

2023 IEEE Silicon Photonics Conference (SiPhotonics 2023)

**Washington, DC, USA
4 – 7 April 2023**



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2023 IEEE Silicon Photonics Conference (SiPhotonics) 04 - 07 Apr 2023 *All times in EDT*

Tuesday, 4 April

8am **WS1 -
Synopsys Workshop: Foundry PDK-Driven Silicon Photonic
Integrated Circuit Design for Aerospace & Defense, Datacom
and High-Performance Computing Applications I**
Alexandria Ballroom

10am **Break**
Alexandria Ballroom

10:30am **WS2 -
Synopsys Workshop: Foundry PDK-Driven Silicon Photonic
Integrated Circuit Design for Aerospace & Defense, Datacom
and High-Performance Computing Applications II**
Alexandria Ballroom

12pm **Lunch (On Your Own)**

1:30pm **Conference Welcome**
Arlington Ballroom
Chaired by: Haisheng Rong (United States)

1:45pm **TuC -
TuC - Silicon Photonics for AI and Quantum Technologies**
Arlington Ballroom
Chaired by: Haisheng Rong (United States)

2023 IEEE Silicon Photonics Conference (SiPhotonics) 04 - 07 Apr 2023 *All times in EDT*

- 1:45pm **TuC1 (Plenary) - Silicon Photonics for Artificial Intelligence and Quantum Information...N/A**
»[Dirk Englund](#) (United States)¹(1. Massachusetts Institute of Technology (MIT))
- 2:30pm **TuC2 (Invited) - Accelerating quantum technologies with programmable integrated photonics...1**
»[Mark Dong](#) (United States)¹(1. The MITRE Corporation)
- 3pm **TuC3 - Design, Packaging, and Testing of Silicon Photonics JTC for Convolution Neural Network...3**
»[Nicola Peserico](#) (United States)¹,[Hangbo Yang](#) (United States)²,[Xiaoxuan Ma](#) (United States)¹,[Shurui Li](#) (United States)²,[Mostafa Hosseini](#) (United States)²,[Jonathan George](#) (United States)¹,[Puneet Gupta](#) (United States)²,[Chee Wei Wong](#) (United States)²,[Volker J. Sorger](#) (United States)¹(1. George Washington University, 2. University of California Los Angeles)
- 3:15pm **TuC4 - Fully Integrated Photonic Dot-product Engine in 45-nm SOI CMOS for Photonic Computing...5**
»[Ahmad Hassan](#) (Canada)¹,[Sreenil Saha](#) (Canada)²,[Anthony Carusone](#) (Canada)¹(1. University of Toronto, 2. Huawei Technologies Canada)
- 3:30pm **Break & Exhibits**
Alexandria Ballroom
- 4pm **TuD -
TuD - Advances in Passive Devices**
Arlington Ballroom
Chaired by: [Wim Bogaerts](#) (Belgium)
- 4pm **TuD1 (Invited) - Technological-Enhanced silicon photonics passive devices...N/A**
»[Bertrand Szlag](#) (France)¹(1. CEA-Leti)

Continued from Tuesday, 4 April

4:30pm **TuD2 - Low-Phase-Error Silicon 90° Optical Hybrid with Large Fabrication Tolerance...7**

»[Akira Oka](#) (Japan)¹, [Jianping Wang](#) (Japan)¹, [Yoshihiko Yoshida](#) (Japan)¹, [Ayahito Uetake](#) (Japan)¹, [Akira Ishii](#) (Japan)¹, [Suguru Akiyama](#) (Japan)¹ (1. Fujitsu Optical Components Limited)

4:45pm **TuD3 - Low-loss Waveguide Bend Supporting a Whispering Gallery Mode...9**

»[Qingzhong Deng](#) (Belgium)¹, [Pieter Neutens](#) (Belgium)¹, [Rafal Magdziak](#) (Belgium)¹, [Ahmed H. El-Saeed](#) (Belgium)¹, [Yoojin Ban](#) (Belgium)¹, [Filippo Ferraro](#) (Belgium)¹, [Guy Lepage](#) (Belgium)¹, [Jeroen De Coster](#) (Belgium)², [Dimitrios Velenis](#) (Belgium)¹, [Maumita Chakrabarti](#) (Belgium)¹, [Peter De Heyn](#) (Belgium)¹, [Peter Verheyen](#) (Belgium)¹, [Pol Van Dorpe](#) (Belgium)¹, [Joris Van Campenhout](#) (Belgium)¹ (1. imec, 2. Ghent University - imec)

5pm **TuD4 - Inverse-Designed Photonic Polarization Control for High-Density Integration on Foundry Platforms...11**

»[Arjun Khurana](#) (United States)¹, [Joel Slaby](#) (United States)¹, [Alec Hammond](#) (United States)², [Stephen Ralph](#) (United States)¹ (1. Georgia Institute of Technology, 2. Reality Labs, Meta Platforms)

5:15pm **TuD5 - A Polarization Splitter and Rotator and an Optical Demultiplexer for a Polarization-Diverse Silicon Photonic Receiver...13**

»[Naoki Matsui](#) (Japan)¹, [Hirotaka Uemura](#) (Japan)¹, [Dan Maeda](#) (Japan)¹, [Reona Motoji](#) (Japan)¹, [Tomoya Sugita](#) (Japan)¹ (1. Kyocera)

5:30pm **TuD6 - Racetrack resonator based-on SiGe waveguide for long-wave infrared range...15**

