

Symposium Program

11th December (Monday)

Venue: Convention 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 (10:00-12:00)

10:00 **A-1 (Keynote)**

Advances in Photonics and Electronics Convergence System Technology

Y. Arakawa (*The University of Tokyo*)

10:30 **A-2 (Plenary)**

Silicon Photonics: Grand Challenges and Key Needs for 2018

L. C. Kimerling (*Massachusetts Institute of Technology, AIM Photonics*)

11:15 **A-3 (Plenary)**

Reliable, High Efficiency, Low Threshold Current Quantum Dot Lasers

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

12:00-13:30 Lunch break

Session B: Silicon Nanophotonics Devices & Systems I (13:30-15:00)

13:30 **B-1 (Invited)**

It's Time for Optical I/O

A. Wright-Gladstein (*Ayar Labs*)

14:10 **B-2**

Computing Performance Improvement using Optical I/O Cores with FPGA

Y. Matsumoto (*PETRA*)

14:35 **B-3**

Ultra-compact Optical Transceivers for TWDM-PON ONU Utilizing Silicon Photonics Technology

H. Yaegashi (*PETRA*)

15:00-15:20 Break

Session C: Silicon Nanophotonics Devices & Systems II (15:20-17:00)

- 15:20 **C-1**
Silicon Photonics Technologies for High-density Optical Interconnects
S. H. Jeong (*PETRA*)
- 15:45 **C-2**
Advanced Light Manipulation with Photonic Crystal Nanostructures
T. Asano (*Kyoto University*)
- 16:10 **C-3**
High Density Parallel Multimode Optical Links on Printed Circuit Board
T. Amano (*AIST*)
- 16:35 **C-4**
Discussion of Taper Structures for Hybrid and 3D Photonic Devices
N. Nishiyama (*Tokyo Tech*)

Banquet (17:15-19:00): ape cucina naturale

12th December (Tuesday)

Venue: Convention Hall

Komaba Research Campus, the University of Tokyo

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

9:30 **D-1 (Invited)**

Membrane Lasers towards Low-power and High-speed Applications

S. Arai (*Tokyo Tech*)

10:10 **D-2 (Invited)**

On-chip Polarization Control for Silicon Photonic Integration

Z. Zhou (*Peking University*)

10:50 **D-3 (Invited)**

Photonic Integrated Devices for Next Generation Coherent Transmission

T. Saida (*NTT*)

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 (14:00-15:30)

14:00 **E-1 (Invited)**

Silicon Photonics for the Next Generations of High-Density and High-Speed Optical Interconnect

P. De Dobbelaere (*Luxtera*)

14:40 **E-2**

"Optical I/O core" Industrialization of the Chip Scale Transceiver Based on Silicon Photonics

K. Kurata (*AIO core*)

15:05 **E-3**

Photonic Crystal Slow Light Modulators -- Optimization and Practical Performance

T. Baba (*Yokohama National University*)

Closing Address (15:30-15:40)

T. Mori (*AIST*)

Poster Session (Tuesday)

P-1

Evaluation of Flip-Chip Optical Coupling for Optoelectronic Hybrid LSI Package

A. Noriki^{1,2}, T. Amano^{1,2}, A. Ukita¹, M. Kurihara¹, K. Takemura¹, M. Mori^{1,2}, K. Kurata³, and Y. Sakakibra^{1,2}

(1 PETRA, 2 AIST, 3 AIO core)

P-2

All MBE Grown InAs/GaAs Quantum Dot Lasers on On-axis Si (100)

J. Kwoen¹, B. Jang¹, J. Lee, T. Kageyama, K. Watanabe, and Y. Arakawa¹

(1 NanoQuine, 2 Univ. Tokyo)

P-3

Impact of Surface Roughness on Optical Loss at a Light Introduction Window Fabricated by Deep SiO₂ Etching

K. Kinoshita¹, T. Horikawa^{1,2}, M. Noguchi¹, T. Nakamura¹, and T. Mogami¹

(1 PETRA, 2 AIST)

