani, Georgia Institute of Technology (United States); Reza Pourabolghasem, NA (United States); Ali Adibi, Georgia Institute of Technology (United States)

12431-40 • 2:20 PM - 2:40 PM

Assessing the design complexity of nanophotonic structures using machine learning

Author(s): Mohammad Hadigheh Javani, Mohammadreza Zandehshahvar, Ali Adibi, Georgia Institute of Technology (United States)

12431-41 • 2:40 PM - 3:00 PM

Inverse design of two-dimensional freeform metagrating using an adversarial conditional variational autoencoder

Author(s): Keisuke Kojima, Boston Quantum Photonics LLC (United States); Toshiaki Koike-Akino, Ye Wang, Mitsubishi Electric Research Labs. (United States); Minwoo Jung, Mitsubishi Electric Research Labs. (United States), Cornell University (United States); Matthew Brand, Mitsubishi Electric Research Labs. (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 11: MODELING, SIMULATION, AND DESIGN OF NANOPHOTONIC STRUCTURES

1 February 2023 • 3:30 PM - 5:40 PM | Moscone Center, Room 50 (Lower Mezzanine South)

Session Chair: Willie J. Padilla, Duke Univ. (United States)

12431-3 • 3:30 PM - 4:00 PM

Freeform metasurfaces: design and applications (*Invited Paper*)

Author(s): Jonathan A. Fan, Stanford Univ. (United States)

12431-43 • 4:00 PM - 4:20 PM

Spectral emissivity prediction in multi-resonant metamaterials using temporal coupled-mode theory

Author(s): Romil Audhkhasi, Michelle L. Povinelli, The Univ. of Southern California (United States)

12431-44 • 4:20 PM - 4:40 PM

Understanding the role of different design parameters in the response of nanophotonic structures

Author(s): Mohammad Hadigheh Javani, Mohammadreza Zandehshahvar, Ali Adibi, Georgia Institute of Technology (United States)

12431-45 • 4:40 PM - 5:00 PM

Method for optimization of achromatic metasurfaces

Author(s): Simon P. Tsaoussis, KostaCLOUD Inc. (United States); Hossein Alisafaei, Rose-Hulman Institute of Technology (United States), KostaCLOUD Inc. (United States)

12431-46 • 5:00 PM - 5:20 PM

Fast metasurface-based angle sensitive pixel design procedure using the discrete dipole approximation

Author(s): Weilin Liu, Euan McLeod, Wyant College of Optical Sciences (United States)

12431-47 • 5:20 PM - 5:40 PM

Engineering band-edge dynamics of photonic filters via topology optimization

Author(s): Berkay Neseli, Seokjin Hong, Jinhyeong Yoon, Junhyeong Kim, Jaeyong Kim, Hyeonho Yoon, Hyo-Hoon Park, Hamza Kurt, KAIST (Republic of Korea)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12431-61

Polarization-independent VO₂ metagrating for broadband optical transmittance modulation

Author(s): Kyuho Kim, Taewon Choi, Seoul National Univ. (Republic of Korea); Sun-Je Kim, Myongji Univ. (Republic of Korea); Yoonchan Jeong, Byoungcho Lee, Seoul National Univ. (Republic of Korea)

12431-62

Quality factor enhancement in low contrast gratings

Author(s): Weronika Glowadzka, Tomasz Czystanowski, Lodz Univ. of Technology (Poland)

12431-63

Enhanced light emission collection from InGaN quantum wells using plasmonic metasurfaces

Author(s): Mohamed Mahmoud Saad Abdelkhalik Mohamed, Aleksandr Vaskin, Technische Univ. Eindhoven (Netherlands); Aimi Abass, Toni López, Lumileds Germany GmbH (Germany); Jaime Gómez Rivas, Technische Univ. Eindhoven (Netherlands); Mark J. Holmes, Univ. of Oxford (United Kingdom)

12431-64

Predictions of nonlinear generation from dielectric metasurfaces using a convolutional neural network

Author(s): Muliang Zhu, Mohammadreza Zandehshahvar, Ali Adibi, Georgia Institute of Technology (United States)

12431-67

Field-enhancement in wafer-scale hollow nanoplasmonic metamaterial for sensing and emission control

Author(s): R. Margoth Cordova-Castro, Univ. of Ottawa (Canada); Dirk Jonker, MESA+ Institute, Univ. Twente (Netherlands); Yaryna Mamchur, Maryam Abbasi, Mahdiah Jabbari, Jeremy Upham, Univ. of Ottawa (Canada); Arturo Susarrey-Arce, MESA+ Institute, Univ. Twente (Netherlands); Robert W. Boyd, Univ. of Ottawa (Canada), The Institute of Optics, Univ. of Rochester (Canada)

12431-66

A resonant field enhancement in in plasmonic multistep structures: theoretical assessment

Author(s): Pavel Kwiecien, Lucie Marešová, Milan Burda, Ivan Richter, Ladislav Kalvoda, Czech Technical Univ. in Prague (Czech Republic)

THURSDAY 2 FEBRUARY**SESSION 12: RESONANCE-BASED NANOPHOTONIC DEVICES**

2 February 2023 • 8:00 AM - 10:10 AM | Moscone Center, Room 50 (Lower Mezzanine South)

Session Chair: Alireza Marandi, Caltech (United States)

12431-48 • 8:00 AM - 8:30 AM

Integrated lithium niobate photonic platform (*Invited Paper*)

Author(s): Marko Loncar, Harvard John A. Paulson School of Engineering and Applied Sciences (United States)

12431-49 • 8:30 AM - 9:00 AM

Enhancing nonlinear performance of resonant cavities using nonlinear organic monolayers (*Invited Paper*)

Author(s): Andrea M. Armani, The Univ. of Southern California (United States)

12431-50 • 9:00 AM - 9:30 AM

Fundamentals and applications in laser frequency microcombs (*Invited Paper*)

Author(s): Chee-Wei Wong, UCLA Samueli School of Engineering (United States)

12431-51 • 9:30 AM - 9:50 AM

Experimental techniques to characterize the geometry of hollow whispering gallery resonators

Author(s): Mohammed Zia Jalaludeen, Shilong Li, Sile Nic Chormaic, Okinawa Institute of Science and Technology Graduate Univ. (Japan)

12431-52 • 9:50 AM - 10:10 AM

Demonstration of telecom-band 2D photonic crystal cavities in a single crystal diamond membrane

Author(s): Kazuhiro Kuruma, Afaq H. Piracha, Dylan Renaud, Cleaven Chia, Harvard Univ. (United States); Neil Sinclair, Harvard Univ. (United States), Caltech (United States); Athavan Nadarajah, The Univ. of Melbourne (Australia); Alastair Stacey, The Univ. of Melbourne (Australia), RMIT Univ. (Australia); Steven Prawer, The Univ. of Melbourne (Australia); Marko Loncar, Harvard Univ. (United States)

Coffee Break 10:10 AM - 10:30 AM

Conference 12431

SESSION 13: NONLINEAR PHOTONIC NANOSTRUCTURES I

2 February 2023 • 10:30 AM - 12:00 PM | Moscone Center, Room 50 (Lower Mezzanine South)

Session Chair: Andrea M. Armani, The Univ. of Southern California (United States)

12431-53 • 10:30 AM - 11:00 AM

Few-cycle nonlinear photonics: from nanoscale devices to large-scale circuits (*Invited Paper*)

Author(s): Alireza Marandi, Caltech (United States)

12431-54 • 11:00 AM - 11:20 AM

Optical Kerr effect in harmonic generation metasurfaces featuring quasibound states of continuum

Author(s): Muliang Zhu, Sajjad Abdollahramezani, Tianren Fan, Xi Wu, Todd J. Walters, Devin K. Brown, Kirsten Masselink, Yolande Berta, Georgia Institute of Technology (United States); Hayk Harutyunyan, Emory Univ. (United States); Ali Adibi, Georgia Institute of Technology (United States)

12431-55 • 11:20 AM - 11:40 AM

Enhancement of solid-state photon upconversion by controlling the spatial arrangement of dyes on plasmonic nano-interfaces

Author(s): Kodai Matsumoto, Udai Danyoshi, Tomohiro Ryu, Junpei Kondo, Takeo Nakano, Kiyoshi Miyata, Nobuhiro Yanai, Shigenori Fujikawa, Nobuo Kimizuka, Kyushu Univ. (Japan)

12431-56 • 11:40 AM - 12:00 PM

Large-area fabrication of nanogap arrays for the enhancement of solid-state photon upconversion

Author(s): Udai Danyoshi, Kodai Matsumoto, Tomohiro Ryu, Naoyuki Harada, Takeo Nakano, Kiyoshi Miyata, Nobuhiro Yanai, Shigenori Fujikawa, Nobuo Kimizuka, Kyushu Univ. (Japan)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 14: NONLINEAR PHOTONIC NANOSTRUCTURES II

2 February 2023 • 1:30 PM - 3:20 PM | Moscone Center, Room 50 (Lower Mezzanine South)

Session Chair: Ann Roberts, The Univ. of Melbourne (Australia)

12431-57 • 1:30 PM - 2:00 PM

Optical harmonics from coupled plasmons in nanoparticle bilayers (*Invited Paper*)

Author(s): Richard F. Haglund, Nathan J. Spear, Yueming Yan, Vanderbilt Univ. (United States); Joshua Queen, North Carolina State Univ. (United States); Mahi R. Singh, Western Univ. (Canada); Janet E. Macdonald, Vanderbilt Univ. (United States)

12431-58 • 2:00 PM - 2:20 PM

Black phosphorus photodetectors with integrated metamaterials

Author(s): Max Lien, Nan Wang, Jiangbin Wu, The Univ. of Southern California (United States); Alexander Soibel, Sarath D. Gunapala, Jet Propulsion Lab. (United States), NASA (United States); Han Wang, Michelle L. Povinelli, The Univ. of Southern California (United States)

12431-59 • 2:20 PM - 2:40 PM

Controlling the magnetic response in dielectrics via near-field interactions

Author(s): Andrei Kiselev, Olivier J. F. Martin, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12431-60 • 2:40 PM - 3:00 PM

Engineering exciton-trion dynamics using strain in two-dimensional transition-metal dichalcogenides

Author(s): Anuj Singh, Kishor Kumar Mandal, Brijesh Kumar, Lekshmi Eswaramoorthy, Anshuman Kumar, Indian Institute of Technology Bombay (India)

12431-37 • 3:00 PM - 3:20 PM

Tunable metasurfaces using ultralow-loss phase-change materials

Author(s): Mengyun Wang, June Sang Lee, Samarth Aggarwal, Nikolaos Farmakidis, Yuhuan He, Tangsheng Cheng, Harish Bhaskaran, Univ. of Oxford (United Kingdom)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12431-17

Photonic-crystal surface-emitting lasers in red wavelength range

Author(s): Tsung-Yeh Ku, Chi-Hao Wang, Gray Lin, National Yang Ming Chiao Tung Univ. (Taiwan)

High Contrast Metastructures XII

30 January - 1 February 2023 | Moscone Center, Room 76 (Lower Mezzanine South)

Conference Chairs: **Connie J. Chang-Hasnain**, Berxel Photonics Corp. Ltd. (United States); **Jonathan A. Fan**, Stanford Univ. (United States); **Weimin Zhou**, DEVCOM Army Research Lab. (United States)

Program Committee: **Andrea Alù**, The City Univ. of New York Advanced Science Research Ctr. (United States); **Markus-Christian Amann**, Walter Schottky Institut (Germany); **Amir Arbabi**, Univ. of Massachusetts Amherst (United States); **Il-Sug Chung**, Ulsan National Institute of Science and Technology (Republic of Korea); **Andrei Faraon**, Caltech (United States); **Yuri S. Kivshar**, The Australian National Univ. (Australia); **Fumio Koyama**, Tokyo Institute of Technology (Japan); **Arseniy I. Kuznetsov**, A*STAR Institute of Materials Research and Engineering (Singapore); **Philippe Lalanne**, Lab. Photonique, Numérique et Nanosciences (France); **John R. Lawall**, National Institute of Standards and Technology (United States); **Tien-Chang Lu**, National Yang Ming Chiao Tung Univ. (Taiwan); **Rainer F. Mahrt**, IBM Research - Zürich (Switzerland); **Arka Majumdar**, Univ. of Washington (United States); **Bala Pesala**, Council of Scientific & Industrial Research (India); **Pengfei Qiao**, Pinnacle Photonics (United States); **Jon A. Schuller**, Univ. of California, Santa Barbara (United States); **Shulin Sun**, Fudan Univ. (China); **Pierre Viktorovitch**, Ecole Centrale de Lyon (France); **Alan E. Willner**, The Univ. of Southern California (United States); **Ming C. Wu**, Univ. of California, Berkeley (United States)

MONDAY 30 JANUARY

OPTO PLENARY SESSION

30 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 207/215 (Level 2 South)

8:00 AM - 8:05 AM: **Welcome and Opening Remarks**
Sonia García-Blanco, Univ. Twente (Netherlands) and Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

8:05 AM - 8:15 AM: **Announcement of the OPTO AI/ML and Net Zero Best Paper Awards**

12424-501 • 8:15 AM - 8:50 AM
High-performance electronic-photonic interfaces: from AI to quantum (*Plenary Presentation*)
Author(s): Rajeev Ram, Massachusetts Institute of Technology (United States)

12416-501 • 8:50 AM - 9:25 AM
Tandem photovoltaic devices: more than one way to make a solar cell (*Plenary Presentation*)
Author(s): Emily L. Warren, National Renewable Energy Lab. (United States)

12421-501 • 9:25 AM - 10:00 AM
Are III-nitride semiconductors also suitable for red emission? (*Plenary Presentation*)
Author(s): Nicolas Grandjean, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 1: META-PHOTONICS

30 January 2023 • 10:30 AM - 12:10 PM | Moscone Center, Room 76 (Lower Mezzanine South)

Session Chair: Weimin Zhou, DEVCOM Army Research Lab. (United States)

12432-1 • 10:30 AM - 11:00 AM
CANCELED: Chiral resonant metaphotonics (*Invited Paper*)
Author(s): Yuri S. Kivshar, The Australian National Univ. (Australia)

12432-2 • 11:00 AM - 11:30 AM
Ultrafast and nonlinear response of symmetric metasurfaces based on bound states in the continuum (*Invited Paper*)
Author(s): Hayk Harutyunyan, Emory Univ. (United States)

12432-3 • 11:30 AM - 11:50 AM
Simultaneous control of the scattering amplitude, phase, and polarization with nonlocal metasurfaces
Author(s): Adam Overvig, Andrea Alù, The City Univ. of New York Advanced Science Research Ctr. (United States); Yoshiaki Kasahara, The Univ. of Texas at Austin (United States)

12432-4 • 11:50 AM - 12:10 PM
Can imaging ellipsometry beat the diffraction limit?
Author(s): Kurt Hingerl, Johannes Kepler Univ. Linz (Austria)

Lunch Break 12:10 PM - 1:40 PM

SESSION 2: TOPOLOGICAL BIC IN METASURFACE

30 January 2023 • 1:40 PM - 3:20 PM | Moscone Center, Room 76 (Lower Mezzanine South)

Session Chair: Weimin Zhou, DEVCOM Army Research Lab. (United States)

12432-5 • 1:40 PM - 2:10 PM
Radial and height-driven bound states in the continuum (*Invited Paper*)
Author(s): Andreas Tittl, Ludwig-Maximilians-Univ. München (Germany)

12432-6 • 2:10 PM - 2:40 PM
Molding the out-of-plane light absorption and emission with manufactured silicon nanophotonic template (*Invited Paper*)
Author(s): Tingyi Gu, Univ. of Delaware (United States)

Conference 12432

12432-7 • 2:40 PM - 3:00 PM

Controlling topological edge states and their radiation in photonic crystals via synthetic strain engineering

Author(s): René Barczyk, AMOLF (Netherlands); Sonakshi Arora, Kobus Kuipers, Technische Univ. Delft (Netherlands); Ewold Verhagen, AMOLF (Netherlands)

12432-8 • 3:00 PM - 3:20 PM

CANCELED: Intracavity spatiotemporal metasurfaces

Author(s): Wenhe Jia, Chenxin Gao, Liu Li, Shun Wen, Tsinghua Univ. (China); Chunping Jiang, Suzhou Institute of Nano-Tech and Nano-Bionics (China); Chengying Bao, Changxi Yang, Yuanmu Yang, Tsinghua Univ. (China)

Coffee Break 3:20 PM - 3:50 PM

SESSION 3: META-OPTICS

30 January 2023 • 3:50 PM - 5:20 PM | Moscone Center, Room 76 (Lower Mezzanine South)

Session Chair: Andreas Tittl, Ludwig-Maximilians-Univ. München (Germany)

12432-9 • 3:50 PM - 4:20 PM

3D-patterned inverse-designed meta-optics for sorting light by wavelength, polarization and spatial mode *(Invited Paper)*

Author(s): Andrei Faraon, Gregory Roberts, Conner Ballew, Ian Foo, Caltech (United States)

12432-10 • 4:20 PM - 4:40 PM

Polarization independent freeform color router for subwavelength-pixel CMOS image sensors

Author(s): Sungmo Ahn, SAMSUNG Advanced Institute of Technology (Republic of Korea); Peter B. Catrysse, E. L. Ginzton Lab., Stanford Univ. (United States); Sangeun Mun, Choonlae Cho, Minwoo Lim, Sookyoung Roh, Seokho Yun, SAMSUNG Advanced Institute of Technology (Republic of Korea); Shanhui Fan, E. L. Ginzton Lab., Stanford Univ. (United States)

12432-11 • 4:40 PM - 5:00 PM

Monolithic integration metalens in the entire matrix of the silicon photomultipliers for improving the performance of the silicon photomultipliers

Author(s): Soh Uenoyama, Ryosuke Ota, Hamamatsu Photonics K.K. (Japan)

12432-12 • 5:00 PM - 5:20 PM

Reconfigurable focusing and defocusing meta lens using Sb₂Se₃ phase change material

Author(s): Jiawei Meng, Nicola Peserico, Yaliang Gui, Haoyan Kang, The George Washington Univ. (United States); Hamed Dalir, Behrouz Movahhed Nouri, optelligence LLC (United States); Volker J. Sorger, The George Washington Univ. (United States)

TUESDAY 31 JANUARY

SESSION 4: INVERSE DESIGN AND MODELING METASURFACE

31 January 2023 • 8:30 AM - 10:00 AM | Moscone Center, Room 76 (Lower Mezzanine South)

Session Chair: Conner Ballew, Caltech (United States)

12432-13 • 8:30 AM - 9:00 AM

Inverse-designed nanophotonic devices based on design space reparameterization *(Invited Paper)*

Author(s): You Zhou, Erez Gershon, Chenkai Mao, Mingkun Chen, Jonathan Fan, Stanford Univ. (United States)

12432-14 • 9:00 AM - 9:20 AM

Bloch mode analysis of subwavelength polarizing planar optics

Author(s): Raphaël Mulin, STMicroelectronics (France); François Deneuville, ISP System (France); Olivier Jeannin, Aledia (France); Matthieu Boffety, Institut d'Optique Graduate School (France); Jerome M. Vaillant, CEA-LETI (France)

12432-15 • 9:20 AM - 9:40 AM

Model-based optical proximity correction for immersion lithography-based flat optics platform

Author(s): Narak Choi, Keng Heng Lai, Arvind Sundaram, Navab Singh, Yuan Hsing Fu, Lennon Yao Ting Lee, A*STAR Institute of Microelectronics (Singapore)

12432-16 • 9:40 AM - 10:00 AM

Dispersion engineered hybrid meta-surface design for highly compact optical systems

Author(s): Lieven Penninck, Bavo Robben, Peter Muys, PlanOpSim (Belgium)

Coffee Break 10:00 AM - 10:30 AM

SESSION 5: CUSTOMIZED LIGHT CONTROL METASURFACE

31 January 2023 • 10:30 AM - 12:00 PM | Moscone Center, Room 76 (Lower Mezzanine South)

Session Chair: Sang-Yeon Cho, DEVCOM Army Research Lab. (United States)

12432-18 • 10:30 AM - 11:00 AM

Customized thermal and guided-wave surface emission with nonlocal metasurfaces *(Invited Paper)*

Author(s): Adam Overvig, J. Ryan Nolen, Andrea Alù, The City Univ. of New York Advanced Science Research Ctr. (United States)

12432-19 • 11:00 AM - 11:20 AM

Deep subwavelength light localization in ultra-high index topological insulator nanostructures

Author(s): Tomer Lewi, Bar-Ilan Univ. (Israel)

12432-20 • 11:20 AM - 11:40 AM

CANCELED: Polarization dichroic confocal cavity

Author(s): Behrooz Semnani, Mohammad Soltani, Rubayet Al Maruf, Michal Bajcsy, Univ. of Waterloo (Canada)

12432-21 • 11:40 AM - 12:00 PM

CANCELED: Metasurface-based Poincaré sphere polarizer

Author(s): Shuai Wang, Yuanmu Yang, Tsinghua Univ. (China)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 6: DESIGN META-OPTICS WITH UNUSUAL PROPERTIES

31 January 2023 • 1:30 PM - 2:40 PM | Moscone Center, Room 76 (Lower Mezzanine South)

Session Chair: You Zhou, Stanford Univ. (United States)

12432-22 • 1:30 PM - 2:00 PM

All-dielectric meta-optic diodes (*Invited Paper*)

Author(s): Sang-Yeon Cho, DEVCOM Army Research Lab. (United States); Michele Cotrufo, The City Univ. of New York Advanced Science Research Ctr. (United States); Andrea Alù, The City Univ. of New York (United States); Jason Sun, Weimin Zhou, DEVCOM Army Research Lab. (United States)

12432-23 • 1:30 PM - 2:00 PM

Scrutinizing the temporal dimension: physical constraints of photonic time crystals and time-varying metamaterials

Author(s): Zeki Hayran, Cornell Univ. (United States); Jacob B. Khurgin, Johns Hopkins Univ. (United States); Francesco Monticone, Cornell Univ. (United States)

12432-25 • 2:20 PM - 2:40 PM

Design, fabrication, and characterization of large metalenses

Author(s): Jeremy Goodsell, Univ. of Rochester (United States); Augustine Urbas, Joel Leger, Air Force Research Lab. (United States); Jannick P. Rolland, The Institute of Optics, Univ. of Rochester (United States)

Coffee Break 2:40 PM - 3:10 PM

SESSION 7: METASURFACE FOR SENSING AND SPECTROSCOPY

31 January 2023 • 3:10 PM - 4:40 PM | Moscone Center, Room 76 (Lower Mezzanine South)

Session Chair: Adam Overvig, The City Univ. of New York Advanced Science Research Ctr. (United States)

12432-26 • 3:10 PM - 3:40 PM

Record sensing with topological plasmons and octave bandwidth metalenses (*Invited Paper*)

Author(s): Boubacar Kanté, Univ. of California, Berkeley (United States)

12432-27 • 3:40 PM - 4:00 PM

Multi-dimensional wavefront sensing using volumetric meta-optics

Author(s): Conner Ballew, Gregory Roberts, Andrei Faraon, Caltech (United States)

12432-28 • 4:00 PM - 4:20 PM

Multiplexing molecular spectroscopy via metasurface using plasmonic resonance energy transfer

Author(s): Hongyoon Kim, Pohang Univ. of Science and Technology (Republic of Korea); Inki Kim, Sungkyunkwan Univ. (Republic of Korea); Seungyeon Han, The Univ. of Seoul (Republic of Korea); Joohoon Kim, Pohang Univ. of Science and Technology (Republic of Korea); Yangkyu Kim, Sungkyunkwan Univ. (Republic of Korea); Inhee Choi, The Univ. of Seoul (Republic of Korea); Junsuk Rho, Pohang Univ. of Science and Technology (Republic of Korea); Luke P. Lee, Univ. of California, Berkeley (United States), Harvard Medical School (United States)

12432-29 • 4:20 PM - 4:40 PM

Deep learning-based glucose sensing robust to sample position error with split ring resonator sensor

Author(s): Seokho Lee, Pohang Univ. of Science and Technology (Republic of Korea); Trevon Badloe, Pohang Univ. of Science and Technology (United Kingdom); Younghwan Yang, Junsuk Rho, Pohang Univ. of Science and Technology (Republic of Korea)

SESSION 8: META-OPTICS AND APPLICATIONS

1 February 2023 • 8:15 AM - 10:05 AM | Moscone Center, Room 76 (Lower Mezzanine South)

Session Chair: Arseniy I. Kuznetsov, A*STAR Institute of Materials Research and Engineering (Singapore)

12432-30 • 8:15 AM - 8:45 AM

Phase change reconfigurable optical wavefront synthesis system (*Invited Paper*)

Author(s): Hyun Jung Kim, Kiumars Aryana, Scott M. Bartram, Stephen Borg, William M. Humphreys, NASA Langley Research Ctr. (United States); Cosmin-Constantin Popescu, Tian Gu, Juejun Hu, Massachusetts Institute of Technology (United States); Steven A. Vitale, MIT Lincoln Lab. (United States)

12432-31 • 8:45 AM - 9:05 AM

Single-mode integrated out-of-plane meta beam shaper

Author(s): Hrishikesh Iyer, Yurii A. Vlasov, Univ. of Illinois (United States)

12432-32 • 9:05 AM - 9:25 AM

Meta-optic miniaturized telephoto lens system

Author(s): Youngjin Kim, Changhyun Kim, Seoul National Univ. (Republic of Korea); Yoonchan Jeong, Seoul National University (Republic of Korea); Byoungcho Lee, Seoul National Univ. (Republic of Korea)

12432-33 • 9:25 AM - 9:45 AM

Monolithic broadband multispectral color filter array

Author(s): Jiewei Xiang, Meiting Song, Yi Zhang, Jennifer Kruschwitz, Jaime Cardenas, Univ. of Rochester (United States)

12432-34 • 9:45 AM - 10:05 AM

Metalenses for visible wavelengths: NIL volume manufacturing

Author(s): Bradley R. Williams, Daniel Bacon-Brown, Ricky Edwards, Stew Nielson, Arash Farhang, Stuart Johnson, Rumyana V. Petrova, Matthew C. George, Shaun Ogden, MOXTEK, Inc. (United States)

Coffee Break 10:05 AM - 10:35 AM

Conference 12432

SESSION 9: TUNABLE METASURFACE FOR IMAGING/LIDAR

1 February 2023 • 10:35 AM - 12:05 PM | Moscone Center, Room 76 (Lower Mezzanine South)

Session Chair: Hyun Jung Kim, NASA Langley Research Ctr. (United States)

12432-35 • 10:35 AM - 11:05 AM

Tunable dielectric metasurfaces for LiDAR and 3D holographic display technologies (*Invited Paper*)

Author(s): Arseniy I. Kuznetsov, A*STAR Institute of Materials Research and Engineering (Singapore)

12432-36 • 11:05 AM - 11:25 AM

Fast and wide-angle integrated laser beam scanner enabled by a metalens

Author(s): Babak Mirzapourbeinekalaye, Mahdad Mansouree, Andrew McClung, Amir Arbabi, Univ. of Massachusetts Amherst (United States)

12432-37 • 11:25 AM - 11:45 AM

Metamaterial spectrometer on a chip for hyperspectral imaging and atmospheric sounding

Author(s): David Crouse, Phoebus Optoelectronics, LLC (United States), Clarkson Univ. (United States); Igor Bendoyim, Lori A. Lepak, Phoebus Optoelectronics, LLC (United States); James Leitch, Jeff Applegate, Ball Aerospace (United States)

12432-38 • 11:45 AM - 12:05 PM

Fisheye-metalens stereo camera

Author(s): Mikhail Y. Shalaginov, Hung-I Lin, Fan Yang, Drew Weninger, Sensong An, Anuradha Agarwal, Juejun Hu, Tian Gu, Massachusetts Institute of Technology (United States)

Lunch/Exhibition Break 12:05 PM - 1:35 PM

SESSION 10: TUNABLE METASURFACE AND APPLICATION

1 February 2023 • 1:35 PM - 2:45 PM | Moscone Center, Room 76 (Lower Mezzanine South)

Session Chair: Amir Arbabi, Univ. of Massachusetts Amherst (United States)

12432-39 • 1:35 PM - 2:05 PM

Electrically tunable metasurface for highly-efficient beam steering (*Invited Paper*)

Author(s): Junghyun Park, Byung Gil Jeong, Sun Il Kim, Minkyung Lee, KyoungHo Ha, Hyuck Choo, SAMSUNG Electronics Co., Ltd. (Republic of Korea)

12432-41 • 2:05 PM - 2:25 PM

Electrical sensing using a fiber-tip metasurface

Author(s): Luca Picelli, René van Veldhoven, Technische Univ. Eindhoven (Netherlands); Ewold Verhagen, Technische Univ. Eindhoven (Netherlands), AMOLF (Netherlands); Andrea Fiore, Technische Univ. Eindhoven (Netherlands)

12432-40 • 2:25 PM - 2:45 PM

CANCELED: Tunable liquid crystal metasurface for computational spectropolarimetry

Author(s): Yibo Ni, Chen Chen, Shun Wen, Xinyuan Xue, Liqun Sun, Yuanmu Yang, Tsinghua Univ. (China)

Coffee Break 2:45 PM - 3:15 PM

SESSION 11: METASURFACE IMAGING AND HOLOGRAPHY

1 February 2023 • 3:15 PM - 5:05 PM | Moscone Center, Room 76 (Lower Mezzanine South)

Session Chair: Junghyun Park, SAMSUNG Electronics Co., Ltd. Session

12432-42 • 3:15 PM - 3:45 PM

Dynamic metasurfaces for holography and structural coloration (*Invited Paper*)

Author(s): Junsuk Rho, Pohang Univ. of Science and Technology (Republic of Korea)

12432-43 • 3:45 PM - 4:05 PM

Holographic alignment of distant patterns using cascaded metasurfaces

Author(s): Andrew McClung, Babak Mirzapourbeinekalaye, Amir Arbabi, Univ. of Massachusetts Amherst (United States)

12432-46 • 4:05 PM - 4:25 PM

CANCELED: Phase shift of liquid crystal-induced resonance tuning in dielectric metasurface at telecommunication wavelength

Author(s): Xin Chang, Mike Pivnenko, Pawan Shrestha, Weijie Wu, Wenhan Zhang, Daping Chu, Univ. of Cambridge (United Kingdom)

12432-47 • 4:25 PM - 4:45 PM

Temperature invariant metasurfaces

Author(s): Shany Z. Cohen, Sukanta Nandi, Danveer Singh, Tomer Lewi, Bar-Ilan Univ. (Israel)

12432-48 • 4:45 PM - 5:05 PM

Spectro-polarimetric long-wave infrared thermal imaging based on spinning metasurfaces

Author(s): Xueji Wang, Ziyi Yang, Zubin Jacob, Purdue Univ. (United States)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12432-17

Deep learning model to design dielectric metasurfaces for surface-enhanced biosensing

Author(s): Julia Hui, Acton-Boxborough Regional High School (United States); Kevin Qi, Boston College (United States); Michael Dubrovsky, SiPhox, Inc. (United States); Sensong An, Massachusetts Institute of Technology (United States); Tingying Helen Zeng, Academy for Advanced Research and Development (United States); Mikhail Y. Shalaginov, Massachusetts Institute of Technology (United States)

Advanced Fabrication Technologies for Micro/Nano Optics and Photonics XVI

29 - 31 January 2023 | Moscone Center, Room 2018 (Level 2 West)

Conference Chairs: **Georg von Freymann**, Technische Univ. Kaiserslautern (Germany); **Eva Blasco**, Ruprecht-Karls-Univ. Heidelberg (Germany); **Debashis Chanda**, Univ. of Central Florida (United States)

Program Committee: **Andrea Alù**, The City Univ. of New York Advanced Science Research Ctr. (United States); **Cornelia Denz**, Westfälische Wilhelms-Univ. Münster (Germany); **Lingjie Jay Guo**, Univ. of Michigan (United States); **Ruth Houbertz**, ThinkMade Engineering & Consulting (Germany); **Saulius Juodkazis**, Swinburne Univ. of Technology (Australia); **Stephen M. Kuebler**, Univ. of Central Florida (United States); **Mangirdas Malinauskas**, Vilnius Univ. (Lithuania); **Virgilio Mattoli**, Istituto Italiano di Tecnologia (Italy); **Robert R. McLeod**, Univ. of Colorado Boulder (United States); **Hernán R. Míguez García**, Instituto de Ciencia de Materiales de Sevilla (Spain); **Christophe Moser**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Aaron J. Pung**, Sandia National Labs. (United States); **Junsuk Rho**, Pohang Univ. of Science and Technology (Republic of Korea); **Raymond C. Rumpf**, The Univ. of Texas at El Paso (United States); **Winston V. Schoenfeld**, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Thomas J. Suleski**, The Univ. of North Carolina at Charlotte (United States); **Michael Thiel**, Nanoscribe GmbH & Co. KG (Germany); **Augustine M. Urbas**, Air Force Research Lab. (United States); **Sandra Wolff**, Technische Univ. Kaiserslautern (Germany)

SUNDAY 29 JANUARY

SESSION 1: METASURFACES

29 January 2023 • 8:30 AM - 10:10 AM | Moscone Center, Room 2018 (Level 2 West)

Session Chair: Angelo Accardo, Technische Univ. Delft (Netherlands)

12433-1 • 8:30 AM - 9:00 AM

Engineered hydrogenated amorphous silicon and nanoparticle-embedded-resin for low-loss and scalable optical metasurfaces (*Invited Paper*)

Author(s): Junsuk Rho, Pohang Univ. of Science and Technology (Republic of Korea)

12433-23 • 9:00 AM - 9:30 AM

Optical metasurfaces for advanced linear and nonlinear functionalities (*Invited Paper*)

Author(s): Michele Cotrufo, The City Univ. of New York Advanced Science Research Ctr. (United States)

12433-3 • 9:30 AM - 9:50 AM

Novel fabrication method for highly conformable THz metasurfaces

Author(s): Andrea Ottomaniello, Istituto Italiano di Tecnologia (Italy); Paolo Vezio, Univ. di Pisa (Italy); Omar Tricinci, Istituto Italiano di Tecnologia (Italy); Alessandro Tredicucci, Univ. di Pisa (Italy); Virgilio Mattoli, Istituto Italiano di Tecnologia (Italy)

12433-4 • 9:50 AM - 10:10 AM

Towards rigid curved metalenses

Author(s): Louis Martin-Monier, Massachusetts Institute of Technology (United States)

Coffee Break 10:10 AM - 10:40 AM

SESSION 2: MICROOPTICS I

29 January 2023 • 10:40 AM - 12:20 PM | Moscone Center, Room 2018 (Level 2 West)

Session Chair: Georg von Freymann, Technische Univ. Kaiserslautern (Germany)

12433-5 • 10:40 AM - 11:10 AM

Advanced 3D printing of micro-optical systems (*Invited Paper*)

Author(s): Harald Giessen, Univ. Stuttgart (Germany)

12433-6 • 11:10 AM - 11:40 AM

Laser direct writing of interfacing structures for short-distance optical interconnections (*Invited Paper*)

Author(s): Jürgen Van Erps, Koen Vanmol, Tigran Baghadasaryan, Vrije Univ. Brussel (Belgium); Athanasios Kyriazis, Vrije Univ. Brussel (Belgium), Univ. Gent (Belgium); Nathalie Vermeulen, Hugo Thienpont, Vrije Univ. Brussel (Belgium)

12433-7 • 11:40 AM - 12:00 PM

Direct laser writing of micrograting arrays using a spatial light modulator

Author(s): Jonas Strobelt, Berliner Hochschule für Technik (Germany); Matthew Van Soelen, David J. McGee, The College of New Jersey (United States)

12433-8 • 12:00 PM - 12:20 PM

High transparency and resiliency free-form micro-optics fabricated by laser 3D nanolithography and post-processing solutions

Author(s): Darius Gailevicius, Karolis Galvanauskas, Vilnius Univ. (Lithuania); Darija Astrauskyte, Ctr. for Physical Sciences and Technology (Lithuania); Rokas Žvirblis, Antanas Butkus, Giedrius Balčas, Vilnius Univ. (Lithuania); Lina Grinevičiūtė, Ctr. for Physical Sciences and Technology (Lithuania); Mangirdas Malinauskas, Vilnius Univ. (Lithuania)

Lunch/Exhibition Break 12:20 PM - 1:50 PM

Conference 12433

SESSION 3: PHOTONICS

29 January 2023 • 1:50 PM - 3:20 PM | Moscone Center, Room 2018 (Level 2 West)

Session Chair: Harald Giessen, Univ. Stuttgart (Germany)

12433-9 • 1:50 PM - 2:20 PM

3D-photonic nanostructures for photonic computing (Invited Paper)

Author(s): Wolfram H. P. Pernice, Daniel Wendland, Frank Brücknerhoff-Plückelmann, Ivonne Bente, Westfälische Wilhelms-Universität Münster (Germany)

12433-10 • 2:20 PM - 2:40 PM

Tailoring optical birefringence of polymers using 3D femtosecond laser structuring

Author(s): Vygantas Mizeikis, Shizuoka Univ. (Japan); Darius Gailevičius, Domas Paipulas, Vilnius Univ. (Lithuania); Kęstutis Staliūnas, ICREA - Institució Catalana de Recerca i Estudis Avançats (Spain)

12433-11 • 2:40 PM - 3:00 PM

Temperature compensated strain sensor in fused silica by femtosecond laser inscription

Author(s): Viktor Geudens, Shahryar Nategh, Geert Van Steenberge, Jan Belis, Jeroen Missinne, Univ. Gent (Belgium)

12433-12 • 3:00 PM - 3:20 PM

Creating fiber-embedded photonic circuitry by liquid-phase structuring of multi-material cores

Author(s): Camila Faccini de Lima, Troy Leffel, Mengxin Zheng, Jeffery Coulter, Alexander Gumennik, Indiana Univ. (United States)

Coffee Break 3:20 PM - 3:50 PM

SESSION 4: MICROOPTICS II

29 January 2023 • 3:50 PM - 5:20 PM | Moscone Center, Room 2018 (Level 2 West)

Session Chair: Georg von Freymann, Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany)