»[Natnicha Koompai](#) (France)¹, [Thi Hao Nhi Nguyen](#) (France)¹, [Luca Lucia](#) (France)¹, [Victor Turpaud](#) (France)¹, [Jacopo Frigerio](#) (Italy)², [Adel Bousseksou](#) (France)¹, [Carlos Alonso-Ramos](#) (France)¹, [Laurent Vivien](#) (France)¹, [Raffaele Colombelli](#) (France)¹, [Giovanni Isella](#) (Italy)², [Delphine Morini](#) (France)¹ (1. Centre de Nanosciences et de Nanotechnologies, 2. Politecnico di Milano)

5:45pm

TuD7 - Enable Fano resonances lineshapes in a Silicon Nitride Photonic Crystal-MicroRing structure...17

»Artem Vorobev (Italy)¹, [Jesus H Mendoza Castro](#) (Italy)¹, Simone Iadanza (Ireland)², Bernhard Lendl (Austria)³, Marco Grande (Italy)¹, William Whelan Curtin (Ireland)²(1. DEI, Politecnico di Bari, 2. CAPP, Munster Technological University, 3. TUW, Institute of Chemical Technologies and Analytics)

Wednesday, 5 April

8am

**WA -
WA - Integrated Lasers and SOAs**
Arlington Ballroom
Chaired by: Di Liang (United States)

8am

WA1 (Invited) - Scalable and high performance monolithic on-chip light sources for integrated silicon photonics...19

»[John Bowers](#) (United States)¹, Chen Shang (United States)¹, Kaiyin Feng (United States)¹, Eamonn Hughes (United States)¹, Andrew Clark (United States)², Mukul Depnath (United States)², Rosalyn Koscica (United States)¹, Gerald Leake (United States)³, Joshua Herman (United States)³, David Hareme (United States)³, Peter Ludewig (Germany)⁴(1. University of California, Santa Barbara, 2. IQE, 3. SUNY Polytechnic, 4. NASP)

8:30am

WA2 - Experimental Measurement of the Tolerance on Optical Feedback for the Heterogeneous Silicon Quantum Dot Comb Laser...21

»[Xian Xiao](#) (United States)¹, Antoine Descos (United States)¹, Geza Kurczveil (United States)¹, Sudharsanan Srinivasan (United States)¹, Di Liang (United States)¹, Raymond G. Beusoleil (United States)¹(1. Hewlett Packard Enterprise)

2023 IEEE Silicon Photonics Conference (SiPhotonics) 04 - 07 Apr 2023 *All times in EDT*

Continued from **Wednesday, 5 April**

- 8:45am **WA3 - CW and comb regimes in III-V SiN hybrid lasers with frequency-selective narrow band mirror...23**
- »Cristina Rimoldi (Italy)¹, Lorenzo Luigi Columbo (Italy)¹, Sebastian Romero-García (Germany)², Jock Bovington (Germany)², Mariangela Gioannini (Italy)¹ (1. Politecnico di Torino, 2. Cisco Optical GmbH)
- 9am **WA4 - Wavelength Converter using Micro Transfer-Printed Optical Amplifiers on a Full SiPh Platform...25**
- »Hong Deng (Belgium)¹, Emadreza Soltanian (Belgium)¹, Jing Zhang (Belgium)¹, Gunther Roelkens (Belgium)¹, Wim Bogaerts (Belgium)¹ (1. Ghent University - imec)
- 9:15am **WA5 - Micro-Transfer-Printed III-V-on-Si Semiconductor Optical Amplifier with 15 dBm Output Saturation Power...27**
- »Emadreza Soltanian (Belgium)¹, Maximilien Billet (Belgium)¹, Artur Hermans (United States)², Bart Kuyken (Belgium)¹, Jing Zhang (Belgium)¹, Gunther Roelkens (Belgium)¹ (1. Ghent University - imec, 2. Massachusetts Institute of Technology (MIT))
- 9:30am **WA6 (Invited) - High-Baud-Rate Direct Modulation of Membrane Laser on SiC under Uncooled Condition...29**
- »Suguru Yamaoka (Japan)¹, Nikolaos-Panteleimon Diamantopoulos (Japan)¹, Hidetaka Nishi (Japan)¹, Takuro Fujii (Japan)¹, Koji Takeda (Japan)¹, Tatsuou Hiraki (Japan)¹, Shigeru Kanazawa (Japan)², Takaaki Kakitsuka (Japan)¹, Shinji Matsuo (Japan)¹ (1. NTT Device Technology Labs, NTT Corporation, 2. NTT Device Innovation Center, NTT Corporation)
- 10am **Break & Exhibits**
Alexandria Ballroom
- 10:30am **WB -**
WB - Photonics for Computing and AI - I
Arlington Ballroom
Chaired by: Dries Van Thourhout (Belgium)

2023 IEEE Silicon Photonics Conference (SiPhotonics) 04 - 07 Apr 2023 *All times in EDT*

10:30am **WB1 (Invited) - Non-volatile Optical Memory and Switch with Magnetic Material Integration...31**

»[Yuya Shoji](#) (Japan)¹,[Toshiya Murai](#) (Japan)²,[Nobuhiko Nishiyama](#) (Japan)¹(1. Tokyo Institute of Technology, 2. AIST)

11am **WB2 - Processing Optical Temporal Signal Using Optical-Electrical Feedback of Silicon Optical Modulator Towards Japanese Vowel Recognition...33**

