

Symposium Program

1st December (Thursday)

Welcome Address (10:00-10:05)

Tatsuo Saitoh (*PETRA*)

Session A: Opening (10:05-11:45)

Session Chair: Hideki Yagi (*PETRA*)

10:05 A-1 (Keynote)

Progress in Photonic Electronic Convergence Technologies through National Projects in Japan

Nobuhiko Nishiyama (*Tokyo Institute of Technology, PETRA*)

10:25 A-2 (Plenary)

High capacity data transmission using mode locked laser comb source and arrays of ring modulators

John E. Bowers (*UCSB*)

11:05 A-3 (Plenary)

Opto-electric hybrid switch system for high-speed and low-power consuming data transmission system

Kenya Suzuki (*NTT, PETRA*)

11:45-13:30 Lunch break

Session B: Optical Modulators (13:30-15:00)

Session Chair: Satoshi Iwamoto (*The University of Tokyo*)

13:30 B-1 (Invited)

High Baud Rate Coherent and Direct Detection Based Optical Fiber Transmission Systems and Their Enabling Technologies

David Plant (*McGill University*)

14:05 B-2 (Invited)

Silicon integrated photonics for high-bandwidth and energy-efficient optical compute interconnect

Haisheng Rong (*Intel*)

14:40 B-3

III-V/Si photonic integrated devices using direct bonding technology

Hideki Yagi (*PETRA*)

15:00-15:20 Break

Session C: Optical Transceivers (15:20-16:50)

Session Chair: Takuo Tanemura (*The University of Tokyo*)

15:20 C-1 (Invited)

Electronic and photonic IC co-design for high-speed optical transceivers

Johan Bauwelinck (*Ghent University, IMEC*)

15:55 C-2 (Invited)

VCSEL Photonics for CPO Transceivers Toward Beyond 5G Networks

Fumio Koyama (*Tokyo Institute of Technology*)

16:30 C-3

Novel optical frontend architecture for energy-efficient coherent transceivers

Shinsuke Tanaka (*PETRA*)

Poster Session (17:00-18:30)

2nd December (Friday)

Session D: Silicon Nanophotonics Devices & Systems (10:30-12:30)

Session Chair: Makoto Okano (*AIST*)

10:30 D-1

Resonant-Characteristics-Monitorable Si Wavelength Filter Using Face-To-Face Loop Mirrors for III-V/Si Hybrid Platform

Kunimasa Saitoh (*Hokkaido University*)

10:50 D-2

Si hybrid integration using ultrathin III-V membrane for photodetection

Mitsuru Takenaka (*The University of Tokyo*)

11:10 D-3

Development of 1.5- μ m InAs Quantum Dots on InP Substrate towards On-Chip Light Sources and Design of Photonic Nanostructured Waveguide for Dispersion Compensation

Satoshi Iwamoto (*The University of Tokyo*)

11:30 D-4

Microresonator frequency combs for ultra-low latency optical communication

Takasumi Tanabe (*Keio University*)

11:50 D-5

Low-loss Integrated optical isolator on Silicon photonics platform

Yuya Shoji (*Tokyo Institute of Technology*)

12:10 D-6

Photonic Integrated Self-Coherent Transceivers for Beyond-Tbps Short-Reach Links

Takuo Tanemura (*The University of Tokyo*)

12:30-14:00 Lunch break

Session E: Optical Network and Computing (14:00-15:30)

Session Chair: Shinsuke Tanaka (*PETRA*)

14:00 E-1 (Invited)

Tsurugi ~Japan National Project for next generation RDB

Takashi Kambayashi (*Nautilus technologies co. ltd.*)

14:35 E-2

Functional Block-based Disaggregation Model for Automating the Optical Layer

Kiyo Ishii (*AIST*)

14:55 E-3 (Invited)

Opportunities and challenges for optical switching in the datacenter

Paraskevas Bakopoulos (*NVIDIA*)

Closing Address (15:30-15:40)

Shu Namiki (*AIST*)

Poster session (Thursday)

P-01

Design of the III-V MOS optical modulator with doped graphene electrode for efficient, high-speed phase modulation