12433-13 • 3:50 PM - 4:20 PM

A novel fabrication method for high-precision polymer aspherical lenses (Invited Paper)

Author(s): Frank C. Wippermann, Jacques W. Duparré, Nico Hagen, mcd - modern camera designs GmbH (Germany)

12433-14 • 4:20 PM - 4:40 PM

3D printing of glass micro-devices for integrated photonics and miniaturized optics

Author(s): Andrea Lovera, Marco Giaccone, Cesare Alfieri, Enrico Casamenti, Rolando Ferrini, FEMTOprint SA (Switzerland)

12433-15 • 4:40 PM - 5:00 PM **Reprogrammable diffractive micro-optical elements**

Author(s): Stefano Luigi Oscurato, Francesco Reda, Marcella Salvatore, Fabio Borbone, Univ. degli Studi di Napoli Federico II (Italy)

12433-16 • 5:00 PM - 5:20 PM

A bi-axially accelerating Airy beam for miniaturized light-sheet microscopy

Author(s): Yanis Taege, Tim S. Winter, Çağlar Ataman, Univ. of Freiburg (Germany)

MONDAY 30 JANUARY

OPTO PLENARY SESSION

30 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 207/215 (Level 2 South)

8:00 AM - 8:05 AM: **Welcome and Opening Remarks**

Sonia García-Blanco, Univ. Twente (Netherlands) and Bernd Witzigmann, Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany)

8:05 AM - 8:15 AM: **Announcement of the OPTO AI/ML and Net Zero Best Paper Awards**

12424-501 • 8:15 AM - 8:50 AM

High-performance electronic-photonic interfaces: from AI to quantum (Plenary Presentation)

Author(s): Rajeev Ram, Massachusetts Institute of Technology (United States)

12416-501 • 8:50 AM - 9:25 AM

Tandem photovoltaic devices: more than one way to make a solar cell (Plenary Presentation)

Author(s): Emily L. Warren, National Renewable Energy Lab. (United States)

12421-501 • 9:25 AM - 10:00 AM

Are III-nitride semiconductors also suitable for red emission? (Plenary Presentation)

Author(s): Nicolas Grandjean, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 5: VOLUMETRIC AND GREYSCALE PRINTING

30 January 2023 • 10:30 AM - 12:30 PM | Moscone Center, Room 2018 (Level 2 West)

Session Chair: Eva Blasco, Ruprecht-Karls-Universität Heidelberg (Germany)

12433-17 • 10:30 AM - 11:00 AM

Triplet fusion upconversion nanocapsules for volumetric 3D printing (Invited Paper)

Author(s): Daniel N. Congreve, Tracy Schloemer, Stanford Univ. (United States); The Rowland Institute at Harvard (United States); Samuel Sanders, Mahesh Gangishetty, Daniel Anderson, The Rowland Institute at Harvard (United States); Michael Seitz, Stanford Univ. (United States); The Rowland Institute at Harvard (United States); Arynn Gallegos, Stanford Univ. (United States); Christopher Stokes, The Rowland Institute at Harvard (United States)

12433-18 • 11:00 AM - 11:30 AM

Computed axial lithography: processing of nanocomposite materials and prospects for fabricating optical elements (Invited Paper)

Author(s): Joseph T. Toombs, Univ. of California, Berkeley (United States); Manuel Luitz, Univ. of Freiburg (Germany); Caitlyn C. Cook, Lawrence Livermore National Lab. (United States); Sophie Jenne, Univ. of Freiburg (Germany); Chi Chung Li, Yaxuan Sun, Univ. of California, Berkeley (United States); Bastian E. Rapp, Frederik Kotz-Helmer, Univ. of Freiburg (Germany); Hayden K. Taylor, Univ. of California, Berkeley (United States)

12433-19 • 11:30 AM - 11:50 AM

High resolution and fast volumetric printing of multi-cm scale objects using projected light

Author(s): Antoine Boniface, Jorge Madrid-Wolff, Christophe Moser, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12433-20 • 11:50 AM - 12:10 PM

Advancement in two-photon grayscale lithography

Author(s): Michael Thiel, Andrea Bertoncini, Tobias Hoose, Matthias Blaicher, Nanoscribe GmbH & Co. KG (Germany)

12433-21 • 12:10 PM - 12:30 PM

Sub-100 nm feature sizes realized by cost-effective microscope projection photolithography

Author(s): Lei Zheng, Leibniz Univ. Hannover (Germany); Carsten Reinhardt, Hochschule Bremen Univ. of Applied Sciences (Germany); Bernhard Roth, Leibniz Univ. Hannover (Germany)

Lunch Break 12:30 PM - 2:00 PM**SESSION 6: 3D PRINTING OF BIO-INSPIRED STRUCTURES AND MATERIALS**

30 January 2023 • 2:00 PM - 3:30 PM | Moscone Center, Room 2018 (Level 2 West)

Session Chair: Georg von Freymann, Technische Univ. Kaiserslautern (Germany)

12433-22 • 2:00 PM - 2:30 PM

High resolution light-based 3D printing of cell-laden bio constructs *(Invited Paper)*

Author(s): Antoine Boniface, Jorge Madrid-Wolff, Christophe Moser, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12433-23 • 2:30 PM - 3:00 PM

Shaping matter by using light: 3D laser-assisted additive manufacturing for fundamental neuromechanobiology and in-vitro brain cancer treatment models *(Invited Paper)*

Author(s): Angelo Accardo, Technische Univ. Delft (Netherlands)

12433-24 • 3:00 PM - 3:30 PM

3D additive fabrication for CMOS-compatible integration of scalable neural networks *(Invited Paper)*

Author(s): Adria Grabulosa i Vallmajó, Johnny Moughames, Xavier Porte, Daniel Brunner, FEMTO-ST (France)

Coffee Break 3:30 PM - 4:00 PM**SESSION 7: NOVEL MATERIALS AND MULTIMATERIAL PRINTING**

30 January 2023 • 4:00 PM - 6:10 PM | Moscone Center, Room 2018 (Level 2 West)

Session Chair: Eva Blasco, Ruprecht-Karls-Univ. Heidelberg (Germany)

12433-25 • 4:00 PM - 4:30 PM

Light responsive elastomers for microscopic and macroscopic robotics and photonics *(Invited Paper)*

Author(s): Hao Zeng, Yasaman Nemati, Tampere Univ. (Finland); Jianxun Liu, YanJun Liu, Southern Univ. of Science and Technology of China (China); Yu-Chieh Cheng, National Taipei Univ. of Technology (Taiwan); Arri Priimagi, Tampere Univ. (Finland)

12433-26 • 4:30 PM - 4:50 PM

Direct laser writing suitable resist based on the monomeric unit of chitin

Author(s): Dominic Meiers, Technische Univ. Kaiserslautern (Germany); Maximilian Rothhammer, Cordt Zollfrank, Technische Univ. München (Germany); Georg von Freymann, Technische Univ. Kaiserslautern (Germany), Fraunhofer-Institut für Techno- und Wirtschaftsmathematik ITWM (Germany)

12433-27 • 4:50 PM - 5:10 PM

Multiphoton polymerization using upconversion nanoparticles for adaptive high-resolution 3D printing

Author(s): Qianyi Zhang, Antoine Boniface, Virendra K. Parashar, Christophe Moser, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12433-28 • 5:10 PM - 5:30 PM

Multi-material additive manufacturing based on μ -dispenser technology for tailored polymer micro-optics

Author(s): Fabian Kranert, Laser Zentrum Hannover e.V. (Germany), Leibniz Univ. Hannover (Germany); Alexander Schulze Finkenbrink, Laser Zentrum Hannover e.V. (Germany); Moritz Hinkelmann, Jörg Neumann, Dietmar Kracht, Laser Zentrum Hannover e.V. (Germany), Cluster of Excellence PhoenixD (Germany)

12433-29 • 5:30 PM - 5:50 PM

Micro-printing of ceramic packaging for sensor integration

Author(s): Tobias Schaedler, Kayleigh A. Porter, Alex C. Yu, Erin S. Wernick, Souren Soukiazian, Trevor Sasse, Christina M. Seeholzer, Bor-An C. Tu, Courtney P. Wilt, Souheil Nadri, John A. Carlson, Jacob M. Hundley, Mark R. O'Masta, Binh-Minh Nguyen, Peter D. Brewer, HRL Labs., LLC (United States)

12433-30 • 5:30 PM - 5:50 PM

Humink: additive manufacturing at the nanoscale

Author(s): Pascal Boncenne, Humink (France); Rick Mental, Sun Nano (United States)

Conference 12433

TUESDAY 31 JANUARY

SESSION 8: QUALITY CONTROL FOR MICRO/NANO FABRICATION

Joint Session with Conferences 12433 and 12412

31 January 2023 • 9:00 AM - 10:00 AM | Moscone Center, Room 2018 (Level 2 West)

Session Chair: Robert R. McLeod, Univ. of Colorado Boulder (United States)

12433-31 • 9:00 AM - 9:20 AM

Towards efficient structure prediction and pre-compensation in multiphoton lithography

Author(s): Julian Hering-Stratemeier, Univ. of Kaiserslautern-Landau (Germany), Opti-Cal GmbH (Germany); Nicolas Lang, Sven Enns, Univ. of Kaiserslautern-Landau (Germany); Georg von Freymann, Univ. of Kaiserslautern-Landau (Germany), Fraunhofer-Institut für Techno- und Wirtschaftsmathematik ITWM (Germany), Opti-Cal GmbH (Germany)

12433-32 • 9:20 AM - 9:40 AM

Manufacturing acceleration of free-form micro-optical arrays (FMOAs) with CAD algorithms

Author(s): Frédéric Zanella, Oscar Fernandez, Ton Offermans, Tamara Aderneuer, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); Julio Chaves, Rubén Mohedano, Limbak 4PI S.L. (Spain); Guillaume Basset, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland)

12412-1 • 9:40 AM - 10:00 AM

Optical coherence tomography for multi-photon 3D laser printing: towards in-situ imaging and quality control

Author(s): Roman Zvahelskyi, Frederik Mayer, Dominik Beutel, Carsten Rockstuhl, Karlsruher Institut für Technologie (Germany); Guillaume Gomard, Carl Zeiss AG (Germany); Martin Wegener, Karlsruher Institut für Technologie (Germany)

Coffee Break 10:00 AM - 10:30 AM

SESSION 9: EMERGING TECHNOLOGY FOR BIO AND OPTICS 3D PRINTING

Joint Session with Conferences 12412 and 12433

31 January 2023 • 10:30 AM - 11:20 AM | Moscone Center, Room 2018 (Level 2 West)

Session Chair: Bo Gu, Bos Photonics (United States)

12412-2 • 10:30 AM - 11:00 AM

LIFT printing of cells and DNA damage study (Invited Paper)

Author(s): Evina Elezoglou, National Technical Univ. of Athens (Greece); Panagiotis Karakaidos, Biomedical Research Foundation, Academy of Athens (Greece); Christina Kryou, National Technical Univ. of Athens (Greece); Antonis Hatzia Apostolou, Univ. of West Attica (Greece); Apostolos Klinakis, Biomedical Research Foundation, Academy of Athens (Greece); Ioanna Zergioti, National Technical Univ. of Athens (Greece)

12412-3 • 11:00 AM - 11:20 AM

4D microprinting of programmable polymers: towards "living" behaviours

Author(s): Eva Blasco, Christoph A. Spiegel, Li-Yun Hsu, Ruprecht-Karls-Univ. Heidelberg (Germany)

Lunch/Exhibition Break 11:40 AM - 1:30 PM

SESSION 10: VOLUMETRIC PRINTING AND MASKLESS LITHOGRAPHY

Joint Session with Conferences 12433 and 12435

31 January 2023 • 1:30 PM - 3:00 PM | Moscone Center, Room 2018 (Level 2 West)

Session Chairs: Michele Cotrufo, The City Univ. of New York Advanced Science Research Ctr. (United States), Benjamin L. Lee, Texas Instruments Inc. (United States)

12433-37 • 1:30 PM - 2:00 PM

(1+1)-photon absorption for 3D laser printing (Invited Paper)

Author(s): Martin Wegener, Karlsruher Institut für Technologie (Germany)

12435-12 • 2:00 PM - 2:20 PM

Transient thermal response of DMD (Digital Micromirror Device) with pulsed laser illumination

Author(s): Scott Overmann, Michael McCormick, Texas Instruments Inc. (United States)

12435-13 • 2:20 PM - 2:40 PM

High-speed optical diffraction tomography for characterizing two-photon photopolymerization fabrication

Author(s): Yanping He, Qi Shao, Shih-Chi Chen, Renjie Zhou, The Chinese Univ. of Hong Kong (Hong Kong, China)

12435-14 • 2:40 PM - 3:00 PM

1550-nm photonic crystal lasers fabricated by maskless digital photolithography

Author(s): Minsu Kang, Heesoo Jin, Heonsu Jeon, Seoul National Univ. (Republic of Korea)

Coffee Break 3:00 PM - 3:30 PM

SESSION 11: VOLUMETRIC PRINTING

Joint Session with Conferences 12433 and 12435

31 January 2023 • 3:30 PM - 5:00 PM | Moscone Center, Room 2018 (Level 2 West)

Session Chairs: Christophe Moser, Ecole Polytechnique Fédérale de Lausanne (Switzerland), Benjamin L. Lee, Texas Instruments Inc. (United States)

12433-34 • 3:30 PM - 4:00 PM

Object-space image generation for volume additive manufacturing to enable improved optical and material systems (Invited Paper)

Author(s): Robert R. McLeod, Charles M. Rackson, Univ. of Colorado Boulder (United States)

12435-10 • 4:00 PM - 4:20 PM

Controlling light dose in tomographic volumetric additive manufacturing

Author(s): Antony Orth, Daniel Webber, Yujie Zhang, National Research Council Canada (Canada); Rene Lam, National Research Council Canada (Canada); Univ. of Waterloo (Canada); Jonathan Boisvert, Chantal Paquet, National Research Council Canada (Canada)

12435-11 • 4:20 PM - 4:40 PM

Enhanced tomographic printing via 3D ray-tracing dose optimization

Author(s): Daniel Webber, Antony Orth, Yujie Zhang, Michel Picard, Chantal Paquet, Jonathan Boisvert, National Research Council Canada (Canada)

12433-36 • 4:40 PM - 5:00 PM

Maskless lithography based on a digital micromirror device with improved patterning speed and quality

Author(s): Jinsu Choi, KAIST (Republic of Korea); Geehong Kim, Wonsup Lee, Hyunmin Cho, Korea Institute of Machinery & Materials (Republic of Korea); Won Seok Chang, Korea Institute of Machinery & Materials (Republic of Korea), Univ. of Science and Technology (Republic of Korea); Hongki Yoo, KAIST (Republic of Korea)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12433-39

Monolithic high-contrast gratings: technological aspects of its fabrication

Author(s): Marek Ekielski, Karolina Bogdanowicz, Renata Kruska, Wojciech Gumulak, Anna Szerling, Lukaszewicz Research Network - Institute of Microelectronics and Photonics (Poland); Weronika Głowadzka, Mikołaj Janczak, Tomasz G. Czystanowski, Lodz Univ. of Technology (Poland); Monika Mikulicz, Michał Rygała, Tristan Smółka, Marcin Motyka, Mikołaj Badura, Beata Ściana, Wrocław Univ. of Science and Technology (Poland)

12433-40

Integration of UV-nanoimprint lithography with two-photon polymerization for scalable production

Author(s): Lei Zheng, Leibniz Univ. Hannover (Germany); Axel Günther, Technische Univ. Braunschweig (Germany); Reinhard Caspary, Leibniz Univ. Hannover (Germany); Wolfgang Kowalsky, Technische Univ. Braunschweig (Germany); Bernhard Roth, Leibniz Univ. Hannover (Germany)

12433-41

Investigation of plasma etching for interlayer dielectric planarization in high-efficiency deep-ultraviolet nanowire LEDs

Author(s): Bryan Melanson, Jing Zhang, Matthew Seitz, Rochester Institute of Technology (United States)

12433-42

Large-area scatterometry for nanoscale metrology

Author(s): Jaime Gómez Rivas, Technische Univ. Eindhoven (Netherlands); Mohammad Ramezani, TeraNova B.V. (Netherlands); Marc A. Verschuuren, SCIL Nanoimprint Solutions (Netherlands); Gabriel Castellanos Gonzalez, TeraNova B.V. (Netherlands)

12433-43

Prototyping and manufacturing of 3D optical and microfluidic components with sub-micron precision by 172 nm lamps outside a clean room

Author(s): Andrey E. Mironov, Univ. of Illinois (United States), Cygnus Photonics (United States); Thomas Reboli, Univ. of Illinois (United States); Dane J. Sievers, Sung-Jin Park, J. Gary Eden, Univ. of Illinois (United States), Cygnus Photonics (United States)

12433-44

Design and fabrication of high numerical aperture diffractive lens with two-photon laser ablation

Author(s): Cheng Zheng, Gaojie Yang, Quansan Yang, Peter T. C. So, Massachusetts Institute of Technology (United States)

12433-45

New approach to realize a clean lift-off processing after sputter metallization

Author(s): Eva Izquierdo, Claire Théveneau, Alexandre Larrue, Bouzid Simozrag, Michel Garcia, III-V Lab. (France)

12433-46

Two-photon 3D-nanostructuring in metal-organic frameworks

Author(s): Angeliki Afentaki, Laser Zentrum Hannover e.V. (Germany), Leibniz Univ. Hannover (Germany); Karen D.J. Hindricks, Leibniz University (Germany), Cluster of Excellence PhoenixD (Germany); Moritz Hinkelmann, Jörg Neumann, Laser Zentrum Hannover e.V. (Germany), Cluster of Excellence PhoenixD (Germany); Peter Behrens, Leibniz University (Germany), Cluster of Excellence PhoenixD (Germany); Dietmar Kracht, Laser Zentrum Hannover e.V. (Germany), Cluster of Excellence PhoenixD (Germany)

12433-47

Patterning of chemically strengthened glasses by nanoimprint lithography (NIL) followed by reactive ion etching (RIE)

Author(s): Joao Gaspar, Ye Zhou, Prasanna Venkatesh Krishnan, Kristian Thulin, Patrik Lundström, Obducat Technologies AB (Sweden); Virginia Soares, Virginia Chu, INESC MN (Portugal)

Conference 12433

12433-48

High-efficiency fill factor recovery using refractive microlens arrays imprinted on 0.5-256 kpixel front-side illuminated SPAD imagers

Author(s): Claudio E. Bruschini, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Ivan Michel Antolović, Ecole Polytechnique Fédérale de Lausanne (Switzerland), Pi Imaging Technology SA (Switzerland); Frédéric Zanella, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); Arin C. Ulku, Scott Lindner, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Alexander L. Kalyanov, Univ. Zürich (Switzerland), UniversitätsSpital Zürich (Switzerland); Tommaso Milanese, Ermanno Bernasconi, Vladimir Pešić, Edoardo Charbon, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12433-49

CANCELED: Morphology-related diffraction behaviour of surface relief gratings on azopolymer films

Author(s): Marcella Salvatore, Stefano Luigi Oscurato, Francesco Reda, Pasqualino Maddalena, Univ. degli Studi di Napoli Federico II (Italy)

MOEMS and Miniaturized Systems XXII

30 - 31 January 2023 | Moscone Center, Room 2020 (Level 2 West)

Conference Chairs: **Hans Zappe**, Univ. of Freiburg (Germany); **Wibool Piyawattanametha**, King Mongkut's Institute of Technology Ladkrabang (Thailand), Michigan State Univ. (United States); **Yong-Hwa Park**, KAIST (Republic of Korea)

Program Committee: **Caglar Ataman**, Univ. of Freiburg (Germany); **Robert Brunner**, Ernst-Abbe-Hochschule Jena (Germany); **Pei-Yu Eric Chiou**, Univ. of California, Los Angeles (United States); **David L. Dickensheets**, Montana State Univ. (United States); **Jan Grahmann**, Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany); **Ulrich Hofmann**, OQmented GmbH (Germany); **Ki-Hun Jeong**, KAIST (Republic of Korea); **Diaa A. M. Khalil**, Si-Ware Systems (Egypt); **David G. Lishan**, Plasma-Therm LLC (United States); **Veljko Milanović**, Mirrorcle Technologies, Inc. (United States); **Heidi Ottevaere**, Vrije Univ. Brussel (Belgium); **Yves-Alain Peter**, Polytechnique Montréal (Canada); **Zhen Qiu**, Michigan State Univ. (United States); **Niels Quack**, The Univ. of Sydney (Australia); **Anna Rissanen**, Aalto Univ. (Finland); **Hamdi Torun**, Northumbria Univ. (United Kingdom); **Frédéric Zamkotsian**, Lab. d'Astrophysique de Marseille (France); **Guangya Zhou**, National Univ. of Singapore (Singapore)

MONDAY 30 JANUARY

OPTO PLENARY SESSION

30 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 207/215 (Level 2 South)

8:00 AM - 8:05 AM: **Welcome and Opening Remarks**
Sonia Garcia-Blanco, Univ. Twente (Netherlands) and Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

8:05 AM - 8:15 AM: **Announcement of the OPTO AI/ML and Net Zero Best Paper Awards**

12424-501 • 8:15 AM - 8:50 AM

High-performance electronic-photonic interfaces: from AI to quantum (*Plenary Presentation*)

Author(s): Rajeev Ram, Massachusetts Institute of Technology (United States)

12416-501 • 8:50 AM - 9:25 AM

Tandem photovoltaic devices: more than one way to make a solar cell (*Plenary Presentation*)

Author(s): Emily L. Warren, National Renewable Energy Lab. (United States)

12421-501 • 9:25 AM - 10:00 AM

Are III-nitride semiconductors also suitable for red emission? (*Plenary Presentation*)

Author(s): Nicolas Grandjean, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 1: NOVEL MATERIALS AND PROCESSES

30 January 2023 • 1:00 PM - 3:10 PM | Moscone Center, Room 2020 (Level 2 West)

Session Chair: Hans Zappe, Univ. of Freiburg (Germany)

12434-1 • 1:00 PM - 1:30 PM

Height-modulation of diffraction gratings by light-controlled capillary force lithography for structural coloring (*Invited Paper*)

Author(s): Myung Gi Ji, Jaeyoun Kim, Iowa State Univ. of Science and Technology (United States)

12434-2 • 1:30 PM - 1:50 PM

Nano-imprint-lithography for very thin optical parts on large area

Author(s): Markus Rawert, temicon GmbH (Germany)

12434-3 • 1:50 PM - 2:10 PM

Modeling, fabrication, and readout of compact optomechanical accelerometers

Author(s): Brina B. Martinez, Andrea Nelson, Adam Hines, Guillermo Valdes, Jose Sanjuan, Felipe Guzmán, Texas A&M Univ. (United States)

12434-4 • 2:10 PM - 2:30 PM

Low-power contactless button system based on MEMS ScAlN pyroelectric detector

Author(s): Linfang Xu, Doris K. T. Ng, Weiguo Chen, Nanxi Li, Chong Pei Ho, Duan Jian Goh, Yao Zhang, Qingxin Zhang, Lennon Y. T. Lee, A*STAR Institute of Microelectronics (Singapore)

12434-30 • 2:30 PM - 2:50 PM

Mechanical tunability in one-dimensional photonic crystals fabricated by direct laser writing

Author(s): Victoria P. Stinson, Nuren Z. Shuchi, Micheal McLamb, Glenn D. Boreman, Tino Hofmann, The Univ. of North Carolina at Charlotte (United States)

12434-5 • 2:50 PM - 3:10 PM

Optimization processes for three-dimensional microprinting of glass micro-optics

Author(s): Phuong-Ha Cu-Nguyen, Chang Tan, Hans Zappe, Univ. of Freiburg (Germany)

Coffee Break 3:10 PM - 3:40 PM

SESSION 2: SPECTROMETERS

30 January 2023 • 3:40 PM - 5:30 PM | Moscone Center, Room 2020 (Level 2 West)

Session Chair: Yong-Hwa Park, KAIST Session

12434-6 • 3:40 PM - 4:10 PM

Flexible micro-spectrometer for grape maturation monitoring (*Invited Paper*)

Author(s): Sophie Jenne, Hans Zappe, Univ. of Freiburg (Germany)

Conference 12434

12434-7 • 4:10 PM - 4:30 PM

A doubly-encoded single-pixel NIR Hadamard transform spectrometer using DMD

Author(s): Zi Heng Lim, Jeremy Xuan Yu Chew, National Univ. of Singapore (Singapore); Yi Qi, A*STAR Agency for Science, Technology and Research (Singapore); Guangcan Zhou, Guangya Zhou, National Univ. of Singapore (Singapore)

12434-8 • 4:30 PM - 4:50 PM

Miniature and multispectral spectrometers in consumer goods and wearables

Author(s): Richard A. Crocombe, Crocombe Spectroscopic Consulting, LLC (United States)

12434-9 • 4:50 PM - 5:10 PM

Aberration correction lens grating micro-spectrometer with improved spectral resolution

Author(s): Gi Beom Kim, Jung-Woo Park, Jaehun Jeon, Ki-Hun Jeong, KAIST (Republic of Korea)

12434-10 • 5:10 PM - 5:30 PM

Applications for a broadband NIR spectrometer with scanning mirror device

Author(s): Heinrich Grüger, Jens Knobbe, Jens Kruse, Tim Schulze, Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany)

TUESDAY 31 JANUARY

SESSION 3: MEDICAL APPLICATIONS

31 January 2023 • 9:00 AM - 10:10 AM | Moscone Center, Room 2020 (Level 2 West)

Session Chair: Caglar Ataman, Univ. of Freiburg (Germany)

12434-12 • 9:00 AM - 9:30 AM

Nanoplasmonic isothermal PCR assay with CRISPR/Cas for real-time SARS-CoV-2 detection (*Invited Paper*)

Author(s): Eun-Sil Yu, Byoung-Hoon Kang, Hamin Na, Ki-Hun Jeong, KAIST (Republic of Korea)

12434-13 • 9:30 AM - 9:50 AM

Plasmon-induced photoacoustic transducer for non-invasive skin tightening

Author(s): Hamin Na, Hyun-Kyung Kim, Byoung-Hoon Kang, Eun-Sil Yu, KAIST (Republic of Korea); Guei-Sam Lim, Nayoung Kim, LG Electronics Inc. (Republic of Korea); Ki-Hun Jeong, KAIST (Republic of Korea)

12434-14 • 9:50 AM - 10:10 AM

Simultaneous identification of microparticles material nature and size distribution using spectral resonances in MIR-ATR spectroscopy

Author(s): Ahmed M. Othman, Univ. Gustave Eiffel (France), Si-Ware Systems (Egypt); Yasser M. Sabry, Si-Ware Systems (Egypt), Ain Shams Univ. (Egypt); Daa Khalil, Ain Shams Univ. (Egypt), Si-Ware Systems (Egypt); Tarik Bourouina, Univ. Gustave Eiffel (France)

Coffee Break 10:10 AM - 10:40 AM

SESSION 4: MICRO-MIRRORS AND SCANNERS

31 January 2023 • 10:40 AM - 11:50 AM | Moscone Center, Room 2020 (Level 2 West)

Session Chair: David L. Dickensheets, Montana State Univ. (United States)

12434-15 • 10:40 AM - 11:10 AM

Sensor-based position feedback for miniaturized piezoelectric fiber optic scanners (*Invited Paper*)

Author(s): Gerardo E. González-Cerdas, Caglar Ataman, Hans Zappe, Shahab Haidarian, Univ. of Freiburg (Germany)

12434-16 • 11:10 AM - 11:30 AM

Efficient piezoelectric gimbal-less MEMS-mirror with large design flexibility

Author(s): Lena Wysocki, Lars Ratzmann, Patrick Schütt, Jörg Albers, Gunnar Wille, Shanshan Gu-Stoppel, Fraunhofer-Institut für Siliziumtechnologie ISIT (Germany)

12434-17 • 11:30 AM - 11:50 AM

Modeling and experimental investigation of novel 1D resonant MEMS scanner

Author(s): Wenhao Chen, Mingzheng Duan, Hadi Tavakkoli, Huahuang Luo, Hong Kong Univ. of Science and Technology (Hong Kong, China); Wibool Piyawattanametha, King Mongkut's Institute of Technology Ladkrabang (Thailand); Yi-Kuen Lee, Hong Kong Univ. of Science and Technology (Hong Kong, China)

Lunch/Exhibition Break 11:50 AM - 1:20 PM

SESSION 5: LIDAR AND 3D IMAGING

31 January 2023 • 1:20 PM - 3:40 PM | Moscone Center, Room 2020 (Level 2 West)

Session Chair: Yong-Hwa Park, KAIST Session

12434-18 • 1:20 PM - 1:50 PM

A long-distance 3D face recognition architecture utilizing MEMS-based region-scanning LiDAR (*Invited Paper*)

Author(s): Yoon-Seop Lim, Sung Hyun Lee, Sungjin Cheong, Yong-Hwa Park, KAIST (Republic of Korea)

12434-19 • 1:50 PM - 2:20 PM

Coherent LiDAR with 2D quasi-static MEMS mirror scanning (*Invited Paper*)

Author(s): Sarah Cwalina, Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); Norman Laske, Shanshan Gu-Stoppel, Fraunhofer-Institut für Siliziumtechnologie ISIT (Germany); Christoph Kottke, Volker Jungnickel, Ronald Freund, Fraunhofer Heinrich-Hertz-Institut (Germany)

12434-20 • 2:20 PM - 2:40 PM

MEMS-based indirect time-of-flight scanning LiDAR with parallel-phase demodulation and multipath interference suppression

Author(s): Sung Hyun Lee, Yoon-Seop Lim, Sungjin Cheong, Yong-Hwa Park, KAIST (Republic of Korea)

12434-21 • 2:40 PM - 3:00 PM

Array camera architecture for high resolution smartphone camera modules with low z-height using tunable lenses for channel-individual focus control

Author(s): Jacques W. Duparre, Frank C. Wippermann, Andreas Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

12434-22 • 3:00 PM - 3:20 PM

CANCELED: Amphibious and panoramic imaging systems inspired by fiddler crab's eye

Author(s): Young Min Song, Gwangju Institute of Science and Technology (Republic of Korea)

12434-23 • 3:20 PM - 3:40 PM

Fiber-based sensor for combustion chamber monitoring: manufacturing challenge

Author(s): Nicole Grubert, Marcel Prochnau, RWTH Aachen Univ. (Germany); Jochen Stollenwerk, Fraunhofer-Institut für Lasertechnik ILT (Germany), RWTH Aachen Univ. (Germany); Carlo Holly, RWTH Aachen Univ. (Germany), Fraunhofer-Institut für Lasertechnik ILT (Germany)

BEST PAPER AWARD CEREMONY FOR MOEMS AND MINIATURIZED SYSTEMS

31 January 2023 • 3:40 PM - 3:45 PM | Moscone Center, Room 2020 (Level 2 West)

Join us to congratulate the winners of the best paper award and best student paper award.

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12434-11

Tiny-spectrometer-based optical coherence tomography with automatical calibration software

Author(s): Dong-Wan Kang, Sangyeob Han, Daewoon Seong, Won Gi, Mansik Jeon, Jeehyun Kim, Kyungpook National Univ. (Republic of Korea)

12434-25

An integrated optical method to readout μ -Coriolis mass flow sensors

Author(s): Anneirudh Sundararajan, Remco J. Wiegerink, Remco G. P. Sanders, Joost C. Lötters, Univ. Twente (Netherlands)

12434-26

Improved comb drive design for MEMS piston mirror arrays

Author(s): Mario Nitzsche, Peter Duerr, Andreas Neudert, Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany)

12434-27

FEM simulations to optimize a micro mirror array package for a wide operating temperature range

Author(s): Peter Dürr, Sreevidya Guru, Alexander Mai, Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany)

12434-28

An integrated MEMS thermal emitter with piezoelectric actuation

Author(s): Nanxi Li, Andrew Whye Keong Fong, Huanhuan Wang, Leh Woon Lim, Landobasa Y. M. Tobing, A*STAR Institute of Microelectronics (Singapore); Yun Da Chua, School of Electrical and Electronic Engineering, Nanyang Technological University (Singapore); Linfang Xu, Weiguo Chen, Qingxin Zhang, Hong Cai, A*STAR Institute of Microelectronics (Singapore); Qi Jie Wang, School of Electrical and Electronic Engineering, Nanyang Technological University (Singapore); Lennon Y. T. Lee, A*STAR Institute of Microelectronics (Singapore)

12434-31

Optofluidic artificial compound eyes with varifocal capability

Author(s): Jihyun Jung, Heesang Ahn, Byungsuk Lee, Pusan National Univ. (Republic of Korea); Kyujung Kim, Pusan National Univ (Republic of Korea)

12434-32

Non-resonant MOEMS mirror for laser cavity-length tuning

Author(s): André Dreyhaupt, Lucas Oswald, Thomas Grasshoff, Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany); Stefan Hugger, Fraunhofer-Institut für Angewandte Festkörperphysik IAF (Germany); Jan Grahmann, Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany)

12434-33

2D MEMS vector scanning mirrors for LIDAR, medical imaging, and high laser power applications

Author(s): Thilo Sandner, Benjamin Mustin, Klemens Birnbaum, Martin Blasl, Thomas Graßhoff, Markus Schwarzenberg, Jan Grahmann, Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany)

12434-34

Wafer level packaged translatable MEMS mirror with large stroke for compact NIR-FT spectrometers

Author(s): Thilo Sandner, Eric Gaumont, Thomas Graßhoff, Andreas Rieck, Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany); Tobias Seifert, Fraunhofer-Institut für Elektronische Nanosysteme ENAS (Germany); Gerald Auböck, Silicon Austria Labs. GmbH (Austria); Jan Grahmann, Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany)

Emerging Digital Micromirror Device Based Systems and Applications XV

30 January - 1 February 2023 | Moscone South Rm 313 (Mon); Moscone South Rm 305 (TueAM); Moscone West Rm 2018 (TuePM-Wed)

Conference Chairs: **John Ehmke**, Texas Instruments Inc. (United States); **Benjamin L. Lee**, Texas Instruments Inc. (United States)

Program Committee: **Arturo A. Bianchetti**, IN-VISION Digital Imaging Optics GmbH (Austria); **Michael R. Douglass**, Texas Instruments Inc. (United States); **Jeremy Gribben**, Ajile Light Industries Inc. (Canada); **Alfred Jacobsen**, Visitech Engineering GmbH (Germany); **Yuval Kapellner Rabinovitz**, EKB Technologies Ltd. (Israel); **Badia Koudsi**, Optecks, LLC (United States); **Daniel L. Lau**, Univ. of Kentucky (United States); **Beiwen Li**, Iowa State Univ. of Science and Technology (United States); **Jinyang Liang**, Institut National de la Recherche Scientifique (Canada); **Alex Lyubarsky**, Texas Instruments Inc. (United States); **Michael W. O'Keefe**, Greenlight Optics, LLC (United States); **Eric Pruett**, Texas Instruments Inc. (United States); **Hakki H. Refai**, Optecks, LLC (United States); **Oliver Seifert**, ViALUX GmbH (Germany); **Bin Yang**, Duquesne Univ. (United States); **Song Zhang**, Purdue Univ. (United States); **Renjie Zhou**, The Chinese Univ. of Hong Kong (Hong Kong, China); **Karel J. Zuzak**, Univ. of Texas Southwestern Medical Ctr. (United States), The Lab. of Biomedical Imaging and Engineering, LBI-51, LLC (United States)

MONDAY 30 JANUARY

OPTO PLENARY SESSION

30 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 207/215 (Level 2 South)

8:00 AM - 8:05 AM: **Welcome and Opening Remarks**

Sonia García-Blanco, Univ. Twente (Netherlands) and Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

8:05 AM - 8:15 AM: **Announcement of the OPTO AI/ML and Net Zero Best Paper Awards**

12424-501 • 8:15 AM - 8:50 AM

High-performance electronic-photonic interfaces: from AI to quantum (*Plenary Presentation*)

Author(s): Rajeev Ram, Massachusetts Institute of Technology (United States)

12416-501 • 8:50 AM - 9:25 AM

Tandem photovoltaic devices: more than one way to make a solar cell (*Plenary Presentation*)

Author(s): Emily L. Warren, National Renewable Energy Lab. (United States)

12421-501 • 9:25 AM - 10:00 AM

Are III-nitride semiconductors also suitable for red emission? (*Plenary Presentation*)

Author(s): Nicolas Grandjean, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 1: COMPUTATIONAL IMAGING/ONN

Joint Session with Conferences 12435 and 12438

30 January 2023 • 10:30 AM - 12:55 PM | Moscone Center, Room 313 (Level 3 South)

Session Chairs: Bahram Jalali, UCLA Samueli School of Engineering (United States), Jinyang Liang, Institut National de la Recherche Scientifique (Canada)

12435-1 • 10:30 AM - 11:00 AM

Partially-coherent neural holography with fast heavily-quantized spatial light modulators (*Invited Paper*)

Author(s): Suyeon Choi, Manu Gopakumar, Stanford Univ. (United States); Yifan Peng, The University of Hong Kong (China); Jonghyun Kim, NVIDIA Corp. (United States); Matthew O'Toole, Carnegie Mellon Univ. (United States); Gordon Wetzstein, Stanford Univ. (United States)

12438-1 • 11:00 AM - 11:15 AM

Diffraction decoders project super-resolved images

Author(s): Cagatay Isil, Deniz Mengu, Yifan Zhao, Anika Tabassum, Jingxi Li, Yi Luo, Mona Jarrahi, Aydogan Ozcan, UCLA Samueli School of Engineering (United States)

12438-2 • 11:15 AM - 11:40 AM

Multiplexing methods for scaling up photonic logic (*Invited Paper*)

Author(s): Ryan Hamerly, NTT Research, Inc. (United States), Massachusetts Institute of Technology (United States); Alexander Sludds, Zaijun Chen, Liane Bernstein, Ronald Davis, Saumil Bandyopadhyay, Sri Krishna Vadlamani, Dirk Englund, Massachusetts Institute of Technology (United States)

12435-2 • 11:40 AM - 12:10 PM

Applications of digital micromirror devices in photonic neural networks (*Invited Paper*)