»[Guangwei Cong](#) (Japan)¹,[Noritsugu Yamamoto](#) (Japan)¹,[Rai Kou](#) (Japan)¹,[Yuriko Maegami](#) (Japan)¹,[Morifumi Ohno](#) (Japan)¹,[Koji Yamada](#) (Japan)¹(1. AIST)

11:15am **WB3 - Mode sensitive SWG-based Phase Shifter for Optical Processors...35**

»[Kaveh \(Hassan\) Rahbardar Mojaver](#) (Canada)¹,[S. Mohammad Reza Safaee](#) (Canada)¹,[Guowu Zhang](#) (Canada)¹,[Odile Liboiron-Ladouceur](#) (Canada)¹(1. McGill University)

11:30am **WB4 (Invited) - Non-volatile Memristive III-V/Si Photonics...37**

»[Stanley Cheung](#) (United States)¹,[Bassem Tossoun](#) (United States)¹(1. Hewlett Packard Enterprise)

12pm **Lunch (On Your Own)**

1:30pm **WC -
WC - Photonic Integration and Architecture - I**
Arlington Ballroom
Chaired by: [Haisheng Rong](#) (United States)

1:30pm **WC1 (Plenary) - Silicon Photonics: An Overview of the Technology and Applications...N/A**

»[Saeed Fatholouloumi](#) (United States)¹(1. Intel Corporation)

Continued from **Wednesday, 5 April**

2:15pm **WC2 (Invited) - Direct detection, coherent detection, or something in between for short-reach optical interconnects?...N/A**

»[Chris Doerr](#) (United States)¹(1. Aloe Semiconductor Inc)

2:45pm **WC3 - Ultra-scalable Microring-based Architecture for Spatial-and-Wavelength Selective Switching...39**

»[Liang Yuan Dai](#) (United States)¹,[Vignesh Gopal](#) (United States)¹,[Keren Bergman](#) (United States)¹(1. Columbia University)

3pm **WC4 - A Si Photonic BiCMOS Coherent QPSK Transmitter Based on Parallel-Dual Ring Modulators...41**

»[Youngkwan Jo](#) (Korea, Republic of)¹,[Yongjin Ji](#) (Korea, Republic of)¹,[Minkyu Kim](#) (Belgium)²,[Hyun-Kyu Kim](#) (Korea, Republic of)¹,[Min-Hyeong Kim](#) (Korea, Republic of)³,[Christian Mai](#) (Germany)⁴,[Stefan Lischke](#) (Germany)⁴,[Lars Zimmermann](#) (Germany)⁵,[Woo-Young Choi](#) (Korea, Republic of)¹(1. Yonsei University, South Korea, 2. Yonsei University, now at IMEC, 3001 Leuven, Belgium, 3. Yonsei University, now at Samsung Electronics, Hwasung, 18448, South Korea, 4. IHP – Leibniz-Institut für innovative Mikroelektronik, 15236 Frankfurt (O.), Germany, 5. IHP – Leibniz-Institut für innovative Mikroelektronik, 15236 Frankfurt (O.) and Technische Universität Berlin, Einsteinufer 25, 10587 Berlin, Germany)

3:15pm **WC5 - Toward FEOL integration of SiN waveguides into a photonic BiCMOS process...43**

»[Florian Goetz](#) (Germany)¹,[Stefan Lischke](#) (Germany)¹,[Anna Peczek](#) (Germany)¹,[Galina Georgieva](#) (Germany)²,[Lars Zimmermann](#) (Germany)¹(1. IHP – Leibniz-Institut für innovative Mikroelektronik, 2. Technische Universität Berlin)

3:30pm **Break & Exhibits**
Alexandria Ballroom

2023 IEEE Silicon Photonics Conference (SiPhotonics) 04 - 07 Apr 2023 *All times in EDT*

4pm	WD - WD - Photonic Integration and Architecture - II <i>Arlington Ballroom</i> Chaired by: Aaron Zilkie (United States)
4pm	WD1 (Invited) - Heterogeneous Integration in Si Photonics...N/A » Dries Van Thourhout (Belgium) ¹ (1. Ghent University - imec)
4:30pm	WD2 (Invited) - Are III-V the Future of Silicon Photonics?...N/A » Frederic Boeuf (Switzerland) ¹ (1. STMicroelectronics)
5pm	WD3 - WDM Ternary Content-addressable Memory for Optical Links...45 » Yanir London (Israel) ¹ , Thomas Van Vaerenbergh (Belgium) ¹ , Luca Ramini (Italy) ¹ , Can Li (Hong Kong) ² , Catherine Graves (United States) ¹ , Marco Fiorentino (United States) ¹ , Raymond G. Beausoleil (United States) ¹ (1. Hewlett Packard Enterprise, 2. The University of Hong Kong)
5:15pm	WD4 - Monolithic Ultra-Low-Loss Si3N4 / Si Photonic Platform for High Delay Density...47 » Brian Mattis (United States) ¹ , Taran Huffman (United States) ¹ , Bryan Woo (United States) ¹ , Jason Andrach (United States) ¹ (1. GenXComm, Inc)
5:30pm	WD5 (Invited) - Advanced Silicon Photonics for Communication and Computing...N/A » Marco Fiorentino (United States) ¹ (1. Hewlett Packard Enterprise)
6pm	Poster - Poster & Welcome Reception <i>Jefferson/Veranda Ballroom</i>

Continued from **Wednesday, 5 April**

P1 - A Minimal-Structured Ring Assisted Mach-Zehnder Modulator...49

»[Ming Gong](#) (United States)¹, [Hui Wu](#) (United States)¹ (1. University of Rochester)