T. Piyapatarakul¹, H. Tang¹, K. Toprasertpong¹, S. Takagi¹, and M. Takenaka¹
(*1 The University of Tokyo*)

P-02

Optimization of Compact and Low-loss 2×2 Si Optical Coupler based on CMA-ES

Y. Miyatake¹, K. Toprasertpong¹, S. Takagi¹, and M. Takenaka¹
(*1 The University of Tokyo*)

P-03

Numerical Analysis of unidirectional lasing in a semiconductor ring resonator

Z. Dai¹, W. Lin² and S. Iwamoto^{1,3}
(*1 Research Center for Advanced Science and Technology, University of Tokyo, 2 Komaba Institute for Science (KIS), The University of Tokyo, 3 Institute of Industrial Science, University of Tokyo*)

P-04

Sub-bandgap photodetection at mid-infrared wavelengths using Ge Micro-ring resonator on Ge-on-insulator platform

C. Zhang¹, Z. Zhao¹, K. Toprasertpong¹, S. Takagi¹, and M. Takenaka¹
(*1 The University of Tokyo*)

P-05

Two-layer integrated photonic architectures for matrix-vector and matrix-matrix multiplications

R. Tang¹, M. Okano², K. Toprasertpong¹, S. Takagi¹, and M. Takenaka¹
(*1 Department of Electrical Engineering and Information Systems, The University of Tokyo, 2 National Institute of Advanced Industrial Science and Technology (AIST)*)

P-06

Si Photonics-Based Wavelength Locker Utilizing Thermal Synchronization with Laser Chip

J. Suzuki¹, K. Hasegawa², K. Masuyama¹, N. Ohata¹, and H. Aruga¹
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P-07

Grating couplers for ion trap quantum computers

M. Shirao¹, D. Klawson¹, S. Mouradian², and M. C. Wu¹
(*1 Department of Electrical Engineering and Computer Sciences, University of California, Berkeley, 2 Department Electrical and Computer Engineering, University of Washington*)

P-08

Temperature-Insensitive pulse and 120°C CW Operation of 1550nm-Band p-doped InAs/InGaAlAs Quantum Dot Lasers on InP(311)B Substrate

R. Yabuki¹, A. Matsumoto², R. Katsuhara¹, S. Heinsalu¹, K. Akahane², Y. Matsushima¹, H. Ishikawa¹, and K. Utaka¹
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P-09

Wafer-level Testing Technology for Hybrid III-V/SOI Integration

T. Horikawa¹ and N. Nishiyama^{1,2}
(*1 Tokyo Institute of Technology, 2 Photonics Electronics Technology Research Association (PETRA)*)

P-10

Saturable Absorber Embedded Microcavity for a Perfect Soliton Crystal

A. Nakashima¹, S. Fujii¹, R. Imamura¹, and T. Tanabe¹

(Faculty of Science and Technology, Keio University)

P-11

Layer structure dependence for controlling active layer optical confinement factor of direct bonding GaInAsP/SOI optical devices

R. Sasaki¹, T. Katsuyama¹, Y. Ohiso¹, T. Kikuchi¹, M. Eissa¹, T. Amemiya^{1,2}, and N. Nishiyama^{1,2,3}

(1 Dep. of Electrical and Electronic Engineering, 2 Institute of Innovative Research, Tokyo Institute of Technology, 3 PETRA)

P-12

Low phase noise THz generation from a Kerr microresonator soliton comb

N. Kuse^{1,2}, K. Nishimoto³, Y. Tokizane¹, S. Okada³, G. Navickaite⁴, M. Geiselmann⁴, K. Minoshima^{1,5}, and T. Yasui¹

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P-13

Fabrication of high-Q Ta₂O₅ microresonator

H. Kitora¹, M. Funakoshi², K. Nishimoto¹, T. Yasui³, K. Minoshima^{3,4}, and N. Kuse³

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P-14

Silicon Based All-Optical Micro-Ring Resonator Thermo-Optic Switch

Z. Liang¹ and Y. Shoji^{1,2}

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P-15

OMA Penalty and Frequency Chirp in Mach-Zehnder Silicon Optical Modulators with Inter-Arm Imbalance

