

Symposium Program

30th November (Monday)

Welcome Address (10:00-10:05)

S. Tahara (*PETRA*)

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

10:05 A-1 (Keynote)

Advances in Photonic and Electronic Convergence System Technology

Y. Arakawa (*The University of Tokyo*)

10:25 A-2 (Plenary)

Standardization for Photonic Integration: Materials, Processes and Architecture

L. C. Kimerling (*Massachusetts Institute of Technology*)

11:05 A-3 (Plenary)

Quantum Dot Optoelectronic Devices on Si

J. Bowers (*University of California, Santa Barbara*)

11:45-14:00 Lunch break

Session B: Silicon Nanophotonics Devices & Systems I (14:00-15:10)

14:00 B-1 (Invited)

Neuromorphic Computing with 3D Silicon Photonic Integrated Circuits

S. J. B. Yoo (*University of California, Davis*)

14:35 B-2 (Invited)

Photonic Reservoir Computing Using Complex Laser Dynamics

A. Uchida (*Saitama University*)

15:10-15:20 Break

Session C: Silicon Nanophotonics Devices & Systems II (15:20-16:35)

15:20 C-1

Silicon-Photonics-Based Electronic-Photonic Interposer Technology Utilizing Glass Substrate toward Tbit Scale Data Transmission

A. Hayakawa (*PETRA*)

15:40 C-2

Active Optical Package Substrate Using Si Photonics and Polymer Optical Components

T. Amano (*AIST*)

16:00 C-3 (Invited)

Advances in Silicon Photonics Technology for Scaling the Cloud and Enabling AI

M. Pantouvaki (*IMEC*)

1st December (Tuesday)

Session D: Silicon Nanophotonics Devices & Systems III (10 :00-11:50)

- 10:00 **D-1 (Invited)**
Silicon Photonics Enabling the Evolution of Optical Transceivers
P. De Dobbelaere (*Cisco*)
- 10:35 **D-2 (Invited)**
Optical I/O for Multi-Tbps Chip-to-Chip Interconnects
M. Wade (*Ayar Labs*)
- 11:10 **D-3**
Si Optical Modulator with Strained SiGe Layer and Ge/Si Electro-Absorption Optical Modulator for 56 Gbaud Optical Transceiver
J. Fujikata (*PETRA*)
- 11:30 **D-4**
The Perspective of Integrated-Photonics Device Verification
T. Murao (*PETRA*)

11:50-13:30 Lunch break

Session E: Silicon Nanophotonics Devices & Systems IV (13:30-15:20)

- 13:30 **E-1 (Invited)**
Computing Craves Optical Interconnect Due to Moore's Law Ending
H. Fukuda (*AIO Core*)
- 14:05 **E-2 (Invited)**
Nanophotonic Linear/Nonlinear Functionalities toward Optical Computing
K. Nozaki (*NTT*)
- 14:40 **E-3**
Slow-Light Waveguide in Semiconductor Valley Photonic Crystal
S. Iwamoto (*The University of Tokyo*)
- 15:00 **E-4**
Si Hybrid MOS Optical Modulators toward High-Speed Operation
M. Takenaka (*The University of Tokyo*)

Closing Address (15:20-15:25)

M. Mori (*AIST*)

Short Presentations (Video)

S-01

Bandwidth Improvement of Waveguide Optical Isolator Based on TE-TM Mode Conversion

R. Yokoi¹, Y. Shoji¹, and T. Mizumoto¹

(1 Tokyo Inst. Tech.)

S-02

Silicon Waveguide Magneto-Optical Devices Fabricated by μ -Transfer Printing

D. Minemura¹, R. Kou², Y. Shoji¹, K. Yamada², and T. Mizumoto¹

(1 Tokyo Inst. Tech., 2 AIST)

S-03

Unidirectional Photon Transfer between Cavities Based on Both Adiabatic and Half-Adiabatic Processes

K. Inoue¹, T. Asano¹, and S. Noda¹

(1 Kyoto Univ.)

S-04

High Bandwidth Efficiency of Collective Communications between FPGAs with Optical I/O Core

K. Mizutani¹, H. Yamaguchi¹, and Y. Urino¹

(1 PETRA)

S-05

Non-Volatile Compact Optical Phase Shifter Based on $\text{Ge}_2\text{Sb}_2\text{Te}_5$ Operating at Mid-Infrared Wavelength

Y. Miyatake¹, C. P. Ho¹, P. Pitchappa², R. Singh², K. Makino³, J. Tominaga³, N. Miyata³, T. Nakano³, N. Sekine¹,
K. Toprasertpong¹, S. Takagi¹, and M. Takenaka¹

(1 Univ. Tokyo, 2 Nanyang Tech. Univ., 3 AIST)

S-06

Design of LN Thin Film Optical Modulator Sandwiched by Si Layers

Y. Nakajima¹, Y. Shoji¹, T. Mizumoto¹, and K. Ogawa¹

(1 Tokyo Inst. Tech.)

S-07

Investigation of Thermal Shunt Structure of Semiconductor Membrane Laser Based on BCB Bonding for Enhancing Heat Evacuation

W. Fang¹, N. Takahashi¹, W. Wang¹, T. Amemiya^{1,2}, and N. Nishiyama^{1,2}

(1 Dept. of EEE, Tokyo Inst. Tech., 2 IIR Tokyo Inst. Tech.)