P-4

Numerical Investigation of Ultralow-capacitance InGaAs Photodetector on III-V/a-Si Hybrid Platform

C. Pengyuan¹, S. Takagi¹, and M. Takenaka¹

(1 Univ. Tokyo)

P-5

Investigation of a Bandpass Filter on Germanium-on-Insulator Photonic Platform

C. P. Ho¹, Z. Zhao¹, S. Takagi¹, and M. Takenaka¹

(1 Univ. Tokyo)

P-6

Distributed-bias Driving of Silicon Traveling Wave Mach-Zehnder Modulator

G. Cong¹, M. Ohno¹, Y. Maegami¹, M. Okano¹, and K. Yamada¹

(1 AIST)

P-7

2D Beam Steering using Double-Periodic Photonic Crystal Slow-Light Waveguide

H. Abe¹, M. Takeuchi¹, H. Ito¹, K. Kondo¹, and T. Baba¹

(1 Yokohama Nat'l. Univ.)

P-8

Carrier Dynamics in a Quantum Dot-Nanocavity System Resolved via Vacuum Rabi Oscillations

K. Kuruma¹, Y. Ota², M. Kakuda², S. Iwamoto^{1,2}, and Y. Arakawa^{1,2}

(1 Univ. Tokyo, 2 NanoQuine)

P-9

Low Polarization Dependent Loss of Two-dimensional Grating Coupler Operating at 1.3 μm for Single Mode Fiber Connection

Y. Sobu¹, S-H. Jeong¹, and Y. Tanaka¹

(1 PETRA)

P-10

Enhancement of Biaxial Tensile Strain using Suspended Cross-shaped Microstructures for N-dope Germanium

S. Ishida¹, S. Kako^{2,3}, K. Oda⁴, S. Iwamoto^{2,3}, and Y. Arakawa^{2,3}

(1 RCAST Univ. Tokyo, 2 Univ. Tokyo, 3 NanoQuine, 4 Hitachi)

P-11

Wavelength Tuning of III-V/SOI Hybrid Lasers by Direct Heating of the Si Waveguide

M. Eissa¹, J. Suzuki¹, N. Nishiyama^{1,2}, S. Arai^{1,2}, and T. Baba³

(1 Tokyo Inst. Tech., 2 IIR Tokyo Inst. Tech., 3 Yokohama Nat'l. Univ.)

P-12

Device Design of Silicon 2 \times 2 Mach-Zehnder-Type Optical Switch for Polarization Independent Operation

K. Shimizu¹, S. Akasaka¹, D. Suehiro¹, Y. Matsushima², H. Ishikawa¹, and K. Utaka¹

(1 FSE Waseda Univ., 2 GCSRO Waseda Univ.)

P-13

Investigation of Nonlinear Properties of MQW-SOA for All-Optical Logic Gate Device

Y. Akashi¹, S. Matsui¹, S. Isawa¹, A. Matsumoto², Y. Matsushima³, H. Ishikawa¹, and K. Utaka¹

(1 FSE Waseda Univ., 2 NICT, 3 GCSRO Waseda Univ.)

P-14

Observation of Cavity Mode Emission from Photonic Crystal Nanocavity with Quantum Dot Active Region Embedded by MBE Regrowth

Q. H. Vo¹, Y. Ota², K. Watanabe², T. Kageyama², S. Iwamoto^{1,2}, and Y. Arakawa^{1,2}

(1 Univ. Tokyo, 2 NanoQuine)

P-15

Hybrid Distributed Feedback Quantum Dot Laser with Laterally Coupled Grating

B. Jang^{1,2}, T. Tsuchizawa³, H. Nishi³, T. Nakamura⁴, S. Iwamoto^{1,2}, and Y. Arakawa^{1,2}

(1 Univ. Tokyo, 2 NanoQuine, 3 NTT, 4 PETRA)

P-16

25 Gb/s Silicon-Photonic Receiver Operating over 85°C with Temperature-Compensated CMOS Transimpedance Amplifier

D. Okamoto¹, Y. Suzuki¹, Y. Hagihara¹, M. Kurihara¹, T. Nakamura¹, and K. Kurata²

(1 PETRA, 2 AIO core)