P2 - Design and Fabrication of Ge on Si Micro-Hole Array Vertical Illuminated Photodetector for Infrared Detection...51

»[Bo-Rui Lai](#) (Taiwan)¹, [Ching-Yu Hsu](#) (Taiwan)², [Li Guan-Yu](#) (Taiwan)¹, [Zingway Pei](#) (Taiwan)¹ (1. National Chung Hsing University, 2. National Yang Ming Chiao Tung University)

P3 - Ge-on-Si APD in Commercial Foundry Process for Near-Infrared Sensing...53

»[John Rollinson](#) (United States)¹, [Asif Chowdhury](#) (United States)¹, [Robert Karlicek](#) (United States)¹, [Mona Hella](#) (United States)¹ (1. Rensselaer Polytechnic Institute)

P4 - Tunable Integrated Photonic True Time Delay...55

»[Kyle Walsh](#) (United States)¹, [Christopher Sunderman](#) (United States)², [Nathan Tyndall](#) (United States)², [Marcel Pruessner](#) (United States)², [John Diehl](#) (United States)², [Joseph Singley](#) (United States)², [Todd Stievater](#) (United States)² (1. NREIP at US Naval Research Laboratory, 2. US Naval Research Laboratory)

P5 - Photonic Reservoir Computing for Wavelength Multiplexed Nonlinear Fiber Distortion Mitigation...57

»[Emmanuel Gooskens](#) (Belgium)¹, [Stijn Sackesyn](#) (Belgium)¹, [Sarah Masaad](#) (Belgium)¹, [Joni Dambre](#) (Belgium)², [Peter Bienstman](#) (Belgium)¹ (1. Ghent University - imec, 2. Ghent University)

P7 - Photonic Interconnect Based Neural Network Simulator...59

»[Neville Wolff](#) (United States)¹, [Kyle Shiflett](#) (United States)¹, [Avinash Karanth](#) (United States)¹ (1. Ohio University)

P8 - Recovery of 40 Gbps PAM4 in a 50 km optical link through a delayed complex perceptron...61

»[Emiliano Staffoli](#) (Italy)¹, Mattia Mancinelli (Italy)¹, Paolo Bettotti (Italy)¹, Lorenzo Pavesi (Italy)¹(1. University of Trento)

P9 - A Design Flow of Combined Logic Circuits with Reconfigurable Electro-optical Logic Gates...63

»[Tung-Yu Su](#) (Taiwan)¹, Yu-Chieh Cheng (Taiwan)²(1. Synopsys, 2. National Taipei University of Technology)

P12 - Sb2Se3/Si tunable rotator with ultra-compact footprint...65

»[Jorge Parra](#) (Spain)¹, Juan Navarro (Spain)², Pablo Sanchis (Spain)³(1. Nanophotonics Technology Center - Universitat Politècnica de València, 2. Institute of Materials Science (ICMUV), Universitat de València, Carrer del Catedratic Jose Beltran Martinez, 2, 46980, València, Spain, 3. Nanophotonics, Technology Center, Universitat Politècnica de València, Camino de Vera s/n, 46022, València, Spain)

P14 - High performance TM-pass polarizer via subwavelength grating bandgap engineering...67

»[Miguel Barona Ruiz](#) (Spain)¹, Carlos Pérez Armenta (Spain)¹, Alejandro Ortega Moñux (Spain)¹, J. Gonzalo Wangüemert Pérez (Spain)¹, Iñigo Molina Fernández (Spain)¹, Cheben Pavel (Canada)², Robert Halir (Spain)¹(1. Universidad de Málaga, 2. National Research Council of Canada)

P15 - Broadband, Fabrication-Tolerant Polarization Rotators in Silicon Nitride...69

»[Michael Barrow](#) (United States)¹, Thomas Murphy (United States)¹, Karen Grutter (United States)²(1. University of Maryland College Park, 2. Laboratory for Physical Sciences)

Continued from **Wednesday, 5 April**

P16 - 'Ultraslow-Light' and Flipping Property of the Crisscrossed-assisted Coupled-Ring Reflector...71

»Avram Gutierrez (Philippines)¹,Benjamin Dingel (Philippines)²,Joel Maquiling (Philippines)¹,Wayne Jasper Sy (Philippines)²,Clint Dominic Bennett (Philippines)¹(1. Department of Physics, School of Science and Engineering, Ateneo de Manila University, 2. Ateneo Research Institute of Science and Engineering, Ateneo de Manila University)

P17 - Comparing Strip-type and Rib-type Demultiplexers from a Fabrication Tolerance Point of View...73

»Naoki Matsui (Japan)¹,Dan Maeda (Japan)¹,Hirotaka Uemura (Japan)¹,Reona Motoji (Japan)¹,Tomoya Sugita (Japan)¹(1. Kyocera)

P18 - Compact side-coupled Silicon Nitride Photonic Crystal Nanobeam Cavity for refractive index sensing...75

»Jesus H Mendoza Castro (Italy)¹,Artem Vorobev (Italy)²,Simone Iadanza (Ireland)³,Taynara Oliveira (Ireland)³,Bernhard Lendl (Austria)⁴,William Whelan Curtin (Ireland)⁵,Marco Grande (Italy)⁶(1. DEI, Politecnico di Bari ; TUW, Institute of Chemical Technologies and Analytics, 2. Politecnico di Bari, 3. Munster Technological University, 4. TUW, Institute of Chemical Technologies and Analytics, 5. Munster Technological University; Tyndall, 6. DEI, Politecnico di Bari, Via Amendola 126/b, Bari, Italy)