Author(s): Tianyu Wang, Mandar M. Sohoni, Shi-Yuan Ma, Cornell Univ. (United States); Logan G. Wright, Tatsuhiko Onodera, Cornell Univ. (United States), NTT Research, Inc. (United States); Martin M. Stein, Maxwell Anderson, Brian C. Richard, Peter L. McMahon, Cornell Univ. (United States)

12435-3 • 12:10 PM - 12:40 PM

Versatile DMDs as input information platform and trainable weights in optical neural networks (*Invited Paper*)

Author(s): Anas Skalli, Xavier Porte, Daniel Brunner, FEMTO-ST (France)

12438-3 • 12:40 PM - 12:55 PM

Michelson interferometric methods for full optical complex convolution

Author(s): Haoyan Kang, The George Washington Univ. (United States), Optelligence, LLC (United States); Jonathan K. George, The George Washington Univ. (United States); Behrouz Movahhed Nouri, Optelligence, LLC (United States); Maria Solyanik-Gorgone, The George Washington Univ. (United States); Hamed Dalir, Volker J. Sorger, The George Washington Univ. (United States), Optelligence, LLC (United States)

TUESDAY 31 JANUARY

SESSION 2: BIOMEDICAL IMAGING USING A DMD OR OTHER ADVANCED TECHNIQUES I

Joint Session with Conferences 12383 and 12435

31 January 2023 • 9:00 AM - 10:00 AM | Moscone Center, Room 305 (Level 3 South)

Session Chair: John Ehmke, Texas Instruments Inc. (United States)

12435-4 • 9:00 AM - 9:20 AM

Hyperspectral mid-infrared single-pixel microscopy

Author(s): Alexander Ebner, Paul Gattinger, Ivan Zorin, Markus Brandstetter, Christian Rankl, Research Ctr. for Non Destructive Testing GmbH (Austria)

12435-5 • 9:20 AM - 9:40 AM

Massively parallel confocal dark field microscopy

Author(s): James S. Napier, Markus Schellenberg, Gerhard Kauer, Hochschule Emden-Leer (Germany); Walter Neu, Hochschule Emden-Leer (Germany), Carl von Ossietzky Univ. Oldenburg (Germany)

12435-6 • 9:40 AM - 10:00 AM

Single-pixel imaging through turbid media by combining a programmable light source and a DMD

Author(s): Erick F. Ipus Bados, Armin J. M. Lenz, Jesús Lancis, Univ. Jaume I (Spain); Alba M. Paniagua-Díaz, Pablo Artal, Univ. de Murcia (Spain); Enrique Tajahuerce, Univ. Jaume I (Spain)

Coffee Break 10:00 AM - 10:30 AM

SESSION 3: BIOMEDICAL IMAGING USING A DMD OR OTHER ADVANCED TECHNIQUES II

Joint Session with Conferences 12383 and 12435

31 January 2023 • 10:30 AM - 12:00 PM | Moscone Center, Room 305 (Level 3 South)

Session Chair: John Ehmke, Texas Instruments Inc. (United States)

12435-7 • 10:30 AM - 11:00 AM

Hybrid illumination DLP architecture for non-invasive, optical surveillance system of vascular access for hemodialysis patients (*Invited Paper*)

Author(s): Gal Goshen, Hagay Drori, Oz Seadia, PatenSee (Israel)

12435-8 • 11:00 AM - 11:20 AM

Facile incorporation of DMD-based photolithography and photopatterning techniques in soft condensed matter research

Author(s): Jordi Ignés-Mullol, Univ. de Barcelona (Spain)

12383-14 • 11:20 AM - 11:40 AM

Learning wavefront shaping through reinforcement learning in a simulation environment

Author(s): Rahmetullah Varol, Tülay Aydın, Univ. der Bundeswehr München (Germany)

12435-9 • 11:40 AM - 12:00 PM

Optimal fitting strategy for modulated illumination localization microscopy

Author(s): Hongfei Zhu, Renjie Zhou, The Chinese Univ. of Hong Kong (Hong Kong, China)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 4: VOLUMETRIC PRINTING AND MASKLESS LITHOGRAPHY

Joint Session with Conferences 12433 and 12435

31 January 2023 • 1:30 PM - 3:00 PM | Moscone Center, Room 2018 (Level 2 West)

Session Chairs: Michele Cotrufo, The City Univ. of New York Advanced Science Research Ctr. (United States), Benjamin L. Lee, Texas Instruments Inc. (United States)

12433-37 • 1:30 PM - 2:00 PM

(1+1)-photon absorption for 3D laser printing (*Invited Paper*)

Author(s): Martin Wegener, Karlsruher Institut für Technologie (Germany)

12435-12 • 2:00 PM - 2:20 PM

Transient thermal response of DMD (Digital Micromirror Device) with pulsed laser illumination

Author(s): Scott Overmann, Michael McCormick, Texas Instruments Inc. (United States)

12435-13 • 2:20 PM - 2:40 PM

High-speed optical diffraction tomography for characterizing two-photon photopolymerization fabrication

Author(s): Yanping He, Qi Shao, Shih-Chi Chen, Renjie Zhou, The Chinese Univ. of Hong Kong (Hong Kong, China)

Conference 12435

12435-14 • 2:40 PM - 3:00 PM

1550-nm photonic crystal lasers fabricated by maskless digital photolithography

Author(s): Minsu Kang, Heesoo Jin, Heonsu Jeon, Seoul National Univ. (Republic of Korea)

Coffee Break 3:00 PM - 3:30 PM

SESSION 5: VOLUMETRIC PRINTING

Joint Session with Conferences 12433 and 12435

31 January 2023 • 3:30 PM - 5:00 PM | Moscone Center, Room 2018 (Level 2 West)

Session Chairs: Christophe Moser, Ecole Polytechnique Fédérale de Lausanne (Switzerland), Benjamin L. Lee, Texas Instruments Inc. (United States)

12433-34 • 3:30 PM - 4:00 PM

Object-space image generation for volume additive manufacturing to enable improved optical and material systems *(Invited Paper)*

Author(s): Robert R. McLeod, Charles M. Rackson, Univ. of Colorado Boulder (United States)

12435-10 • 4:00 PM - 4:20 PM

Controlling light dose in tomographic volumetric additive manufacturing

Author(s): Antony Orth, Daniel Webber, Yujie Zhang, National Research Council Canada (Canada); Rene Lam, National Research Council Canada (Canada), Univ. of Waterloo (Canada); Jonathan Boisvert, Chantal Paquet, National Research Council Canada (Canada)

12435-11 • 4:20 PM - 4:40 PM

Enhanced tomographic printing via 3D ray-tracing dose optimization

Author(s): Daniel Webber, Antony Orth, Yujie Zhang, Michel Picard, Chantal Paquet, Jonathan Boisvert, National Research Council Canada (Canada)

12433-36 • 4:40 PM - 5:00 PM

Maskless lithography based on a digital micromirror device with improved patterning speed and quality

Author(s): Jinsu Choi, KAIST (Republic of Korea); Geehong Kim, Wonsup Lee, Hyunmin Cho, Korea Institute of Machinery & Materials (Republic of Korea); Won Seok Chang, Korea Institute of Machinery & Materials (Republic of Korea), Univ. of Science and Technology (Republic of Korea); Hongki Yoo, KAIST (Republic of Korea)

31 January 2023 | Moscone Center, Room 2018 (Level 2 West)

WEDNESDAY 1 FEBRUARY

SESSION 6: NOVEL AND ADVANCED APPLICATIONS

1 February 2023 • 9:00 AM - 10:20 AM | Moscone Center, Room 2018 (Level 2 West)

Session Chair: Benjamin L. Lee, Texas Instruments Inc. (United States)

12435-15 • 9:00 AM - 9:20 AM

Compact digital micromirror device (DMD) based optical architecture for augmented reality (AR) glasses

Author(s): Zhongyan Sheng, Xi Zhou, Steven A. Shaw, Alex Lyubarsky, Texas Instruments Inc. (United States)

12435-16 • 9:20 AM - 9:40 AM

Optical simulation of device efficiency and contrast ratio for a digital micromirror device

Author(s): John J. Piotrowski, Johns Hopkins Univ. (United States); Dmitry Vorobiev, Lab. for Atmospheric and Space Physics (United States); Stephen A. Smee, Johns Hopkins Univ. (United States)

12435-17 • 9:40 AM - 10:00 AM

Dynamic three-dimensional imaging with cubic-meter-level measurement volume using multi-scale band-limited illumination profilometry

Author(s): Cheng D. Jiang, Patrick Kilcullen, Yingming Lai, Siqi Wang, Tsuneyuki Ozaki, Jinyang Liang, Institut National de la Recherche Scientifique (Canada)

12435-18 • 10:00 AM - 10:20 AM

Wide field of view real-time flash DMD-lidar with 2D multi-pixel photon counter

Author(s): Jeff Ching-Wen Chan, Chin-I Tang, Xianyu Deng, Ted Lee, Yuzuru Takashima, The Univ. of Arizona (United States)

Coffee Break 10:20 AM - 10:50 AM

SESSION 7: TI PLM

1 February 2023 • 10:50 AM - 11:50 AM | Moscone Center, Room 2018 (Level 2 West)

Session Chair: Jinyang Liang, Institut National de la Recherche Scientifique (Canada)

12435-19 • 10:50 AM - 11:10 AM

Complex hologram encoding by using TI PLM device

Author(s): Shaghayegh Yaraghi, Oussama Mhibik, Leonid B. Glebov, Ivan Divliansky, Univ. of Central Florida (United States)

12435-20 • 11:10 AM - 11:30 AM

Beam tracking and image steering by TI PLM based on camera input for lidar and AR applications

Author(s): Xianyu Deng, Chin-I Tang, Yuzuru Takashima, Wyant College of Optical Sciences (United States)

12435-21 • 11:30 AM - 11:50 AM

Enhancement of image quality utilizing time multiplexing phase only holograms

Author(s): Heiko Schröder, Volkswagen AG (Germany)

Conference 12436

Complex Light and Optical Forces XVII

30 January - 2 February 2023 | Moscone Center, Room 314 (Level 3 South)

Conference Chairs: **David L. Andrews**, Univ. of East Anglia (United Kingdom); **Enrique J. Galvez**, Colgate Univ. (United States); **Halina Rubinsztein-Dunlop**, The Univ. of Queensland (Australia)

Program Committee: **Kishan Dholakia**, Univ. of St. Andrews (United Kingdom); **Angela Louise Dudley**, Univ. of the Witwatersrand, Johannesburg (South Africa); **Andrew Forbes**, Univ. of the Witwatersrand, Johannesburg (South Africa); **Kayn A. Forbes**, Univ. of East Anglia (United Kingdom); **Sonja Franke-Arnold**, Univ. of Glasgow (United Kingdom); **Jesper Glückstad**, Univ. Southern Denmark (Denmark); **Rüdiger Grunwald**, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); **Simon Hanna**, Univ. of Bristol (United Kingdom); **Martin P. J. Lavery**, Univ. of Glasgow (United Kingdom); **Ting-Hua Lu**, National Taiwan Normal Univ. (Taiwan); **Mehul Malik**, Heriot-Watt Univ. (United Kingdom); **Takashige Omatsu**, Chiba Univ. (Japan); **Daryl C. Preece**, Beckman Laser Institute and Medical Clinic (United States); **Monika Ritsch-Marte**, Medizinische Univ. Innsbruck (Austria); **Nirmal K. Viswanathan**, Univ. of Hyderabad (India)

MONDAY 30 JANUARY

OPTO PLENARY SESSION

30 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 207/215 (Level 2 South)

8:00 AM - 8:05 AM: **Welcome and Opening Remarks**
Sonia García-Blanco, Univ. Twente (Netherlands) and Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

8:05 AM - 8:15 AM: **Announcement of the OPTO AI/ML and Net Zero Best Paper Awards**

12424-501 • 8:15 AM - 8:50 AM

High-performance electronic-photonic interfaces: from AI to quantum (*Plenary Presentation*)

Author(s): Rajeev Ram, Massachusetts Institute of Technology (United States)

12416-501 • 8:50 AM - 9:25 AM

Tandem photovoltaic devices: more than one way to make a solar cell (*Plenary Presentation*)

Author(s): Emily L. Warren, National Renewable Energy Lab. (United States)

12421-501 • 9:25 AM - 10:00 AM

Are III-nitride semiconductors also suitable for red emission? (*Plenary Presentation*)

Author(s): Nicolas Grandjean, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 1: SPIN-ORBIT COUPLING

30 January 2023 • 10:30 AM - 12:40 PM | Moscone Center, Room 314 (Level 3 South)

Session Chair: Enrique J. Galvez, Colgate Univ. (United States)

12436-1 • 10:30 AM - 11:00 AM

Spin-orbit coupling and topology of optical fields (*Invited Paper*)

Author(s): Anatoly V. Zayats, King's College London (United Kingdom)

12436-2 • 11:00 AM - 11:30 AM

Vector beam shaping for transverse angular momentum transfer (*Invited Paper*)

Author(s): Alexander B. Stilgoe, Halina Rubinsztein-Dunlop, The Univ. of Queensland (Australia)

12436-3 • 11:30 AM - 11:50 AM

Influence of polarization on the optical chirality of vortex beams

Author(s): Dale Green, Kayn A. Forbes, Univ. of East Anglia (United Kingdom)

12436-4 • 11:50 AM - 12:10 PM

Spin-orbit coupling of quasiguided modes in plasmonic crystals

Author(s): Jeeban Nayak, Nirmalya Ghosh, Harley Suchiang, Ayan Banerjee, Subhasish Dutta Gupta, Indian Institute of Science Education and Research Kolkata (India)

12436-9 • 12:10 PM - 12:40 PM

Spatio-temporal optical vortex (STOV) pulses (*Invited Paper*)

Author(s): Howard M. Milchberg, Univ. of Maryland, College Park (United States); Sina Zahedpour, Andrew Goffin, Univ. of Maryland (United States)

Lunch Break 12:40 PM - 1:50 PM

SESSION 2: BEAMS AND MODES I

30 January 2023 • 1:50 PM - 3:10 PM | Moscone Center, Room 314 (Level 3 South)

Session Chair: Alison M. Yao, Univ. of Strathclyde (United Kingdom)

12436-5 • 1:50 PM - 2:20 PM

Propagating pendulum beams to simulate the quantum-pendulum time evolution (*Invited Paper*)

Author(s): Valeria Rodríguez-Fajardo, Thao P. Nguyen, Enrique J. Galvez, Colgate Univ. (United States)

12436-6 • 2:20 PM - 2:50 PM

Arbitrary vector spatiotemporal beamshaping: any amplitude, phase and polarization at any delay (*Invited Paper*)

Author(s): Mickael Mounaix, The Univ. of Queensland (Australia); Nicolas K. Fontaine, David T. Neilson, Roland Ryf, Haoshuo Chen, Juan Carlos Alvarado-Zacarias, Nokia Bell Labs. (United States); Joel A. Carpenter, The Univ. of Queensland (Australia)

12436-7 • 2:50 PM - 3:10 PM

Is it possible to make a perfect optical bottle beam?

Author(s): Nicolas R. Perez, Daryl Preece, Beckman Laser Institute and Medical Clinic (United States)

Coffee Break 3:10 PM - 3:40 PM

Conference 12436

SESSION 3: BEAMS AND MODES II

30 January 2023 • 3:40 PM - 4:50 PM | Moscone Center, Room 314 (Level 3 South)

Session Chair: Alison M. Yao, Univ. of Strathclyde (United Kingdom)

12436-8 • 3:40 PM - 4:00 PM

Structuring light by combining spatial modulation and fast angular shaping

Author(s): Rüdiger Grunwald, Mathias Jurke, Martin Bock, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); Max Liebmann, HOLOEYE Photonics AG (Germany); Binal P. Bruno, Hitesh Gowda, Ulrike Wallrabe, Univ. of Freiburg (Germany)

12436-11 • 4:00 PM - 4:20 PM

Evolution of Bessel skyrmions in free-space

Author(s): Pedro Ornelas, Keshaan Singh, Andrew Forbes, Univ. of the Witwatersrand, Johannesburg (South Africa)

12436-44 • 4:20 PM - 4:50 PM

Topology, skyrmions, and superoscillation of structured light (*Invited Paper*)

Author(s): Yijie Shen, Univ. of Southampton (United Kingdom); Anatoly V. Zayats, King's College London (United Kingdom)

TUESDAY 31 JANUARY

SESSION 4: ATOMS, IONS, AND CONDENSATES

31 January 2023 • 8:30 AM - 10:00 AM | Moscone Center, Room 314 (Level 3 South)

Session Chair: Halina Rubinsztein-Dunlop, The Univ. of Queensland (Australia)

12436-13 • 8:30 AM - 9:00 AM

Structuring ultracold atoms with light in an optical cavity (*Invited Paper*)

Author(s): Alison M. Yao, Gordon R. M. Robb, Gian-Luca Oppo, Grant W. Henderson, Univ. of Strathclyde (United Kingdom)

12436-15 • 9:00 AM - 9:20 AM

Re-shaping Bose-Einstein condensates with complex light for atomic persistent currents and trapping

Author(s): Grant W. Henderson, Gordon R. M. Robb, Gian-Luca Oppo, Alison M. Yao, Univ. of Strathclyde (United Kingdom)

12436-16 • 9:20 AM - 9:40 AM

Single-frame characterization and nonlinear conversion of ultrafast vortex pulses carrying spatiotemporal orbital angular momentum

Author(s): Chen-Ting Liao, Guan Gui, Nathan J. Brooks, Bin Wang, Univ. of Colorado Boulder (United States); Henry C. Kapteyn, Univ. of Colorado Boulder (United States), KMLabs, Inc. (United States); Margaret M. Murnane, Univ. of Colorado Boulder (United States)

12436-17 • 9:40 AM - 10:00 AM

HoloTile: a new high-speed and speckle-surpressed digital holography modality

Author(s): Andreas Gejl Madsen, Jesper Glückstad, Univ. of Southern Denmark (Denmark)

Coffee Break 10:00 AM - 10:30 AM

SESSION 5: MECHANICAL EFFECTS

31 January 2023 • 10:30 AM - 12:00 PM | Moscone Center, Room 314 (Level 3 South)

Session Chair: Martin P. J. Lavery, Univ. of Glasgow (United Kingdom)

12436-18 • 10:30 AM - 11:00 AM

Ultra sensitive measurement of mechanical displacements with photonic gears (*Invited Paper*)

Author(s): Vincenzo D'Ambrosio, Univ. degli Studi di Napoli Federico II (Italy)

12436-19 • 11:00 AM - 11:20 AM Optical Archimedes Screw along arbitrary trajectories

Author(s): Keren Zhalenchuck, Barak Hadad, Alon Bahabad, Tel Aviv Univ. (Israel)

12436-20 • 11:20 AM - 11:40 AM Fast trapping and positioning of multiple polystyrene nanoparticles in a metamaterial plasmonic array

Author(s): Theodoros Bouloumis, Okinawa Institute of Science and Technology Graduate Univ. (Japan); Domna G. Kotsifaki, Duke Kunshan Univ. (China); Sile Nic Chormaic, Okinawa Institute of Science and Technology Graduate Univ. (Japan)

12436-21 • 11:40 AM - 12:00 PM

Review of Current Trends in Digital Holographic Microscopy

Author(s): Andreas Gejl Madsen, Jesper Glückstad, Univ. of Southern Denmark (Denmark)

Lunch/Exhibition Break 12:00 PM - 1:50 PM

SESSION 6: PROPAGATION I

31 January 2023 • 1:50 PM - 3:00 PM | Moscone Center, Room 314 (Level 3 South)

Session Chair: Ebrahim Karimi, Univ. of Ottawa (Canada)

12436-24 • 1:50 PM - 2:10 PM

High sensitivity speckle metrology

Author(s): Morgan Facchin, Univ. of St. Andrews (United Kingdom); Kishan Dholakia, Univ. of St. Andrews (United Kingdom), The Univ. of Adelaide (Australia), Yonsei Univ. (Republic of Korea); Graham D. Bruce, Univ. of St. Andrews (United Kingdom)

12436-25 • 2:10 PM - 2:40 PM

Invariant vectorial light in complex media (*Invited Paper*)

Author(s): Isaac M. Nape, Andrew Forbes, Univ. of the Witwatersrand, Johannesburg (South Africa)

12436-26 • 2:40 PM - 3:00 PM

Dynamics of vortex dipole annihilation in optical quantum fluids

Author(s): Chuanzhou Zhu, Jonathon Damenti, Colorado School of Mines (United States); Patrick C. Ford, Mark E. Siemens, Univ. of Denver (United States); Mark T. Lusk, Colorado School of Mines (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 7: PROPAGATION II

31 January 2023 • 3:30 PM - 5:10 PM | Moscone Center, Room 314 (Level 3 South)

Session Chair: Ebrahim Karimi, Univ. of Ottawa (Canada)

12436-27 • 3:30 PM - 3:50 PM

Free-space Optical Multiplexed Orbital Angular Momentum Beam Identification System using Fourier Optical Convolutional Layer based on 4f System

Author(s): Jiachi Ye, Zibo Hu, Maria Solyanik, Volker Sorger, The George Washington Univ. (United States); Hamed Dalir, Behrouz Movahhed Nouri, Optelligence (United States)

12436-28 • 3:50 PM - 4:10 PM

Nonlinear vortex propagation in light

Author(s): Patrick C. Ford, Mark E. Siemens, Andrew Voitiv, Univ. of Denver (United States); Mark T. Lusk, Chuanchou Zhu, Colorado School of Mines (United States)

12436-29 • 4:10 PM - 4:30 PM

The eigenmodes of atmospheric turbulence

Author(s): Cade Peters, Asher Klug, Andrew Forbes, Univ. of the Witwatersrand, Johannesburg (South Africa)

12436-64 • 4:30 PM - 4:50 PM

Ultra-compact and robust setup for synthesis of space-time wave packets

Author(s): Murat Yessenov, Oussama Mhibik, Lam Mach, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); Tina M. Haywar, The Univ. of Utah (United States); Rajesh Menon, Department of Electrical and Computer Engineering (United States); Leonid Glebov, Ivan Divliansky, Ayman F. Abouraddy, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

12436-65 • 4:50 PM - 5:10 PM

Bulk optical turbulence mitigation using dynamic multiple plane light conversion

Author(s): Rakan Alsaigh, Univ. of Glasgow (United Kingdom); Nicolas Fontaine, Nokia Bell Labs. (United States); Martin P. J. Lavery, Univ. of Glasgow (United Kingdom)

WEDNESDAY 1 FEBRUARY

SESSION 8: SYMMETRY I

1 February 2023 • 9:10 AM - 10:00 AM | Moscone Center, Room 314 (Level 3 South)

Session Chair: Kayn A. Forbes, Univ. of East Anglia (United Kingdom)

12436-30 • 9:10 AM - 9:40 AM

Einstein beams: uncovering the unobserved aspects of gravitational lensing (*Invited Paper*)

Author(s): Enrique J. Galvez, Valeria Rodríguez-Fajardo, Thao P. Nguyen, Kiyan S. Hocek, Colgate Univ. (United States)

12436-31 • 9:40 AM - 10:00 AM

Principles of fundamental symmetry in optical vortex interactions

Author(s): David L. Andrews, Univ. of East Anglia (United Kingdom)

Coffee Break 10:00 AM - 10:30 AM

SESSION 9: QUANTUM

1 February 2023 • 10:30 AM - 11:40 AM | Moscone Center, Room 314 (Level 3 South)

Session Chair: David L. Andrews, Univ. of East Anglia (United Kingdom)

12436-34 • 10:30 AM - 11:00 AM

The geometric phase of entanglement for two-photon optical vortices (*Invited Paper*)

Author(s): Mark T. Lusk, Colorado School of Mines (United States); Mark E. Siemens, Univ. of Denver (United States)

12436-35 • 11:00 AM - 11:20 AM

Quantum entangled skyrmions and their quantum topology

Author(s): Pedro Ornelas, Isaac M. Nape, Andrew Forbes, Univ. of the Witwatersrand, Johannesburg (South Africa)

12436-36 • 11:20 AM - 11:40 AM

Position-position classical entanglement realized through optical beam shifts

Author(s): Niladri Modak, S. Ashutosh, Shyamal Guchhait, Sayantan Das, Nirmalya Ghosh, Indian Institute of Science Education and Research Kolkata (India)

Lunch/Exhibition Break 11:40 AM - 1:30 PM

WORKSHOP ON METHODS OF COMPLEX LIGHT

1 February 2023 • 1:30 PM - 3:00 PM | Moscone Center, Room 308 (Level 3 South)

This workshop is part of the Complex Light and Optical Forces XVII conference.

Attendees will get to speak with experienced researchers in the field and learn new techniques that they could deploy within future experiments.

This Session will be a small group discussion format, where attendees will get the opportunity to interact with the instructors and ask technical questions in an informal setting. You will have the opportunity to speak to each instructor where the small groups will be rotated at 20-minute intervals over the course of the session. Drop in attendees are welcome at any time during the event and this is open to anyone, from any area of optics, who are interested in controlling light.

The topics that will be focused on are:

Spatial Light Modulators: The basics and beyond

The power of SSH for the remote operation of experiments

Deformable mirrors and optical wavefront mapping

Basics of Multiple Plane Light Conversion for optical transformations

Moderator:

Martin P. J. Lavery, Univ. of Glasgow (United Kingdom)

Instructors:

Meadowlark Optics (United States)

Mikael Mazur, Nokia Bell Labs (United States)

Michael R. Feinberg, Boston Micromachines (United States)

Nicolas Fontaine, Nokia Bell Labs (United States)

Coffee Break 3:00 PM - 3:30 PM

Conference 12436

SESSION 10: BEAMS AND MODES III

1 February 2023 • 3:30 PM - 5:30 PM | Moscone Center, Room 314 (Level 3 South)

Session Chair: Halina Rubinsztein-Dunlop, The Univ. of Queensland (Australia)

12436-38 • 3:30 PM - 4:00 PM

Tailored focal fields for the analysis of dipolar nano-emitters (*Invited Paper*)

Author(s): Eileen Otte, Hyoungnan Kwon, Nicholas A. Günsken, Stanford Univ. (United States); Niklas Arndt, Bart Jan Ravoo, Westfälische Wilhelms-Univ. Münster (Germany); Mark L. Brongersma, Stanford Univ. (United States)

12436-39 • 4:00 PM - 4:30 PM

Structured waves: recent SQOgroup progress (*Invited Paper*)

Author(s): Ebrahim Karimi, Univ. of Ottawa (Canada)

12436-41 • 4:30 PM - 4:50 PM

High power tunable fiber mode selection with a dual-axicon beam expander

Author(s): Jeffrey J. Perkins, Triple Ring Technologies, Inc. (United States)

12436-42 • 4:50 PM - 5:10 PM

Red and orange vortex Pr³⁺ fibre laser using a mode converting output coupler

Author(s): William R. Kerridge-Johns, Imperial College London (United Kingdom); A. Srinivasa Rao, Chiba Univ. (Japan); Yasushi Fujimoto, Chiba Institute of Technology (Japan); Takashi Omatsu, Chiba Univ. (Japan)

12436-66 • 5:10 PM - 5:30 PM

Reconfigurable universal mode sorter built on an integrated photonics platform

Author(s): Aleksandr Boldin, Rakan Alsaigh, Univ. of Glasgow (United Kingdom); Fabio Toso, Maziyar Milanizadeh, Giorgio Ferrari, Andrea Melloni, Politecnico di Milano (Italy); David Miller, Stanford Univ. (United States); Francesco Morichetti, Politecnico di Milano (Italy); Martin P. J. Lavery, Univ. of Glasgow (United Kingdom)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12436-60

CANCELED: Optical vortex pair detection using diffraction by a triangular aperture

Author(s): Dina Grace C. Banguilan, Nathaniel P. Hermosa, National Institute of Physics (Philippines), Univ. of the Philippines Diliman (Philippines)

12436-61

Eigenmodes of the tilted lens

Author(s): Cade Peters, Wagner Buono, Isaac M. Nape, Andrew Forbes, Univ. of the Witwatersrand, Johannesburg (South Africa)

12436-62

Optical trapping dynamics of the micron-sized dielectric particle at different axial planes under femtosecond pulsed excitation

Author(s): Sumit Yadav, Arijit K. De, Amit Kumar, Indian Institute of Science Education and Research Mohali (India)

12436-63

Efficient Speckle Reduction in Digital Holography using HoloTile: A Matched Sub-Hologram Tiling and Point Spread Function Shaping Technique

Author(s): Andreas Gejl Madsen, Jesper Glückstad, Univ. of Southern Denmark (Denmark)

SESSION 11: SYMMETRY II

2 February 2023 • 8:50 AM - 10:10 AM | Moscone Center, Room 314 (Level 3 South)

Session Chair: Kayn A. Forbes, Univ. of East Anglia (United Kingdom)

12436-43 • 8:50 AM - 9:20 AM

Probing molecular chirality with x-rays using the orbital angular momentum of light (*Invited Paper*)

Author(s): Jeremy Rouxel, Univ. Jean Monnet Saint-Etienne (France); Shaul Mukamel, University of California, Irvine (United States); Majed Chergui, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12436-45 • 9:20 AM - 9:50 AM

Topology of light and darkness in engineered optical media (*Invited Paper*)

Author(s): Natalia M. Litchinitser, Danilo Gomes Pires, Jiannan Gao, Dmitrii Tsvetkov, Hooman Barati Sedeh, Nitish Chandra, Duke Univ. (United States); Ivan Kravchenko, Oak Ridge National Lab. (United States)

12436-46 • 9:50 AM - 10:10 AM

Polarization state generator for the generation of complex light with controllable degree of polarization

Author(s): Ignacio Moreno, María del Mar Sanchez-Lopez, Univ. Miguel Hernández (Spain); Carlos Hernandez-Garcia, University of Salamanca (Spain)

Coffee Break 10:10 AM - 10:40 AM

SESSION 12: TRAPPING

2 February 2023 • 10:40 AM - 12:30 PM | Moscone Center, Room 314 (Level 3 South)

Session Chair: David L. Andrews, Univ. of East Anglia (United Kingdom)

12436-48 • 10:40 AM - 11:10 AM

Deep Learning for Microscopy (*Invited Paper*)

Author(s): Giovanni Volpe, Göteborgs Univ. (Sweden)

12436-49 • 11:10 AM - 11:30 AM

Optical binding in complex landscapes

Author(s): Simon Hanna, Michael O'Donnell, Univ. of Bristol (United Kingdom)

12436-50 • 11:30 AM - 11:50 AM

Free-space traps of light by light with Bessel beams

Author(s): Andrew A. Voitiv, Mark E. Siemens, Univ. of Denver (United States); Mark T. Lusk, Colorado School of Mines (United States)

12436-51 • 11:50 AM - 12:10 PM

Sympathetic cooling and asymmetric interactions in optical binding

Author(s): Graham D. Bruce, Yoshihiko Arita, Univ. of St. Andrews (United Kingdom); XiaoYong Duan, Jiaying Univ. (China); Ewan M. Wright, The Univ. of Arizona (United States); Stephen H. Simpson, Pavel Zemánek, Institute of Scientific Instruments of the CAS, v.v.i. (Czech Republic); Kishan Dholakia, Univ. of St. Andrews (United Kingdom), The Univ. of Adelaide (Australia), Yonsei Univ. (Republic of Korea)

12436-52 • 12:10 PM - 12:30 PM

Continuously tuneable on-chip photonic hook for manipulating nanoparticles along curved trajectories

Author(s): Aneesh V. Veluthandath, Ganapathy Senthil Murugan, Univ. of Southampton (United Kingdom)

Lunch/Exhibition Break 12:30 PM - 2:20 PM

SESSION 13: MATERIALS

2 February 2023 • 2:20 PM - 3:20 PM | Moscone Center, Room 314 (Level 3 South)

Session Chair: Halina Rubinsztein-Dunlop, The Univ. of Queensland (Australia)

12436-54 • 2:20 PM - 2:40 PM

Revealing substrate-coupling strengths of layered materials by using spin angular momentum of light

Author(s): Yu-Chen Chang, Ye-Ru Chen, Yu-Fang Chiang, Yann-Wen Lan, Ting-Hua Lu, National Taiwan Normal Univ. (Taiwan)

12436-55 • 2:40 PM - 3:00 PM

Simultaneous 2D sub-wavelength patterning and alloying of bimetal systems on silicon

Author(s): Norbert A. Hampp, Philipps-Univ. Marburg (Germany)

12436-56 • 3:00 PM - 3:20 PM

Aberration corrected structured light for in-house fabrication of functional micro-structures

Author(s): Declan J. Armstrong, Halina Rubinsztein-Dunlop, Timo A. Nieminen, Alexander Stilgoe, The Univ. of Queensland (Australia)

Coffee Break 3:20 PM - 3:50 PM

SESSION 14: OPTICAL METHODS

2 February 2023 • 3:50 PM - 4:30 PM | Moscone Center, Room 314 (Level 3 South)

Session Chair: Halina Rubinsztein-Dunlop, The Univ. of Queensland (Australia)

12436-57 • 3:50 PM - 4:10 PM

Structured light for topography measurements in the nanometric regime

Author(s): Valeria Rodríguez-Fajardo, Colgate Univ. (United States), Univ. of the Witwatersrand, Johannesburg (South Africa); Andrew Forbes, Univ. of the Witwatersrand, Johannesburg (South Africa)

12436-59 • 4:10 PM - 4:30 PM

Electrically-driven-dynamics of real-space optical vortex based on high-dimensional topological criticality

Author(s): Dongha Kim, Geonhyeong Park, Yun-Seok Choi, Sanghyeok Park, Arthur Baucour, Jonghwa Shin, Dongki Yoon, Min-Kyo Seo, KAIST (Republic of Korea)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12436-10

Near complete spin-to-orbital angular momentum conversion in a focused-reflected beam of light

Author(s): Nirmal K. Viswanathan, Nitish Kumar, Univ. of Hyderabad (India)

12436-12

Spin-orbit interaction effects due to joint spectral-spatial dispersion

Author(s): Nirmal K. Viswanathan, Anagha Sreedharan, Univ. of Hyderabad (India)

12436-37

Measurement of orbital angular momentum of light using Stokes parameters and Barnett's formalism

Author(s): Anirban Debnath, Nirmal K. Viswanathan, Univ. of Hyderabad (India)

12436-47

Orbital-to-spin angular momentum conversion in inhomogeneous-anisotropic medium

Author(s): Nirmal K. Viswanathan, Pradeep Chakravarthy, Univ. of Hyderabad (India)

Photonic Heat Engines: Science and Applications V

1 - 2 February 2023 | Moscone Center, Room 54 (Lower Mezzanine South)

Conference Chairs: Denis V. Seletskiy, Polytechnique Montréal (Canada); Masaru K. Kuno, Univ. of Notre Dame (United States); Peter J. Pauzauskie, Univ. of Washington (United States)

Program Committee: Michel J. F. Digonnet, Stanford Univ. (United States); Peter D. Dragic, Univ. of Illinois (United States); Richard I. Epstein, ThermoDynamic Films LLC (United States); Fedor Jelezko, Univ. Ulm (Germany); Raman Kashyap, Polytechnique Montréal (Canada); Arash Mafi, The Univ. of New Mexico (United States); Ali Sayir, Air Force Office of Scientific Research (United States); Mansoor Sheik-Bahae, The Univ. of New Mexico (United States); Mauro Tonelli, Univ. di Pisa (Italy); Eli Yablonovitch, Univ. of California, Berkeley (United States)

WEDNESDAY 1 FEBRUARY

SESSION 1: PHOTONIC HEAT ENGINES AND APPLICATIONS

1 February 2023 • 1:00 PM - 3:40 PM | Moscone Center, Room 54 (Lower Mezzanine South)

Session Chair: Denis V. Seletskiy, Polytechnique Montréal (Canada)

12437-10 • 1:00 PM - 1:30 PM

Nanodevices and nanomachines powered by photonic heat engines *(Invited Paper)*

Author(s): Yuebing Zheng, The Univ. of Texas at Austin (United States)

12437-6 • 1:30 PM - 2:00 PM

Étendue-matched photonic structures for laser and electro-luminescent cooling *(Invited Paper)*

Author(s): Parthiban Santhanam, Aaswath P. Raman, Jae S. Hwang, David Abraham, Univ. of California, Los Angeles (United States)

12437-7 • 2:00 PM - 2:20 PM

Thermodynamics of AlGaAs near-field thermophotonic devices for energy harvesting and cooling purposes

Author(s): Julien Legendre, Thomas Châtelet, Olivier Merchiers, Pierre-Olivier Chapuis, Ctr. d'Énergétique et de Thermique de Lyon (France)

12437-8 • 2:20 PM - 2:40 PM

Thermal emission of spinning photons from temperature gradients

Author(s): Parry Chen, Ben-Gurion Univ. of the Negev (Israel); Chinmay Khandekar, Zubin Jacob, Purdue Univ. (United States); Yonatan Sivan, Ben-Gurion Univ. of the Negev (Israel)

12437-9 • 2:40 PM - 3:10 PM

Moving media as a photonic heat engine and pump *(Invited Paper)*

Author(s): Yoichiro Tsurimaki, Renwen Yu, Shanhui Fan, Stanford Univ. (United States)

12437-24 • 3:10 PM - 3:40 PM

Trends in photonic quantum heat engine studies *(Invited Paper)*

Author(s): Barnabas (Moochan) Kim, Anatoly A. Svidzinsky, Texas A&M Univ. (United States); Marlan O. Scully, Texas A&M Univ. (United States), Baylor Univ. (United States), Princeton Univ. (United States)

Coffee Break 3:40 PM - 4:10 PM

SESSION 2: RARE-EARTH CRYOCOOLERS AND APPLICATIONS

1 February 2023 • 4:10 PM - 6:20 PM | Moscone Center, Room 54 (Lower Mezzanine South)

Session Chair: Peter J. Pauzauskie, Univ. of Washington (United States)

12437-1 • 4:10 PM - 4:40 PM

Payload cooling to <125K using optical refrigeration in Yb:YLF *(Invited Paper)*

Author(s): Jackson L. Kock, Alexander R. Albrecht, Duncan McGraw, The Univ. of New Mexico (United States); Richard I. Epstein, ThermoDynamic Films LLC (United States); Mansoor Sheik-Bahae, The Univ. of New Mexico (United States)