P-17

Demonstration of Thresholdless Lasing in a Nanolaser with Quantum Dot Gain

Y. Ota¹, K. Watanabe¹, M. Kakuda¹, S. Iwamoto^{1,2}, and Y. Arakawa^{1,2}

(1 NanoQuine, 2 Univ. Tokyo)

P-18

High Speed and Highly Efficient Si Optical Modulator with Strained SiGe Layer, and its 25 Gbps Operation with CMOS Driver

J. Fujikata¹, S. Takahashi¹, K. Kinoshita¹, J. Han², T. Horikawa¹, K. Yashiki¹, M. Kurihara¹, Y. Hagihara¹, M. Takenaka², K. Kurata¹, T. Mogami¹, and T. Nakamura¹

(1 PETRA, 2 Univ. Tokyo)

P-19

Analysis of Slow-light Effect in Metamaterial Optical Waveguide

S. Yamasaki¹, T. Amemiya^{1,2}, Z. Gu¹, J. Suzuki¹, N. Nishiyama^{1,2}, and S. Arai^{1,2}

(1 Tokyo Inst. Tech., 2 IIR Tokyo Inst. Tech.)

P-20

Thermally-Controlled Si Photonic Crystal Waveguide Slow Light Beam Steering Device

G. Takeuchi¹, Y. Terada¹, M. Takeuchi¹, H. Abe¹, N. Miura¹, and T. Baba¹

(1 Yokohama Nat'l Univ.)

P-21

Fabrication of InGaN/GaN Nanowires by Thermal Decomposition

M. Arita¹, and Y. Arakawa^{1,2}

(1 NanoQuine, 2 Univ. Tokyo)

P-22

Effect of Ar-FAB Irradiation to PL Characteristics of GaInAs/InP toward Room Temperature Surface Activated Bonding

K. Nagasaka¹, J. Suzuki², T. Amemiya^{1,2}, N. Nishiyama^{1,2}, and S. Arai^{1,2}

(1 Tokyo Inst. Tech., 2 IIR Tokyo Inst. Tech.)

P-23

Silicon Photonics Devices and Photonic Crystal Waveguides Operating at O band

K. Itagaki¹, H. Ito¹, and T. Baba¹

(1 Yokohama Nat'l Univ.)

P-24

Investigation of the Spectral Diffusion Effect in GaN Interface Fluctuation Quantum Dots

K. Gao¹, I. Solovev³, M. Holmes^{1,2}, M. Arita^{1,2}, and Y. Arakawa^{1,2}

(1 Univ. Tokyo, 2 NanoQuine, 3 St. Peterburg State Univ.)

P-25

Photoluminescence Improvements of InAs/GaAs Quantum-dot Multiple Layers by Introducing GaAsP Layers

K. Watanabe¹, S. Iwamoto^{1,2}, and Y. Arakawa^{1,2}

(1 NanoQuine, 2 Univ. Tokyo)

P-26

An Ultralow Power (0.93 mW/Gbps) Transmitter with a Microring Laser-Injection-Locker Modulator

T. Akiyama^{1,2,3}, T. Kurahashi¹, S. Tanaka^{1,2,3}, H. Ebe², and S. Sekiguchi^{1,2,3}

(1 PETRA, 2 Fujitsu Labs, 3 Fujitsu)

P-27

Improved Optical Properties of Low-density InAs/GaAs Quantum Dots after the Optimization of Partial Capping and In-flush Process

M. Kakuda¹, Y. Ota¹, K. Kuruma², K. Watanabe¹, S. Iwamoto^{1,2}, and Y. Arakawa^{1,2}

(1 NanoQuine, 2 Univ. Tokyo)

P-28

Dynamic Switching of Propagation Direction in Coupled Photonic Nanocavities

M. Nakada¹, T. Asano¹, and S. Noda¹

(1 Kyoto Univ.)