P19 - Multimode silicon y-splitter with in-phase and off-phase TE0 outputs...77

»Juan Villegas (United Arab Emirates) ¹,Mahmoud Rasras (United Arab Emirates) ¹(1. New York University Abu Dhabi)

Thursday, 6 April

- 8am **ThA -
ThA - Photodetectors**
Arlington Ballroom
Chaired by: Yuan Yuan (United States) and Dries Van Thourhout (Belgium)
- 8am **ThA1 (Invited) - Ultra-fast Germanium Photodiodes...N/A**
»Stefan Lischke (Germany)¹, Anna Peczek (Germany)¹, Daniel Steckler (Germany)¹, Jesse Morgan (United States)², Andreas Beling (United States)², Lars Zimmermann (Germany)¹(1. IHP – Leibniz-Institut für innovative Mikroelektronik, 2. Department of Electrical and Computer Engineering, University of Virginia)
- 8:30am **ThA2 - Germanium Fin Photodiode with 3dB-Bandwidth >110 GHz and High L-Band Responsivity...79**
»Daniel Steckler (Germany)¹, Stefan Lischke (Germany)¹, Aleksandra Kroh (Germany)¹, Anna Peczek (Germany)¹, Galina Georgieva (Germany)², Lars Zimmermann (Germany)¹(1. IHP – Leibniz-Institut für innovative Mikroelektronik, 2. Technische Universität Berlin)
- 8:45am **ThA3 - An O-Band All-Silicon Microring Avalanche Photodiode with > 38 GHz RF Bandwidth...81**
»Yuan Yuan (United States)¹, Yiwei Peng (United States)¹, Zhihong Huang (United States)¹, Jared Hulme (United States)¹, Stanley Cheung (United States)¹, Wayne Sorin (United States)¹, Di Liang (United States)¹, Marco Fiorentino (United States)¹, Raymond G. Beausoleil (United States)¹(1. Hewlett Packard Enterprise)
- 9am **ThA4 - Germanium on Silicon Photodiodes for Back-End-Of-Line Photonic Integration...83**
»Stephanie Marzen (United States)¹, Eveline Postelnicu (United States)¹, Kazumi Wada (United States)¹, Jurgen Michel (United States)¹, Lionel Kimerling (United States)¹(1. Massachusetts Institute of Technology (MIT))

Continued from **Thursday, 6 April**

9:15am

ThA5 - Effect of passivation on selectively grown sub- μm Ge-on-Si devices towards single photon avalanche diode detectors...85

»[Conor Coughlan](#) (United Kingdom)¹, Muhammad Mirza (United Kingdom)¹, Jaroslav Kirdoda (United Kingdom)¹, Derek Dumas (United Kingdom)¹, Charles Smith (United Kingdom)¹, Charlie McCarthy (United Kingdom)¹, Hannah Mowbray (United Kingdom)¹, Ross Millar (United Kingdom)¹, Douglas Paul (United Kingdom)¹ (1. James Watt School of Engineering, University of Glasgow)

9:30am

ThA6 - Enhancement of Sensitivity and Bandwidth of Waveguide Photodiodes by Multimode-Interference Waveguiding Structure...87

»[Hiroataka Uemura](#) (Japan)¹, Naoki Matsui (Japan)¹, Reona Motoji (Japan)¹, Dan Maeda (Japan)¹, Tomoya Sugita (Japan)¹ (1. Kyocera)

9:45am

ThA7 - Micro-transfer printed InGaAs photodetector on SOI platform...89

»[Hemalatha Muthuganesan](#) (Ireland)¹, Enrica Mura (Ireland)¹, Emanuele Pelucchi (Ireland)¹, Callum Littlejohns (United Kingdom)², Xingzhao Yan (United Kingdom)², Mehdi Banakar (United Kingdom)², Ying Tran (United Kingdom)², Brian Corbett (Ireland)¹ (1. Tyndall National Institute, 2. Optoelectronics Research Centre, University of Southampton)

10am

Break & Exhibits

Alexandria Ballroom

10:30am

**ThB -
ThB - Photonics for Computing and AI - II**

Arlington Ballroom

Chaired by: Shiyoshi Yokoyama (Japan)

2023 IEEE Silicon Photonics Conference (SiPhotonics) 04 - 07 Apr 2023 *All times in EDT*

10:30am

ThB1 (Invited) - Integrated optic circuits for neuromorphic computing...N/A

»[Bert Offrein](#) (Switzerland)¹(1. IBM Research Europe, Zurich)

11am

ThB2 - Design and testing of a Silicon Photonic Tensor Core with integrated lasers...91

»[Xiaoxuan Ma](#) (United States)¹,[Nicola Peserico](#) (United States)¹,[Bhavin J. Shastri](#) (Canada)²,[Volker J. Sorger](#) (United States)¹(1. George Washington University, 2. Queen's University)

11:15am

ThB3 - Ultra-compact High-speed Passive NOT Gate in SOI...93

»[Mauricio Tosi](#) (Canada)¹,[Saket Kaushal](#) (Canada)¹,[Alejandro Fasciszewsky](#) (Argentina)²,[Pablo Costanzo-Caso](#) (Argentina)³,[José Azaña](#) (Canada)¹(1. Institut National de la Recherche Scientifique - Centre Énergie Matériaux Télécommunications (INRS-EMT), 2. Departamento de Micro y Nanotecnología - Comisión Nacional de Energía Atómica (CNEA), 3. Instituto Balseiro (Universidad Nacional de Cuyo - CNEA) and CONICET)