12437-2 • 4:40 PM - 5:10 PM

Laser cooling for space cryogenics: practical implementations *(Invited Paper)*

Author(s): Gilles Nogues, Rémi Vicente, Institut NÉEL (France); Arnaud Gardelein, Air Liquide Advanced Technologies (France); Mauro Tonelli, Alberto Di Lieto, Univ. di Pisa (Italy); Bauke Heeg, Lumium Inc. (Netherlands)

12437-3 • 5:10 PM - 5:30 PM

Laser cooling silica: current status and future prospects

Author(s): Brian Topper, Alexander Neumann, Alexander R. Albrecht, The Univ. of New Mexico (United States); Angel S. Flores, Air Force Research Lab. (United States); Stefan Kuhn, Denny Hässner, Sigrun Hein, Christian Hupel, Johannes Nold, Nicoletta Haarlamert, Thomas Schreiber, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Mansoor Sheik-Bahae, Arash Mafi, The Univ. of New Mexico (United States)

12437-4 • 5:30 PM - 5:50 PM

Demonstration of diode-pumped optical refrigeration to cryogenic temperature

Author(s): Alexander R. Albrecht, Jackson L. Kock, The Univ. of New Mexico (United States); Seth D. Melgaard, Sandia National Labs. (United States); Richard I. Epstein, Mansoor Sheik-Bahae, The Univ. of New Mexico (United States)

12437-5 • 5:50 PM - 6:20 PM

Cryogenic silicon cavity for record laser frequency stability *(Invited Paper)*

Author(s): Dhruv Kedar, Univ. of Colorado Boulder (United States); Jun Ye, Univ. of Colorado Boulder (United States), National Institute of Standards and Technology (United States)

SESSION 3: SEMICONDUCTORS AND UPCONVERSION

2 February 2023 • 8:15 AM - 9:55 AM | Moscone Center, Room 54 (Lower Mezzanine South)

Session Chair: Denis V. Seletskiy, Polytechnique Montréal (Canada)

12437-11 • 8:15 AM - 8:45 AM

Evaluation of electron-phonon interactions in halide perovskites toward semiconductor optical refrigeration (*Invited Paper*)

Author(s): Yasuhiro Yamada, Yuto Kajino, Chiba Univ. (Japan); Yoshihiko Kanemitsu, Kyoto Univ. (Japan)

12437-12 • 8:45 AM - 9:05 AM

Surface chemistry of near-unity emission quantum yield CsPbBr₃ perovskite nanocrystals

Author(s): Yang Ding, Zhuoming Zhang, Jeffrey Peng, Masaru Kuno, Univ. of Notre Dame (United States)

12437-13 • 9:05 AM - 9:25 AM

Understanding efficient up-conversion in CsPbBr₃ perovskite nanocrystals

Author(s): Zhuoming Zhang, Sushrut Ghonge, Shubin Zhang, Yang Ding, Univ. of Notre Dame (United States); Richard Schaller, Ctr. for Nanoscale Materials, Argonne National Lab. (United States); Masaru Kuno, Univ. of Notre Dame (United States)

12437-15 • 9:25 AM - 9:55 AM

Thermal-to-optical energy scavenging with all-inorganic perovskite nanocrystals (*Invited Paper*)

Author(s): Matthew T. Sheldon, Texas A&M Univ. (United States)

Coffee Break 9:55 AM - 10:25 AM

SESSION 4: MATERIALS I

2 February 2023 • 10:25 AM - 12:10 PM | Moscone Center, Room 54 (Lower Mezzanine South)

Session Chair: Masaru K. Kuno, Univ. of Notre Dame (United States)

12437-16 • 10:25 AM - 11:10 AM

Material approaches to thermal management in advanced fiber lasers and amplifiers (*Keynote Presentation*)

Author(s): John M. Ballato, Thomas W. Hawkins, Clemson Univ. (United States); Peter D. Dragic, Univ. of Illinois (United States); Magnus Engholm, Mid Sweden Univ. (Sweden); Michel J. F. Digonnet, Stanford Univ. (United Kingdom); Liang Dong, Clemson Univ. (United States)

12437-17 • 11:10 AM - 11:40 AM

Steaming ahead with laser cooling: new perspectives in materials engineering for photonics in all-oxide silica glass (*Invited Paper*)

Author(s): Thomas Meyneng, Ctr. d'optique, photonique et laser (Canada); Jyothis Thomas, Polytechnique Montréal (Canada); Nicolas Grégoire, Younès Messaddeq, Ctr. d'optique, photonique et laser (Canada); Raman Kashyap, Polytechnique Montréal (Canada)

12437-18 • 11:40 AM - 12:10 PM

Ytterbium-doped KY₃F₁₀ as a promising material for optical cryocoolers (*Invited Paper*)

Author(s): Stefan Püschel, Hiroki Tanaka, Christian Kränkel, Leibniz-Institut für Kristallzüchtung (Germany)

Lunch/Exhibition Break 12:10 PM - 1:30 PM

SESSION 5: MATERIALS II

2 February 2023 • 1:30 PM - 3:10 PM | Moscone Center, Room 54 (Lower Mezzanine South)

Session Chair: Alexander R. Albrecht, The Univ. of New Mexico (United States)

12437-20 • 1:30 PM - 2:00 PM

Laser-induced cooling of rare earth doped oxide-only silica glass (*Invited Paper*)

Author(s): Jyothis Thomas, Polytechnique Montréal (Canada); Thomas Meyneng, Nicolas Grégoire, Univ. Laval (Canada); Frédéric Monet, Amirhossein Tehrani, Denis Seletskiy, Polytechnique Montréal (Canada); Younès Messaddeq, Univ. Laval (Canada); Raman Kashyap, Polytechnique Montréal (Canada)

12437-21 • 2:00 PM - 2:30 PM

Cooling Yb-doped silica fibers and fiber lasers using anti-Stokes pumping (*Invited Paper*)

Author(s): Michel J. F. Digonnet, Jennifer M. Knall, Stanford Univ. (United States); Pierre-Baptiste Vigneron, Univ. Savoie Mont Blanc (France), Stanford Univ. (United States); Mary Ann Cahoon, Thomas W. Hawkins, John M. Ballato, Clemson Univ. (United States); Tommy Boilard, Martin Bernier, Univ. Laval (Canada); Peter D. Dragic, Univ. of Illinois (United States)

12437-22 • 2:30 PM - 2:50 PM

Analytical and numerical modeling of photothermal heat transfer in hexagonal microcavity heat engines

Author(s): Chaman Gupta, Lars Forberger, R. Greg Felsted, E. James Davis, Peter J. Pauzuskie, Univ. of Washington (United States)

12437-23 • 2:50 PM - 3:10 PM

Synthesis and laser-cooling of hexagonal microcavities for optically levitated sensing

Author(s): Lars Forberger, R. Greg Felsted, Peter J. Pauzuskie, Univ. of Washington (United States)

AI and Optical Data Sciences IV

30 January - 2 February 2023 | Moscone Center, Room 313 (Level 3 South)

Conference Chairs: **Bahram Jalali**, UCLA Samueli School of Engineering (United States); **Ken-ichi Kitayama**, National Institute of Information and Communications Technology (Japan), Hamamatsu Photonics (Japan)

Program Committee: **Christopher Barsi**, BRELYON, Inc. (United States); **Goëry Genty**, Tampere Univ. (Finland); **Don Lahiru Nirmal M. Hettiarachchi**, Univ. of Dayton (United States); **Ryoichi Horisaki**, The Univ. of Tokyo (Japan); **Yunshan Jiang**, Waymo, LLC (United States); **Koichiro Kishima**, Pinpoint Photonics, Inc. (Japan); **Cejo K. Lonappan**, UCLA Samueli School Of Engineering (United States); **Arka Majumdar**, Univ. of Washington (United States); **Peter L. McMahon**, Cornell Univ. (United States); **Masaya Notomi**, NTT Basic Research Labs. (Japan); **Aydogan Ozcan**, UCLA Samueli School of Engineering (United States); **Natan T. Shaked**, Tel Aviv Univ. (Israel); **Volker J. Sorger**, The George Washington Univ. (United States); **Madhuri Suthar**, UCLA Samueli School Of Engineering (United States); **Haruyoshi Toyoda**, Hamamatsu Photonics K.K. (Japan); **George C. Valley**, The Aerospace Corp. (United States); **Tingyi Zhou**, UCLA Samueli School of Engineering (United States)

MONDAY 30 JANUARY

OPTO PLENARY SESSION

30 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 207/215 (Level 2 South)

8:00 AM - 8:05 AM: **Welcome and Opening Remarks**
Sonia García-Blanco, Univ. Twente (Netherlands) and Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

8:05 AM - 8:15 AM: **Announcement of the OPTO AI/ML and Net Zero Best Paper Awards**

12424-501 • 8:15 AM - 8:50 AM

High-performance electronic-photonic interfaces: from AI to quantum (*Plenary Presentation*)

Author(s): Rajeev Ram, Massachusetts Institute of Technology (United States)

12416-501 • 8:50 AM - 9:25 AM

Tandem photovoltaic devices: more than one way to make a solar cell (*Plenary Presentation*)

Author(s): Emily L. Warren, National Renewable Energy Lab. (United States)

12421-501 • 9:25 AM - 10:00 AM

Are III-nitride semiconductors also suitable for red emission? (*Plenary Presentation*)

Author(s): Nicolas Grandjean, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 1: COMPUTATIONAL IMAGING/ONN

Joint Session with Conferences 12435 and 12438

30 January 2023 • 10:30 AM - 12:55 PM | Moscone Center, Room 313 (Level 3 South)

Session Chairs: Bahram Jalali, UCLA Samueli School of Engineering (United States), Jinyang Liang, Institut National de la Recherche Scientifique (Canada)

12435-1 • 10:30 AM - 11:00 AM

Partially-coherent neural holography with fast heavily-quantized spatial light modulators (*Invited Paper*)

Author(s): Suyeon Choi, Manu Gopakumar, Stanford Univ. (United States); Yifan Peng, The University of Hong Kong (China); Jonghyun Kim, NVIDIA Corp. (United States); Matthew O'Toole, Carnegie Mellon Univ. (United States); Gordon Wetzstein, Stanford Univ. (United States)

12438-1 • 11:00 AM - 11:15 AM

Diffraction decoders project super-resolved images

Author(s): Cagatay Isil, Deniz Mengu, Yifan Zhao, Anika Tabassum, Jingxi Li, Yi Luo, Mona Jarrahi, Aydogan Ozcan, UCLA Samueli School of Engineering (United States)

12438-2 • 11:15 AM - 11:40 AM

Multiplexing methods for scaling up photonic logic (*Invited Paper*)

Author(s): Ryan Hamerly, NTT Research, Inc. (United States), Massachusetts Institute of Technology (United States); Alexander Sludds, Zaijun Chen, Liane Bernstein, Ronald Davis, Saamil Bandyopadhyay, Sri Krishna Vadlamani, Dirk Englund, Massachusetts Institute of Technology (United States)

12435-2 • 11:40 AM - 12:10 PM

Applications of digital micromirror devices in photonic neural networks (*Invited Paper*)

Author(s): Tianyu Wang, Mandar M. Sohoni, Shi-Yuan Ma, Cornell Univ. (United States); Logan G. Wright, Tatsuhiro Onodera, Cornell Univ. (United States), NTT Research, Inc. (United States); Martin M. Stein, Maxwell Anderson, Brian C. Richard, Peter L. McMahon, Cornell Univ. (United States)

12435-3 • 12:10 PM - 12:40 PM

Versatile DMDs as input information platform and trainable weights in optical neural networks (*Invited Paper*)

Author(s): Anas Skalli, Xavier Porte, Daniel Brunner, FEMTO-ST (France)

12438-3 • 12:40 PM - 12:55 PM

Michelson interferometric methods for full optical complex convolution

Author(s): Haoyan Kang, The George Washington Univ. (United States), Optelligence, LLC (United States); Jonathan K. George, The George Washington Univ. (United States); Behrouz Movahhed Nouri, Optelligence, LLC (United States); Maria Solyanik-Gorgone, The George Washington Univ. (United States); Hamed Dalir, Volker J. Sorger, The George Washington Univ. (United States), Optelligence, LLC (United States)

Lunch Break 12:55 PM - 2:25 PM

SESSION 2: PHOTONIC HARDWARE ACCELERATORS I

30 January 2023 • 2:25 PM - 5:15 PM | Moscone Center, Room 313 (Level 3 South)

Session Chair: Ken-ichi Kitayama, National Institute of Information and Communications Technology (Japan)

12438-4 • 2:25 PM - 2:50 PM

A Clements-type silicon photonics 16x16 analog matrix processor with complex-valued inputs toward nanophotonics accelerators *(Invited Paper)*

Author(s): Shota Kita, Kohei Ikeda, Kengo Nozaki, Kenta Takata, NTT Basic Research Labs. (Japan); Kazuo Aoyama, NTT Communication Science Labs. (Japan); Keiichi Suzuki, Yuriko Maegami, Morifumi Ohno, Guangwei Cong, Noritsugu Yamamoto, Koji Yamamoto, National Institute of Advanced Industrial Science and Technology (Japan); Akihiko Shinya, NTT Basic Research Labs. (Japan); Hiroshi Sawada, NTT Communication Science Labs. (Japan); Masaya Notomi, NTT Basic Research Labs. (Japan)

12438-5 • 2:50 PM - 3:05 PM

Scalable and efficient coherent photonic unit cell for time-multiplexed multiplication and correlation detection

Author(s): Sadra Rahimi Kari, Dominique Pantin, Nathan Youngblood, Univ. of Pittsburgh (United States)

12438-6 • 3:05 PM - 3:20 PM

Diffraction optical permutation networks

Author(s): Deniz Mengu, Yifan Zhao, Anika Tabassum, Mona Jarrahi, Aydogan Ozcan, UCLA Samueli School of Engineering (United States)

12438-7 • 3:20 PM - 3:45 PM

Ultrahigh bandwidth applications of Kerr microcombs *(Invited Paper)*

Author(s): Mengxi Tan, RMIT University (Australia); bill corcoran, monash (Australia); arnan mitchell, rmit (Australia); David J. Moss, Swinburne Univ. of Technology (Australia)

Coffee Break 3:45 PM - 4:15 PM

12438-10 • 4:15 PM - 4:30 PM

Optical deep learning with nonlinear multimode signals

Author(s): Yuval Tamir, Moti Fridman, Bar-Ilan Univ. (Israel)

12438-11 • 4:30 PM - 4:45 PM

Towards a novel coherent Ising machine using symmetry breaking in a Kerr resonator

Author(s): Liam J. Quinn, Gang Xu, Zongda Li, The Univ. of Auckland (New Zealand); Julien Fatome, Univ. de Bourgogne (France); Stuart Murdoch, Yiqing Xu, Stéphane Coen, Miro Erkintalo, The Univ. of Auckland (New Zealand)

12438-12 • 4:45 PM - 5:00 PM

Energy-efficient on-chip learning for a fully connected neural network using domain wall device

Author(s): Anubha Sehgal, Brajesh Kumar Kaushik, Indian Institute of Technology Roorkee (India)

12438-9 • 5:00 PM - 5:15 PM

Polarization diffractive networks: performing multiple linear transformations using a polarization-encoded diffractive optical network

Author(s): Jingxi Li, Yi-Chun Hung, Onur Kulce, Deniz Mengu, Aydogan Ozcan, UCLA Samueli School of Engineering (United States)

TUESDAY 31 JANUARY

SESSION 3: REALTIME INFERENCE

31 January 2023 • 8:00 AM - 9:50 AM | Moscone Center, Room 313 (Level 3 South)

Session Chair: Volker J. Sorger, The George Washington Univ. (United States)

12438-13 • 8:00 AM - 8:25 AM

Brain-derived neuromorphic computing with 3D electronic-photonic integrated circuits *(Invited Paper)*

Author(s): S. J. Ben Yoo, Univ. of California, Davis (United States)

12438-14 • 8:25 AM - 8:40 AM

Exploring the potential of high-speed 2D and 3D materials in silicon photonics

Author(s): Hao Wang, The George Washington Univ. (United States), Optelligence, LLC (United States); Jiachi Ye, Yaliang Gui, Chaobo Dong, Martin Thomaschewski, Hamed Dalir, Volker J. Sorger, The George Washington Univ. (United States)

12438-15 • 8:40 AM - 8:55 AM

Training on the optical system: local search method

Author(s): Zibo Hu, The George Washington Univ. (United States); Hamed Dalir, The George Washington Univ. (United States), Optelligence LLC (United States); Volker J. Sorger, The George Washington Univ. (United States)

12438-16 • 8:55 AM - 9:20 AM

Metasurface optics enabled computational sensing *(Invited Paper)*

Author(s): Fan Yang, Hung-I Lin, Juejun Hu, Mikhail Shalaginov, Tian Gu, Massachusetts Institute of Technology (United States)

12438-17 • 9:20 AM - 9:35 AM

Optimization and training of the nonlinear Schrödinger kernel

Author(s): Tingyi Zhou, Bahram Jalali, UCLA Samueli School of Engineering (United States)

Conference 12438

12438-18 • 9:35 AM - 9:50 AM

Coherent VCSEL Homodyne Neural Networks

Author(s): Zaijun Chen, The Univ. of Southern California (United States), Massachusetts Institute of Technology (United States); Alexander Sludds, Ronald Davis, Ian Christen, Liane Bernstein, Massachusetts Institute of Technology (United States); Tobias Heuser, Niels Heermeier, James A. Lott, Stephan Reitzenstein, Technische Univ. Berlin (Germany); Ryan Hamerly, Massachusetts Institute of Technology (United States), NTT Research, Inc. (United States); Dirk Englund, Massachusetts Institute of Technology (United States)

Coffee Break 9:50 AM - 10:20 AM

SESSION 4: ANALOG OPTICAL COMPUTING

31 January 2023 • 10:20 AM - 11:55 AM | Moscone Center, Room 313 (Level 3 South)

Session Chair: Volker J. Sorger, The George Washington Univ. (United States)

12438-20 • 10:20 AM - 10:45 AM

Photonics ASICs: a promising approach toward high throughput, short latency, and parallelized computing hardware (*Invited Paper*)

Author(s): Hamed Dalir, Optelligence, LLC (United States)

12438-22 • 10:45 AM - 11:00 AM

Leveraging the Advantages of Photonics Tensor Core for Secure, High-Speed Computing: An Optical encryption Approach

Author(s): Behrouz Movahhed Nouri, Optelligence, LLC (United States); Volker J. Sorger, The George Washington Univ. (United States)

12438-23 • 11:00 AM - 11:25 AM

Deep optics: learning cameras and optical computing systems (*Invited Paper*)

Author(s): Gordon Wetzstein, Stanford Univ. (United States)

12438-24 • 11:25 AM - 11:40 AM

Object classification through unknown random diffusers using a single-pixel diffractive network and spectrum encoding

Author(s): Yi Luo, Bijie Bai, Yuhang Li, Xurong Li, Ege Çetintas, Mona Jarrahi, Aydogan Ozcan, UCLA Samueli School of Engineering (United States)

12438-25 • 11:40 AM - 11:55 AM

Parallel and deep reservoir computing based on frequency multiplexing

Author(s): Alessandro Lupo, Serge Massar, Univ. Libre de Bruxelles (Belgium)

Lunch/Exhibition Break 11:55 AM - 1:50 PM

SESSION 5: PHOTONIC HARDWARE ACCELERATORS II

31 January 2023 • 1:50 PM - 4:35 PM | Moscone Center, Room 313 (Level 3 South)

Session Chair: George C. Valley, The Aerospace Corp. (United States)

12438-26 • 1:50 PM - 2:05 PM

Integrated optical output layer for a reservoir computer based on frequency multiplexing

Author(s): Tigers Jonuzi, VLC Photonics S.L. (Spain); Alessandro Lupo, Univ. Libre de Bruxelles (Belgium); Jose David Domenech Gomez, VLC Photonics S.L. (Spain); Miguel Cornelles Soriano, Univ. de les Illes Balears (Spain); Serge Massar, Univ. Libre de Bruxelles (Belgium)

12438-27 • 2:05 PM - 2:20 PM

Breaking the barrier of Nyquist sampling theorem for laser speckle information reconstruction via artificial intelligence

Author(s): Huanhao Li, Zhipeng Yu, Qi Zhao, Shengfu Cheng, Tianting Zhong, Chi-Man Woo, Puxiang Lai, The Hong Kong Polytechnic Univ. (Hong Kong, China)

12438-28 • 2:20 PM - 2:45 PM

Reconstructing seen and unseen attractors from data via autonomous-mode reservoir computing (*Invited Paper*)

Author(s): André Röhm, Kohei Tsuchiyama, Takatomo Mihana, Ryoichi Horisaki, The Univ. of Tokyo (Japan); Daniel J. Gauthier, The Ohio State Univ. (United States); Ingo Fischer, Instituto de Física Interdisciplinar y Sistemas Complejos (Spain); Makoto Naruse, The Univ. of Tokyo (Japan)

Coffee Break 2:45 PM - 3:15 PM

12438-30 • 3:15 PM - 3:30 PM

Photonic tensor core machine learning accelerator

Author(s): Xiaoxuan Ma, The George Washington Univ. (United States); Behrouz Movahhed Nouri, Optelligence (United States); Volker J. Sorger, The George Washington Univ. (United States), Optelligence, LLC (United States)

12438-31 • 3:30 PM - 3:45 PM

Photonic-chip Fourier convolution processor

Author(s): Behrouz Movahhed Nouri, Optelligence (United States); Volker J. Sorger, The George Washington Univ. (United States), Optelligence, LLC (United States)

12438-32 • 3:45 PM - 4:10 PM

Fully (implemented, scalable, and parallel) recurrent photonic neural networks in multimode semiconductor lasers (*Invited Paper*)

Author(s): Anas Skalli, Xavier Porte, FEMTO-ST (France); Nasibeh Haghighi, James A. Lott, Stephan Reitzenstein, Technische Univ. Berlin (Germany); Daniel Brunner, FEMTO-ST (France)

12438-33 • 4:10 PM - 4:35 PM

Deep physical neural networks based on ultrafast nonlinear optics (*Invited Paper*)

Author(s): Tatsuhiro Onodera, Logan G. Wright, Cornell Univ. (United States), NTT Research, Inc. (United States); Martin M. Stein, Tianyu Wang, Darren T. Schachter, Zoey Hu, Peter L. McMahon, Cornell Univ. (United States)

WEDNESDAY 1 FEBRUARY

SESSION 6: INVERSE DESIGN

1 February 2023 • 8:00 AM - 8:55 AM | Moscone Center, Room 313 (Level 3 South)

Session Chair: Ken-ichi Kitayama, National Institute of Information and Communications Technology (Japan)

12438-34 • 8:00 AM - 8:25 AM

Machine learning for design optimizations and prediction of optical chip performance *(Invited Paper)*

Author(s): Ksenia Yadav, Serge Bidnyk, Ashok Balakrishnan, Enablence Technologies, Inc. (Canada)

12438-35 • 8:25 AM - 8:40 AM

Decentralized power grid control scheme utilizing photonic sensing and computing

Author(s): Benedict Vergara, Cooter McGrew, Volker J. Sorger, The George Washington Univ. (United States)

12438-36 • 8:40 AM - 8:55 AM

Linking a start-to-end software model and neural networks for optimization of CPA laser systems

Author(s): Jack Hirschman, Stanford Univ. (United States), SLAC National Accelerator Lab. (United States); Randy Lemons, SLAC National Accelerator Lab. (United States), Colorado School of Mines (United States); Minyang Wang, Univ. of California, Los Angeles (United States); Ravikiran Saripalli, SLAC National Accelerator Lab. (United States); Peter Krötz, Max-Planck-Institut für Struktur und Dynamik der Materie (Germany), Univ. Hamburg (Germany); Federico Belli, Heriot-Watt Univ. (United Kingdom); Sergio Carbajo, Univ. of California, Los Angeles (United States), SLAC National Accelerator Lab. (United States)

SESSION 7: PHYSICS-AI SYMBIOSIS I

1 February 2023 • 8:55 AM - 10:10 AM | Moscone Center, Room 313 (Level 3 South)

Session Chair: Ken-ichi Kitayama, National Institute of Information and Communications Technology (Japan)

12438-37 • 8:55 AM - 9:20 AM

Scaling laws for deep neural networks *(Invited Paper)*

Author(s): Yasaman Bahri, Google (United States)

12438-38 • 9:20 AM - 9:45 AM

Circuits that train themselves: decentralized, physics-driven learning *(Invited Paper)*

Author(s): Sam Dillavou, Benjamin Beyer, Menachem Stern, Marc Z. Miskin, Andrea J. Liu, Douglas J. Durian, Univ. of Pennsylvania (United States)

12438-39 • 9:45 AM - 10:10 AM

Ultrafast imaging of THz-electric waveforms via Quantum-probe Field Microscopy (QFIM) *(Invited Paper)*

Author(s): Georg Herink, Moritz B. Heindl, Univ. Bayreuth (Germany); Nick Kirkwood, ARC Ctr. of Excellence in Exciton Science (Australia), The Univ. of Melbourne (Australia); Tobias Lauster, Julia A. Lang, Markus Retsch, Univ. Bayreuth (Germany); Paul Mulvaney, ARC Ctr. of Excellence in Exciton Science (Australia)

Coffee Break 10:10 AM - 10:40 AM

SESSION 8: MACHINE LEARNING FOR OPTICAL SENSING AND METROLOGY

1 February 2023 • 10:40 AM - 12:40 PM | Moscone Center, Room 313 (Level 3 South)

Session Chair: Tingyi Zhou, UCLA Samueli School of Engineering (United States)

12438-41 • 10:40 AM - 11:05 AM

Optical ranging and localization at beyond the coherence length of lasers *(Invited Paper)*

Author(s): Ozdal Boyraz, Mustafa M. Bayer, Ataberk Atalar, Xun Li, Haoyu Xie, Berken U. Demirel, Univ. of California, Irvine (United States)

12438-42 • 11:05 AM - 11:20 AM

Deep learning super resolution for high-speed excitation emission matrix measurements

Author(s): Umberto Michelucci, TOELT LLC (Switzerland); Francesca Venturini, Zürcher Hochschule für Angewandte Wissenschaften (Switzerland)

12438-43 • 11:20 AM - 11:35 AM

Depth video super-resolution using a high-speed time-of-flight sensor

Author(s): Germán Mora Martín, The Univ. of Edinburgh (United Kingdom); Stirling Scholes, Alice Ruget, Heriot-Watt Univ. (United Kingdom); Robert Henderson, The Univ. of Edinburgh (United Kingdom); Jonathan Leach, Heriot-Watt Univ. (United Kingdom); Istvan Gyöngy, The Univ. of Edinburgh (United Kingdom)

12438-44 • 11:35 AM - 12:00 PM

Low-power actuators for programmable photonic processors *(Invited Paper)*

Author(s): Muhammad Umar Khan, Iman Zand, Lukas Van Iseghem, Univ. Gent (Belgium); Pierre Edinger, Gaehun Jo, Simon J. Bleiker, KTH Royal Institute of Technology (Sweden); Alain Y. Takabayashi, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Cleitus Antony, Moises Jezzini, Giuseppe Talli, Tyndall National Institute (Ireland); Hamed Sattari, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Jun Su Lee, Arun Kumar Mallik, Tyndall National Institute (Ireland); Peter Verheyen, imec (Belgium); Cristina Lerma Arce, CommScope, Inc. (Belgium); Marco Garcia Porcel, Tigers Jonuzi, VLC Photonics S.L. (Spain); Ewout Picavet, K. P. Nagarjun, Univ. Gent (Belgium); Jan Watté, CommScope, Inc. (Belgium); Niels Quack, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Frank Niklaus, K. B. Gylfason, KTH Royal Institute of Technology (Sweden); Klaartje De Buysser, Jeroen Beeckman, Wim Bogaerts, Univ. Gent (Belgium)

12438-45 • 12:00 PM - 12:15 PM

Infrared image-based remote target detection for maritime rescue utilizing a deep learning network and data augmentation

Author(s): Sungjin Cheong, Yoon-Seop Lim, Wonho Jung, Yonghwa Park, KAIST (Republic of Korea)

12438-46 • 12:15 PM - 12:40 PM

Applications of artificial intelligence to nonlinear fiber-optics *(Invited Paper)*

Author(s): Goëry Genty, Lauri Salmela, Mathilde Hary, Tampere Univ. (Finland); Mehdi Mabad, Andrei Ermolaev, John M. Dudley, Univ. Bourgogne Franche-Comté (France)

Lunch/Exhibition Break 12:40 PM - 2:10 PM

Conference 12438

SESSION 9: IMAGING AND SPECTROSCOPY

1 February 2023 • 2:10 PM - 5:05 PM | Moscone Center, Room 313 (Level 3 South)

Session Chair: Yiming Zhou, Univ. of California, Los Angeles (United States)

12438-47 • 2:10 PM - 2:25 PM

Image sensing with multilayer nonlinear optical neural networks

Author(s): Tianyu Wang, Mandar M. Sohoni, Cornell Univ. (United States); Logan G. Wright, Cornell Univ. (United States), NTT Research, Inc. (United States); Tatsuhiko Onodera, Cornell Univ. (United States), NTT Research, Inc. (United States); Shi-Yuan Ma, Maxwell Anderson, Peter L. McMahon, Cornell Univ. (United States)

12438-48 • 2:25 PM - 2:40 PM

Design and Analysis of High-Performance Real-Time Image Dehazing Using Convolutional Neural and Generative Adversarial Networks

Author(s): Partha Kaushik, Avi Gupta, Hemkant Nehete, Raman Balasubramanian, Brajesh Kumar Kaushik, Indian Institute of Technology Roorkee (India)

12438-49 • 2:40 PM - 2:55 PM

Path-integrated concentration and multi-gas detection in FTIR spectroscopy with deep learning methods

Author(s): Shane Choo, Yonsei Univ. (Republic of Korea), Moori Technologies Co., Ltd. (Republic of Korea); Dohyun Park, Moori Technologies Co., Ltd. (Republic of Korea); Bernd BURGSTALLER, Yonsei Univ. (Republic of Korea)

12438-50 • 2:55 PM - 3:10 PM

Understanding the learning mechanism of convolutional neural networks applied to fluorescence spectra: application to olive oil quality assessment

Author(s): Francesca Venturini, Zürcher Hochschule für Angewandte Wissenschaften (Switzerland), TOELT LLC (Switzerland); Umberto Michelucci, TOELT LLC (Switzerland); Michela Sperti, PolitoBIOMed Lab. (Italy), Politecnico di Torino (Italy); Arnaud Gucciardi, TOELT LLC (Switzerland); Vanessa M. Martos, Univ. de Granada (Spain); Marco A. Deriu, PolitoBIOMed Lab. (Italy), Politecnico di Torino (Italy)

12438-51 • 3:10 PM - 3:25 PM

Camera calibration as machine learning problem using dense phase shifting pattern, checkerboards, and different cameras

Author(s): Steffen Reichel, Hochschule Pforzheim (Germany); Jan Burke, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany); Alexey Pak, Huawei Sweden R&D (Sweden); Tobias Rentschler, Hochschule Pforzheim (Germany)

Coffee Break 3:25 PM - 3:55 PM

12438-52 • 3:55 PM - 4:20 PM

Column IV sensors for 2D and 3D infrared imaging (Invited Paper)

Author(s): Cliff A. King, SemiKing, LLC (United States); Shui-Qing Yu, University of Arkansas (United States)

12438-54 • 4:20 PM - 4:35 PM

Identifying the advantageous latent space dimensionality for StyleGANs used in industrial machine vision applications

Author(s): Dominik Wolfschläger, WZL der RWTH Aachen Univ. (Germany); Ruslan Yermakov, RWTH Aachen Univ. (Germany); Benjamin Montavon, WZL der RWTH Aachen Univ. (Germany); Benjamin Berkels, Aachen Institute for Advanced Study in Computational Engineering Science, RWTH Aachen Univ. (Germany); Robert H. H. Schmitt, WZL der RWTH Aachen Univ. (Germany)

12438-55 • 4:35 PM - 4:50 PM

Computer microvision-based precision motion measurement by digital holographic microscopy and deep transformer neural networks

Author(s): Stéphane Cuenat, Jesus E. Brito Carcaño, Patrick Sandoz, Raphaël Couturier, Guillaume J. Laurent, Maxime Jacquot, FEMTO-ST (France)

12438-56 • 4:50 PM - 5:05 PM

AI-based analysis of extremely low-resolved spectrogram fingerprints for the calculation of surface profiles in low-coherence interferometry

Author(s): Alexander Kabardiadi-Virkovski, Christopher Taudt, Peter Hartmann, Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany), Westsächsische Hochschule Zwickau (Germany)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12438-53

Direct face pose estimation using multiple camera views and deep learning

Author(s): Hyuno Kim, Seohyun Lee, Yuji Yamakawa, The Univ. of Tokyo (Japan)

12438-78

Image reconstruction for the artificial compound eye based on deep learning

Author(s): Jioh Lee, Youngin Choi, Heung-No Lee, Gwangju Institute of Science and Technology (Republic of Korea)

12438-80

Automatic 2D material detection in optical images using deep-learning-based computer vision

Author(s): Fereshteh Ramezani, Parvez Sheikh, John Fix, Nick Borys, Bradley Whitaker, Montana State Univ. (United States)

THURSDAY 2 FEBRUARY**SESSION 10: OPTICAL DATA SCIENCES I**

2 February 2023 • 8:15 AM - 10:05 AM | Moscone Center, Room 313 (Level 3 South)

Session Chair: Callen MacPhee, Univ. of California, Los Angeles (United States)

12438-58 • 8:15 AM - 8:30 AM

Simultaneous License Plate Recognition and Face Detection Application at the edge

Author(s): Fikret Alim, Enes Kavakli, Ertugrul Dogan, Cevahir Cigla, ASELSAN A.S. (Turkey)

12438-59 • 8:30 AM - 8:45 AM

Transformation and phase retrieval of electromagnetic fields between a plane and an arbitrary surface using machine learning

Author(s): Barak Hadad, Sahar Froim, Amit Bekerman, Yakir Hadad, Alon Bahabad, Tel Aviv Univ. (Israel)

12438-60 • 8:45 AM - 9:10 AM

Data assimilation-based internal structure modeling for waveguide devices (*Invited Paper*)

Author(s): Tsuyoshi Konishi, Tomoya Kurahashi, Junpei Funatsuki, Osaka Univ. (Japan)

12438-61 • 9:10 AM - 9:25 AM

Intelligent multispectral vision system for contactless water quality monitoring for wastewater

Author(s): Karen Preitner, Sébastien Blanc, David Honzatko, Clément Kündig, Pedram Pad, Sareh Saeedi, CSEM SA (Switzerland); Salvador Peña, Photrack AG (Switzerland); Pierre Lechevallier, Jörg Rieckermann, Eawag (Switzerland); Andrea L. Dunbar, CSEM SA (Switzerland)

12438-62 • 9:25 AM - 9:50 AM

High-performance optoelectronics for integrated photonic neural networks (*Invited Paper*)

Author(s): Martin Thomaschewski, Zibo Hu, Yaliang Gui, The George Washington Univ. (United States); Hao Wang, Hamed Dalir, Volker J. Sorger, The George Washington Univ. (United States), Optelligence, LLC (United States)

12438-63 • 9:50 AM - 10:05 AM

Vision Enhancement via Virtual diffraction and coherent Detection (VEViD): a physics-inspired low-light enhancement algorithm

Author(s): Callen MacPhee, Bahram Jalali, Univ. of California, Los Angeles (United States)

Coffee Break 10:05 AM - 10:35 AM

SESSION 11: OPTICAL DATA SCIENCES II

2 February 2023 • 10:35 AM - 12:15 PM | Moscone Center, Room 313 (Level 3 South)

Session Chair: Christopher Barsi, BRELYON, Inc. (United States)

12438-64 • 10:35 AM - 11:00 AM

Integrated optical phased arrays: augmented reality, LiDAR, and beyond (*Invited Paper*)

Author(s): Jelena Notaros, Massachusetts Institute of Technology (United States)

12438-65 • 11:00 AM - 11:15 AM

SeidelNet: an aberration-informed deep learning model for spatially-varying deblurring

Author(s): Esther Whang, The Cooper Union for the Advancement of Science and Art (United States); David McAllister, Ashwin Reddy, Amit Kohli, Laura Waller, Univ. of California, Berkeley (United States)

12438-8 • 11:15 AM - 11:30 AM

Hardware-efficient, large-scale reconfigurable optical neural network (ONN) with backpropagation

Author(s): Fei Xia, Ziao Wang, Ecole Normale Supérieure (France); Logan G. Wright, Tatsuhiro Onodera, Martin M. Stein, Cornell Univ. (United States); Jianqi Hu, Ecole Normale Supérieure (France); Peter L. McMahon, Cornell Univ. (United States); Sylvain Gigan, Ecole Normale Supérieure (France)

12438-68 • 11:30 AM - 11:45 AM

Speckle-based optical cryptosystem for face recognition

Author(s): Qi Zhao, Huanhao Li, Zhipeng Yu, Puxiang Lai, Shengfu Cheng, The Hong Kong Polytechnic Univ. (Hong Kong, China)

12438-69 • 11:45 AM - 12:00 PM

Global phase insensitive loss function for deep learning in holographic imaging and projection applications

Author(s): Yijie Zheng, George S. D. Gordon, Rafael Fuentes-Dominguez, The Univ. of Nottingham (United Kingdom)

12438-70 • 12:00 PM - 12:15 PM

LSTM-based autoencoder for the inverse design of achromatic metalenses

Author(s): Parama Pal, Prajith P. Pillai, Tata Consultancy Services, Ltd. (India); Aravind Kumar Yelashetty, Tapajyoti Das Gupta, Indian Institute of Science, Bengaluru (India); Beena Rai, Tata Consultancy Services, Ltd. (India)

Lunch/Exhibition Break 12:15 PM - 1:45 PM

SESSION 12: PHYSICS-AI SYMBIOSIS II

2 February 2023 • 1:45 PM - 4:10 PM | Moscone Center, Room 313 (Level 3 South)

Session Chair: Ken-ichi Kitayama, National Institute of Information and Communications Technology (Japan)