P-29

Low Power Operation of Membrane Distributed-Reflector Lasers on Si

N. Nakamura¹, T. Tomiyasu¹, T. Hiratani¹, D. Inoue¹, T. Uryu¹, Z. Gu¹, T. Amemiya^{1,2}, N. Nishiyama^{1,2}, and S. Arai^{1,2}

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P-30

Fabrication and Evaluation of Quantum Dot Distributed Feedback Lasers for a Si Integrated Light Source without an Optical Isolator

N. Hatori¹, K. Mizutani¹, S-H. Jeong¹, Y. Tanaka¹, and K. Kurata¹

(1 PETRA)

P-31

16ch x 25 Gb/s On-Package High-Density Silicon Photonics TRx

T. Aoki^{1,2,3}, S. Sekiguchi^{1,2,3}, T. Simoyama¹, S. Tanaka^{1,2,3}, M. Nishizawa¹, N. Hatori¹, Y. Sobu¹, A. Sugama³, T. Akiyama^{1,2,3}, A. Hayakawa^{1,2,3}, H. Muranaka³, T. Mori^{1,2,3}, C. Yanfei⁴, S-H. Jeong¹, Y. Tanaka^{1,2,3}, and K. Morito^{1,2,3}

(1 PETRA, 2 Fujitsu, 3 Fujitsu Labs., 4 Contributed to this work while employed by Fujitsu Labs.)

P-32

III-V/Si hybrid MOS Optical Phase Shifter toward Low-crosstalk Switching

L. Qiang¹, S. Takagi¹, and M. Takenaka¹

(1 Univ. Tokyo)

P-33

Broadband White Light Generation by Air-cladding Silicon Waveguide

R. Kou^{1,3}, T. Hatakeyama², J. Horng¹, J. Kang¹, Z. Zhang², and F. Wang¹

(1 D. Physics, Univ. California Barkely, 2 D. Mech. Eng. Univ. California Barkely, 3 AIST)

P-34

Optical Beam Receiver using Si Photonic Crystal Antenna Array

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P-35

High-Speed Operation of Waveguide Germanium Photodetector with Very Simple Lateral PIN Configuration

T. Simoyama¹, K. Kinoshita¹, T. Horikawa¹, Y. Tanaka¹, and T. Mogami¹

(1 PETRA)

P-36

Wavelength Dependence of Ge Thermo-optic Switch Operating at Mid-infrared Wavelength Range

T. Fujigaki¹, S. Takagi¹, and M. Takenaka¹

(1 Univ. Tokyo)

P-37

PAM-4 Direct Modulation of GaInAsP/InP Membrane DR Laser on Si Substrate

T. Uryu¹, N. Nishiyama^{1,2}, T. Hiratani¹, D. Inoue², T. Amemiya^{1,2}, and S. Arai^{1,2}

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P-38

Wavelength-Sensitive Response of Longitudinally Graded Stub Filter Based on Pillar-Photonic-Crystal Waveguide

M. Tokushima¹

(1 PETRA)

P-39

Unidirectional Radiation from Si Photonic Crystal Slow-light Beam Steering Device

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(1 Yokohama Nat'l Univ.)

P-40

Si Photonic Crystal Slow Light Modulator for Full C-band

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(1 Yokohama Nat'l Univ.)

P-41

Improvement of Frequency Response by Electro-Optic Phase Matching in Si Photonic Crystal Slow-Light Modulator

Y. Hinakura¹, Y. Terada¹, H. Arai¹, and T. Baba¹

(1 Yokohama Nat'l Univ.)

P-42

Experimental Simulation of FMCW LiDAR Using Si Photonic Crystal Modulator, Optical Antenna and Fiber Delay Line

Y. Furukado¹, H. Abe¹, Y. Hinakura¹, and T. Baba¹

(1 Yokohama Nat'l Univ.)

P-43

**Observation of Optical Coupling in a Quantum Dot-Nanocavity-Waveguide Coupled System Fabricated
Transfer Printing**

R. Katsumi¹, Y. Ota², M. Kakuda², T. Miyazawa³, K. Takemoto³, S. Iwamoto^{1,2}, and Y. Arakawa^{1,2}

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