11:30am

ThB4 (Invited) - Quasi-passive silicon photonics with embedded nonvolatile phase-change materials...N/A

»[Niloy Acharjee](#) (United States)¹,[Chuanyu Lian](#) (United States)¹,[Carlos Ríos](#) (United States)¹(1. University of Maryland College Park)

12pm

Lunch (On Your Own)

1:30pm

ThC - ThC - SiGeSn and MIR Photonics

Arlington Ballroom

Chaired by: [Wei Du](#) (United States)

Continued from **Thursday, 6 April**

1:30pm

ThC1 - Mid-infrared dual-comb QCLs integrated with beam combiner based on Ge-on-Si platform...95

»[Dongbo Wang](#) (Belgium)¹,[Harindra Kannoja](#) (Belgium)¹,[Pierre Jouy](#) (Switzerland)²,[Etienne Giraud](#) (Switzerland)³,[Geert Steenberge](#) (Belgium)¹,[Bart Kuyken](#) (Belgium)¹(1. Ghent University - imec, 2. IRsweep AG, 3. Alpes Lasers S.A.)

1:45pm

ThC2 - Electrically pumped GeSn/SiGeSn Heterostructure microdisk Lasers on silicon with minimum threshold current of 40 mA...97

»[Teren Liu](#) (Germany)¹,[Lukas Seidel](#) (Germany)²,[Bahareh Marzban](#) (Germany)³,[Michael Oehme](#) (Germany)²,[Giovanni Capellini](#) (Italy)⁴,[Jeremy Witzens](#) (Germany)³,[Detlev Grützmacher](#) (Germany)⁵,[Dan Buca](#) (Germany)⁶(1. Peter-Grünberg-Institute (PGI-9), Forschungszentrum Jülich, 2. Institut für Halbleitertechnik, University of Stuttgart, 3. Institute of Integrated Photonics, RWTH Aachen University and JARA-Fundamentals of Future Information Technologies, 4. IHP-Leibniz Institut für innovative Mikroelektronik, and Department of Sciences, Università Roma, 5. Peter-Grünberg-Institute (PGI-9) Forschungszentrum Jülich and JARA-Fundamentals of Future Information Technologies, 6. Peter-Grünberg-Institute (PGI-9), Forschungszentrum Jülich and JARA-Fundamentals of Future Information Technologies)

2pm

ThC3 - Why Room Temperature GeSn Lasers Need Carbon...99

»[Tuhin Dey](#) (United States)¹,[Augustus Arbogast](#) (United States)¹,[Qian Meng](#) (United States)²,[Shamim Reza](#) (United States)¹,[Aaron Muhowski](#) (United States)²,[Joshua Cooper](#) (United States)³,[Thales Borrelly](#) (United States)³,[Erdem Ozdemir](#) (United States)³,[Fabian Naab](#) (United States)³,[Rachel Goldman](#) (United States)³,[Seth Bank](#) (United States)²,[Mark Wistey](#) (United States)¹(1. Texas State University, 2. University of Texas at Austin, 3. University of Michigan)

2:15pm

ThC4 - SiGeSn/GeSn Multi Quantum Wells Light Emitting Diodes with a Negative Differential Resistance...101

»[Lukas Seidel](#) (Germany)¹, Teren Liu (Germany)², Bahareh Marzban (Germany)³, Vivien Kiyek (Germany)², Jörg Schulze (Germany)⁴, Giovanni Capellini (Italy)⁵, Jeremy Witzens (Germany)³, Dan Buca (Germany)⁶, Michael Oehme (Germany)¹ (1. Institut für Halbleitertechnik, University of Stuttgart, 2. Peter-Grünberg-Institute (PGI-9), 3. Institute of Integrated Photonics, RWTH Aachen University and JARA-Fundamentals of Future Information Technologies, 4. Chair of Electron Devices, FAU Erlangen, 5. IHP-Leibniz Institut für innovative Mikroelektronik, and Department of Sciences, Università Roma, 6. Peter-Grünberg-Institute (PGI-9), Forschungszentrum Jülich and JARA-Fundamentals of Future Information Technologies)

2:30pm

ThC5 - Growth of Ge_{1-x}Sn_x Alloys by Remote Plasma-Enhanced Chemical Vapor Deposition...103

»[Bruce Clafin](#) (United States)¹, Gordon Grzybowski (United States)², Joshua Duran (United States)³ (1. Air Force Research Laboratory, 2. KBR, 3. Air Force Research Laboratory, Sensors Directorate)

2:45pm

ThC6 - Si-based photodetector with very broadband response from visible to mid-infrared spectral range...105

»[Ching-Fuh Lin](#) (Taiwan)¹, Zih-Chun Su (Taiwan)¹ (1. Graduate Institute of Photonics and Optoelectronics, National Taiwan University)

3pm

ThC7 - Integrated photodetector operating in the long-wave infrared spectral range...107

»[Thi Hao Nhi Nguyen](#) (France)¹, Natnicha Koompai (France)¹, Victor Turpaud (France)¹, Miguel Montesinos Ballester (Switzerland)², Jacopo Frigerio (Italy)³, Andrea Ballabio (Italy)³, Jean-Rene Coudeville (France)¹, Cedric Villebasse (France)¹, David Bouville (France)¹, Carlos Alonso-Ramos (France)¹, Laurent Vivien (France)¹, Giovanni Isella (Italy)³, Delphine Morini (France)¹ (1. Centre de Nanosciences et de Nanotechnologies, 2. Institute for Quantum Electronics, ETH Zurich, Zurich, Switzerland, 3. Politecnico di Milano)

