Symposium Program

3rd December (Monday)

Venue: ENEOS Hall
Komaba Research Campus, the University of Tokyo

Registration (9:00-9:50)

Welcome Address (9:50-10:00)

S. Tahara (*PETRA*)

Session A: Opening (10:00-11:55)

10:00 **A-1 (Keynote)**
Advances in Photonic and Electronic Convergence System Technology
Y. Arakawa (*The University of Tokyo*)

10:30 **A-2 (Plenary)**
Electronic-Photonic Integration Platforms: Datacom, RF and Sensing
L. C. Kimerling (*Massachusetts Institute of Technology*)

11:15 **A-3 (Invited)**
Photonic Integration of Ultra-High-Q Optical Resonators for Next-Generation Clocks and Hertz-Absolute-Accuracy Optical Frequency Synthesizers
K. Vahala (*California Institute of Technology*)

11:55-13:20 Lunch break

Session B: Silicon Nanophotonics Devices & Systems I (13:20-15:20)

13:20 **B-1 (Invited)**
Silicon Photonics Packaging for Optical Interconnects and Integrated Sensors
C. Xiong (*IBM Research*)

14:00 **B-2 (Invited)**
Silicon Photonic Switching Toward Future Cloud Networking
S. Namiki (*AIST*)

14:40 **B-3 (Invited)**
Femtojoule 3D Nanophotonic-Nanoelectronic Integrated Circuits for Computing Beyond Moore's Law
S. J. B. Yoo (*University of California, Davis*)

15:20-15:40 Break

Session C: Silicon Nanophotonics Devices & Systems II (15:40-18:05)

15:40 **C-1 (Invited)**

Beyond 110Gbit/s OOK and PAM-4 Signaling Using a Single Drive Hybrid Silicon and Polymer Modulator

S. Yokoyama (*Kyusyu University*)

16:20 **C-2**

Toward Optical Interposer for 10-Tbps Interconnection

T. Nakamura (*PETRA*)

16:40 **C-3**

High-Density Silicon Photonics Technologies toward Large-Capacity Optical Interconnection

Y. Tanaka (*PETRA*)

17:00 **C-4**

Optical and Electrical Hybrid Interposer using Single Mode Polymer Optical Waveguides

T. Amano (*AIST*)

17:20 **C-5**

Optical Hub for Rack-Scale Parallel-Processing Systems

Y. Urino (*PETRA*)

17:40 **C-6**

Efficient Optical Phase Modulator Based on Si Hybrid MOS Capacitor

M. Takenaka (*The University of Tokyo*)

Banquet (18:30-20:00): ape cucina naturale

4th December (Tuesday)

Venue: ENEOS Hall
Komaba Research Campus, the University of Tokyo

Session D: Silicon Nanophotonics Devices & Systems III (9:30-11:30)

9:30 **D-1 (Invited)**
Co-Packaging of Ethernet Switches & Optical I/Os Enabled by Silicon Photonics
P. De Dobbelaere (*Luxtera*)

10:00 **D-2 (Invited)**
Deci-Dime Scale Optical Transceiver "Optical I/O core" Based on Si Photonics Technology
H. Fukuda (*AIO CORE*)

10:30 **D-3 (Invited)**
High-Density Si Photonics for In-Package Optics
A. Zilkie (*Rockley Photonics*)

11:00 **Panel Discussion**
Moderator: S. Tahara (*PETRA*)
Panelists: P. De Dobbelaere, H. Fukuda, and A. Zilkie

Poster Session (11:30-14:00)

11:30 **Poster preview**

12:30 **Poster presentation with Lunch**

12:30-14:00 Lunch break

Session E: Silicon Nanophotonics Devices & Systems IV (14:00-15:55)

14:00 **E-1 (Invited)**
TE Mode Optical Isolator for Silicon Photonics
T. Mizumoto (*Tokyo Institute of Technology*)

14:40 **E-2 (Invited)**
Reliable, Feedback Insensitive p-Modulation Doped Quantum Dot Lasers Epitaxially Grown on CMOS Compatible Silicon Substrates
J. Norman (*University of California, Santa Barbara*)

15:20 **E-3**
Light Propagation in Semiconductor Valley Photonic Crystal Slab
S. Iwamoto (*The University of Tokyo*)

Closing Address (15:45-15:55)

M. Mori (*AIST*)

Poster Session (Tuesday)

P-01

Si Waveguide Polarization Beam Splitter using Reversed Δβ Directional Coupler

H. Okayama[1,2], Y. Onawa[1,2], D. Shimura[1,2], H. Yaegashi[1,2], and H. Sasaki[1,2]

(1 OKI Electric Industry Co. Ltd., 2 PETRA)

P-02

The Novel Frequency Modulator Design and Synthesis based on BJT Transistor

K. Tripetch[1]

(*1 Rajamangala University of Technology Suvarnabhumi*)