S-08

Demonstration of 4×4 Microring Resonator Crossbar Array for Optical Neural Network

S. Ohno¹, K. Toprasertpong¹, S. Takagi¹, and M. Takenaka¹

(*I Univ. Tokyo*)

S-09

Thermally Controlled 2D Beam Steering Using Si Photonic Crystal Slow-Light Waveguides

H. Ito¹, T. Tamanuki¹, and T. Baba¹

(*I Yokohama Nat'l Univ.*)

S-10

High-Speed Silicon Photonic Crystal Modulators and Wavelength Division Multiplexing

T. Baba¹, Y. Hinakura¹, D. Akiyama¹, and H. Ito¹

(*I Yokohama Nat'l Univ.*)

S-11

Experimental Evaluation of the Free-carrier Plasma Dispersion Effect in Germanium

Z. Zhao¹, C. P. Ho¹, Q. Li¹, K. Toprasertpong¹, S. Takagi¹, and M. Takenaka¹

(*I Univ. Tokyo*)

S-12

Two-Micrometer Monolithic Germanium Waveguide Photodetector Integrated with Lateral PIN Junction

Z. Zhao¹, C. P. Ho¹, Q. Li¹, K. Toprasertpong¹, S. Takagi¹, and M. Takenaka¹

(*I Univ. Tokyo*)

S-13

High-Speed Thermo-Optic Beam Scanner Employing Si Photonic Crystal Slow-Light Waveguides

T. Tamanuki¹, H. Ito¹, J. Gondo¹, and T. Baba¹

(*I Yokohama Nat'l Univ.*)

S-14

Controlled Beam Steering in Serial Array of Si Photonic Crystal Waveguide Optical Antennas

R. Tetsuya¹, H. Abe¹, H. Ito¹, T. Tamanuki¹, and T. Baba¹

(*I Yokohama Nat'l Univ.*)

S-15

Matrix Multiplication Algorithm for Fully Connected Parallel Computing Systems

Y. Urino¹

(*I PETRA*)

S-16

Particle Swarm Optimization of Si Photonic Crystal Waveguide Junction Structure (II) -Experimental Demonstration-

R. Shiratori¹, K. Hayashi¹, and T. Baba¹

(1 Yokohama Nat'l Univ.)

S-17

Lowering Power Consumption of WDM Optical Interconnect Link Using Efficient EDFA

S. Nakamura¹, T. Usuki¹, T. Shimizu¹, K. Mizutani¹, and Y. Urino¹

(1 PETRA)

S-18

Error-Free Operation in Wavelength-Routing Inter-Node Interconnect System Using Photonic and Electronic Integrated Circuits

T. Shimizu¹, S. Nakamura¹, K. Takemura¹, J. Fujikata¹, T. Nakamura¹, and Y. Urino¹

(1 PETRA)

S-19

Theoretical Study of QCSE in InAs/GaAs Quantum Dot Composition Intermixing Structure

T. Ito¹, Y. Hiraishi¹, K. Atsugi¹, J. Kwoen², Y. Matsushima¹, H. Ishikawa¹, Y. Arakawa², and K. Utaka¹

(1 Waseda Univ., 2 NanoQuine, Univ. Tokyo)

S-20

Buried-Ridge-Waveguide Type GaInAsP/InP Membrane Lasers for Reduction of Differential Resistance

N. Takahashi¹, W. Fang¹, W. Wang¹, T. Amemiya^{1,2}, and N. Nishiyama^{1,2}

(1 Dept. of EEE, Tokyo Inst. Tech., 2 IIR Tokyo Inst. Tech.)

S-21

Topological Taper Structure for High-Efficiency Coupling between Si Wire Waveguide and Topological Waveguide

H. Kagami¹, T. Amemiya^{1,2}, S. Okada¹, N. Nishiyama^{1,2}, and X. Hu³

(1 Dept. of EEE, Tokyo Inst. Tech., 2 IIR Tokyo Inst. Tech., 3 NIMS)

S-22

Coarse Meshing for 3D Full-Vector Simulation in Silicon Photonics

T. Usuki¹

(1 PETRA)

S-23

Topological Power Splitter on Si-photonics Platform

S. Okada¹, T. Amemiya^{1,2}, H. Kagami¹, N. Nishiyama^{1,2}, and X. Hu³

(1 Dept. of EEE, Tokyo Inst. Tech., 2 IIR Tokyo Inst. Tech., 3 NIMS)

S-24

Conceptual Model of Co-Packaged Optics for 51.2 Tbps Switch Applications

K. Takemura¹, I. Ogura¹, A. Noriki^{1,2}, and T. Amano^{1,2}

(1 PETRA, 2 AIST)

S-25

Optical Fiber Assembly for Optical Polymer Waveguides on Co-packaged Substrate by Using V-groove Guide and Low-Profile Ferrule

T. Aoki¹, A. Noriki^{1,2}, and T. Amano^{1,2}

(1 PETRA, 2 AIST)

S-26

E-band InAs Quantum Dot Laser on InGaAs Metamorphic Buffer Layer

J. -K. Kwoen¹, W. Zhan¹, and Y. Arakawa¹

(1 NanoQuine, Univ. Tokyo)

S-27

Growth of InAs/GaAs Trilayer Quantum Dots with Emission Wavelength beyond 1.4 μm

W. Zhan¹, J. -K. Kwoen¹, K. Watanabe¹, M. Kakuda¹, S. Iwamoto^{1,2,3}, and Y. Arakawa¹

(1 NanoQuine, Univ. Tokyo, 2 IIS, Univ. Tokyo, 3 RCAST, Univ. Tokyo.)

S-28

Effect of P-Doping on Threshold Current Characteristics in InAs/GaAs Quantum Dot Lasers

M. Kakuda¹, J. -K. Kwoen¹, K. Watanabe¹, and Y. Arakawa¹

(1 NanoQuine, Univ. Tokyo)

S-29

Analysis of Threshold Gain Difference in a Topological Edge State Laser

N. Ishida¹, Y. Ota¹, W. Lin^{2,3}, Y. Arakawa¹, and S. Iwamoto^{1,2,3}

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