12438-71 • 1:45 PM - 2:00 PM

Predicting nonlinear optical scattering with physics informed neural networks

Author(s): Carlo Gigli, Amirhossein Saba, Ahmed Bassam Ayoub, Demetri Psaltis, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Conference 12438

12438-72 • 2:00 PM - 2:25 PM

CANCELED: Using deep learning in various computer vision applications: from deepfake detection to autonomous car driving (*Invited Paper*)

Author(s): Ofer Hadar, Ben-Gurion Univ. of the Negev (Israel)

12438-73 • 2:25 PM - 2:40 PM

Towards imaging through side-scattering in a multi-mode optical fiber

Author(s): Daniel Marima, Barak Hadad, Sahar Froim, Alon Bahabad, Avishay Eyal, Tel Aviv Univ. (Israel)

12438-74 • 2:40 PM - 2:55 PM

Diffraction imagers see through random unknown diffusers

Author(s): Yuhang Li, Yi Luo, Bijie Bai, Aydogan Ozcan, Univ. of California, Los Angeles (United States)

Coffee Break 2:55 PM - 3:25 PM

12438-75 • 3:25 PM - 3:40 PM

PhyCV: the first physics-inspired computer vision library

Author(s): Yiming Zhou, Callen MacPhee, Madhuri Suthar, Bahram Jalali, Univ. of California, Los Angeles (United States)

12438-77 • 3:40 PM - 3:55 PM

Data class-specific imaging with all-optical erasure of undesired objects using diffractive computing

Author(s): Bijie Bai, Yi Luo, Tianyi Gan, Jingtian Hu, Yuhang Li, Yifan Zhao, Deniz Mengu, Mona Jarrahi, Aydogan Ozcan, Univ. of California, Los Angeles (United States)

12438-79 • 3:55 PM - 4:10 PM

Conditional normalizing flow for variational single image super-resolution on microscopy images

Author(s): Joel Ang, Alexander Yong, Chiyo Tan, Jessica Kng, Ko Hui Tan, Liyun Saw, Kaicheng Liang, Institute of Bioengineering and Bioimaging (Singapore)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12438-81

Interpolated template subtraction method for stimulus artifact removal

Author(s): Chui Kong, Fudan Univ. (China)

12438-76

High-resolution computational ghost imaging based on physics-guided generative adversarial network

Author(s): Xiangru Liu, Harbin Institute of Technology (China); Xiangfeng Meng, Shandong Univ. (China); Zhengjun Liu, Wei Liu, Harbin Institute of Technology (China)

12438-66

Deep deconvolution of object information transformed by a lens

Author(s): Shivasubramanian Gopinath, Univ. of Tartu (Estonia), Thiagarajar College (India); Praveen Periyasamy Angamuthu, Univ. of Tartu (Estonia); Francis Gracy Arokiaraj, Univ. of Tartu (Estonia), The American College (India); Daniel Smith, Swinburne Univ. of Technology (Australia); Tauno Kahro, Sandhira-Mirella Valdma, Andrei Bleahu, Univ. of Tartu (Estonia); Soon Hock Ng, Swinburne Univ. of Technology (Australia); Andra Naresh Kumar Reddy, Univ. of Latvia (Latvia); Tomas Katkus, Swinburne Univ. of Technology (Australia); Aravind Simon John Francis Rajeswary, Univ. of Tartu (Estonia); Rashid A. Ganeev, Univ. of Latvia (Latvia), National Research Univ. (Uzbekistan); Siim Pikker, Kaupo Kukli, Aile Tamm, Univ. of Tartu (Estonia); Saulius Juodkazis, Swinburne Univ. of Technology (Australia), Tokyo Institute of Technology (Japan); Vijayakumar Anand, Univ. of Tartu (Estonia), Swinburne Univ. of Technology (Australia)

Vertical-Cavity Surface-Emitting Lasers XXVII

1 - 2 February 2023 | Moscone Center, Room 158 (Upper Mezzanine South)

Conference Chairs: **Chun Lei**, Lumentum (United States); **Luke A. Graham**, Dallas Quantum Devices, Inc. (United States)

Program Committee: **Kent D. Choquette**, Univ. of Illinois (United States); **Aaron J. Danner**, National Univ. of Singapore (Singapore); **Martin Grabherr**, Priolas GmbH (Germany); **James Guenter**, Dallas Quantum Devices, Inc. (United States); **Anders G. Larsson**, OptiGOT AB (Sweden); **James A. Lott**, Technische Univ. Berlin (Germany); **M. V. Ramana Murty**, Broadcom Inc. (United States); **Krassimir Panajotov**, Vrije Univ. Brussel (Belgium); **Darwin K. Serkland**, Sandia National Labs. (United States); **Jean-Francois Seurin**, ams-OSRAM AG (United States); **Noriyuki Yokouchi**, Furukawa Electric Co., Ltd. (Japan); **Mial E. Warren**, Seinan Photonics (United States)

WEDNESDAY 1 FEBRUARY

SESSION 1: NOVEL CONFIGURATIONS AND APPLICATIONS

1 February 2023 • 8:00 AM - 10:10 AM | Moscone Center, Room 158 (Upper Mezzanine South)

Session Chair: Luke A. Graham, Dallas Quantum Devices, Inc. (United States)

12439-1 • 8:00 AM - 8:30 AM

Polarization Multiplexing in VCSEL-Arrays *(Invited Paper)*

Author(s): Roman Alexander Koerner, Sven Bader, Markus Herper, Jenny Tempeler, Alexander van der Lee, Holger Moench, Armand Pruijmboom, Ulrich Weichmann, Alexander Weigl, TRUMPF Photonic Components GmbH (Germany)

12439-2 • 8:30 AM - 8:50 AM

High efficiency 10-micron-pitch 64x64 addressable VCSEL array with intracavity structure

Author(s): Hideki Watanabe, Tatsuya Matou, Shuhei Yamaguchi, Sony Group Corp. (Japan); Kota Tokuda, Sony Semiconductor Solutions Corp. (Japan); Yasunari Hanzawa, Naoto Kikuchi, Masato Oishi, Shouetsu Nagane, Yuuta Otoguro, Yusuke Nakayama, Kei Sato, Sony Semiconductor Manufacturing Corp. (Japan); Rintaro Koda, Noriyuki Fuutagawa, Sony Group Corp. (Japan)

12439-3 • 8:50 AM - 9:10 AM

Depletion-mode and inversion-mode dual-laser nonlinear optoelectronic tunneling junction microwave CMOS VCSEL for integrated system-on-chip lasing RF ASIC, high-power pulsed and CW lasers: performance advantages over traditional VCSEL

Author(s): James N. Pan, Northrop Grumman Corp. (United States), American Enterprise and License Co. (United States)

12439-4 • 9:10 AM - 9:30 AM

Fourier Beam Analysis of Photonic Crystal Coupled Triangular VCSEL Array

Author(s): Nusrat Jahan, William North, Nisha Kolagotla, Kent D. Choquette, Univ. of Illinois (United States)

12439-5 • 9:30 AM - 9:50 AM

Towards VCSEL-based Ising Computation

Author(s): Soon Thor Lim, A*STAR Institute of High Performance Computing (Singapore); Zifeng Yuan, Dewen Zhang, Yuan Gao, Yuchi Lan, National Univ. of Singapore (Singapore); Thanh Xuan Hoang, Yew Li Hor, A*STAR Institute of High Performance Computing (Singapore); Aaron J. Danner, National Univ. of Singapore (Singapore)

12439-30 • 9:50 AM - 10:10 AM

HCG MEMS tunable VCSEL with intracavity integrated detector

Author(s): Carlos F. R. Mateus, Dalila Ellafi, Chuanshun Cao, Carl V. Ford, Neelanjan Bandyopadhyay, Kai-C. A. Hui, Christopher Chase, D. Philip Worland, Bandwidth10 Inc. (United States)

Coffee Break 10:10 AM - 10:20 AM

SESSION 2: LIDAR APPLICATIONS

1 February 2023 • 10:20 AM - 12:10 PM | Moscone Center, Room 158 (Upper Mezzanine South)

Session Chair: Chun Lei, Lumentum (United States)

12439-6 • 10:20 AM - 10:50 AM

3D integrated 45W peak power 2D addressable VCSEL array and laser driver for true solid-state LiDAR *(Invited Paper)*

Author(s): Yasutaka Higa, Gyongsok Song, Hideki Watanabe, Shuhei Yamaguchi, Sony Group Corp. (Japan); Yoshio Konishi, Hayato Kamizuru, Sony Semiconductor Manufacturing Corp. (Japan); Kiyohisa Sakai, Hirohisa Yasukawa, Sony Semiconductor Solutions Corp. (Japan); Rintaro Koda, Noriyuki Fuutagawa, Sony Group Corp. (Japan)

12439-7 • 10:50 AM - 11:10 AM

Monolithic VCSEL illuminator with integrated holographic beam shaper

Author(s): Feng Zhao, ams-OSRAM AG (United States)

12439-8 • 11:10 AM - 11:30 AM

Single-mode multijunction VCSELs with integrated transverse mode filter

Author(s): Matthew M. Dummer, Amirhossein Ghods, Guoyang Xu, Sara Rothwell, Klein Johnson, ams-OSRAM AG (United States)

12439-9 • 11:30 AM - 11:50 AM

ViBO: VCSEL with integrated backside optics for LiDAR applications

Author(s): Holger Moench, Stephan Gronenborn, TRUMPF Photonic Components GmbH (Germany); Xi Gu, TRUMPF Photonic Components B.V. (Netherlands); Markus Herper, Roman Koerner, Johanna S. Kolb, TRUMPF Photonic Components GmbH (Germany); Armand Pruijmboom, TRUMPF Photonic Components B.V. (Netherlands); Stefan Schlegel, Alexander Weigl, TRUMPF Photonic Components GmbH (Germany)

Conference 12439

12439-31 • 11:50 AM - 12:10 PM

1D addressable multi-channel VCSELs with SPAD arrays for short to medium range LIDARs

Author(s): Hemashilpa Kalagara, Eric Hegblom, Benjamin Kesler, Matthew G. Peters, Guowei Zhao, Lumentum Operations LLC (United States); Kevin Yu, Lumentum Operations LLC (Taiwan)

Lunch/Exhibition Break 12:10 PM - 1:20 PM

SESSION 3: DATA COMMUNICATIONS

1 February 2023 • 1:20 PM - 2:50 PM | Moscone Center, Room 158 (Upper Mezzanine South)

Session Chair: Kent D. Choquette, Univ. of Illinois (United States)

12439-10 • 1:20 PM - 1:50 PM

100G VCSELs for bidirectional multimode links (*Invited Paper*)

Author(s): M. V. Ramana Murty, Jingyi Wang, David Dolfi, An-Nien Cheng, Broadcom Inc. (United States); Zheng-Wen Feng, Sumitro T. Joyo, Aadi Sridhara, Jason Chu, Broadcom, Inc. (Singapore); Laura M. Giovane, Broadcom Inc. (United States)

12439-11 • 1:50 PM - 2:10 PM

VCSELs for optical wireless communication

Author(s): Nasibeh Haghighi, Ferdinand-Braun-Institut (Germany); Weronika Glowadzka, Tomasz G. Czystanowski, Lodz Univ. of Technology (Poland); Denise B. Webb, Sandia National Labs. (United States); Martin Zorn, JENOPTIK Optical Systems GmbH (Germany); John R. Joseph, OptiPulse, Inc. (United States); James A. Lott, Technische Univ. Berlin (Germany)

12439-12 • 2:10 PM - 2:30 PM

100Gb/s short wavelength VCSELs applying a multi-aperture approach

Author(s): Lukasz Chorchos, Warsaw Univ. of Technology (Poland); Nikolay Ledentsov, Oleg Makarov, Vitaly A. Shchukin, Nikolai Ledentsov, Joerg-R. Kropp, VI Systems GmbH (Germany); Jaroslaw P. Turkiewicz, Warsaw Univ. of Technology (Poland); Sarah Cwalina, Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany)

12439-13 • 2:30 PM - 2:50 PM

Effects of detuning on wide-temperature behavior of 25 Gbaud 850 nm VCSELs

Author(s): Hans Daniel Kaimre, Alexander Grabowski, Anders Larsson, Johan Gustavsson, Chalmers Univ. of Technology (Sweden)

Coffee Break 2:50 PM - 3:20 PM

SESSION 4: FABRICATION AND CHARACTERIZATION

1 February 2023 • 3:20 PM - 4:50 PM | Moscone Center, Room 158 (Upper Mezzanine South)

Session Chair: Chun Lei, Lumentum (United States)

12439-14 • 3:20 PM - 3:50 PM

Adjusting VCSEL wavelength and index by etching and regrowth (*Invited Paper*)

Author(s): Darwin K. Serkland, Michael G. Wood, Kent M. Geib, Alejandro J. Grine, Gregory M. Peake, Ping-Show Wong, Victor J. Patel, Sandia National Labs. (United States)

12439-16 • 3:50 PM - 4:10 PM

Impact of VCSEL array geometry on their performance

Author(s): Marcin Gebiski, Dominika Dabrowka, Marta Wieckowska, Patrycja Spiewak, Weronika Glowadzka, Robert P. Sarzala, Michal Wasiak, Lodz Univ. of Technology (Poland); Rafal Pietruszka, Cezary Kobylecki, Iwona Pasternak, Walery Kolkowski, Wlodek Strupinski, VIGO Photonics S.A. (Poland); James A. Lott, Technische Univ. Berlin (Germany); Tomasz Czystanowski, Lodz Univ. of Technology (Poland)

12439-17 • 4:10 PM - 4:30 PM

Reliability and failure mode analysis of high-speed 850-nm oxide confined multi-mode VCSELs for space applications

Author(s): Yongkun Sin, Jesse Theiss, Michael Huang, Zachary Lingley, The Aerospace Corp. (United States)

12439-18 • 4:30 PM - 4:50 PM

Analysis of defect-related optical degradation of VCSILs for photonic integrated circuits

Author(s): Michele Zenari, Matteo Buffolo, Carlo De Santi, Mirko Fornasier, Univ. degli Studi di Padova (Italy); Jeroen Goyvaerts, Univ. Gent (Belgium), imec (Belgium); Alexander Grabowski, Johan Gustavsson, Chalmers Univ. of Technology (Sweden); Sulakshna Kumari, Univ. Gent (Belgium), imec (Belgium); Andim Stassen, imec (Belgium); Roel Baets, Univ. Gent (Belgium), imec (Belgium); Anders Larsson, Chalmers Univ. of Technology (Sweden); Günther Roelkens, Univ. Gent (Belgium), imec (Belgium); Gaudenzio Meneghesso, Enrico Zanoni, Matteo Meneghini, Univ. degli Studi di Padova (Italy)

THURSDAY 2 FEBRUARY

SESSION 5: SENSORS

2 February 2023 • 8:00 AM - 10:30 AM | Moscone Center, Room 158 (Upper Mezzanine South)

Session Chair: M. V. Ramana Murty, Broadcom Inc. (United States)

12439-19 • 8:00 AM - 8:30 AM

650nm Red VCSELs with Improved Temperature Performance (*Invited Paper*)

Author(s): Amirhossein Ghods, Matthew M. Dummer, Klein Johnson, ams-OSRAM AG (United States)

12439-20 • 8:30 AM - 8:50 AM

Design and characterisation of VCSELs for atomic sensor applications

Author(s): Samuel Shutts, Curtis Hentschel, Sara-Jayne Gillgrass, James Meiklejohn, Craig P. Allford, Jack Baker, Josie Nabialek, Cardiff Univ. (United Kingdom); Denise Powell, Compound Semiconductor Ctr. (United Kingdom); Witold Chalupczak, Mohsin Haji, National Physical Lab. (United Kingdom); Wyn Meredith, Compound Semiconductor Ctr. (United Kingdom); Peter M. Smowton, Cardiff Univ. (United Kingdom)

12439-21 • 8:50 AM - 9:10 AM

HCG VCSELs as one-device gas detectors

Author(s): Magdalena Marciniak, Lodz Univ. of Technology (Poland), Instituto de Física Interdisciplinar y Sistemas Complejos, Univ. de les Illes Balears, Consejo Superior de Investigaciones Científicas (Spain); Lukasz Piskorski, Weronika Glowadzka, Tomasz Czystanowski, Lodz Univ. of Technology (Poland)

12439-22 • 9:10 AM - 9:30 AM

Polarization-sensitive imaging using optical coherence tomography and a HCG-VCSEL laser

Author(s): Chien-Hua Peng, Yu-Cheng Mei, Graduate Institute of Photonics and Optoelectronics, National Taiwan Univ. (Taiwan); Hung-Kai Chen, Bandwidth10 Inc. (United States); Ting-Yen Tsai, Ting-Hao Chen, Chuan-Bor Chueh, Graduate Institute of Photonics and Optoelectronics, National Taiwan Univ. (Taiwan); Dalila Ellafi, Chris Chase, Bandwidth10 Inc. (United States); Hao-Chung Kuo, National Yang Ming Chiao Tung Univ. (Taiwan); Michael C. Y. Huang, Bandwidth10 Inc. (United States); Hsiang-Chieh Lee, Graduate Institute of Photonics and Optoelectronics, National Taiwan Univ. (Taiwan)

12439-23 • 9:30 AM - 9:50 AM

VCSEL as sensing element to measure distance changes in the nm-range

Author(s): Axel Günther, Technische Univ. Braunschweig (Germany); Divyaben Korat, Bernhard Roth, Hannoversches Zentrum für Optische Technologien (Germany); Wolfgang Kowalsky, Technische Univ. Braunschweig (Germany); Pavan Kotra, Hannoversches Zentrum für Optische Technologien (Germany)

12439-24 • 9:50 AM - 10:10 AM

Threshold optimization of pulse operating quantum cascade vertical cavity emitting lasers (QC VCSELs)

Author(s): Mikolaj Janczak, Robert P. Sarzala, Maciej Dems, Lodz Univ. of Technology (Poland); Andrzej Kolek, Rzeszów Univ. of Technology (Poland); Maciej Bugajski, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); Włodzimierz Nakwaski, Tomasz Czyszanowski, Lodz Univ. of Technology (Poland)

12439-29 • 10:10 AM - 10:30 AM

Long wavelength dilute nitride VCSELs, edge emitters and detectors for 3D sensing applications

Author(s): Andrew D. Johnson, IQE (United Kingdom); Kalyan Nunna, Andrew Clark, IQE (United States); Andrew Joel, Rodney Pelzel, IQE (United Kingdom)

Coffee Break 10:30 AM - 10:40 AM

SESSION 6: DESIGN, GROWTH, AND FABRICATION SERVICES

2 February 2023 • 10:40 AM - 12:00 PM | Moscone Center, Room 158 (Upper Mezzanine South)

Session Chair: Luke A. Graham, Dallas Quantum Devices, Inc. (United States)

12439-25 • 10:40 AM - 11:00 AM

Characterisation of 200 mm GaAs and Ge substrate VCSELs for high-volume manufacturing

Author(s): Sara-Jayne Gillgrass, Craig P. Allford, Cardiff Univ. (United Kingdom); Andrew D. Johnson, IQE (United Kingdom); Jack Baker, Cardiff Univ. (United Kingdom); Iwan Davies, IQE (United Kingdom); Samuel Shutts, Peter M. Smowton, Cardiff Univ. (United Kingdom)

12439-26 • 11:00 AM - 11:20 AM

Quick fabrication VCSEL characterisation for rapid assessment of epitaxy design & growth

Author(s): Craig P. Allford, Jack Baker, Sara-Jayne Gillgrass, James Meiklejohn, Cardiff Univ. (United Kingdom); Denise Powell, Wyn Meredith, Compound Semiconductor Ctr. (United Kingdom); Tracy Sweet, Iwan Davies, IQE (United Kingdom); Samuel Shutts, Peter M. Smowton, Cardiff Univ. (United Kingdom)

12439-27 • 11:20 AM - 11:40 AM

Near unity internal quantum efficiency and reliable vertical-cavity surface-emitting lasers

Author(s): Wei-Hao Huang, WIN Semiconductors Corp. (Taiwan); Tien-Chang Lu, WIN Semiconductors Corp. (Taiwan); National Yang Ming Chiao Tung Univ. (Taiwan); Kai-Lun Chi, Chun-Tse Chang, Yin-Hsiang Lin, Kai-Sin Cho, WIN Semiconductors Corp. (Taiwan)

12439-28 • 11:40 AM - 12:00 PM

Full vectorial analysis of Surface Relief VCSEL

Author(s): Ahmed Nashed, Michel Lestrade, Z. M. Simon Li, Z. Q. Li, Crosslight Software Inc. (Canada)

Novel In-Plane Semiconductor Lasers XXII

31 January - 2 February 2023 | Moscone Center, Room 157 (Upper Mezzanine South)

Conference Chairs: **Alexey A. Belyanin**, Texas A&M Univ. (United States); **Peter M. Smowton**, Cardiff Univ. (United Kingdom)

Program Committee: **Yasuhiko Arakawa**, Institute of Industrial Science, The Univ. of Tokyo (Japan); **Mikhail A. Belkin**, Technische Univ. München (Germany); **Dan Botez**, Univ. of Wisconsin-Madison (United States); **Federico Capasso**, Harvard John A. Paulson School of Engineering and Applied Sciences (United States); **Gary A. Evans**, Southern Methodist Univ. (United States); **Mariangela Gioannini**, Politecnico di Torino (Italy); **Michael Kneissl**, Technische Univ. Berlin (Germany); **Sophie Lange**, Microsoft Research Ltd. (United Kingdom); **Kei-May Lau**, Hong Kong Univ. of Science and Technology (Hong Kong, China); **Luke F. Lester**, Virginia Polytechnic Institute and State Univ. (United States); **Shinji Matsuo**, NTT Device Technology Labs. (Japan); **Luke J. Mawst**, Univ. of Wisconsin-Madison (United States); **Jerry R. Meyer**, U.S. Naval Research Lab. (United States); **Roberto Paiella**, Boston Univ. (United States); **Katrin Paschke**, Ferdinand-Braun-Institut (Germany); **Richard V.enty**, Univ. of Cambridge (United Kingdom); **Johann Peter Reithmaier**, Univ. Kassel (Germany); **Haisheng Rong**, Intel Corp. (United States); **Gary M. Smith**, MIT Lincoln Lab. (United States); **Nelson Tansu**, The Univ. of Adelaide (Australia); **Miriam S. Vitiello**, Istituto Nanoscienze (Italy); **Qijie Wang**, Nanyang Technological Univ. (Singapore); **Wanhua Zheng**, Institute of Semiconductors, Chinese Academy of Sciences (China)

TUESDAY 31 JANUARY

SESSION 1: LASERS FOR PHOTONIC INTEGRATION

31 January 2023 • 8:00 AM - 9:40 AM | Moscone Center, Room 157 (Upper Mezzanine South)

Session Chair: Johann Peter M. Reithmaier, Univ. Kassel (Germany)

12440-1 • 8:00 AM - 8:20 AM

1.3- μm InAs QD lasers for integrated photonics

Author(s): Lydia Jarvis, Ben Maglio, Sara Gillgrass, Craig P. Allford, Cardiff Univ. (United Kingdom); Fwoziah Albeladi, Cardiff Univ. (United Kingdom), Univ. of Jeddah (Saudi Arabia); Abigail Enderson, Sam Shutts, Cardiff Univ. (United Kingdom); Huiwen Deng, Mingchu Tang, Huiyun Liu, Univ. College London (United Kingdom); Peter M. Smowton, Cardiff Univ. (United Kingdom)

12440-2 • 8:20 AM - 8:40 AM

Improving the reliability of InAs quantum-dot laser diodes for silicon photonics: the role of trapping layers and misfit-dislocation density

Author(s): Matteo Buffolo, Michele Zenari, Carlo De Santi, Univ. degli Studi di Padova (Italy); Chen Shang, Eamon Hughes, Yating Wan, John E. Bowers, Univ. of California, Santa Barbara (United States); Robert W. Herrick, Intel Corp. (United States); Gaudenzio Meneghesso, Enrico Zanoni, Matteo Meneghini, Univ. degli Studi di Padova (Italy)

12440-3 • 8:40 AM - 9:00 AM

Evaluation of 1.3- μm -region emitting InAs QD edge-emitting lasers over 150-mm substrates

Author(s): Sara-Jayne Gillgrass, Craig P. Allford, Cardiff Univ. (United Kingdom); Mukul Debnath, Andrew Clark, IQE plc (United States); Peter M. Smowton, Cardiff Univ. (United Kingdom)

12440-4 • 9:00 AM - 9:20 AM

800 nm narrow linewidth tunable hybrid laser based on a dual microring external cavity

Author(s): Raimond Frentrop, Noor A. Schilder, Arnoud S. Everhardt, Edwin J. Klein, Douwe H. Geuzebroek, LioniX International BV (Netherlands); Lisa V. Winkler, Univ. Twente (Netherlands), TOPTICA Photonics AG (Germany); Jason Ensher, Insight Photonic Solutions, Inc. (United States); René G. Heideman, LioniX International BV (Netherlands); Carl Kelly, Insight Photonic Solutions (United States)

12440-6 • 9:20 AM - 9:40 AM

InAs quantum dots emitting in C and L-wavelength band

Author(s): Samuel Shutts, Zhongming Cao, Bogdan Ratiu, Oumaima Abouzaid, Maryam Alsayyadi, Josie Nabialek, Ben Salmond, Harry Gordon-Moys, Craig P. Allford, Sara-Jayne Gillgrass, Qiang Li, Peter M. Smowton, Cardiff Univ. (United Kingdom)

Coffee Break 9:40 AM - 10:10 AM

SESSION 2: DFB AND DBR

31 January 2023 • 10:10 AM - 11:50 AM | Moscone Center, Room 157 (Upper Mezzanine South)

Session Chair: Gary A. Evans, Southern Methodist Univ. (United States)

12440-7 • 10:10 AM - 10:30 AM

Modulated DFB ridge laser diodes at 894 nm for compact Cesium CPT atomic clocks

Author(s): Michel Krakowski, Maxime Meghnagi, Paulo Afuso Roxo, Borge Vinter, François Duport, Frederic Van Dijk, Alexandre Larrue, Claire Thevenneau, Eric Vinet, Yannick Robert, Jean-Pierre Legoec, Michel Garcia, Olivier Parillaud, Bruno Gerard, III-V Lab. (France)

12440-8 • 10:30 AM - 10:50 AM

Comparison of dual-wavelength Y-branch DBR single chip diode lasers and diode laser arrays at 785 nm

Author(s): Lara Sophie Theurer, Martin Maiwald, André Müller, Jörg Fricke, Andrea Knigge, Bernd Sumpf, Günther Tränkle, Ferdinand-Braun-Institut (Germany)

12440-9 • 10:50 AM - 11:10 AM

Comparison of micro integrated dual-wavelength master oscillator power amplifiers at 785 nm

Author(s): André Müller, Martin Maiwald, Bernd Sumpf, Ferdinand-Braun-Institut (Germany)

12440-10 • 11:10 AM - 11:30 AM

Sub-4 kHz linewidth distributed feedback lasers at 778.1 nm wavelength for two-photon Rb spectroscopy

Author(s): Eugenio Di Gaetano, Univ. of Glasgow (United Kingdom); Brendan Keliehor, Paul Griffin, Univ. of Strathclyde (United Kingdom); Marc Sorel, Univ. of Glasgow (United Kingdom); Erling Riis, Univ. of Strathclyde (United Kingdom); Douglas J. Paul, Univ. of Glasgow (United Kingdom)

12440-11 • 11:30 AM - 11:50 AM

Novel >57GHz bandwidth O-band InGaAlAs MQW RW Dual DFB

Author(s): Gayatri Vasudevan Rajeswari, Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany)

Lunch/Exhibition Break 11:50 AM - 1:10 PM

SESSION 3: EPITAXIAL GROWTH AND MATERIAL PHYSICS

31 January 2023 • 1:10 PM - 3:20 PM | Moscone Center, Room 157 (Upper Mezzanine South)

Session Chair: Michael Kneissl, Technische Univ. Berlin (Germany)

12440-12 • 1:10 PM - 1:40 PM

Development of AlGaIn-based laser diodes in the UV-A to UV-B regions *(Invited Paper)*

Author(s): Motoaki Iwaya, Meijo Univ. (Japan); Sho Iwayama, Meijo Univ. (Japan); Mie Univ. (Japan); Tetsuya Takeuchi, Satoshi Kamiyama, Meijo Univ. (Japan); Hideto Miyake, Mie Univ. (Japan)

12440-13 • 1:40 PM - 2:00 PM

Mechanisms limiting the operation time of UVB Al(In) GaN quantum well light emitters

Author(s): Jens W. Tömm, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); Jan Ruschel, Hyun Kyong Cho, Sven Einfeldt, Ferdinand-Braun-Institut (Germany)

12440-14 • 2:00 PM - 2:20 PM

Semi-insulating InP:Fe growth by hydride vapor phase epitaxy for advanced buried heterostructure quantum cascade lasers

Author(s): Axel Strömberg, Balaji Manavaimaran, Xiaodan Pang, Richard Schatz, Oskars Ozolins, Sebastian Lourduodoss, KTH Royal Institute of Technology (Sweden); David Stark, Mattias Beck, Giacomo Scalari, Jérôme Faist, ETH Zurich (Switzerland); Jae Ha Ryu, Luke J. Mawst, Dan Botez, Univ. of Wisconsin-Madison (United States); Robert Marsland, Intraband, LLC (United States); Grégory Maisons, Mathieu Carras, mirSense (France); Yan-Ting Sun, KTH Royal Institute of Technology (Sweden)

12440-15 • 2:20 PM - 2:40 PM

2D selective area growth for photonic crystal surface emitting lasers

Author(s): Xingyu Zhao, Adam F. McKenzie, Connor W. Munro, Jingzhao Liu, Sam L. Bayliss, Katherine J. Hill, Daehyun Kim, Richard A. Hogg, Univ. of Glasgow (United Kingdom)

12440-16 • 2:40 PM - 3:00 PM

Polariton Bose-Einstein condensate from a topologically protected state

Author(s): Fabrizio Riminucci, Lawrence Berkeley National Lab. (United States); Vincenzo Ardizzone, Istituto di Nanotecnologia (Italy); Adam Schwartzberg, Lawrence Berkeley National Lab. (United States); Daniele Sanvitto, Istituto di Nanotecnologia (Italy)

12440-61 • 3:00 PM - 3:20 PM

Engineering scalable in-plane semiconductor lasers for high volume manufacturing

Author(s): Andrew Clark, IQE (United States); Andrew Johnson, Matthew Geen, IQE (United Kingdom); Mark Furlong, IQE Silicon Compounds Ltd. (United Kingdom); Rodney Pelzel, IQE (United Kingdom)

Coffee Break 3:20 PM - 3:50 PM

SESSION 4: MID-INFRARED LASERS

31 January 2023 • 3:50 PM - 5:50 PM | Moscone Center, Room 157 (Upper Mezzanine South)

Session Chair: Xiaojun Wang, AdTech Photonics, Inc. (United States)

12440-18 • 3:50 PM - 4:10 PM

Concentric double-ring interband cascade lasers for bi-color emission in continuous wave mode

Author(s): Georg Marschick, Hedwig Knötig, Technische Univ. Wien (Austria); Robert Weih, Johannes Koeth, nanoplus Nanosystems and Technologies GmbH (Germany); Gottfried Strasser, Borislav Hinkov, Technische Univ. Wien (Austria)

12440-19 • 4:10 PM - 4:30 PM

Continuous-wave single-mode slotted interband cascade lasers emitting at 3.5 μm

Author(s): Jordan A. Fordyce, Univ. de Montpellier (France), Tyndall National Institute (Ireland), Munster Technological Univ. (Ireland); Daniel Diaz-Thomas, Univ. de Montpellier (France); Tomasz Piwonski, Tyndall National Institute (Ireland), Munster Technological Univ. (Ireland); Alexei N. Baranov, Univ. de Montpellier (France); Liam O'Faolain, Tyndall National Institute (Ireland), Munster Technological Univ. (Ireland); Laurent Cerutti, Univ. de Montpellier (France)

12440-20 • 4:30 PM - 4:50 PM

Interband cascade lasers emitting beyond 6 μm in cw by mitigation of valence intersubband absorption

Author(s): Robert Weih, Josephine Nauschütz, nanoplus Nanosystems and Technologies GmbH (Germany); Benedikt Schwarz, Hedwig Knötig, Technische Univ. Wien (Austria); Johannes Koeth, nanoplus Nanosystems and Technologies GmbH (Germany)

12440-17 • 4:50 PM - 5:10 PM

Progress in interband cascade lasers with advanced waveguides operating near 3.3 and 3.4 μm

Author(s): Jeremy A. Massengale, Yixuan Shen, Rui Q. Yang, Tetsuya D. Mishima, Michael B. Santos, The Univ. of Oklahoma (United States)

12440-21 • 5:10 PM - 5:30 PM

Correlation of emission wavelength with cross-plane thermal conductivity in InAlAs/InGaAs quantum cascade lasers

Author(s): Alejandro M. Villalobos-Meza, Monas Shahzad, Dagan Hathaway, Univ. of Central Florida (United States); Hong Shu, IRGLARE, LLC (United States); Arkadiy Lyakh, Univ. of Central Florida (United States)

Thermal management of integrated multi-emitter quantum cascade lasers platform

Author(s): Dorota Pierscinska, Grzegorz Sobczak, Krzysztof Michalak, Joanna Branas, Aleksandr Kuzmich, Kamil Pierscinski, Lukaszewicz Research Network - Institute of Microelectronics and Photonics (Poland)

Conference 12440

WEDNESDAY 1 FEBRUARY

SESSION 5: VERTICALLY COUPLED IN-PLANE LASERS

1 February 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 157 (Upper Mezzanine South)

Session Chair: Luke J. Mawst, Univ. of Wisconsin-Madison (United States)

12440-23 • 8:00 AM - 8:30 AM

High-peak-power short-pulse generation from photonic-crystal surface-emitting lasers (*Invited Paper*)

Author(s): Takuya Inoue, Ryohei Morita, Susumu Noda, Kyoto Univ. (Japan)

Show Abstract +

12440-24 • 8:30 AM - 8:50 AM

convergence criteria for probabilistic Markov chains modelling of photonic crystal surface emitting lasers

Author(s): Jingzhao Liu, Daehyun Kim, Jianyang Feng, Yunyun Gao, Richard A. Hogg, Univ. of Glasgow (United Kingdom)

12440-25 • 8:50 AM - 9:10 AM

High-power single-lobe-beam operation of 1.3- μ m InP-based double-lattice photonic-crystal surface-emitting lasers

Author(s): Yuhki Itoh, Naoya Kouno, Kosuke Fujii, Hiroyuki Yoshinaga, Naoki Fujiwara, Sumitomo Electric Industries, Ltd. (Japan), Kyoto Univ. (Japan); Makoto Ogasawara, Rei Tanaka, Hideki Yagi, Masaki Yanagisawa, Sumitomo Electric Industries, Ltd. (Japan); Masahiro Yoshida, Takuya Inoue, Menaka De Zoysa, Kenji Ishizaki, Susumu Noda, Kyoto Univ. (Japan)

12440-26 • 9:10 AM - 9:30 AM

Epitaxially regrown quantum dot photonic crystal surface emitting laser

Author(s): AyeSuMon Kyaw, Ben C. King, Adam F. McKenzie, Zijun Bian, Daehyun Kim, Neil D. Gerrard, Jingzhao Liu, Xingyu Zhao, Univ. of Glasgow (United Kingdom); Kenichi Nishi, Keizo Takemasa, Mitsuru Sugawara, QD Laser, Inc. (Japan); David T. D. Childs, Calum H. Hills, Vector Photonics Ltd. (United Kingdom); Iain M. E. Butler, Defence Science and Technology Lab. (United Kingdom); Richard J. E. Taylor, Vector Photonics Ltd. (United Kingdom); Richard A. Hogg, Univ. of Glasgow (United Kingdom), Vector Photonics Ltd. (United Kingdom)

12440-27 • 9:30 AM - 10:00 AM

The Berkeley Surface Emitting Laser (BerkSEL) (*Invited Paper*)

Author(s): Boubacar Kanté, Univ. of California, Berkeley (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 6: QCL FREQUENCY COMBS

1 February 2023 • 10:30 AM - 12:20 PM | Moscone Center, Room 157 (Upper Mezzanine South)

Session Chair: Alexey Belyanin, Texas A&M Univ. (United States)

12440-28 • 10:30 AM - 11:00 AM

Solitons and pulses from quantum cascade laser combs (*Invited Paper*)

Author(s): Jérôme Faist, ETH Zurich (Switzerland)

12440-29 • 11:00 AM - 11:30 AM

Quantum cascade laser frequency combs induced by a giant Kerr nonlinearity (*Invited Paper*)

Author(s): Benedikt Schwarz, Nikola Opacak, Florian Pilat, Technische Univ. Wien (Austria); Dmitry Kazakov, Harvard John A. Paulson School of Engineering and Applied Sciences (United States); Sandro Dal Cin, Maximilian Beiser, Technische Univ. Wien (Austria); Lorenzo Luigi L. Colombo, Politecnico di Torino (Italy); Johannes Hillbrand, Technische Univ. Wien (Austria); Marco Piccardo, Federico Capasso, Harvard John A. Paulson School of Engineering and Applied Sciences (United States)

12440-30 • 11:30 AM - 12:00 PM

Parametric processes and nonlinear dynamics of self-starting frequency combs (*Invited Paper*)

Author(s): Nikola Opacak, Technische Univ. Wien (Austria); Dmitry Kazakov, Harvard Univ. (United States); Lorenzo L. Colombo, Politecnico di Torino (Italy); Maximilian Beiser, Florian Pilat, Gottfried Strasser, Technische Univ. Wien (Austria); Massimo Brambilla, Politecnico di Bari (Italy); Franco Prati, Univ. degli Studi dell'Insubria (Italy); Marco Piccardo, Istituto Italiano di Tecnologia (Italy); Federico Capasso, Harvard Univ. (United States); Benedikt Schwarz, Technische Univ. Wien (Austria)