P-03

High-Efficiency and High-Resolution Si Photonic Crystal Slow-Light Beam Steering Device

H. Ito[1], Y. Kusunoki[1], D. Akiyama[1], H. Abe[1], G. Takeuchi[1], and T. Baba[1]

(*1 Yokohama Nat'l University*)

P-04

High-Speed Operation of Meander Line Electrode Photonic Crystal Optical Modulator

Y. Hinakura[1], H. Arai[1], and T. Baba[1]

(*1 Yokohama Nat'l University*)

P-05

Uniaxial Crystalline Yttrium Iron Garnet on Amorphous SiO_2 by Layer-by-Layer Pulsed LASER Deposition

G. Nakamura[1], and H. Isshiki[1,]

(*1 The University of Electro-Communications*)

P-06

Fabrication of Vertical DBR Cavity with Er Silicate Active Region using Radical Assisted Sputtering

G. D. Fuentes[1], T. Kasumi[1], Y. Tanaka[1,2], and H. Isshiki[1]

(*1 The University of Electro-Communications, 2 Shincron Co. Ltd.*)

P-07

Investigation of a Germanium-on-Insulator Band-Stop Filter

C. P. Ho[1,2], Z. Zhao[1], Q. Li[1], S. Takagi[1], and M. Takenaka[1]

(*1 Univ. Tokyo, 2 JSPS Research Fellow*)

P-08

Fabrication of High-Q Ring Resonator Using Low Loss GeOI Wafer

Z. Zhao[1], C. P. Ho[1], S. Takagi[1], and M. Takenaka[1]

(*1 Univ. Tokyo*)

P-09

Demonstration of Si Racetrack Resonator Based on III-V/Si Hybrid MOS Phase Shifter

Q. Li[1], C. P. Ho[2], S. Takagi[1], and M. Takenaka[1]

(*1 Univ. Tokyo, 2 JSPS Research Fellow*)

P-10

Estimation of Performance and Measurement of Beam Steering of Si Photonics FMCW LiDAR

H. Abe[1], H. Ito[1], and T. Baba[1]

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P-11

Packaging of Hybrid-Integrated Light Sources Mounted on Silicon Platform

M. Nishizawa[1], S. –H. Jeong[1], and Y. Tanaka[1,2,3]

(*1 PETRA, 2 Fujitsu Ltd., 3 Fujitsu Laboratories Ltd.*)

P-12

Si (De)Multiplexers with Automated Fabrication-Error Correction

T. Akiyama[1,2,3], T. Aoki[1], T. Mori[2], T. Simoyama[1,2,3], S. –H. Jeong[1], N. Hatori[1], S. Sekiguchi[1], Y. Sobu[1,2,3], S. Tanaka[1,2,3], M. Nishizawa[1], A. Sugama[2], A. Hayakawa[1,2,3], and Y. Tanaka[1,2,3]

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P-13

Cobalt Ferrite with Large Magneto-Optical Effect for Silicon Photonics

M. A. Serrano-Nunez[1], Y. Shoji[1,2], and T. Mizumoto[1,2]

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

P-14

High-Speed Ge/Si Electro-Absorption Optical Modulator for High-Bandwidth Optical Interconnect

J. Fujikata[1], M. Noguchi[1], K. Kawashita[2], S. Takahashi[1], M. Nishimura[2,3], H. Ono[1], D. Shimura[1], H. Takahashi[1], H. Yaegashi[1], Y. Ishikawa[2], and T. Nakamura[1]

(*1 PETRA, 2 Toyohashi Univ. Tech, 3 Tokyo Univ.*)

P-15

Numerical Study on Modulation Efficiency Enhancement of SIS Optical Phase Shifter Using Negative Capacitance Effect

J. –H. Han[1,3], K. Bidenko[1,2,3], J. Song[1,2], S. –H. Kim[1,2]

(*1 KIST, 2 KIST school UST, 3 These authors contributed equally to this work.*)

P-16

Low-Loss Silicon Waveguide Optical Isolator Fabricated by Direct Bonding

R. Tian[1], Y. Shoji[1], and T. Mizumoto[1]

(*1 Tokyo Inst. Tech.*)

P-17

Energy Cost Study of Membrane Distributed-Reflector (DR) Lasers for High-Speed Modulation

N. Nakamura[1], T. Yoshida[2], W. Fang[1], T. Amemiya[1,2], N. Nishiyama[1,2], and S. Arai[1,2]

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

P-18

Magneto-Optical Photonic Crystal Waveguides

K. B. Walid[1], K. Ogawa[1], Y. Shoji[1], and T. Mizumoto[1]

(*1 Tokyo Inst. Tech.*)

P-19

Reception Antenna Characteristics of Si Photonics Crystal Optical Beam Steering Device