Continued from **Thursday, 6 April**

3:15pm

ThC8 - Direct Band Gap Ge_{0.85}Sn_{0.15} Photodiodes for Room Temperature Gas Sensing...109

»[Clément Cardoux](#) (France)¹, Lara Casiez (France)¹, Marvin Frauenrath (France)¹, Nicolas Pauc (France)², Vincent Calvo (France)², Jean-Michel Hartmann (France)¹, Nicolas Coudurier (France)¹, Philippe Rodriguez (France)¹, Philippe Grosse (France)¹, Christophe Constancias (France)¹, Olivier Lartigue (France)¹, Pierre Barritault (France)¹, Olivier Gravrand (France)¹, Alexei Chelnokov (France)¹, Vincent Reboud (France)¹ (1. Univ. Grenoble Alpes, CEA, LETI, 2. Univ. Grenoble Alpes, CEA, Grenoble INP, IRIG, PHELIQS)

3:30pm

Break & Exhibits

Alexandria Ballroom

4pm

**ThD -
ThD - Modulators**

Arlington Ballroom

Chaired by: Yuan Yuan (United States)

4pm

ThD1 (Invited) - Reliable High-speed Transmitter of Spin-on Electro-optic Waveguide Modulators...111

»[Shiyoshi Yokoyama](#) (Japan)¹, Jiawei Mao (Japan)¹, Futa Uemura (Japan)¹, Hiromu Sato (Japan)¹, Guo-Wei Lu (Japan)² (1. Kyushu University, 2. Aizu University)

4:30pm

ThD2 - Uncooled Operation of Membrane InGaAlAs MQW Electro-absorption Modulator on Si Platform...113

»[Tatsurou Hiraki](#) (Japan)¹, Takuma Aihara (Japan)¹, Yoshiho Maeda (Japan)¹, Takuro Fujii (Japan)¹, Tomonari Sato (Japan)¹, Tai Tsuchizawa (Japan)¹, Kiyoto Takahata (Japan)², Takaaki Kakitsuka (Japan)², Shinji Matsuo (Japan)¹ (1. NTT Device Technology Labs, NTT Corporation, 2. Graduate School of Information, Production and Systems, Waseda University)

4:45pm

ThD3 - Electro-Optic Barium Titanate Modulators on Silicon Photonics Platform...115

»[Agham Posadas](#) (United States)¹, Vincent Stenger (United States)², John DeFouw (United States)², Goran Mashanovich (United Kingdom)³, Daniel Wasserman (United States)⁴, Alex Demkov (United States)¹(1. La Luce Cristallina, Inc., 2. SRICO, Inc., 3. Optoelectronics Research Centre, University of Southampton, 4. University of Texas at Austin)

5pm

ThD4 - The superlinear carrier absorption enhanced silicon MOS micro-ring modulator...117

»[Weiwei Zhang](#) (United Kingdom)¹, Martin Ebert (United Kingdom)¹, Ke Li (United Kingdom)¹, Bigeng Chen (United Kingdom)¹, Xingzhao Yan (United Kingdom)¹, Han Du (United Kingdom)¹, Mehdi Banakar (United Kingdom)¹, Ying Tran (United Kingdom)¹, Callum Littlejohns (United Kingdom)¹, Adam Scofield (United States)², Guomin Yu (United States)², Roshanak Shafiiha (United States)², Aaron Zilkie (United States)², Graham Reed (United Kingdom)¹, David Thomson (United Kingdom)¹(1. Optoelectronics Research Centre, University of Southampton, 2. Rockley Photonics)

5:15pm

ThD5 - Towards subvolt and half-mm scale silicon MOS-capacitor MZI modulators...119

»[Weiwei Zhang](#) (United Kingdom)¹, Arian Hashemi Talkhoonchah (United States)², Martin Ebert (United Kingdom)³, Ke Li (United Kingdom)³, Minwo Wang (United States)², Bigeng Chen (United Kingdom)³, Graham Reed (United Kingdom)³, Azita Emami (United States)², David Thomson (United Kingdom)³(1. University of Southampton, 2. California Institute of Technology, 3. Optoelectronics Research Centre, University of Southampton)

5:30pm

ThD6 - Measurements and modelling of free carrier lifetimes in Si and Si/poly-Si microrings...121

»[Marco Novarese](#) (Italy)¹, Sebastian Romero-García (Germany)², Jock Bovington (United States)³, Mariangela Gioannini (Italy)¹(1. Politecnico di Torino, 2. Cisco Optical GmbH, 3. Cisco Systems)

Continued from **Thursday, 6 April**

5:45pm

ThD7 - Electrically Tunable Silicon Microring Resonator with 589 pm/V Wavelength Tunability...123

»Wei-Che Hsu (United States)¹, Nabila Nujhat (United States)¹, Benjamin Kupp (United States)¹, John Conley (United States)¹, Alan X. Wang (United States)²(1. Oregon State University, 2. Baylor University)

6pm

Break

Alexandria Ballroom

6:15pm

**PD -
Post-Deadline Session**

Arlington Ballroom

Chaired by: Haisheng Rong (United States)