12440-31 • 12:00 PM - 12:20 PM

Quantum cascade laser frequency comb at $\lambda \sim 5.3 \mu\text{m}$ with double-plasmon waveguide design

Author(s): Richard Maulini, Sargis Hakobyan, Stéphane Blaser, Tobias Gresch, Antoine Muller, Alpes Lasers SA (Switzerland)

Lunch/Exhibition Break 12:20 PM - 1:40 PM

SESSION 7: RING QCLS AND INTEGRATED MID-IR PHOTONICS

1 February 2023 • 1:40 PM - 3:10 PM | Moscone Center, Room 157 (Upper Mezzanine South)

Session Chair: Qi Jie Wang, Nanyang Technological Univ. (Singapore)

12440-32 • 1:40 PM - 2:10 PM

Ring quantum cascade lasers as versatile photonic components for the mid-infrared (*Invited Paper*)

Author(s): Dmitry Kazakov, Harvard John A. Paulson School of Engineering and Applied Sciences (United States); Theodore P. Letsou, Harvard John A. Paulson School of Engineering and Applied Sciences (United States), Massachusetts Institute of Technology (United States); Nikola Opacak, Technische Univ. Wien (Austria), Harvard John A. Paulson School of Engineering and Applied Sciences (United States); Maximilian Beiser, Sandro Dal Cin, Technische Univ. Wien (Austria); Lorenzo L. Colombo, Politecnico di Torino (Italy); Massimo Brambilla, Politecnico di Bari (Italy); Franco Prati, Luigi Lugiato, Univ. degli Studi dell'Insubria (Italy); Marco Piccardo, Istituto Italiano di Tecnologia (Italy), Harvard John A. Paulson School of Engineering and Applied Sciences (United States); Benedikt Schwarz, Technische Univ. Wien (Austria), Harvard John A. Paulson School of Engineering and Applied Sciences (United States); Federico Capasso, Harvard John A. Paulson School of Engineering and Applied Sciences (United States)

12440-33 • 2:10 PM - 2:40 PM

Solitary structures and optical frequency combs in a ring quantum cascade laser (*Invited Paper*)

Author(s): Lorenzo Luigi L. Columbo, Politecnico di Torino (Italy); Massimo Brambilla, CNR-Istituto di Fotonica e Nanotecnologie, Politecnico di Bari (Italy); Franco Prati, Univ. degli Studi dell'Insubria (Italy); Nikola Opacak, Institut für Festkörperphysik, Technische Univ. Wien (Austria); Dmitry Kazakov, Marco Piccardo, Harvard John A. Paulson School of Engineering and Applied Sciences (United States); Benedikt Schwarz, Institut für Festkörperphysik, Technische Univ. Wien (Austria); Luigi Lugiato, Univ. degli Studi dell'Insubria (Italy); Federico Capasso, Harvard John A. Paulson School of Engineering and Applied Sciences (United States)

12440-34 • 2:40 PM - 3:10 PM

Mid-infrared photonic integration on InP (*Invited Paper*)

Author(s): Kevin Zhang, Dominik Burghart, Edoardo De Toma, Rudolf Mayer, Alexander Gardanow, Gerhard Boehm, Mikhail A. Belkin, Walter Schottky Institut (Germany)

Coffee Break 3:10 PM - 3:40 PM

SESSION 8: QCL APPLICATIONS: QUANTUM TECHNOLOGIES, HIGH-SPEED COMMUNICATIONS, AND MODULATION

1 February 2023 • 3:40 PM - 5:40 PM | Moscone Center, Room 157 (Upper Mezzanine South)

Session Chair: Miriam S. Vitiello, Istituto Nanoscienze (Italy)

12440-35 • 3:40 PM - 4:10 PM

Designing and controlling quantum cascade lasers for quantum technologies: towards a new generation of infrared sub-classical sources (*Invited Paper*)

Author(s): Francesco Cappelli, Simone Borri, Luigi Consolino, Istituto Nazionale di Ottica (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); Tecla Gabbriellini, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); Giacomo Roati, Istituto Nazionale di Ottica (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); Mauro Giuntini, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); Alessio Montori, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), ppqSense S.r.l. (Italy); Alessandro Zavatta, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), QTI S.R.L. (Italy); Mario Siciliani de Cumis, Agenzia Spaziale Italiana (Italy); Natalia Bruno, Paolo De Natale, Istituto Nazionale di Ottica (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); Maurizio De Rosa, Iolanda Ricciardi, CNR-INO (Italy)

12440-36 • 4:10 PM - 4:40 PM

Multi GHz free space optics in the thermal-infrared atmospheric window (*Invited Paper*)

Author(s): Carlo Sirtori, Ecole Normale Supérieure (France)

12440-37 • 4:40 PM - 5:10 PM

Recent advances in high-speed data communications using mid-infrared quantum cascade lasers (*Invited Paper*)

Author(s): Frédéric Grillot, Pierre Didier, Télécom Paris (France); Hamza Dely, Thomas Bonazzi, Ecole Normale Supérieure (France); Olivier Spitz, Univ. of Central Florida (United States); Elie Awwad, Télécom Paris (France); Etienne Rodriguez, Angela Vasanelli, Carlo Sirtori, Ecole Normale Supérieure (France)

12440-38 • 5:10 PM - 5:40 PM

Mid-infrared saturable absorbers with ultra-low saturation intensities: towards mid-IR SESAMs (*Invited Paper*)

Author(s): Mathieu Jeannin, Jean-Michel Manceau, Eduardo Cosentino, Stefano Pirota, Mario Malerba, Ctr. de Nanosciences et de Nanotechnologies (France); Giorgio Biasiol, Istituto Officina dei Materiali, Consiglio Nazionale delle Ricerche (Italy); Raffaele Colombelli, Ctr. de Nanosciences et de Nanotechnologies (France)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12440-58

Spin-on-glass in the technology of InAs-based quantum cascade lasers

Author(s): Kumar Kinjalk, Ariane Meguekam, Daniel Andres Diaz-Thomas, Institut d'Électronique et des Systèmes (France), Univ. de Montpellier (France), CNRS (France); Zeineb Loughmari, mirSense (France); Michael Bahriz, Institut d'Électronique et des Systèmes (France), Univ. de Montpellier (France), CNRS (France); Roland Teissier, mirSense (France); Alexei N. Baranov, Institut d'Électronique et des Systèmes (France), Univ. de Montpellier (France), CNRS (France)

12440-59

Delayed differential equation based study of sub-terahertz emission in multi-section quantum dot ring lasers

Author(s): Emanuele Groppo, Lorenzo Tunesi, Paolo Bardella, Politecnico di Torino (Italy)

12440-60

Design strategies for GaAs-based THz quantum-cascade lasers in the 5-6 THz range

Author(s): Mohammad Shahili, Benjamin S. Williams, Univ. of California, Los Angeles (United States)

12440-5

Improving optical feedback tolerance in a III-V DFB laser for integration in silicon photonic platforms

Author(s): Cristina Rimoldi, Lorenzo L. Columbo, Politecnico di Torino (Italy); Jock Bovington, Sebastian Romero-García, Cisco Optical GmbH (Germany); Mariangela Gioannini, Politecnico di Torino (Italy)

Conference 12440

THURSDAY 2 FEBRUARY

SESSION 9: HIGH BRIGHTNESS I

2 February 2023 • 8:20 AM - 10:00 AM | Moscone Center, Room 157 (Upper Mezzanine South)

Session Chair: Gary M. Smith, MIT Lincoln Lab. (United States)

12440-47 • 8:20 AM - 8:40 AM

Semiconductor optical amplifier integrated on a single mode quantum cascade laser in the mid-infrared region

Author(s): Lauréline Durupt, mirSense (France), Lab. de Physique de l'Ecole Normale Supérieure (France); Grégory Maisons, Johan Abautret, Maxime Guais, Roland Teissier, mirSense (France); Djamal Gacemi, Angela Vasanelli, Carlo Sirtori, Lab. de Physique de l'Ecole Normale Supérieure (France)

12440-39 • 8:40 AM - 9:00 AM

Investigation of distributed Bragg reflectors tapered-ridge-waveguide lasers under nanosecond high pulse current excitation

Author(s): Heike C. P. Christopher, Maximilian Beier, Jörg Fricke, Johannes Glaab, Armin Liero, Andre Maassdorf, Jan-Philipp Koester, Hans Wenzel, Andrea Knigge, Ferdinand-Braun-Institut (Germany)

12440-40 • 9:00 AM - 9:20 AM

High optical power pulsed laser structures at 905 nm for automotive LIDAR

Author(s): Michel Krakowski, Maxime Meghnagi, Paulo Afuso Roxo, Patrick Resneau, Claire Theveneau, Eva Izquierdo, Jean-Pierre Legoe, Eric Vinet, Yannick Robert, Michel Garcia, Olivier Parillaud, Bruno Gerard, III-V Lab. (France)

12440-41 • 9:20 AM - 9:40 AM

Spectral linewidth narrowing and beam combining of linear 1D array of high-power broad-area blue diodes (447nm) via external cavity

Author(s): Parashu R. Nyaupane, Olivier Spitz, Patrick L. Likamwa, Yehuda Braiman, Gregory Scranton, Univ. of Central Florida (United States)

12440-42 • 9:40 AM - 10:00 AM

Coherent combination of microsecond-pulse tapered amplifiers for a water-vapor differential absorption lidar

Author(s): Qin Liu, Clément Marque, Sylvie Janicot, Patrick Georges, Gaëlle Lucas-Leclin, Lab. Charles Fabry (France)

Coffee Break 10:00 AM - 10:30 AM

SESSION 10: HIGH BRIGHTNESS II

2 February 2023 • 10:30 AM - 11:30 AM | Moscone Center, Room 157 (Upper Mezzanine South)

Session Chair: Katrin Paschke, Ferdinand-Braun-Institut (Germany)

12440-43 • 10:30 AM - 10:50 AM

Red laser diodes explore the future of biomedical and quantum technology

Author(s): Masato Hagimoto, Shintaro Miyamoto, Kyohei Watanabe, Manabu Hashizume, Kazuaki Yano, Ushio Inc. (Japan)

12440-44 • 10:50 AM - 11:10 AM

Reliable operation of 1064 nm DBR tapered lasers and monolithic master oscillator tapered amplifiers at output powers up to 7 W

Author(s): Bernd Sumpf, Christof Zink, Andre Maassdorf, Jörg Fricke, Peter Ressel, André Müller, Martin Maiwald, Andrea Knigge, Günther Tränkle, Ferdinand-Braun-Institut (Germany)

12440-45 • 11:10 AM - 11:30 AM

Efficiency optimization of ridge waveguide amplifiers at 1122 nm

Author(s): Nils Werner, Marie Triebkorn, Arnim Ginolas, Sabrina Kreutzmann, Philipp Hildenstein, Katrin Paschke, Günther Tränkle, Ferdinand-Braun-Institut (Germany)

Lunch/Exhibition Break 11:30 AM - 1:00 PM

SESSION 11: THZ QCLS

2 February 2023 • 1:00 PM - 2:40 PM | Moscone Center, Room 157 (Upper Mezzanine South)

Session Chair: Benedikt Schwarz, Technische Univ. Wien (Austria)

12440-48 • 1:00 PM - 1:30 PM

Graphene-coupled passive mode-locked terahertz laser (Invited Paper)

Author(s): Miriam S. Vitiello, Istituto Nanoscienze (Italy)

12440-49 • 1:30 PM - 2:00 PM

Planarized THz quantum cascade lasers for broadband coherent photonics (Invited Paper)

Author(s): Giacomo Scalari, Urban Senica, Paolo Micheletti, Andres Forrer, ETH Zurich (Switzerland); Sara Cibella, Guido Torrioli, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Mattias Beck, Jérôme Faist, ETH Zurich (Switzerland)

12440-50 • 2:00 PM - 2:20 PM

Terahertz quantum cascade ring lasers: comb operation and integration on Si-substrates

Author(s): Michael Jaidl, Nikola Opacak, Dominik Theiner, Marie Ertl, Benedikt Limbacher, Maximilian Beiser, Miriam Giparakis, M. A. Andrews, Gottfried Strasser, Benedikt Schwarz, Karl Unterrainer, Technische Univ. Wien (Austria)

12440-52 • 2:20 PM - 2:40 PM

RF injection locking of THz metasurface quantum-cascade-VECSEL

Author(s): Yu Wu, Univ. of California, Los Angeles (United States); Christopher A. Curwen, Jet Propulsion Lab. (United States); John L. Reno, Sandia National Labs. (United States); Benjamin S. Williams, Univ. of California, Los Angeles (United States)

Coffee Break 2:40 PM - 3:10 PM

SESSION 12: MID-INFRARED QCLS: HIGH-POWER, ARRAYS, AND INTEGRATION

2 February 2023 • 3:10 PM - 5:00 PM | Moscone Center, Room 157 (Upper Mezzanine South)

Session Chair: Dmitry Kazakov, Harvard John A. Paulson School of Engineering and Applied Sciences (United States)

12440-53 • 3:10 PM - 3:40 PM

Monolithic coherent power scaling of mid-ir quantum cascade lasers *(Invited Paper)*

Author(s): Luke J. Mawst, Jae Ha Ryu, Jeremy D. Kirch, Morgan Turville-Heitz, Shuqi Zhang, Dan Botez, Univ. of Wisconsin-Madison (United States); Benjamin B. Knipfer, Robert Marsland, Steve Jacobs, Intraband, LLC (United States); Axel Strömberg, Yan-Ting Sun, Sebastian Lourduoss, KTH Royal Institute of Technology (Sweden); Tom Earles, Steven Ruder, Kevin Oresick, Chris Galstad, Mike Klaus, DRS Daylight Solutions (United States)

12440-54 • 3:40 PM - 4:00 PM

High Power RT Quasi-CW 4.6 μ m Quantum Cascade Laser (QCL) Arrays

Author(s): Xiaojun Wang, AdTech Photonics, Inc. (United States)

12440-55 • 4:00 PM - 4:20 PM

Multiplexed quantum cascade laser sources for multi-species gas sensing using photonic integration

Author(s): Dominik Burghart, Kevin Zhang, Gerhard Boehm, Mikhail A. Belkin, Walter Schottky Institut (Germany)

12440-56 • 4:20 PM - 4:40 PM

Graded-interfaces modeling of record-performance mid and long-wave infrared quantum cascade lasers

Author(s): Suraj Suri, Univ. of Wisconsin-Madison (United States); Benjamin B. Knipfer, Intraband, LLC (United States); Thomas Grange, nextnano GmbH (France); Huilong Gao, Jeremy D. Kirch, Luke J. Mawst, Univ. of Wisconsin-Madison (United States); Robert Marsland, Intraband, LLC (United States); Dan Botez, Univ. of Wisconsin-Madison (United States)

12440-57 • 4:40 PM - 5:00 PM

Beam quality analysis for tree-array quantum cascade laser arrays based on multi-mode interference couplers and broad-area emitters

Author(s): Luke Milbocker, Arkadiy Lyakh, Univ. of Central Florida (United States); Hong Shu, IRGLARE, LLC (United States); Guifang Li, Dhruvkumar Desai, Univ. of Central Florida (United States); Enrique Sanchez, IRGLARE, LLC (United States)

Light-Emitting Devices, Materials, and Applications XXVII

30 January - 1 February 2023 | Moscone Center, Room 153 (Upper Mezzanine South)

Conference Chairs: **Jong Kyu Kim**, Pohang Univ. of Science and Technology (Republic of Korea); **Michael R. Krames**, Arkesso, LLC (United States); **Martin Strassburg**, ams-OSRAM International GmbH (Germany)

Program Committee: **Jim R. Bonar**, Meta (United States); **Yong-Hoon Cho**, KAIST (Republic of Korea); **Aurelien David**, Google (United States); **Amélie Dussaigne**, CEA-LETI (France); **Kolja Haberland**, LayTec AG (Germany); **Jana Hartmann**, Technische Univ. Braunschweig (Germany); **Michael Heuken**, AIXTRON SE (Germany); **Christoph G. A. Hoelen**, Signify N.V. (Netherlands); **Hee Jin Kim**, Lumileds, LLC (United States); **Juanita N. Kurtin**, OSRAM Opto Semiconductors Inc. (United States); **Soo Min Lee**, Veeco Instruments Inc. (United States); **Yun-Li Li**, PlayNitride Inc. (Taiwan); **Tien-Chang Lu**, National Yang Ming Chiao Tung Univ. (Taiwan); **Koh Matsumoto**, Nagoya Univ. (Japan); **Matteo Meneghini**, Univ. degli Studi di Padova (Italy); **Klaus P. Streubel**, OSRAM GmbH (United States); **Tetsuya Takeuchi**, Meijo Univ. (Japan); **Rie Togashi**, Sophia Univ. (Japan); **Marie Anne van de Haar**, Seaborough Research B.V. (Netherlands); **Dong-Sing Wu**, National Chung Hsing Univ. (Taiwan); **Erin C. Young**, Apple Inc. (United States)

MONDAY 30 JANUARY

OPTO PLENARY SESSION

30 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 207/215 (Level 2 South)

8:00 AM - 8:05 AM: **Welcome and Opening Remarks**

Sonia García-Blanco, Univ. Twente (Netherlands) and Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

8:05 AM - 8:15 AM: **Announcement of the OPTO AI/ML and Net Zero Best Paper Awards**

12424-501 • 8:15 AM - 8:50 AM

High-performance electronic-photonic interfaces: from AI to quantum (*Plenary Presentation*)

Author(s): Rajeev Ram, Massachusetts Institute of Technology (United States)

12416-501 • 8:50 AM - 9:25 AM

Tandem photovoltaic devices: more than one way to make a solar cell (*Plenary Presentation*)

Author(s): Emily L. Warren, National Renewable Energy Lab. (United States)

12421-501 • 9:25 AM - 10:00 AM

Are III-nitride semiconductors also suitable for red emission? (*Plenary Presentation*)

Author(s): Nicolas Grandjean, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 1: MICRO LEDS AND AR/VR/MR/XR I

30 January 2023 • 10:30 AM - 12:20 PM | Moscone Center, Room 153 (Upper Mezzanine South)

Session Chair: Michael R. Krames, Arkesso, LLC (United States)

12441-1 • 10:30 AM - 11:00 AM

Performance of MicroLED chip and display for different applications (*Invited Paper*)

Author(s): Yun-Li Li, PlayNitride Inc. (Taiwan)

12441-2 • 11:00 AM - 11:30 AM

Relaxed InGaN templates as a basis for ultra-small RGB-emitting microLEDs (*Invited Paper*)

Author(s): Zhaoxia Bi, Lund Univ. (Sweden), Hexagem AB (Sweden); Jovana Colvin, Hexagem AB (Sweden), Lund Univ. (Sweden); Anders Gustafsson, Rainer Timm, Reine Wallenberg, Bo Monemar, Lund Univ. (Sweden); Mikael Björk, Hexagem AB (Sweden); Lars Samuelson, Lund Univ. (Sweden), Hexagem AB (Sweden), Southern Univ. of Science and Technology of China (China)

12441-3 • 11:30 AM - 11:50 AM

A compact design of passive and active matrix micro light-emitting diode array using resistive-switching memristor

Author(s): Ho Jin Lee, Seok Hee Hong, Korea Univ. (Republic of Korea); Wanqi Ren, Korea Univ. (China); Nahyun Kim, Hwi Geun Kim, Tae Ho Kim, Tae Geun Kim, Korea Univ. (Republic of Korea)

12441-65 • 11:50 AM - 12:20 PM

LED applications of electrochemical sub-surface porosification of nitrides (*Invited Paper*)

Author(s): Rachel A. Oliver, Univ. of Cambridge (United Kingdom)

Lunch Break 12:20 PM - 1:50 PM

SESSION 2: UV EMITTERS I

30 January 2023 • 1:50 PM - 4:10 PM | Moscone Center, Room 153 (Upper Mezzanine South)

Session Chair: Siddharth Rajan, The Ohio State Univ. (United States)

12441-4 • 1:50 PM - 2:20 PM

AlGaIn and BN Far UV-C LEDs (*Invited Paper*)

Author(s): Zetian Mi, Univ. of Michigan (United States)

12441-5 • 2:20 PM - 2:50 PM

III-N materials for UV light emitters: from atomistic structure to optical properties (*Invited Paper*)

Author(s): Stefan Schulz, Tyndall National Institute (Ireland), Univ. College Cork (Ireland)

12441-6 • 2:50 PM - 3:20 PM

Performance of high power deep ultraviolet light-emitting diodes and factors limiting the lifetime (*Invited Paper*)

Author(s): Jianping Zhang, Ling Zhou, Ying Gao, Alexander Lunev, Shuai Wu, Bolb, Inc. (United States)

12441-7 • 3:20 PM - 3:50 PM

Theoretical characterization and computational discovery of AlGaIn and BN UV light emitters with predictive atomistic calculations (*Invited Paper*)

Author(s): Emmanouil Kioupakis, Univ. of Michigan (United States)

12441-8 • 3:50 PM - 4:10 PM

UVC LED reliability and its effect on disinfection systems design

Author(s): Nicola Trivellin, Francesco Piva, Matteo Buffolo, Carlo De Santi, Enrico Zanon, Gaudenzio Meneghesso, Matteo Meneghini, Univ. degli Studi di Padova (Italy)

Coffee Break 4:10 PM - 4:40 PM

SESSION 3: LED GROWTH AND APPLICATIONS I

30 January 2023 • 4:40 PM - 6:10 PM | Moscone Center, Room 153 (Upper Mezzanine South)

Session Chair: Jong Kyu Kim, Pohang Univ. of Science and Technology Session

12441-9 • 4:40 PM - 5:10 PM

Challenges and opportunities of nitride light emitting devices by HVPE thanks to a stable Mg source (*Invited Paper*)

Author(s): Koh Matsumoto, Kazuki Ohnishi, Hiroshi Amano, Nagoya Univ. (Japan)

12441-10 • 5:10 PM - 5:40 PM

Enabling GaN based MicroLEDs using leading-edge single wafer MOCVD technology (*Invited Paper*)

Author(s): Rudy Parekh, Bumjoon Kim, Soo Min Lee, Swaminathan Srinivasan, Drew Hanser, Anil Vijayendran, Veeco Instruments Inc. (United States)

12441-11 • 5:40 PM - 6:10 PM

Unconventional epitaxy for fabricating deformable and heterogeneously integrated devices (*Invited Paper*)

Author(s): Young Joon Hong, Sejong Univ. (Republic of Korea)

TUESDAY 31 JANUARY

SESSION 4: UV EMITTERS II

31 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 153 (Upper Mezzanine South)

Session Chair: Zetian Mi, Univ. of Michigan (United States)

12441-12 • 8:00 AM - 8:30 AM

Development in AlGaIn homojunction tunnel junction deep UV LEDs (*Invited Paper*)

Author(s): Kengo Nagata, Toyoda Gosei Co., Ltd. (Japan); Satoshi Anada, Japan Fine Ceramics Ctr. (Japan); Yoshiki Saito, Toyoda Gosei Co., Ltd. (Japan); Maki Kushimoto, Yoshio Honda, Nagoya Univ. (Japan); Tetsuya Takeuchi, Meijo Univ. (Japan); Hiroshi Amano, Nagoya Univ. (Japan)

12441-13 • 8:30 AM - 9:00 AM

Fabrication of vertical UV light-emitting devices by separation of sapphire substrates (*Invited Paper*)

Author(s): Motoaki Iwaya, Toma Nishibayashi, Moe Shimokawa, Ryota Hasegawa, Eri Matsubara, Ryoya Yamada, Yoshinori Imoto, Ryosuke Kondo, Ayumu Yabutani, Meijo Univ. (Japan); Sho Iwayama, Meijo Univ. (Japan); Mie Univ. (Japan); Tetsuya Takeuchi, Satoshi Kamiyama, Meijo Univ. (Japan); Hideto Miyake, Mie Univ. (Japan); Kohei Miyoshi, Koichi Naniwa, Ushio Inc. (Japan); Akihiko Yamaguchi, Seishin Trading Co., Ltd. (Japan)

12441-14 • 9:00 AM - 9:30 AM

Recent development of semiconductor deep UV LEDs with AlGaIn nanowires (*Invited Paper*)

Author(s): Songrui Zhao, Qihua Zhang, Mohammad Vafadar, Heemal Parimoo, Xue Yin, McGill Univ. (Canada)

12441-15 • 9:30 AM - 10:00 AM

Interband tunnel junctions for AlGaIn Ultra-Violet light emitting diodes (*Invited Paper*)

Author(s): Agnes Maneesha Dominic Merwin Xavier, Arnob Ghosh, Sheikh Ifatur Rahman, Shamsul Arafin, Siddharth Rajan, The Ohio State Univ. (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 5: LIGHT-BASED SENSORS AND COMMUNICATION

31 January 2023 • 10:30 AM - 12:20 PM | Moscone Center, Room 153 (Upper Mezzanine South)

Session Chair: Michael R. Krames, Arkesso, LLC (United States)

12441-16 • 10:30 AM - 11:00 AM

Recent developments in micro-LED based high-speed optical camera communication and deep ultraviolet optical wireless communication (*Invited Paper*)

Author(s): Martin D. Dawson, Jonathan McKendry, Johannes Herrnsdorf, Enyuan Xie, Michael J. Strain, Univ. of Strathclyde (United Kingdom); David Armstrong, Fraunhofer UK Research Ltd. (United Kingdom)

12441-17 • 11:00 AM - 11:30 AM

Sub 1pJ/bit dense optical interconnects using microLEDs on CMOS transceiver ICs (*Invited Paper*)

Author(s): Bardia Pezeshki, Alexander A. Tselikov, Robert F. Kalman, Emad Affi, AvicenaTech Corp. (United States)

Conference 12441

12441-18 • 11:30 AM - 12:00 PM

High junction count VCSELs for LiDAR and related sensing applications (*Invited Paper*)

Author(s): Klein L. Johnson, Matthew Dummer, ams-OSRAM International GmbH (Germany); Amirhossein Ghods, Karim Tatah, ams-OSRAM International GmbH (United States)

12441-19 • 12:00 PM - 12:20 PM

Increasing the detection range of non-scanning solid-state LiDAR systems using beam shaping

Author(s): Zhuoqun Dai, Max C. Sundermeier, Tobias Glück, Philipp Findling, Roland Lachmayer, Leibniz Univ. Hannover (Germany)

Lunch/Exhibition Break 12:20 PM - 1:50 PM

SESSION 6: MICRO LEDS AND AR/VR/MR/XR II

31 January 2023 • 1:50 PM - 2:50 PM | Moscone Center, Room 153 (Upper Mezzanine South)

Session Chair: Yun-Li Li, PlayNitride Inc. (Taiwan)

12441-20 • 1:50 PM - 2:20 PM

Native InGaN red-green-blue micro-LEDs for full color micro-display (*Invited Paper*)

Author(s): Amélie Dussaigne, Frederic Barbier, Helge Haas, Jean-Christophe Pillet, Benjamin Samuel, Guillaume Veux, Patrick Le Maitre, CEA-LETI (France)

12441-21 • 2:20 PM - 2:50 PM

GaN-on-Silicon nanowire technology for microLED devices. (*Invited Paper*)

Author(s): Pierre Tchoulfian, Ulrich Steegmueller, Benoit Amstatt, Markus Broell, Philippe Gilet, Aledia (France)

Coffee Break 2:50 PM - 3:20 PM

SESSION 7: LED GROWTH AND APPLICATIONS II

31 January 2023 • 3:20 PM - 5:10 PM | Moscone Center, Room 153 (Upper Mezzanine South)

Session Chair: Young Joon Hong, Sejong Univ. Session

12441-23 • 3:20 PM - 3:50 PM

Advances in digital light source technology for lighting and display applications (*Invited Paper*)

Author(s): Wouter A. Soer, Lumileds, LLC (United States); Erik Young, Grigoriy Basin, Ron Bonné, Lumileds (United States); Mehdi Aas, Rob Engelen, Lumileds (Netherlands)

12441-24 • 3:50 PM - 4:20 PM

Beyond the visible: the proven effects of near-infrared light on our health and well-being (*Invited Paper*)

Author(s): Anne Berends, Seaborough Research B.V. (Netherlands); Marina Giménez, Michelle Luxwolda, Marijke Gordijn, Chrono@Work B.V. (Netherlands); Michael Krames, Seaborough Research B.V. (Netherlands)

12441-25 • 4:20 PM - 4:50 PM

Step pinning and hillock formation in (Al,Ga)N films on native AlN substrates (*Invited Paper*)

Author(s): Tobias Schulz, Leibniz-Institut für Kristallzüchtung (Germany); Liverios Lymperakis, Suyun Yoo, Max-Planck-Institut für Eisenforschung GmbH (Germany); Humberto Foronda, Christian Brandl, Hans-Jürgen Lugauer, Marc Patrick Hoffmann, ams-OSRAM International GmbH (Germany); Martin Albrecht, Leibniz-Institut für Kristallzüchtung (Germany)

12441-26 • 4:50 PM - 5:10 PM

CANCELED: Mitigating positive sheet polarization in high efficiency InGaN blue light-emitting diodes

Author(s): Ravi Teja Velpula, Barsha Jain, Hieu Pham Trung Nguyen, Manobalasankar Muthu, New Jersey Institute of Technology (United States)

WEDNESDAY 1 FEBRUARY

SESSION 8: EMERGING ELECTROLUMINESCENT SEMICONDUCTOR MATERIALS AND DEVICES

1 February 2023 • 8:00 AM - 9:50 AM | Moscone Center, Room 153 (Upper Mezzanine South)

Session Chair: Matteo Meneghini, Univ. degli Studi di Padova (Italy)

12441-27 • 8:00 AM - 8:30 AM

Development of CVD technology for halide perovskite-based optoelectronics (*Invited Paper*)

Author(s): Michael Heuken, AIXTRON SE (Germany), RWTH Aachen Univ. (Germany); Jona Riedel, Andrei Vescan, Holger Kalisch, RWTH Aachen Univ. (Germany)

12441-28 • 8:30 AM - 9:00 AM

Tunnel junctions for new architecture of III-N devices (*Invited Paper*)

Author(s): Czeslaw Skierbiszewski, Institute of High Pressure Physics (Poland)

12441-29 • 9:00 AM - 9:30 AM

Group III-chalcogenide monolayers grown by MOCVD for novel optoelectronic applications (*Invited Paper*)

Author(s): Johannes Glowatzki, Robin Guenkel, Oliver Massmeyer, Philipps-Univ. Marburg (Germany); Marius Mueller, Sangam Chatterjee, Justus-Liebig-Univ. Giessen (Germany); Kerstin Volz, Philipps-Univ. Marburg (Germany)

12441-30 • 9:30 AM - 9:50 AM

Hybrid plasmonic-photonic structures for directional light amplification in perovskite LEDs

Author(s): Zher Ying Ooi, Univ. of Cambridge (United Kingdom); Alberto Jiménez-Solano, Univ. de Córdoba (Spain); Yuqi Sun, Jordi Ferrer Orri, Hayden Salway, Krzysztof Galkowski, Univ. of Cambridge (United Kingdom); Piotr Nyga, Wojskowa Akademia Techniczna im. Jarosława Dąbrowskiego (Poland); Caterina Ducati, Miguel Anaya, Sam Stranks, Univ. of Cambridge (United Kingdom)

Coffee Break 9:50 AM - 10:20 AM

SESSION 9: BORON NITRIDES

1 February 2023 • 10:20 AM - 12:20 PM | Moscone Center, Room 153 (Upper Mezzanine South)

Session Chair: Yong-Hoon Cho, KAIST Session

12441-31 • 10:20 AM - 10:50 AM

Electrically driven deep ultraviolet light emission from hexagonal boron nitride van der Waals heterostructures (*Invited Paper*)

Author(s): Young Duck Kim, Kyung Hee Univ. (Republic of Korea)

12441-32 • 10:50 AM - 11:20 AM

Optoelectronic properties of boron nitride polytypes (*Invited Paper*)

Author(s): Guillaume Cassabois, CNRS (France), Univ. de Montpellier (France)

12441-33 • 11:20 AM - 11:50 AM

Growth of suspended hexagonal boron nitride on GaN substrate by MOCVD (*Invited Paper*)

Author(s): Seokho Moon, Pohang Univ. of Science and Technology (Republic of Korea); Adrien Rousseau, Univ. de Montpellier (France); Francis Ngome Okello Odongo, Pohang Univ. of Science and Technology (Republic of Korea); Youngjae Kim, Daegu Gyeongbuk Institute of Science & Technology (Republic of Korea); Yunjae Park, Ulsan National Institute of Science and Technology (Republic of Korea); Institute for Basic Science (Republic of Korea); Jiye Kim, Pohang Univ. of Science and Technology (Republic of Korea); Pierre Valvin, Univ. de Montpellier (France); Jaehee Cho, Jeonbuk National Univ. (Republic of Korea); Feng Ding, Ulsan National Institute of Science and Technology (Republic of Korea); Institute for Basic Science (Republic of Korea); Jaedong Lee, Daegu Gyeongbuk Institute of Science & Technology (Republic of Korea); Si-Young Choi, Pohang Univ. of Science and Technology (Republic of Korea); Bernard Gil, Guillaume Cassabois, Univ. de Montpellier (France); Jong Kyu Kim, Pohang Univ. of Science and Technology (Republic of Korea)

12441-34 • 11:50 AM - 12:20 PM

Hexagonal boron nitride: a source for quantum photonics applications (*Invited Paper*)

Author(s): Simon White, Tieshan Yang, Connor Stewart, Zai-Quan Xu, Univ. of Technology, Sydney (Australia); Alexander S. Solntsev, Univ. of Technology (Australia); Mehran Kianinia, Univ. of Technology, Sydney (Australia); Alastair Stacey, The Univ. of Melbourne (Australia); Milos Toth, Igor Aharonovich, Univ. of Technology, Sydney (Australia)

Lunch/Exhibition Break 12:20 PM - 1:50 PM

SESSION 10: NANOMATERIALS AND NANOSTRUCTURES FOR LEDs

1 February 2023 • 1:50 PM - 3:40 PM | Moscone Center, Room 153 (Upper Mezzanine South)

Session Chair: Hee Jin Kim, Lumileds, LLC (United States)

12441-35 • 1:50 PM - 2:20 PM

Group III-nitride quantum photonic structures for single photon generation and polaritonic non-Hermitian system (*Invited Paper*)

Author(s): Yong-Hoon Cho, KAIST (Republic of Korea)

12441-36 • 2:20 PM - 2:50 PM

Advances in quantum dot light emitting devices (*Invited Paper*)

Author(s): Yasuhiko Arakawa, The Univ. of Tokyo (Japan)

12441-37 • 2:50 PM - 3:20 PM

Stable nano-YAG:Ce³⁺ phosphors for photonic applications (*Invited Paper*)

Author(s): Atul D. Sontakke, Federico Montanarella, Vasilii Khanin, Mohamed Tachikirt, Valerio Favale, Anne Berends, Michael Krames, Marie Anne van de Haar, Seaborough Research B.V. (Netherlands)

12441-38 • 3:20 PM - 3:40 PM

Radial (In,Al)GaAs(Sb)-nanowire heterojunctions for optoelectronic devices

Author(s): Tobias Schreitmüller, Daniel Ruhstorfer, Akhil Ajay, Andreas Thurn, Paul Schmiedeke, Jonathan J. Finley, Gregor Koblmüller, Walter Schottky Institut (Germany)

Coffee Break 3:40 PM - 4:10 PM

SESSION 11: MEASUREMENTS AND CHARACTERIZATIONS FOR LED MATERIALS AND DEVICES

1 February 2023 • 4:10 PM - 6:00 PM | Moscone Center, Room 153 (Upper Mezzanine South)

Session Chair: Guillaume Cassabois, Univ. de Montpellier (France)

12441-39 • 4:10 PM - 4:40 PM

Advanced nano-characterization of cascaded InGaN/GaN LED using GaN:Mg/GaN:Ge tunnel junctions (*Invited Paper*)

Author(s): Frank Bertram, Gordon Schmidt, Juergen Christen, Otto-von-Guericke-Univ. Magdeburg (Germany)

12441-40 • 4:40 PM - 5:10 PM

Cathodoluminescence imaging for nanoscale optical analysis of microLEDs (*Invited Paper*)

Author(s): Toon Coenen, Delmic B.V. (Netherlands)

12441-41 • 5:10 PM - 5:40 PM

III-N optoelectronic devices: understanding the physics of electro-optical degradation (*Invited Paper*)

Author(s): Matteo Meneghini, Nicola Roccato, Francesco Piva, Carlo De Santi, Matteo Buffolo, Univ. degli Studi di Padova (Italy); Camille Haller, Jean-Francois Carlin, Nicolas Grandjean, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Alberto Tibaldi, Francesco Bertazzi, Michele Goano, Politecnico di Torino (Italy); Giovanni Verzellesi, Univ. degli Studi di Modena e Reggio Emilia (Italy); Tim Wernicke, Michael Kneissl, TU Berlin (Germany); Gaudenzio Meneghesso, Enrico Zanoni, Univ. degli Studi di Padova (Italy)

12441-42 • 5:40 PM - 6:00 PM

Injection-limited efficiency of InGaN LEDs and impact on electro-optical performance and ageing: a case study

Author(s): Claudia Casu, Matteo Buffolo, Alessandro Caria, Carlo De Santi, Enrico Zanoni, Gaudenzio Meneghesso, Matteo Meneghini, Univ. degli Studi di Padova (Italy)

Conference 12441

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12441-43

High-performance vacuum-deposited perovskite light-emitting diodes with the assistance of small-molecule hole-transport materials

Author(s): Chung An Hsieh, National Yang Ming Chiao Tung Univ. (Taiwan); Guang Hsun Tan, Hao Cheng Lin, Kai-Yuan Hsiao, Ming-Yen Lu, National Tsing Hua Univ. (Taiwan); Li Yin Chen, National Yang Ming Chiao Tung Univ. (Taiwan); Hao Wu Lin, National Tsing Hua Univ. (Taiwan)

12441-44

Photoluminescence studies from ps to ms with high-power fast-gate cw pulse pattern by a RGB laser excitation source in combination: characterization and applications

Author(s): Maryam Sadeghi, Volker Buschmann, Eugeny Ermilov, Christian Oelsner, PicoQuant GmbH (Germany)