Y. Furukado[1], H. Ito[1], Y. Kusunoki[1], D. Akiyama[1], H. Abe[1], and T. Baba[1]

(*1 Yokohama Nat'l University*)

P-20

Study of Microcrystalline Silicon Optical Modulator with Multi-layered Structure

K. Matsumoto[1], Y. Kondo[1], R. Takei[2], Y. Shoji[1], T. Mizumoto[1], and T. Kamei[2]

(*1 Tokyo Inst. Tech., 2 AIST*)

P-21

Control of Light Emission Characteristics from a Serial Array of Si Photonic Crystal Beam Steering Devices

R. Tetsuya[1], H. Abe[1], and T. Baba[1]

(*1 Yokohama Nat'l University*)

P-22

Design of a High-Q Coupled Nanocavity System for Dynamic Photon Manipulations

M. Nakadai[1,2], T. Asano[1], and S. Noda[1]

(*1 Kyoto Univ., 2 JSPS Research Fellow*)

P-23

Optimization of Doubly-Periodic Photonic Crystal Waveguide for Improving the Transmission and Reception Efficiency in Si Photonics Slow-Light Antenna

G. Takeuchi[1], H. Abe[1], and T. Baba[1]

(*1 Yokohama Nat'l Univ.*)

P-24

Single Sideband Modulation Using Si Photonic Crystal Optical Modulator

M. Kamata[1], Y. Hinakura[1], and T. Baba[1]

(*1 Yokohama Nat'l Univ.*)

P-25

1200nm-Band InAs Quantum Dot Intermixing for Monolithic Photonic Integrated Circuits in Data Centers

K. Utaka[1], T. Shirai[1], Y. Hiraishi[1], Y. Matsushima[1], H. Ishikawa[1], Y. Arakawa[2], and J. –K. Kwoen[2]

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

P-26

Demonstration of a Topological Photonic Crystal Nanocavity Laser with Quantum Dot Gain

Y. Ota[1], R. Katsumi[2], K. Watanabe[1], S. Iwamoto[1,2] and Y. Arakawa[1]

(*1 NanoQuine, Univ. Tokyo, 2 IIS, Univ. Tokyo*)

P-27

Demonstration of a Quantum Dot Laser on Silicon using Transfer Printing

B. –Y. Jang[1], Y. Ota[1], R. Katsumi[2], J. –K. Kwoen[1], N. Morais[1], and Y. Arakawa[1]

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P-28

Over 100 °C CW Operation of InAs/GaAs Quantum-Dot Lasers on Si (001) Substrate

J. –K. Kwoen[1], B. –Y. Jang[1], K. Watanabe[1] and Y. Arakawa[1]

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P-29

On-Chip Excitation of Single Quantum Dots using a Silicon Waveguide

A. Osada[1], Y. Ota[1], R. Katsumi[2], T. Yamaguchi[2], M. Kakuda[1], S. Iwamoto[1,2], and Y. Arakawa[1]

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P-30

Growth of InAs/GaAs Bilayer Quantum Dots for Long-Wavelength Emission

W. Zhan[1], J. –K. Kwoen[1], K. Watanabe[1], S. Iwamoto[1,2], and Y. Arakawa[1]

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P-31

MBE Growth of Stacked InAs/GaAs Quantum Dots with Thin (25.5 nm) Barrier Layer

M. Kakuda[1], J. –K. Kwoen[1], K. Watanabe[1], and Y. Arakawa[1]

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P-32

Observation of Light Propagation through Sharp Bends in a Slab-type Valley Photonic Crystal Waveguide

T. Yamaguchi[1], Y. Ota[2], R. Katsumi[1], S. Ishida[1], A. Osada[2], Y. Arakawa[2], and S. Iwamoto[1,2]

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P-33

Characteristics of a Quantum Dot Infrared Photodetector on On-Axis Si (100) Substrate

H. Yoshikawa[1,2], J. –K. Kwoen[1], T. Doe[1,2], M. Izumi[2], S. Iwamoto[1], Y. Arakawa[1]

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P-34

Investigation of Photoluminescence Intensity of GaInAs/InP Quantum-Wells Irradiated by Various Fast Atom Beam Sources

Y. Wang[1], T. Mitarai[1], T. Amemiya[1,2], N. Nishiyama[1,2], and S. Arai[1,2]

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P-35

MBE Growth of GaInAs Metamorphic Layers and 1.5-μm-Band InAs/GaInAs Quantum Dots on GaAs Substrates

K. Watanabe[1], W. Zhan[1], M. Kakuda[1], J. –K. Kwoen[1], and Y. Arakawa[1]

(*1 NanoQuine, Univ. Tokyo*)

P-36

Single Plasmon Generation in a Plasmonic Microring Resonator Embedding Self-Assembled Quantum Dots

A. Tamada[1], Y. Ota[2], K. Kurama[1], K. Watanabe[2], S. Iwamoto[1,2], and Y. Arakawa[2]

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