T. Murao¹, J. Ushida¹, H. Takahashi¹, M. Tokushima¹, A. Shiina¹, and T. Horikawa¹

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P-16

Design of S+C+L band Tapered Asymmetric Directional Coupler for Broadband Polarization Splitter-Rotator

S. Ochiai¹, T. Fujisawa, K. Nakamura, Y. Sawada, T. Sato, and K. Saitoh

(1 Graduate School of Information Science and Technology, Hokkaido University)

P-17

Investigation of Fabrication Tolerance for III-V/Si Connecting Structures Based on Symmetric and Asymmetric Tapered Waveguides

K. Uchida¹, T. Sato¹, T. Fujisawa¹, T. Mitarai², T. Hiratani², T. Okimoto², T. Ishikawa², N. Kono², N. Fujiwara², H. Yagi², and K. Saitoh²

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P-18

Performance evaluation of optical Nyquist filter for energy efficient coherent transceiver

J. Matsui^{1,2}, T. Akiyama^{1,2}, G. Huang², H. Nakashima², S. Tanaka^{1,2}, and T. Hoshida²

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P-19

Compact Phased Array Type Wavelength-selective Switch Based on Silicon Photonics

Y. Ni¹, Y. Shoji^{1,2}

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P-20

Characteristics of SiON waveguides at various refractive indices

K. Yamaguchi¹, M. Eissa¹, Y. Oiso², T. Amemiya^{1,2} and N. Nishiyama^{1,2,3}

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P-21

Field demonstration of low-latency optical transmission with soliton microcombs

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P-22

Impedance and mode matching for high-efficient Si/SiN waveguides coupling

R. Sugano¹, R. Nishihata¹, and Takasumi Tanabe¹

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P-23

Design and Characterization of Multi-Wavelength Coherent Receiver Circuit

S. Maeda¹, T. Fukui¹, G. Soma¹, T. Tanemura¹, and Y. Nakano¹

(1 School of Engineering, The University of Tokyo)

P-24

Experimental measurement of Raman comb stability and mutual coherence in silica rod microresonator

S. Sugawara¹, S. Fujii¹, H. Kumazaki¹, and T. Tanabe¹

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P-25

Effect of detuning on RF beat note in modulation instability comb

S. Kogure¹, S. Fujii^{1,2}, H. Kumazaki¹, S. Sota¹, and T. Tanabe¹

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P-26

Low-capacitance InGaAs/Si Waveguide Photodetector for Energy-efficient Receiver System

T. Akazawa¹, D. Wu¹, K. Sumita¹, N. Sekine¹, M. Okano², K. Toprasertpong¹, S. Takagi¹, and M. Takenaka¹

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P-27

Ultra-low-power Optical DAC Operation (2pJ/bit) using 28-nm CMOS Driver and All-silicon Segmented Modulator for Coherent Optical Transmitter

Y. Sobu^{1,2}, T. Mori^{1,2}, Y. Tsunoda^{1,2}, T. Yamamoto^{1,2}, and S. Tanaka^{1,2}

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P-28

Low-thermal-resistance hybrid GaInAsP/SOI ridge-waveguide Fabry-Pérot lasers by enhanced heat dissipation

M. Eissa¹, T. Kikuchi¹, Y. Ohiso¹, T. Amemiya^{1,2}, and N. Nishiyama^{1,2,3}

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P-29

Crosstalk-Free 32-ch Dense WDM Demultiplexer on Standard Si PIC Platform

T. Akiyama^{1,2}, M. Nishizawa^{1,2}, A. Sugama², Y. Nakasha², S. Tanaka^{1,2}, Y. Tanaka², and T. Hoshida²

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P-30

High-Power CW Operation of 1.3 μm Wavelength InP-based Photonic-Crystal Surface-Emitting Lasers with Double-Lattice Air Holes

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P-31

Experimental Demonstration of Mosaic-based Ultra-small Power Splitters Designed by Bayesian Direct-binary-search method

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P-32

All III-arsenide L-band InAs quantum dot lasers on InP(001)

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