12441-47

Using visible light communication to implement intelligent traffic signals and cooperative trajectories at urban intersections

Author(s): Rafael Fernandes, Instituto Superior de Engenharia de Lisboa (Portugal), Instituto Politécnico de Lisboa (Portugal); Manuel A. Vieira, UNINOVA (Portugal), Instituto Superior de Engenharia de Lisboa (Portugal); Manuela Vieira, Instituto Superior de Engenharia de Lisboa (Portugal), UNINOVA (Portugal); Pedro Vieira, Instituto Superior de Engenharia de Lisboa (Portugal), Instituto Superior Técnico (Portugal); Paula A. Louro, UNINOVA (Portugal); Mário Véstias, Instituto Superior de Engenharia de Lisboa (Portugal), Instituto Politécnico de Lisboa (Portugal), INESC-ID (Portugal)

12441-48

Mid-infrared resonant-cavity GaSb light emitting diodes with a metal back plane

Author(s): Andrea Simaz, Mina Beshara, Gerhard Boehm, Anna Koeninger, Mikhail Belkin, Walter Schottky Institut, Technische Univ. München (Germany)

12441-49

Pure white light generation from a single biphasic phosphor using enhanced blue upconversion yield

Author(s): Prasenjit Prasad Sukul, Missouri Univ. of Science and Technology (United States)

12441-51

LED based systems for remote sensing of liquid levels in automotive fluid tanks

Author(s): Quamrul Huda, Chelsea Ragbir, Matthew Hart, Andrew Anderson-Serson, Ben Ripka, Alberto Leon Cevallos, NAIT (Canada); Anas Ahmed, Dan Priestley, Imperial Oil Ltd. (Canada)

12441-52

Optical pulse generation in nanosecond range with conventional high-power LED modules for metrology and calibration purposes

Author(s): Elena Kabardiadi-Virkovski, Westsächsische Hochschule Zwickau (Germany); Alexander Kabardiadi-Virkovski, Peter Hartmann, Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany), Westsächsische Hochschule Zwickau (Germany)

12441-53

Design and manufacturing of compact on-Silicon MQW color-converters using photonic-crystal light-extractors and Bloch-mode replication for μ LED applications

Author(s): Amade Ndiaye, Ahlem Ghazouani, Romain Sommer, Elisa Vermande, Christine Di Nardo, Hai Son Nguyen, CEA-LETI (France); Christian Seassal, Emmanuel Drouard, Institut des Nanotechnologies de Lyon (France); Badhise Ben Bakir, CEA-LETI (France)

12441-55

Monolithic integration of small pitch hybrid LED-OLED bicolor array on 8" Si for pure color applications

Author(s): Paolo De Martino, Bernard Aventurier, Patrick Le Maitre, Christelle Laugier, Basien Miralles, Clement Ballot, Benoit Racine, Julia Simon, CEA (France)

12441-56

Nanowire bonding pads for hybrid integration of GaN-based microLEDs

Author(s): Florian Meierhofer, Maximilian Vergin, Georg Schöttler, Steffen Bornemann, Andreas Waag, Technische Univ. Braunschweig (Germany)

12441-57

Demonstration of III-nitride red LEDs on silicon substrates via strain relaxed template by InGaN decomposition layer

Author(s): Vincent Rienzi, Jordan Smith, Norleakvisoth Lim, Hsun-Ming Chang, Philip Chan, Matthew S. Wong, Steven P. DenBaars, Shuji Nakamura, Univ. of California, Santa Barbara (United States)

12441-58

Improving the resolution of light emitting diode for biological image via ZnO nanorods array

Author(s): Heesang Ahn, Hyerin Song, Taerim Yoon, Mihee Park, Kyujung Kim, Pusan National Univ. (Republic of Korea)

12441-59

Optoelectronic technologies to boost photobioreactors for algae production: from pulsed light sources to PV integrated net zero system

Author(s): Nicola Trivellin, Lisa Borella, Noah Tormena, Elena Barbera, Eleonora Sforza, Univ. degli Studi di Padova (Italy)

12441-61

Optimal detector size for optical wireless communication systems

Author(s): Lev Azarkh, Xiaochen Liu, Technische Univ. Eindhoven (Netherlands); Jean-Paul M. G. Linnartz, Signify N.V. (Netherlands)

12441-62

Optical modeling of single crystal phosphor for laser-excited white-light source

Author(s): Tsung-Xian Lee, Meng-Hsuan Lin, Yi-Ming Li, National Taiwan Univ. of Science and Technology (Taiwan); Wei-Chang Lin, Taiwan Applied Crystal Co., Ltd. (Taiwan)

12441-63

Demonstration of p-side down green light emitting diodes with high external quantum efficiencies

Author(s): Sheikh Ifatur Rahman, Agnes Maneesha Dominic Merwin Xavier, The Ohio State Univ. (United States); Robert Armitage, Lumileds, LLC (United States); Siddharth Rajan, The Ohio State Univ. (United States)

12441-64

Distorting optical system for automotive μ LED array headlamps

Author(s): Max Caspar Sundermeier, Zhuoqun Dai, Tobias Glück, Philipp Findling, Lukas Hanisch, Roland Lachmayer, Leibniz Univ. Hannover (Germany)

12441-66

Micro LED Electroluminescence measurement system using probing wafer

Author(s): Huijin Kim, Boseong Son, Young-Woong Lee, Yeungnam Univ. (Republic of Korea); Si-Hyun Park, Yeungnam university (Republic of Korea)

Emerging Liquid Crystal Technologies XVIII

1 - 2 February 2023 | Moscone West Rm 2016 (Wednesday); Moscone South Rm 101 (Thursday)

Conference Chairs: **Liang-Chy Chien**, Kent State Univ. (United States); **Igor Muševič**, Jožef Stefan Institute (Slovenia); **Nelson V. Tabiryan**, BEAM Engineering for Advanced Measurements Co. (United States)

Program Committee: **Etienne Brasselet**, Univ. de Bordeaux (France); **Cheng-Huan Chen**, National Tsing Hua Univ. (Taiwan); **Vladimir G. Chigrinov**, Foshan Univ. (China), Hong Kong Univ. of Science and Technology (Hong Kong, China); **Michael J. Escuti**, ImagineOptix (United States); **Antônio M. Figueiredo Neto**, Univ. de São Paulo (Brazil); **Jun-ichi Fukuda**, Kyushu Univ. (Japan); **Tigran Galstian**, Univ. Laval (Canada); **Linda S. Hirst**, Univ. of California, Merced (United States); **Hirotugu Kikuchi**, Kyushu Univ. (Japan); **Heinz S. Kitzerow**, Univ. Paderborn (Germany); **Jan P. F. Lagerwall**, Univ. du Luxembourg (Luxembourg); **Byoung-Ho Lee**, Seoul National Univ. (Republic of Korea); **Chia-Rong Lee**, National Cheng Kung Univ. (Taiwan); **Yi-Hsin Lin**, National Chiao Tung Univ. (Taiwan); **Danqing Liu**, Technische Univ. Eindhoven (Netherlands); **Lu Lu**, Meta (United States); **Akihiro Mochizuki**, i-CORE Technology, LLC (United States); **Stephen M. Morris**, Univ. of Oxford (United Kingdom); **Kristiaan Neyts**, Univ. Gent (Belgium); **Toshiaki Nose**, Akita Prefectural Univ. (Japan); **Masanori Ozaki**, Osaka Univ. (Japan); **Miha Ravnik**, Univ. of Ljubljana (Slovenia); **Ivan I. Smalyukh**, Univ. of Colorado Boulder (United States); **Timothy J. White**, Univ. of Colorado Boulder (United States); **Michael Wittek**, Merck KGaA (Germany); **Shin-Tson Wu**, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Jun Yamamoto**, Kyoto Univ. (Japan); **Tae-Hoon Yoon**, Pusan National Univ. (Republic of Korea)

WEDNESDAY 1 FEBRUARY

SESSION 1: INFRARED, MICROWAVE, AND TERAHERTZ APPLICATIONS

1 February 2023 • 8:40 AM - 10:20 AM | Moscone Center, Room 2016 (Level 2 West)

Session Chair: Nelson V. Tabiryan, BEAM Engineering for Advanced Measurements Co. (United States)

12442-1 • 8:40 AM - 9:10 AM

Novel switching of liquid crystals for use in rapid THz phase shifters discovered from the dimensional effects of electrodes (*Invited Paper*)

Author(s): Masahito Oh-e, National Tsing Hua Univ. (Taiwan)

12442-2 • 9:10 AM - 9:40 AM

Microwave optimized liquid crystals for space and terrestrial communication (*Invited Paper*)

Author(s): Matthias Jost, Dieter Schroth, Carsten Fritzsche, Michael Wittek, Merck KGaA (Germany)

12442-3 • 9:40 AM - 10:00 AM

THz spectroscopy of thermotropic liquid crystals

Author(s): Patrick Friebe, Max-Planck-Institut für Kernphysik (Germany); Daria Galimberti, Radboud University Nijmegen (Netherlands); Riccardo Piccoli, Politecnico di Milano (Italy); Laura Cattaneo, Max-Planck-Institut für Kernphysik (Germany)

12442-4 • 10:00 AM - 10:20 AM

Development of reconfigurable liquid crystal metasurface reflector based on TFT-LCD technology

Author(s): Mitsutaka Okita, Daiichi Suzuki, Kazuki Matsunaga, Shinichiro Oka, Japan Display, Inc. (Japan); Hiromi Matsuno, Takuya Ohto, KDDI Research, Inc. (Japan)

Coffee Break 10:20 AM - 10:50 AM

SESSION 2: LASING, WAVEGUIDES, NONLINEAR OPTICS, AND FLAT OPTICS

1 February 2023 • 10:50 AM - 12:30 PM | Moscone Center, Room 2016 (Level 2 West)

Session Chair: Chia-Rong Lee, National Cheng Kung Univ. (Taiwan)

12442-5 • 10:50 AM - 11:20 AM

Liquid crystal lasers: potential light source for holographic imaging (*Invited Paper*)

Author(s): Yi-Kai Chung, Jia-De Lin, National Dong Hwa Univ. (Taiwan)

12442-6 • 11:20 AM - 11:50 AM

Effects of waveguide surface micro-structure on the transmission of light (*Invited Paper*)

Author(s): Peter Ropac, Miha Ravnik, Univ. of Ljubljana (Slovenia)

12442-7 • 11:50 AM - 12:10 PM

A liquid crystal phase and polarization controller for kW-class high-power laser

Author(s): Keisuke Yoshiki, Univ. of Hyogo (Japan); Takeshi Yamamoto, Oasa Electronics Co., Ltd. (Japan)

12442-8 • 12:10 PM - 12:30 PM

Low threshold and high Q-factor lasing in topologically directed assemblies of blue-phase liquid crystal microspheres

Author(s): Sumanyu Chauhan, Souptik Mukherjee, Andrii Varanytsia, Chien Tsung Hou, Lu Zou, Liang-Chy Chien, Kent State Univ. (United States)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

SESSION 3: AR/VR AND 3D APPLICATIONS

1 February 2023 • 2:00 PM - 3:10 PM | Moscone Center, Room 2016 (Level 2 West)

Session Chair: Nelson V. Tabiryan, BEAM Engineering for Advanced Measurements Co. (United States)

12442-9 • 2:00 PM - 2:30 PM

Liquid crystal photonic technology in AR application (*Invited Paper*)

Author(s): Xiayu Feng, Junren Wang, Zhixin Zhao, Stephen Choi, Mengfei Wang, Mavis Hu, Lu Lu, Barry Silverstein, Meta (United States)

12442-10 • 2:30 PM - 2:50 PM

Biaxially curved ultra-thin, light ambient dimming LC films for AR headsets

Author(s): Paul Cain, FlexEnable (United Kingdom); James Harding, Andrew Russell, Ashley James, May Wheeler, Will Reeves, FlexEnable Technology Ltd. (United Kingdom)

12442-11 • 2:50 PM - 3:10 PM

Study and validation of switchable grating using liquid crystal for active waveguide addressing

Author(s): Salaheddine Toubi, CEA-LETI (France); Matthias Colard, CEA-LETI (France), Institut de Recherche en Informatique, Mathématiques, Automatique et Signal, Univ. de Haute-Alsace (France); Yann Lee, Benoit Racine, Aurelien Suhm, CEA-LETI (France); David Grosso, Institut Matériaux Microélectronique Nanosciences de Provence, Aix-Marseille Univ. (France); Badre Kerzabi, Solnil (France); Christophe Martinez, CEA-LETI (France)

Coffee Break 3:10 PM - 3:40 PM

SESSION 4: POLARIZERS, OPTICAL RETARDERS, AND OTHER DISPLAY COMPONENTS

1 February 2023 • 3:40 PM - 5:00 PM | Moscone Center, Room 2016 (Level 2 West)

Session Chair: Akihiro Mochizuki, i-CORE Technology, LLC (United States)

12442-12 • 3:40 PM - 4:10 PM

Investigation on molecular directors packing nature of SSD liquid crystals by means of retardation switching dynamics (*Invited Paper*)

Author(s): Akihiro Mochizuki, i-CORE Technology, LLC (United States)

12442-13 • 4:10 PM - 4:40 PM

Liquid crystal electro-optical device with organic single crystal rubrene substrates (*Invited Paper*)

Author(s): Pravinraj Selvaraj, National Changhua Univ. of Education (Taiwan), Tunghai Univ. (Taiwan); Mareena Antony, National Changhua Univ. of Education (Taiwan); Chia-Yi Huang, Tunghai Univ. (Taiwan); Yu-Wu Wang, Jyh-Pin Chou, Che-Ju Hsu, Chi-Yen Huang, National Changhua Univ. of Education (Taiwan)

12442-14 • 4:40 PM - 5:00 PM

Efficient optical technique for the characterisation of twist elastic constant and thin liquid crystal cells

Author(s): Malgosia Kaczmarek, Giampaolo D'Alessandro, Nina Podoliak, Oleksandr Buchnev, Denitsa Bankova, Nicolas Brouckaert, Univ. of Southampton (United Kingdom)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12442-26

Enhanced stabilization of photo-induced Helfrich deformation by doping bent-dimers in cholesteric liquid crystals

Author(s): Zhi-Qun Wang, Hung-Lin Chen, Yan-Song Zhang, Chia-Rong Lee, National Cheng Kung Univ. (Taiwan)

12442-28

Intra-cavity up-conversion of coherent light emission in ferroelectric nematic fluid

Author(s): Daichi Okada, Hiroya Nishikawa, Fumito Araoka, RIKEN (Japan)

12442-29

Liquid crystal-based electrically controlled programmable metasurface for terahertz beam manipulation

Author(s): Chandresh Dhote, Anamika Singh, Visvesvaraya National Institute of Technology, Nagpur (India)

THURSDAY 2 FEBRUARY

SESSION 5: SPATIAL LIGHT MODULATORS

2 February 2023 • 9:00 AM - 10:10 AM | Moscone Center, Room 101 (Level 1 South Lobby)

Session Chair: Jun Yamamoto, Kyoto Univ. (Japan)

12442-15 • 9:00 AM - 9:30 AM

Imaging dynamic heterogeneity of soft matter by fluctuation microscopy (*Invited Paper*)

Author(s): Jun Yamamoto, Kyoto Univ. (Japan)

12442-16 • 9:30 AM - 9:50 AM

Characteristics of large active area, phase-only spatial light modulator with dielectric mirror

Author(s): Hiroshi Tanaka, Yu Takiguchi, Tsubasa Watanabe, Naoaki Kato, Keisuke Uchida, Munenori Takumi, Tomoko Otsu-Hyodo, Kazuhiro Kanamura, Hiroaki Ishii, Atsushi Ihori, Yoshiki Akizawa, Hirokazu Asai, Mikio Nagata, Yoshiyuki Ohtake, Haruyoshi Toyoda, Hamamatsu Photonics K.K. (Japan)

12442-17 • 9:50 AM - 10:10 AM

Biomimetic color engineering from nature to applications

Author(s): Silvia Vignolini, Univ. of Cambridge (United Kingdom)

Coffee Break 10:10 AM - 10:40 AM

Conference 12442

SESSION 6: NEW MATERIALS, CHIRAL PHASES, AND POLYMER COMPOSITES

2 February 2023 • 10:40 AM - 12:00 PM | Moscone Center, Room 101 (Level 1 South Lobby)

Session Chair: Liang-Chy Chien, Kent State Univ. (United States)

12442-18 • 10:40 AM - 11:10 AM

LiDAR/3D depth mapping systems using advanced swift FLC photonics (*Invited Paper*)

Author(s): Abhishek Srivastava, Hong Kong Univ. of Science and Technology (Hong Kong, China)

12442-19 • 11:10 AM - 11:40 AM

Electrically tunable, fully solid, reflective optical elements (*Invited Paper*)

Author(s): Alexis T. Phillips, Kyle Schlafmann, Hayden Fowler, Timothy J. White, Univ. of Colorado Boulder (United States)

12442-20 • 11:40 AM - 12:00 PM

Dynamic ion assisted optical changes in polymer stabilized cholesteric liquid crystals

Author(s): Brian P. Radka, Gaurav K. Pande, Timothy J. White, Univ. of Colorado (United States)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 7: SWITCHABLE GRATINGS

2 February 2023 • 1:30 PM - 4:10 PM | Moscone Center, Room 101 (Level 1 South Lobby)

Session Chair: Liang-Chy Chien, Kent State Univ. (United States)

12442-21 • 1:30 PM - 2:00 PM

Control of large-area orderliness for 2D supramolecular chiral microgrid structure of electro-induced Helfrich deformation (*Invited Paper*)

Author(s): Zhi-Qun Wang, Yu-Jun Wong, Yan-Song Zhang, Chia-Rong Lee, National Cheng Kung Univ. (Taiwan)

12442-22 • 2:00 PM - 2:20 PM

Instrumentation wavelength range selection and reconfiguration using electrically switchable diffraction gratings

Author(s): Garry A. Lester, Adrian M. Strudwick, L-electronics Ltd. (United Kingdom)

12442-23 • 2:20 PM - 2:40 PM

CANCELED: Printed liquid crystal photonics technologies

Author(s): Waqas Kamal, Mengmeng Li, Andrew Orr, Alfonso A. Castrejón-Pita, Steve J. Elston, Stephen Morris, Univ. of Oxford (United Kingdom)

Coffee Break 2:40 PM - 3:10 PM

12442-24 • 3:10 PM - 3:30 PM

Liquid crystal speckle reducers for head-up displays and polarization imaging

Author(s): Yihan Jin, Nathan P. Spiller, Chao He, David Hansford, Martin J. Booth, Steve J. Elston, Stephen Morris, Univ. of Oxford (United Kingdom)

12442-25 • 3:30 PM - 3:50 PM

Dynamic correction of astigmatism and defocus using tunable liquid crystal lens

Author(s): Amit K. Bhowmick, Advanced Materials and Liquid Crystal Institute (United States)

12442-30 • 3:50 PM - 4:10 PM

CANCELED: Non-mechanical optical beam-steering of an LC laser and a free-space communications link

Author(s): Guanxiong Zhang, Steve J. Elston, Andy Schreier, Grahame Faulkner, Dominic O'Brien, Stephen M. Morris, Univ. of Oxford (United Kingdom)

Advances in Display Technologies XIII

30 - 31 January 2023 | Moscone Center, Room 2016 (Level 2 West)

Conference Chairs: **Jiun-Haw Lee**, National Taiwan Univ. (Taiwan); **Qiong-Hua Wang**, Beihang Univ. (China); **Tae-Hoon Yoon**, Pusan National Univ. (Republic of Korea)

Program Committee: **Karlheinz Blankenbach**, Hochschule Pforzheim (Germany); **Pierre M. Boher**, ELDIM (France); **Liangcai Cao**, Tsinghua Univ. (China); **Liang-Chy Chien**, Kent State Univ. (United States); **Tien-Lung Chiu**, Yuan Ze Univ. (Taiwan); **Nobuyuki Hashimoto**, Citizen Watch Co., Ltd. (Japan); **Yi-Pai Huang**, Apple Inc. (United States); **Byoung-ho Lee**, Seoul National Univ. (Republic of Korea); **Sin-Doo Lee**, Seoul National Univ. (Republic of Korea); **Yan Li**, Shanghai Jiao Tong Univ. (China); **Akihiro Mochizuki**, i-CORE Technology, LLC (United States); **Fenglin Peng**, Meta (United States); **Michael Wittek**, Merck KGaA (Germany)

MONDAY 30 JANUARY

OPTO PLENARY SESSION

30 January 2023 • 8:00 AM - 10:00 AM | Moscone Center, Room 207/215 (Level 2 South)

8:00 AM - 8:05 AM: **Welcome and Opening Remarks**
Sonia García-Blanco, Univ. Twente (Netherlands) and Bernd Witzigmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

8:05 AM - 8:15 AM: **Announcement of the OPTO AI/ML and Net Zero Best Paper Awards**

12424-501 • 8:15 AM - 8:50 AM

High-performance electronic-photonic interfaces: from AI to quantum (*Plenary Presentation*)

Author(s): Rajeev Ram, Massachusetts Institute of Technology (United States)

12416-501 • 8:50 AM - 9:25 AM

Tandem photovoltaic devices: more than one way to make a solar cell (*Plenary Presentation*)

Author(s): Emily L. Warren, National Renewable Energy Lab. (United States)

12421-501 • 9:25 AM - 10:00 AM

Are III-nitride semiconductors also suitable for red emission? (*Plenary Presentation*)

Author(s): Nicolas Grandjean, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 1: AUTOMOTIVE DISPLAY

30 January 2023 • 10:30 AM - 11:00 AM | Moscone Center, Room 2016 (Level 2 West)

Session Chair: Akihiro Mochizuki, i-CORE Technology, LLC (United States)

12443-1 • 10:30 AM - 11:00 AM

RGB LED matrix display for augmented driving for higher traffic safety (*Invited Paper*)

Author(s): Karlheinz Blankenbach, Matthias Eisenhardt, Katharina Brezing, Steffen Reichel, Hochschule Pforzheim (Germany)

SESSION 2: LCD I

30 January 2023 • 11:00 AM - 12:00 PM | Moscone Center, Room 2016 (Level 2 West)

Session Chair: Akihiro Mochizuki, i-CORE Technology, LLC (United States)

12443-3 • 11:00 AM - 11:30 AM

High-performance LCDs for future VR applications (*Invited Paper*)

Author(s): Fenglin Peng, Ying “Melissa” Geng, Jacques Gollier, Xingzhou Tu, Yun Wang, Barry Silverstein, Meta (United States)

12443-4 • 11:30 AM - 12:00 PM

0.37-inch UHD, 11,800 PPI liquid crystal on silicon micro-display with embedded 4x up-scaler using micro-mirror space-interpolation pixel circuit for metaverse augmented reality glasses (*Invited Paper*)

Author(s): Minsu Jeong, Junghwan Lee, Kwang soo Lee, Jihoon Kim, Saejin Park, Bo-Eun Kim, RAONTECH (Republic of Korea)

Lunch Break 12:00 PM - 1:30 PM

SESSION 4: AR/VR/MR

30 January 2023 • 1:30 PM - 2:50 PM | Moscone Center, Room 2016 (Level 2 West)

Session Chair: Fenglin Peng, Meta (United States)

12443-9 • 1:30 PM - 2:00 PM

Intraocular augmented reality display with retinal prosthesis (*Invited Paper*)

Author(s): Seak Pang Zou, Shanghai Jiao Tong University (China); Ning Xi, Jiaxun Ye, Chao Ping Chen, Qiang Chu, Haiyang Hu, Shanghai Jiao Tong Univ. (China)

12443-11 • 2:00 PM - 2:30 PM

The advanced color conversion layer for a full-color micro-display (*Invited Paper*)

Author(s): Chien-Chung Lin, National Taiwan Univ. (Taiwan)

12443-41 • 2:30 PM - 2:50 PM

Low power consumption implications for AR glasses design

Author(s): Xavier Bonjour, MicroOLED (France)

Coffee Break 2:50 PM - 3:20 PM

Conference 12443

SESSION 3: LCD II

30 January 2023 • 3:20 PM - 4:20 PM | Moscone Center, Room 2016 (Level 2 West)

Session Chair: Chien-Chung Lin, National Taiwan Univ. (Taiwan)

12443-5 • 3:20 PM - 3:50 PM

Challenges of 1.0 μm -pitch liquid crystal spatial light modulator for future high-quality electric holographic display *(Invited Paper)*

Author(s): Takahiro Ishinabe, Kazuma Chida, Yoshitomo Isomae, Yosei Shibata, Hideo Fujikake, Tohoku Univ. (Japan)

12443-6 • 3:50 PM - 4:20 PM

Fast-switching speed image flipping technique using an SSD-LC drive mode for VR/AR/MR uses *(Invited Paper)*

Author(s): Akihiro Mochizuki, i-CORE Technology, LLC (United States)

TUESDAY 31 JANUARY

SESSION 5: OLED

31 January 2023 • 8:00 AM - 10:30 AM | Moscone Center, Room 2016 (Level 2 West)

Session Chair: Bo-Yen Lin, Yuan Ze Univ. (Taiwan)

12443-12 • 8:00 AM - 8:30 AM

Organic light-emitting diode (OLED) frontplanes for high-resolution microdisplay with high color gamut *(Invited Paper)*

Author(s): Hyunsu Cho, Chan-mo Kang, Jin-Wook Shin, Sukyung Choi, Chul Woong Joo, Byoung-Hwa Kwon, Kukjoo Kim, Dae Hyun Ahn, Gi Heon Kim, Chun-Won Byun, Nam Sung Cho, Jeong-Ik Lee, Electronics and Telecommunications Research Institute (Republic of Korea); Soobin Sim, Jinha Ryu, Hyunkoo Lee, Sookmyung Women's Univ. (Republic of Korea); Hyoc Min Youn, Young Jae An, Jin Sun Kim, Dongjin Semichem Co., Ltd. (Republic of Korea)

12443-13 • 8:30 AM - 9:00 AM

Multi-resonance terminal emitters towards narrowband, high-efficiency, and stable hyperfluorescence organic light-emitting diodes *(Invited Paper)*

Author(s): Yi-Ting Lee, Soochow Univ. (Taiwan), OPERA Ctr. for Organic Photonics and Electronics Research, Kyushu Univ. (Japan); Chin-Yiu Chan, Masaki Tanaka, Masashi Mamada, Kenichi Goushi, Youichi Tsuchiya, Chihaya Adachi, OPERA Ctr. for Organic Photonics and Electronics Research, Kyushu Univ. (Japan)

12443-14 • 9:00 AM - 9:30 AM

Lifetime elongation for high-efficiency, blue fluorescent organic light-emitting diode based on pyrene derivative *(Invited Paper)*

Author(s): Lian-Chun Huang, Chia-Hsun Chen, Graduate Institute of Photonics and Optoelectronics, National Taiwan Univ. (Taiwan); Bo-Yen Lin, National Dong Hwa Univ. (Taiwan); Man-Kit Leung, National Taiwan Univ. (Taiwan); Tien-Lung Chiu, Yuan Ze Univ. (Taiwan); Jiun-Haw Lee, Graduate Institute of Photonics and Optoelectronics, National Taiwan Univ. (Taiwan); Yi-Ru Huang, National Taiwan Univ. (Taiwan)

12443-15 • 9:30 AM - 10:00 AM

High-efficiency, blue triplet-triplet annihilation OLED-based on pyrene derivative *(Invited Paper)*

Author(s): Yuan-Zhen Zhuang, Chia-Hsun Chen, Bo-Yen Lin, Jiun-Haw Lee, National Taiwan Univ. (Taiwan); Tien-Lung Chiu, Yuan Ze Univ. (Taiwan); Man-Kit Leung, Chi-Chi Chang, Chin-Huang Chiu, National Taiwan Univ. (Taiwan)

12443-16 • 10:00 AM - 10:30 AM

Long triplet diffusion hosts for high efficiency organic light-emitting diodes *(Invited Paper)*

Author(s): Chia-Hsun Chen, National Taiwan Univ. (Taiwan); Bo-Yen Lin, Yuan Ze Univ. (Taiwan); Jiun-Haw Lee, National Taiwan Univ. (Taiwan); Tien-Lung Chiu, Yuan Ze Univ. (Taiwan)

Coffee Break 10:30 AM - 11:00 AM

SESSION 6: HOLOGRAPHIC AND LIGHT-FIELD DISPLAYS

31 January 2023 • 11:00 AM - 12:10 PM | Moscone Center, Room 2016 (Level 2 West)

Session Chair: Minsu Jeong, RAONTECH Session

12443-17 • 11:00 AM - 11:30 AM

High-fidelity, model-driven deep learning network for phase-only computer-generated hologram generation *(Invited Paper)*

Author(s): Liangcai Cao, Kexuan Liu, Tsinghua Univ. (China)

12443-18 • 11:30 AM - 11:50 AM

Vision transformer-based, high-fidelity, computer-generated holography

Author(s): Zhenxing Dong, Chao Xu, Yaoqi Tang, Yuye Ling, Yan Li, Yikai Su, Shanghai Jiao Tong Univ. (China); Yu Gan, Stevens Institute of Technology (United States)

12443-19 • 11:50 AM - 12:10 PM

Evaluation of a pixelated holographic display concept for a near-eye display: recent results and technological developments

Author(s): Christophe Martinez, Matthias Colard, Daivid Fowler, Yann Lee, Sylvia Meunier-Della-Gatta, Kyllian Millard, Fabian Rainouard, Salaheddine Toubi, CEA-LETI (France)

Lunch/Exhibition Break 12:10 PM - 2:10 PM

SESSION 7: 3D DISPLAYS

31 January 2023 • 2:10 PM - 2:50 PM | Moscone Center, Room 2016 (Level 2 West)

Session Chair: Jiun-Haw Lee, National Taiwan Univ. (Taiwan)

12443-22 • 2:10 PM - 2:30 PM

Optical design of 3D seamless space viewer

Author(s): Tomohiro Kawasaki, Masahiro Mizuta, Ryoichi Sataka, Toru Hirayama, Kosuke Kita, Nikon Corp. (Japan)

12443-24 • 2:30 PM - 2:50 PM

Advanced integral imaging display system based on high-resolution simplified light field image acquisition method

Author(s): Munkh-Uchral Erdenebat, Nyamsuren Darkhanbaatar, Tuvshinjargal Amgalan, Joon Hyun Kim, Oh-Seung Nam, Chungbuk National Univ. (Republic of Korea); Sang-Keun Gil, The Univ. of Suwon (Republic of Korea); Seok-Hee Jeon, Incheon National Univ. (Republic of Korea); Nam Kim, Anar Khuderchuluun, Chungbuk National Univ. (Republic of Korea)

Coffee Break 2:50 PM - 3:20 PM

SESSION 8: DISPLAY COMPONENTS AND NOVEL DISPLAYS

31 January 2023 • 3:20 PM - 4:20 PM | Moscone Center, Room 2016 (Level 2 West)

Session Chair: Jiun-Haw Lee, National Taiwan Univ. (Taiwan)

12443-25 • 3:20 PM - 3:40 PM

Development of high-refractive index materials including nanofiller with Nanoimprint and gapfill property expected to be applied to AR

Author(s): Hiroki Chisaka, Tokyo Ohka Kogyo Co., Ltd. (Japan); Yuehchun Liao, Satoshi Shimatani, Tokyo Ohka Kogyo Co. (Japan)

12443-26 • 3:40 PM - 4:00 PM

Speckle mitigation techniques for laser point scanned displays in head-up display applications

Author(s): Gus McDonald, Valeo (United States); Pierre Mermillod, Valeo (France)

12443-29 • 4:00 PM - 4:20 PM

Effects of photophoretic trapping under varying wavelengths of light

Author(s): Essa Ababseh, Jason Childers, Xiaomin Jin, California Polytechnic State Univ., San Luis Obispo (United States)

WEDNESDAY 1 FEBRUARY**POSTERS-WEDNESDAY**

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12443-30 • 6:00 PM - 8:00 PM

Design and numerical analysis of functional contact lens AR display based on volume holographic optical element waveguide

Author(s): Jin Su Lee, Kwang-Hoon Lee, Jung Hoon Choo, Korea Photonics Technology Institute (Republic of Korea)

12443-31

Autostereoscopic 3D display with high-aperture-ratio parallax barrier for bright 3D images and 2D images with less image quality degradation

Author(s): Maho Hashimoto, Osaka City Univ. (Japan); Goro Hamagishi, Kayo Yoshimoto, Hideya Takahashi, Osaka Metropolitan Univ. (Japan)

On demand | Presented live 1 February 2023**Show Abstract +12443-32****Fs pulse laser-based, micro LED chips transfer technology**

Author(s): Seungman Kim, Seongheum Han, Korea Institute of Machinery & Materials (Republic of Korea); Jae Seung Lim, Chonnam National Univ. (Republic of Korea); Sumin Kang, Korea Institute of Machinery & Materials (Republic of Korea); Seunghwoi Han, Chonnam National Univ. (Republic of Korea); Jae-Hak Lee, Ah-Young Park, Jun-Yeob Song, Korea Institute of Machinery & Materials (Republic of Korea)

12443-33

Compact imaging system based on multi-variable focal lens system in AR display

Author(s): Jae-Sang Lee, Seong-Hyeon Cho, Seung-Jin Lee, Woo June Choi, Young-Wan Choi, Chung-Ang Univ. (Republic of Korea)

12443-34

Implementation of varifocal occlusion using lens arrays and focus-tunable lenses

Author(s): Minseok Chae, Jehyeon Shin, Youngjin Jo, Yoonchan Jeong, Byoungcho Lee, Seoul National Univ. (Republic of Korea)

12443-35

Fast deep-trained transformation technique for computer-generated holograms

Author(s): Juhyun Lee, Yoonchan Jeong, Byoungcho Lee, Seoul National Univ. (Republic of Korea)

12443-36

Optimized design and manufacturing process of diffuse micro corner cubes for head-up projection display applications

Author(s): Christophe Martinez, Jean-Marie Quemper, Yann Lee, Pierre Sixt, CEA-LETI (France)

12443-38

Pyrene-based emitter containing electron moiety for efficient, blue fluorescent organic light-emitting diode

Author(s): Zi Wen Su, Jiun-Haw Lee, Graduate Institute of Photonics and Optoelectronics, National Taiwan Univ. (Taiwan); Tien-Lung Chiu, Yuan Ze Univ. (Taiwan); Bo-Yen Lin, National Dong Hwa Univ. (Taiwan); Chia-Hsun Chen, Graduate Institute of Photonics and Optoelectronics, National Taiwan Univ. (Taiwan); Man-Kit Leung, Chi-Chi Chang, National Taiwan Univ. (Taiwan)

12443-39

Synthesis and characterization of new high-visibility xanthene dye molecules toward color filter material

Author(s): Younga Son, Chungnam National Univ. (Republic of Korea)

Conference 12443

12443-40

Prevalence of oculomotor changes following the near work in stereoscopic augmented reality

Author(s): Kristiana Zizlane, Reinis Alksnis, Tatjana Pladere, Univ. of Latvia (Latvia)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12443-20

Optimization of 3D light field display by neural network based image deconvolution algorithm

Author(s): Parsa Omid, Mahdi Safari, Huawei Technologies Co., Ltd. (Canada); Simon Thibault, Univ. Laval (Canada); Herman Man Kai Wong, Huawei Technologies Co., Ltd. (Canada)

12443-23

Enlarged mid-air image display based on slim DOE waveguide

Author(s): Svetlana Danilova, Ilya Malyshev, Stanislav Shtykov, Nikolay Muravyev, Alexander Aspidov, SAMSUNG R&D Institute Russia (Russian Federation); Changmin Keum, Jungkweon Bae, Sunil Lee, SAMSUNG Research (Republic of Korea)

12443-28

Modeling and experiment on point spread function of refractive and metasurface microlens arrays used in 3D integral imaging light field displays

Author(s): Mahdi Safari, Huawei Technologies Co., Ltd. (Canada); Sédick Rabia, Univ. Laval (Canada); Parsa Omid, Huawei Technologies Co., Ltd. (Canada); Simon Thibault, Univ. Laval (Canada); Herman Man Kai Wong, Huawei Technologies Co., Ltd. (Canada)

12443-37

Fast method for real-time holographic display with large size

Author(s): Haowen Ma, Chenxiao Wei, Juan Liu, Beijing Institute of Technology (China)

Ultra-High-Definition Imaging Systems VI

1 - 2 February 2023 | Moscone West Rm 2020 (Wednesday); Moscone South Rm 104 (Thursday)

Conference Chairs: **Seizo Miyata**, Tokyo Univ. of Agriculture and Technology (Japan); **Toyohiko Yatagai**, Utsunomiya Univ. Ctr. for Optical Research & Education (Japan); **Yasuhiro Koike**, Keio Univ. (Japan)

Program Committee: **Partha P. Banerjee**, Univ. of Dayton (United States); **Liangcai Cao**, Tsinghua Univ. (China); **Janglin Chen**, Industrial Technology Research Institute (Taiwan); **Ray T. Chen**, The Univ. of Texas at Austin (United States); **Toshio Chiba**, Kairos Co., Ltd. (Japan); **Namho Hur**, Electronics and Telecommunications Research Institute (Republic of Korea); **Norihiko Ishii**, NHK Japan Broadcasting Corp. (Japan); **Toru Iwane**, Nikon Corp. (Japan); **Bahram Javidi**, Univ. of Connecticut (United States); **Kyuheon Kim**, Kyung Hee Univ. (Republic of Korea); **Gauthier Lafruit**, Univ. Libre de Bruxelles (Belgium); **Byoungcho Lee**, Seoul National Univ. (Republic of Korea); **Shiuan-Huei Lin**, National Chiao Tung Univ. (Taiwan); **Kenta Muramoto**, Keio Univ. (Japan); **Wolfgang Osten**, Institut für Technische Optik (Germany); **No-Cheol Park**, Yonsei Univ. (Republic of Korea); **Ifor D. W. Samuel**, Univ. of St. Andrews (United Kingdom); **Mark Schubert**, Hollywood Post Alliance (United States); **Okihiro Sugihara**, Utsunomiya Univ. (Japan); **Xiaodi Tan**, Fujian Normal Univ. (China); **Kenkichi Tanioka**, Medical Imaging Consortium (Japan); **Din Ping Tsai**, City Univ. of Hong Kong (Hong Kong, China); **Kenji Yamamoto**, National Institute of Information and Communications Technology (Japan); **Hiromasa Yamashita**, Air Water Inc. (Japan); **Whitney R. White**, Chromis Fiberoptics Inc. (United States)

WEDNESDAY 1 FEBRUARY

SESSION 1: DATA STORAGE

1 February 2023 • 9:00 AM - 11:55 AM | Moscone Center, Room 2020 (Level 2 West)

Session Chairs: Yasuhiro Koike, Keio Univ. (Japan), Boaz Jessie Jackin, Kyoto Institute of Technology (Japan)

12444-1 • 9:00 AM - 9:25 AM

High capacity optical data storage for active archives *(Invited Paper)*

Author(s): Kenneth D. Singer, Irina Shiyonovskaya, Folio Photonics LLC (United States)

12444-2 • 9:25 AM - 9:50 AM

Numerical investigation of the storage density in multi-valued holographic data storage systems *(Invited Paper)*

Author(s): Ryushi Fujimura, Utsunomiya Univ. (Japan); Tsutomu Shimura, Institute of Industrial Science, The Univ. of Tokyo (Japan)

12444-3 • 9:50 AM - 10:15 AM

Bifocal-polarization holographic lens made from volume hologram *(Invited Paper)*

Author(s): Jinyu Wang, Peiliang Qi, Jianying Hao, Po Hu, Ruixian Chen, Xinyi Yuan, Tian Ye, Shujun Zheng, Shenghui Ke, Jinhong Li, Di Zhang, Yiping Liu, Yi Yang, Xiao Lin, Xiaodi Tan, Fujian Normal Univ. (China)

12444-4 • 10:15 AM - 10:40 AM

Deep learning image segmentation method based on coding characteristics *(Invited Paper)*

Author(s): Ruixian Chen, Jianying Hao, Jinyu Wang, Jianan Li, Yongkun Lin, Hongjie Liu, Rupeng Yang, Rongquan Fan, Kun Wang, Dakui Lin, Xiaodi Tan, Xiao Lin, Fujian Normal Univ. (China)

Coffee Break 10:40 AM - 11:10 AM

12444-5 • 11:10 AM - 11:30 AM

Phase reconstruction based on deep learning with high pass filtering for holographic data storage

Author(s): Rongquan Fan, Jianying Hao, Ruixian Chen, Jianan Li, Yongkun Lin, Hongjie Liu, Rupeng Yang, Linlin Fan, Kun Wang, Dakui Lin, Xiao Lin, Xiaodi Tan, Fujian Normal Univ. (China)

12444-6 • 11:30 AM - 11:55 AM

Volume holograms for ultra-high-definition Imaging *(Invited Paper)*

Author(s): Daisuke Barada, Utsunomiya Univ. (Japan)

Lunch/Exhibition Break 11:55 AM - 1:25 PM

SESSION 2: UHD DISPLAY AND IMAGES I

1 February 2023 • 1:25 PM - 3:05 PM | Moscone Center, Room 2020 (Level 2 West)

Session Chairs: Daisuke Barada, Utsunomiya Univ. (Japan), Kenneth D. Singer, Folio Photonics LLC (United States)

12444-7 • 1:25 PM - 1:50 PM

Photoalignment of liquid crystals for imaging systems *(Invited Paper)*

Author(s): Atsushi Shishido, Tokyo Institute of Technology (Japan)

12444-8 • 1:50 PM - 2:15 PM

High bandwidth holographic imaging *(Invited Paper)*

Author(s): Zhengzhong Huang, Yunhui Gao, Liangcai Cao, Tsinghua Univ. (China)

12444-9 • 2:15 PM - 2:40 PM

Brightness and vividness lead to better viewing for UHD, HDR programming *(Invited Paper)*

Author(s): Dale Stoltzka, SAMSUNG Electronics Co., Ltd. (United States)

12444-10 • 2:40 PM - 3:05 PM

Silicon photonic chip-based biosensor for COVID-19 and flu detection with high sensitivity and specificity *(Invited Paper)*

Author(s): Shupeng Ning, The Univ. of Texas at Austin (United States); Vivian Chang, Omega Optics, Inc. (United States); James Fan, The Univ. of Texas at Austin (United States); May H. Hlaing, Omega Optics, Inc. (United States); Sourabh Jain, Jackson Carmichael, Devangshu Goswami, Sasid Sriwattana, Hayden Pietsch, Savithri H. Ramamoorthy, Ray T. Chen, The Univ. of Texas at Austin (United States)

Coffee Break 3:05 PM - 3:35 PM

Conference 12444

SESSION 3: UHD DISPLAY AND IMAGES II

1 February 2023 • 3:35 PM - 5:15 PM | Moscone Center, Room 2020 (Level 2 West)

Session Chairs: Atsushi Shishido, Tokyo Institute of Technology (Japan), Yasuhiro Koike, Keio Univ. (Japan)

12444-11 • 3:35 PM - 3:55 PM

High-definition imaging by super-resolution holographic optical microscopy

Author(s): Yuki Yamamoto, Daisuke Barada, Utsunomiya Univ. (Japan)

12444-12 • 3:55 PM - 4:15 PM

Novel birefringence control by alternating copolymerization

Author(s): Yasuhiro Koike, Keio Univ. (Japan); Hikaru Hotta, Keio Univ. (Japan), Dai Nippon Printing Co., Ltd. (Japan)

12444-13 • 4:15 PM - 4:35 PM

The effect of PQ concentration on holographic data storage in PQ/PMMA material

Author(s): Zeyi Zeng, Po Hu, Jianying Hao, Junchao Jin, Jinhong Li, Jie Liu, Junhui Wu, Qingdong Li, Xiao Lin, Xiaodi Tan, Fujian Normal Univ. (China)

12444-14 • 4:35 PM - 4:55 PM

Analysis of depolarization effects of random depolarization film for real-color displays

Author(s): Shizuki Sasaki, Keio Univ. (Japan); Yasuhiro Koike, Keio Univ. (Japan), Keio Photonics Research Institute (Japan)

12444-15 • 4:55 PM - 5:15 PM

Meta-lens array for smart sensing

Author(s): Mu-Ku Chen, Xiaoyuan Liu, Jingcheng Zhang, Din Ping Tsai, City Univ. of Hong Kong (Hong Kong, China)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

12444-23

Three-dimensional projection from multi-layered light field

Author(s): Youngjin Jo, Dongheon Yoo, Yoonchan Joeng, Byoungcho Lee, Seoul National Univ. (Republic of Korea)

THURSDAY 2 FEBRUARY

SESSION 4: HIGH SPEED AND WIDE BAND COMMUNICATION SYSTEMS

2 February 2023 • 9:25 AM - 10:40 AM | Moscone Center, Room 104 (Level 1 South Lobby)

Session Chair: Ryushi Fujimura, Utsunomiya Univ. (Japan)

12444-16 • 9:25 AM - 9:50 AM

Nitto's polymer technologies for high-data rate optical transmission (*Invited Paper*)

Author(s): Yuichi Tsujita, Nitto Innovations, Inc. (United States)

12444-18 • 9:50 AM - 10:15 AM

Near-infrared, self-written waveguides for multichannel optical coupling (*Invited Paper*)

Author(s): Okihiro Sugihara, Hidetaka Terasawa, Keisuke Kondo, Utsunomiya Univ. (Japan)

12444-19 • 10:15 AM - 10:40 AM

Gi-POF in active optical cables (*Invited Paper*)

Author(s): Whitney R. White, Chromis Fiber Optics Inc. (United States)

SESSION 5: ULTRA-HIGH-DEFINITION SYSTEMS

2 February 2023 • 10:40 AM - 11:30 AM | Moscone Center, Room 104 (Level 1 South Lobby)

Session Chair: Whitney R. White, Chromis Fiber Optics Inc. (United States)

12444-21 • 10:40 AM - 11:05 AM

Digitally-printed holographic screens for flexible 3D head-up displays (*Invited Paper*)

Author(s): Boaz Jessie Jackin, Kyoto Institute of Technology (Japan)

12444-22 • 11:05 AM - 11:30 AM

8K-UHD medical image remote transmission with low latency encoding and decoding (*Invited Paper*)

Author(s): Hiromasa Yamashita, Air Water Inc. (Japan), Teikyo Univ. (Japan); Yasushi Hara, Shigehiro Fuseya, Air Water Inc. (Japan); Yasuhisa Kato, Mina Yamazaki, Miharuru Communications, Inc. (Japan); Takashi Kodama, Satoru Furuyama, ASTRODESIGN, Inc. (Japan); Hironori Sakou, Tokushima Prefecture General Policy Department (Japan)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12444-17

Gi-POF optical fiber connecting technologies and all-optical network with glass optical fiber (*Invited Paper*)

Author(s): Dexi Weng, Dexyan Global, LLC (United States); Qirong Chen, Zhejiang Univ. of Technology (China); Liangji Lai, Shenghong Chen, Hangzhou FlexMI Technology Co., Ltd (China); Weijing Chen, Zhejiang Univ. of Technology (China); Yuping Zhang, Dexyan Global, LLC (United States)

Conference 12445

Practical Holography XXXVII: Displays, Materials, and Applications

31 January - 1 February 2023 | Moscone Center, Room 2014 (Level 2 West)

Conference Chairs: **Pierre-Alexandre J. Blanche**, Wyant College of Optical Sciences (United States); **Seung-Hyun Lee**, Kwangwoon Univ. (Republic of Korea)

Program Committee: **Maria Isabel Azevedo**, Univ. de Aveiro (Portugal); **Hans I. Bjelkhagen**, Glyndwr Univ. (United Kingdom), Hansholo Consulting Ltd. (United Kingdom); **David Brotherton-Ratcliffe**, Geola Technologies Ltd. (United Kingdom); **Philippe Gentet**, Kwangwoon Univ. (Republic of Korea), Ultimate Holography (France); **Nam Kim**, Chungbuk National Univ. (Republic of Korea); **Alkiviadis Lembessis**, The Hellenic Institute of Holography (Greece); **Juan Liu**, Beijing Jiaotong Univ. (China); **Deanna McMillen**, EOTech, Inc. (United States); **Hiroshi Yoshikawa**, Nihon Univ. (Japan)

TUESDAY 31 JANUARY

SESSION 1: MATERIAL FOR HOLOGRAPHY

31 January 2023 • 8:30 AM - 11:00 AM | Moscone Center, Room 2014 (Level 2 West)

Session Chair: Pierre-Alexandre J. Blanche, Wyant College of Optical Sciences (United States)

12445-2 • 8:30 AM - 9:00 AM

Diffraction optical networks and computational imaging without a computer (*Invited Paper*)

Author(s): Aydogan Ozcan, UCLA Samueli School of Engineering (United States)

12445-3 • 9:00 AM - 9:30 AM

Generating diffraction efficiency profiles in Bayfol HX vHOEs (*Invited Paper*)

Author(s): Friedrich-Karl Bruder, Johannes Frank, Sven Hansen, Alexander Lorenz, Christel Manecke, Covestro AG (Germany); Jack Mills, Covestro LLC (United States); Lena Pitzer, Igor Pochorovski, Thomas Rölle, Covestro AG (Germany)

12445-5 • 9:30 AM - 9:50 AM

Holographic polymer material with double recording effect

Author(s): Uladzimir V. Mahilny, Belarusian State Univ. (Belarus); Edhar Khramtsou, Belarusian State Univ. (Belarus), LEMT UE (Belarus); Alexei P. Shkadarevich, LEMT UE (Belarus)

Coffee Break 9:50 AM - 10:20 AM

12445-6 • 10:20 AM - 10:40 AM

Comparison of particle types for 3D optical trap displays

Author(s): Kyle Chaney, Chase Grochett, Benjamin Coers, Cooper D. Bond, Eric Youngsang Ji, Garath Vettters, Jason Childers, Daniel E. Smalley, Brigham Young Univ. (United States)

12445-37 • 10:40 AM - 11:00 AM

Manufacturing holographic optical elements for automotive industry needs

Author(s): Stanislovas J. Zacharovas, Christoph Erler, Petr Vojtisek, Yi Zhong, Roman Kleindienst, Carl Zeiss Jena GmbH (Germany)

SESSION 2: ARTISTIC APPLICATIONS OF HOLOGRAPHY

31 January 2023 • 11:00 AM - 11:20 AM | Moscone Center, Room 2014 (Level 2 West)

Session Chair: Seunghyun Lee, Kwangwoon Univ. Session

12445-7 • 11:00 AM - 11:20 AM

Full-parallax digital holography, anatomy, and art

Author(s): Tove N. Dalenius, De Montfort Univ. (United Kingdom)

Lunch/Exhibition Break 11:20 AM - 12:50 PM

SESSION 3: HOLOGRAPHIC DISPLAY, TECHNIQUES, AND CONCEPTS

31 January 2023 • 12:50 PM - 4:50 PM | Moscone Center, Room 2014 (Level 2 West)

Session Chair: Seunghyun Lee, Kwangwoon Univ. Session

12445-8 • 12:50 PM - 1:20 PM

Interactive aerial-3D-touch holographic light-field display (*Invited Paper*)

Author(s): Masahiro Yamaguchi, Iván A. Sánchez Salazar Chavarria, Kyoka Shimomura, Saori Takeyama, Tokyo Institute of Technology (Japan)

12445-9 • 1:20 PM - 1:50 PM

Encoding scattered wavefronts through spectral-envelope modulated double-phase method (*Invited Paper*)

Author(s): Xiaomeng Sui, Liangcai Cao, Tsinghua Univ. (China)

12445-11 • 1:50 PM - 2:10 PM

Color optimization of a full-color holographic stereogram printing system using a single SLM based on iterative exposure control

Author(s): Anar Khuderchuluun, Erkhembataar Dashdavaa, Shindae Rupali, Ki-Chul Kwon, Chungbuk National Univ. (Republic of Korea); Hoonjong Kang, Wonkwang Univ. (Republic of Korea); Kwon-Yeon Lee, Suncheon National Univ. (Republic of Korea); Nam Kim, Chungbuk National Univ. (Republic of Korea)

12445-10 • 2:10 PM - 2:30 PM

Simulation of speckle in pixelated hologram image recovery: application for AR retinal projection device

Author(s): Fabian Rainouard, CEA-LETI (France), Univ. de Haute-Alsace (France), Univ. Grenoble Alpes (France); Matthias Colard, CEA-LETI (France), Univ. de Haute-Alsace (France); Olivier Haeberlé, Univ. de Haute-Alsace (France); Christophe Martinez, CEA-LETI (France)

Conference 12445

12445-12 • 2:30 PM - 3:00 PM

Enabling ultra-compact, high-quality 3D displays with neural holography *(Invited Paper)*

Author(s): Manu Gopakumar, Suyeon Choi, Stanford Univ. (United States); Jonghyun Kim, NVIDIA (United States); Evan Y. Peng, The Univ. of Hong Kong (Hong Kong, China); Gordon Wetzstein, Stanford Univ. (United States)

Coffee Break 3:00 PM - 3:50 PM

12445-15 • 3:50 PM - 4:10 PM

Exponentially expanding étendue of displays with a tilting cascade

Author(s): Sagi Monin, Technion-Israel Institute of Technology (Israel); Aswin C. Sankaranarayanan, Carnegie Mellon Univ. (United States); Anat Levin, Technion-Israel Institute of Technology (Israel)

12445-17 • 4:10 PM - 4:30 PM

An in-house-designed scanner for CHIMERA holograms

Author(s): Philippe Gentet, Kwangwoon Univ. (Republic of Korea); Yves Gentet, Ultimate Holography (France); Seung Hyun Lee, Kwangwoon Univ. (Republic of Korea)

12445-18 • 4:30 PM - 4:50 PM

Panoramic ultra-high-definition augmented reality 360° color holograms as inclusive tools in transportation

Author(s): Jana Skirnewskaja, Univ. of Cambridge (United Kingdom); Yunuen Montelongo, Univ. of Oxford (United Kingdom); Timothy D. Wilkinson, Univ. of Cambridge (United Kingdom)

HOLOGRAPHY TECHNICAL EVENT

31 January 2023 • 7:30 PM - 9:00 PM | InterContinental Hotel, Intercontinental Ballroom B (5th Floor)

Session Chairs: Pierre-Alexandre J. Blanche, Wyant College of Optical Sciences (United States), Seunghyun Lee, Kwangwoon Univ. Session

The Holography Technical Group is involved with the whole record of research, engineering, recording materials, and applications of holography. The main fields of interest are display holograms, commercial and artistic, holographic optical elements (HOEs), holographic interferometry and holographic non-destructive testing (HNDT), computer-generated holography (CGH), electro and digital holography, holographic microscopy, and holographic data storage (HDS).

This meeting will focus on recent developments and directions, in particular, in regard to new materials, color display holography, digital holography, CGHs, and HOEs. Confirmed presentations include:

James Hall from Texas Instruments on their new development of the Phase Light Modulator MEMS

Philippe Gentet from Kwangwoon University on the CHIMERA holographic printer

Christoph Erler from Zeiss on the "Industrialization of Holographic Optics by ZEISS Microoptics"

WEDNESDAY 1 FEBRUARY

SESSION 4: 3D IMAGING FOR APPLICATIONS

1 February 2023 • 8:30 AM - 10:50 AM | Moscone Center, Room 2014 (Level 2 West)

Session Chair: Seunghyun Lee, Kwangwoon Univ. Session

12445-19 • 8:30 AM - 9:00 AM

AR and lidar applications enabled by beam and image steering by MEMS SLM *(Invited Paper)*

Author(s): Yuzuru Takashima, Xianye Deng, Chin-I Tang, Eunmo Kang, Heejoo Choi, Ching-Wen Chan, Jeff Chen, Brandon Hellman, Ted Liang-tai Lee, Parker Liu, Gregory M. Nero, Tianyao Zhang, Yexin Pei, Wyant College of Optical Sciences (United States)

12445-20 • 9:00 AM - 9:30 AM

The influence of ocular visual function on watching digital hologram: focused on accommodative response and blink rate *(Invited Paper)*

Author(s): Jungho Kim, Yujung Lee, Soonchul Kwon, Seunghyun Lee, Kwangwoon Univ. (Republic of Korea)

12445-21 • 9:30 AM - 10:00 AM

Diffraction optics for scaling photophoretic trap displays *(Invited Paper)*

Author(s): Cooper D. Bond, Riley Kuttler, Christian M. Hales, Daniel E. Smalley, Brigham Young Univ. (United States)

12445-22 • 10:00 AM - 10:30 AM

On the use of physics-enhanced machine learning for computational imaging *(Invited Paper)*

Author(s): George Barbastathis, Qihang Zhang, Subeen Pang, Zhen Guo, Massachusetts Institute of Technology (United States); Ziling Wu, Singapore-MIT Alliance for Research and Technology (Singapore)

12445-25 • 10:30 AM - 10:50 AM

Double exposure ESPI for non-contact surface topography tracking

Author(s): Hui Wang, Parsa Omid, Mamadou Diop, Jeffrey Carson, Western Univ. (Canada)

Coffee Break 10:50 AM - 11:20 AM

SESSION 5: ELECTRO-HOLOGRAPHY: ELECTRONIC GENERATION/DISPLAY OF HOLOGRAPHIC IMAGE INFORMATION

1 February 2023 • 11:20 AM - 12:10 PM | Moscone Center, Room 2014 (Level 2 West)

Session Chair: Pierre-Alexandre J. Blanche, Wyant College of Optical Sciences (United States)

12445-33 • 11:20 AM - 11:40 AM

Flexible modeling of next-generation displays using a differentiable toolkit

Author(s): Kaan Aksit, Koray Kavakli, Univ. College London (United Kingdom)

12445-34 • 11:40 AM - 12:10 PM

Optical image processing of 2-D and 3-D objects using digital holography (*Invited Paper*)

Author(s): Eric Smith, Partha P. Banerjee, Univ. of Dayton (United States)

Lunch/Exhibition Break 12:10 PM - 2:00 PM

SESSION 6: HOES AND DOES UTILIZING MATERIALS PROPERTIES FOR ENHANCED PERFORMANCE

1 February 2023 • 2:00 PM - 3:50 PM | Moscone Center, Room 2014 (Level 2 West)

Session Chair: Pierre-Alexandre J. Blanche, Wyant College of Optical Sciences (United States)

12445-27 • 2:00 PM - 2:30 PM

Practical design for holographic head-mounted display system using holographic printing technology (*Invited Paper*)

Author(s): Leehwan Hwang, Kwangpyo Hong, Jinwon Choi, Seunghyun Lee, Kwangwoon Univ. (Republic of Korea)

12445-28 • 2:30 PM - 2:50 PM

Analysis of phase masks for wide étendue holographic displays

Author(s): Sagi Monin, Technion-Israel Institute of Technology (Israel); Aswin C. Sankaranarayanan, Carnegie Mellon Univ. (United States); Anat Levin, Technion-Israel Institute of Technology (Israel)

12445-29 • 2:50 PM - 3:10 PM

Monocular passive ranging through a PQ:PMMA holographic wavelength division demultiplexer

Author(s): Julian Gamboa, Tabassom Hamidfar, Xi Shen, Northwestern Univ. (United States); Jason Bonacum, Digital Optics Technologies, Inc. (United States); Selim M. Shahriar, Northwestern Univ. (United States)

12445-30 • 3:10 PM - 3:30 PM

Holographic diffraction of complex beams and gratings: theory and simulation

Author(s): Xi Shen, Julian Gamboa, Tabassom Hamidfar, Northwestern Univ. (United States); Jason Bonacum, Digital Optics Technologies, Inc. (United States); Selim M. Shahriar, Northwestern Univ. (United States)

12445-38 • 3:30 PM - 3:50 PM

Generalized polarization holography using metasurfaces

Author(s): Aun Zaidi, Noah A. Rubin, Ahmed H. Dorrah, Harvard Univ. (United States); Federico Capasso, Harvard Univ (United States)

POSTERS-WEDNESDAY

1 February 2023 • 6:00 PM - 8:00 PM | Moscone Center, Level 2 West

Conference attendees are invited to attend the OPTO poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>.

12445-4

Highly transparent wave front printed volume holograms realized by amplitude-modulated incoherent pre-illumination

Author(s): Tobias Wilm, Max Wieland, Reinhold Fiess, Robert Bosch GmbH (Germany); Wilhelm Stork, Karlsruher Institut für Technologie (Germany)

On demand | Presented live 1 February 2023
Show Abstract

12445-16

Improvement in wavefront measurement accuracy in grating array-based zonal wavefront sensors by modulating the intensity profile of the incident beam

Author(s): Nagendra Kumar, Stanford Univ. School of Medicine (United States); Pranjal Choudhury, Nedup Sherpa, Akanshu Chauhan, Indian Institute of Technology Guwahati (India); Satya Siddharta Goutam Buddha, Tata Institute of Fundamental Research (India); Karuna Sindhu Malik, Indian Institute of Technology Guwahati (India); Santanu Konwar, Abhayapuri College (India); Bosanta Ranjan Boruah, Indian Institute of Technology Guwahati (India)

12445-31

Design and analysis of meta-pixel with expanded viewing zone controlling complex spatial light modulation

Author(s): Jonghyun Lee, Sehwan Na, Wonwoo Choi, Shin-Woong Park, Hwi Kim, Korea Univ. (Republic of Korea)

12445-35

Numerical analysis of eyeglow reduction in AR near eye display using holographic optical element

Author(s): Sangyoon Kim, Youngjin Jeon, Sehwan Na, Shin-Woong Park, Hwi Kim, Korea Univ. (Republic of Korea)

12445-36

Meta-surface of adjoint inverse design using local curvature filter algorithm for AR combiner

Author(s): Youngjin Jeon, Sangyoon Kim, Wonwoo Choi, Shin-Woong Park, Hwi Kim, Korea Univ. (Republic of Korea)

12445-39

Method for large field of view and eye-box of holographic waveguide display based on LED illumination

Author(s): Tianyao Zhang, Yushi Kaneda, Wyant College of Optical Sciences (United States)

DIGITAL POSTERS

28 January 2023 • 8:00 AM - 8:00 AM PST

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Photonics West.

12445-1

Computational three-dimensional Imaging with near infrared synchrotron beam using Fresnel zone apertures fabricated on barium fluoride windows using femtosecond laser ablation (*Invited Paper*)

Author(s): Daniel Smith, Molong Han, Soon Hock Ng, Tomas A. Katkus, Swinburne Univ. of Technology (Australia); Aravind Simon John Francis Rajeswary, Univ. of Tartu (Estonia); Mark J. Tobin, Jitraporn Vongsvivut, Australian Synchrotron (Australia); Saulius Juodkazis, Swinburne Univ. of Technology (Australia); Vijayakumar Anand, Univ. of Tartu (Estonia)

12445-14

4D imaging using accelerating airy beams and nonlinear reconstruction

Author(s): Andrei Bleahu, Univ. of Tartu (Estonia); Shivasubramanian Gopinath, Thiagarajar College (India), Univ. of Tartu (Estonia); Ravi Kumar, SRM University (India); Francis Gracy Arokiaraj, Univ. of Tartu (Estonia), The American College (India); Daniel Smith, Swinburne Univ. of Technology (Australia); Tauno Kahro, Praveen Periyasamy Angamuthu, Univ. of Tartu (Estonia); Soon Hock Ng, Swinburne Univ. of Technology (Australia); Agnes Pristy, Univ. of Tartu (Estonia), The American College (India); Tomas A. Katkus, Swinburne Univ. of Technology (Australia); Aravind Simon John Francis Rajeswary, Kaupo Kukli, Aile Tamm, Univ. of Tartu (Estonia); Saulius Juodkazis, Swinburne Univ. of Technology (Australia), Tokyo Institute of Technology (Japan); Joseph Rosen, Ben-Gurion Univ. of the Negev (Israel); Vijayakumar Anand, Univ. of Tartu (Estonia), Swinburne Univ. of Technology (Australia)

12445-23

Interferenceless coded aperture correlation holography: history, development, and applications (*Invited Paper*)

Author(s): Vijayakumar Anand, Univ. of Tartu (Estonia); Yossi Rosen, Ben-Gurion Univ. of the Negev (Israel)

12445-24

Three-dimensional phase imaging with near infrared synchrotron beam using phase-retrieval algorithm

Author(s): Molong Han, Daniel Smith, Soon Hock Ng, Tomas A. Katkus, Swinburne Univ. of Technology (Australia); Aravind Simon John Francis Rajeswary, Praveen P A, Univ. of Tartu (Estonia); Mark J. Tobin, Jitraporn Vongsvivut, Australian Synchrotron (Australia); Saulius Juodkazis, Swinburne Univ. of Technology (Australia); Vijayakumar Anand, Univ. of Tartu (Estonia)

GENERAL INFORMATION

Badge pick up and registration hours

Recommended: Speakers use North Lobby to pick up badges.

The Moscone Center

Friday 27 January	4:00 PM–7:00 PM	North lobby
Saturday 27 January	7:15 AM–5:00 PM	North + South lobby
Sunday 28 January	7:30 AM–5:00 PM	North + South lobby
Monday 29 January	7:30 AM–5:00 PM	North + South lobby
Tuesday 30 January	7:30 AM–5:00 PM	North + South lobby
Wednesday 1 February	7:45 AM–5:00 PM	North + South lobby
Thursday 2 February	7:45 AM–4:00 PM	North + South lobby

SPIE Cashier

Moscone Center, South Lobby

Open during registration hours

Registration payments online only

If you are planning to register onsite, your credit card payment will be processed during registration. If you wish to pay with cash or check, register at the “Need to Register” stations; you will be directed to the Cashier once you have completed registration except for final payment.

If you have already registered and wish to add a course, workshop or special event, you may do so at the “Need to Register” stations.

Receipt and certificate of attendance

Preregistered attendees who need an SPIE-stamped receipt or attendees who need a Certificate of Attendance may obtain those at Badge Corrections and Receipts.

Badge corrections

Badge corrections can be made at the Badge Corrections station. Please have your badge removed from the badge holder and marked with your changes before approaching the counter.

Speaker Check-In and Preview Station

Moscone Center, North Lobby

Open during Registration hours

All speakers must stop at Speaker Check-In to upload and preview their slide presentation files at least two hours before their scheduled session or the day before if you present in the first session. Speakers are not able to present using their own devices. All conference rooms have a laptop, projector, screen, lapel microphone, and laser pointer

SPIE health and safety products

Moscone Center, available at all information desks and registration desks

Open during registration hours

Stop by to pick up face masks, hand sanitizer, and other safety products, all free from SPIE.

COVID testing locations nearby

Walgreens

670 4th St
San Francisco, CA 94107

Walgreens

825 Market St
San Francisco, CA 94103

Internet access

Moscone Center, North, South, West

Complimentary wireless internet access is available throughout Moscone Center North, South, and West buildings, including the exhibition halls.

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Search and browse the program, special events, participants, exhibitors, courses, and more. Build your personalized schedule and sync with the online MySchedule tool. Free Conference App available for iPhone and Android phones. Information about restaurants and food options also available on the App. If you have questions, visit the App Lounge. Download the app.

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SPIE App Lounge

Moscone Center Hall D entry, exhibit level

Our SPIE App developer will be onsite and available to answer any questions on its use or navigation and how to get the best user experience. We welcome your feedback.

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Moscone Center North Lower Lobby, Exhibition Level

Saturday–Wednesday 8:30 AM–5:30 PM

Thursday 8:30 AM–4:00 PM

Stop by the SPIE Bookstore to browse the latest SPIE Press Books, proceedings, and educational materials. While there, get a t-shirt or educational toy to bring home to the family. Credit and debit cards only will be accepted; no cash.

SPIE Course Materials

Moscone Center, South Lobby

Open during registration hours

Browse course offerings or learn more about SPIE courses available in portable formats, such as online and customized, in-company courses.



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spie.org/pw or on the **SPIE App**

SPIE Press Room

Open during registration hours

For registered press only. The Press Room provides meeting space, refreshments, access to exhibitor press releases, and Internet connections. Press are urged to register before the meeting by emailing name, contact information, and name of publication to media@spie.org. Preregistration closes approximately 10 days before the start of the event.

SPIE luggage and coat check

Moscone Center, North Lobby

Saturday–Wednesday open during registration hours

Complimentary luggage, package, and coat storage are available. Please note posted hours; no late pickup available. Business Center

Moscone Center, South near Hall C, Exhibit Level

Tuesday–Thursday 9:00 AM–5:00 PM

The Moscone Business Center provides full service business needs for your convenience. Their services include photocopying, faxing, computer workstations, and printing services.

Copy services available near Moscone Center

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615 Mission St (at 2nd Street)
San Francisco, CA 94105
Phone: 415.882.7737

CityCopy Print Center

837 Mission St
San Francisco, CA 94103
Phone: 415.757.0673

Child care services

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San Francisco Bay Area
408.452.0225
Rachael Osorio
Email: rforosio15@gmail.com
www.bayareasittersunlimited.com

Note: SPIE does not imply an endorsement or recommendation of these services. They are provided on an “information only” basis for your further analysis and decision. Other services may be available.

Did you know SPIE offers Family Care Grants to SPIE members? For more information about deadlines and how to apply: <https://spie.org/about-spie/equity-diversity-inclusion/family-care-grants>

Mothers’ Lounge

Moscone Center, North and South Lobbies and West Level 2

Open during registration hours

The Mothers’ Lounge is a lockable room intended for nursing mothers. There is no storage, running water, or refrigeration available in this space.

Quiet Room

Moscone Center, North Lobby, Level 1, Room 115

Open during registration hours

The Quiet Room is intended for silent meditation, reflection, or prayer. No mobile device or computer use, and no food or beverages allowed.

Gender inclusive restroom

Moscone Center, South Lobby and West Level 2

Urgent message line

An urgent message line is available during registration hours: 415.978.3700

Lost and found

Cashier, Moscone Center, South Lobby

Open during registration hours

Found items will be kept at SPIE Cashier in the Registration area during the meeting and available only during registration hours. At the end of the meeting, all found items will be turned over to the Moscone Security Control 415.974.4021.

Food and beverage services

Moscone Center, near conference rooms and within the exhibit halls when open

Complimentary coffee daily 7:00 AM–4:00 PM

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Food and refreshments for purchase

Moscone Center, various locations

Saturday–Thursday

There is a variety of food and drink options, including hot and cold snacks, espresso, beverages, hot entrees, deli sandwiches, salads, and pastries available for purchase. Credit cards payments only.

San Francisco restaurants and city information

Moscone Center, South Lobby

The San Francisco Travel Association will have visitor’s guides and maps available. The association sells the San Francisco CityPASS, Muni 1-, 3- and 7-Day Pass-ports, cable car tickets, the Explorer Pass, Muni maps and hop-on-hop-off bus tickets. Staff are available to discuss city information including tips on local restaurants, the city’s many attractions, sightseeing suggestions and transit information.

SPIE Event Policies

Acceptance of policies and registration conditions

The following policies and conditions apply to all SPIE events, both online and in person. As a condition of registration, you will be required to acknowledge and accept the SPIE policies and conditions contained herein.

SPIE has established a confidential reporting system for all SPIE event participants to raise concerns about possible unethical or inappropriate behavior within our community. When at an SPIE event, you may contact any SPIE staff with concerns. If you feel that you are in immediate danger, please dial the local emergency number for police intervention.

Agreement to hold harmless

Attendee agrees to release and hold harmless SPIE from any and all claims, demands, and causes of action arising out of or relating to your participation in the event you are registering to participate in and use of any associated facilities or hotels.

Be well agreement

Any public space where other people are present holds an inherent risk of exposure to COVID-19 and other communicable diseases. By attending this event, I agree to voluntarily assume all risk related to exposure and agree to not hold SPIE or any of their affiliates including partners and sponsors, directors, officers, employees, agents, contractors, volunteers, or sponsored venues liable for illness. I will take necessary precautions while at the event including, but not limited to, engaging in appropriate social distancing, wearing a mask in public areas when not consuming food or beverage if required, minimizing face touching, frequently washing hands, and avoiding risky environments such as overcrowded bars or restaurants. I agree to not attend any SPIE event if I feel ill or had recent exposure to a COVID-19 case.

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It is SPIE policy that all employees, volunteers, and participants are entitled to respectful treatment. Any form of bullying, discrimination, harassment, sexual or otherwise, is unacceptable and will not be tolerated. This policy applies to all locations and situations where SPIE business is conducted and to all SPIE-sponsored activities and events.

Read complete policy

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Code of conduct

SPIE is committed to providing a harassment- and discrimination-free experience for everyone at our events, an experience that embraces the richness of diversity where participants may exchange ideas, learn, network, and socialize in the company of colleagues in an environment of mutual respect.

Read complete code

Event cancellation policy

If for some unforeseen reason SPIE should have to cancel an event, processed registration fees will be refunded to registrants. Registrants will be responsible for cancellation of travel arrangements or housing reservations and the applicable fees.

Family-friendly policy

Conference events: All conference technical and networking events require a badge for admission. Registered attendees may bring children with them if they have been issued a badge. Registration badges for children under 18 are free and available at the SPIE registration desk onsite. Children under 14 years of age must be accompanied by an adult at all times, and guardians are asked to help maintain a professional, disturbance-free conference environment.

Exhibition hall: Everyone who attends the exhibition must be registered and have a badge. Badges for children are free and available onsite at the registration desk. Children under 14 years of age must be accompanied by an adult at all times. Guardians are asked to help maintain a professional, disturbance-free exhibition environment. Children under 18 are not allowed in the exhibition area during exhibition move-in and move-out.

Identification requirement

To verify registered participants and provide a measure of security, SPIE will ask attendees to present a government-issued photo identification at registration to collect registration materials. Individuals are not allowed to pick up badges for other attendees. Further, attendees may not have some other person participate in their place at any conference-related activity. Such other individuals will be required to register on their own behalf to participate.

For online events, SPIE requires individuals to register with their legal identity.

Laser-pointer safety policy

SPIE events are subject to the applicable laser safety rules and regulations of the host location. SPIE supplies industry standard Class 2 presentation laser pointers for all conference and other meeting rooms. For safety reasons, SPIE requests that presenters use provided laser pointers. Use of a personal laser pointer represents the user's acceptance of liability for any damage or injuries to presenter or others.

No smoking policy

Attendees will observe all non-smoking regulations that are publicly posted by the facilities used by the event.

Online commenting policy

SPIE moderates all comments posted in an online event. We encourage robust discussion, the exchange of scientific ideas, and the sharing of multiple, diverse perspectives. We expect the discussion to be consistent with the norms of scholarly research community interactions at events. Online event participants should report any comments or content that falls short of those community norms. We will remove comments, content, or people that are considered inappropriate by SPIE standards or that:

- are defamatory, libelous, obscene, indecent, abusive, or threatening to others
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- upload viruses or are a cybersecurity hazard
- are off topic or inappropriately commercial in nature
- are in violation of any applicable laws or regulations

Payment policy

Registrations must be fully paid before access to the conference is allowed. SPIE accepts VISA, MasterCard, American Express, Discover, Diner's Club, checks, and wire transfers. Onsite registrations can also be paid with cash.

Recording policy

Conferences, courses, and poster sessions: For copyright reasons, recordings of any kind are prohibited without prior written consent of the presenter or instructor. Attendees may not capture or use materials presented in any meeting/course room or in course notes on display without written permission. Consent forms are available at speaker check-in, SPIE registration, or from SPIE online event hosts. Individuals not complying with this policy will be asked to leave a given session and/or asked to surrender their recording media. Refusal to comply with such requests is grounds for expulsion from the event.

Exhibition hall: Recordings of any kind are prohibited without explicit permission from on-site company representatives. Individuals not complying with this policy will be asked to surrender their recording media and to leave the exhibition hall. Refusal to comply with such requests is grounds for expulsion from the event.

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Unauthorized solicitation in the exhibition hall is prohibited. Any non-exhibiting organization observed to be distributing information or soliciting business in the aisles, or in another company's booth, will be asked to leave immediately.

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Personal belongings should not be left unattended in meeting rooms or public areas. Unattended items are subject to removal by security. SPIE is not responsible for items left unattended.

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