6:15pm

PD1 - Ultra-Compact Silicon Modulator for 124 GBaud Coherent Optical Links...125

»Alireza Geravand (Canada)¹, Zibo Zheng (Canada)¹, Simon Levasseur (Canada)¹, Leslie A. Rusch (Canada)¹, Wei Shi (Canada)¹(1. Department of Electrical and Computer Engineering, COPL, Universite Laval, Quebec, Canada)

6:30pm

PD2 - A Single-Chip High-Speed Silicon Photonic Transmitter with Integrated Laser and Micro-Ring Modulator...127

»Xinru Wu (United States)¹, Ranjeet Kumar (United States)¹, Duanni Huang (United States)¹, Chaoxuan Ma (United States)¹, Guan-lin Su (United States)¹, Xiaoxi Wang (United States)¹, Songtao Liu (United States)¹, Haisheng Rong (United States)¹(1. Intel Corporation)

2023 IEEE Silicon Photonics Conference (SiPhotonics) 04 - 07 Apr 2023 *All times in EDT*

6:45pm

PD3 - 240/160 Gbaud OOK Silicon Photonics MZM/RRM Transmitters for Short-Reach Applications...129

»Armands Ostrovskis (Latvia)¹, Michael Koenigsmann (Germany)², Toms Salgals (Latvia)¹, Benjamin Krueger (Germany)², Fabio Pittala (Germany)², Ryan P. Scott (United States)³, Hansjoerg Haisch (Germany)², Hadrien Louchet (Germany)², Aleksandrs Marinins (Latvia)¹, Sandis Spolitis (Latvia)¹, Jurgis Porins (Latvia)¹, Lu Zhang (China)⁴, Richard Schatz (Sweden)⁵, Xianbin Yu (China)⁴, Vjaceslavs Bobrovs (Latvia)¹, Markus Gruen (Germany)², Xiaodan Pang (Sweden)⁵, Oskars Ozolins (Latvia)¹ (1. Riga Technical University, 2. Keysight Technologies Deutschland, 3. Keysight Technologies, Inc., 4. Zhejiang University and Zhejiang Lab, 5. KTH Royal Institute of Technology)

7pm

PD4 - A 224 Gb/s per Channel PAM4 DR4-Tx Optical SubSystem Based on Si Micro-Ring Modulator with Hybrid Integrated Laser and SOA...131

»Ye Wang (United States)¹, Kadhair Al-hemyari (United States)¹, Olufemi I Dosunmu (United States)¹, Saeed Fatholouloumi (United States)¹, Pierre Doussiere (United States)¹, Kimchau Nguyen (United States)¹, Stefan Burmeister (United States)¹, David Patel (United States)¹, Ansheng Liu (United States)¹, Pengyue Wen (United States)¹, Charlie Wang (United States)¹, Sunil Priyadarshi (United States)¹, Jianying Zhou (United States)² (1. SPPD, Intel Corp, 2200 Mission College Blvd, Santa Clara, CA 95054, 2. SPPD, Intel Corp, 2200 Mission College Blvd, Santa Clara, CA)

Friday, 7 April

8am

FA - FA - A Special Session

Arlington Ballroom

Chaired by: Graham Reed (United Kingdom)

10am

Break & Exhibits

Alexandria Ballroom

2023 IEEE Silicon Photonics Conference (SiPhotonics) 04 - 07 Apr 2023 *All times in EDT*

Continued from **Friday, 7 April**

10:30am **FB -
FB - Silicon Photonics for Lidar**
Arlington Ballroom
Chaired by: Ray Chen

10:30am **FB1 (Invited) - MEMS Silicon Photonics LIDAR...N/A**
»[Ming Wu](#) (United States)¹ (1. UC Berkeley)

11am **FB2 - GeSi APD with Ultralow Dark Currents for LiDAR...133**
»[Neil Na](#) (United States)¹, Y.-C. Lu (Taiwan)¹, Y.-H. Liu (Taiwan)¹, P.-W. Chen (Taiwan)¹, Y.-C. Lai (Taiwan)¹, Y.-R. Lin (Taiwan)¹, C.-C. Lin (Taiwan)¹, T. Shia (Taiwan)¹, C.-H. Cheng (Taiwan)¹, P.-Y. Huang (Taiwan)¹, L. Wang (Taiwan)², S.-L. Chen (Taiwan)¹ (1. Artilux Inc., 2. National Tsing-Hua University)

11:15am **FB3 - Metamaterial antenna array fed by distributed Bragg deflector for beam steering on SOI platform...135**
»[Pablo Ginel-Moreno](#) (Spain)¹, Abdelfettah Hadij-ElHouati (Spain)¹, Alejandro Sánchez-Postigo (Spain)¹, J. Gonzalo Wangüemert Pérez (Spain)¹, Íñigo Molina Fernández (Spain)¹, Jens Schmid (Canada)², Cheben Pavel (Canada)², Alejandro Ortega Moñux (Spain)¹ (1. Telecommunication Research Institute (TELMA), Universidad de Málaga, 2. National Research Council Canada)

11:30am **FB4 (Invited) - High Accuracy Integrated LIDAR Using Silicon Photonics...N/A**
»[Graham Reed](#) (United Kingdom)¹ (1. Optoelectronics Research Centre, University of Southampton)

12pm **Lunch (On Your Own)**

1:30pm

FC -

FC - Optical Sensing

Arlington Ballroom

Chaired by: Aaron Zilkie (United States)

1:30pm

FC1 (Invited) - Silicon Photonics for Biosensing / Health Sensing...N/A

»[Cary Gunn](#) (United States)¹(1. Genalyte)

2pm

FC2 - Silicon Photonics System for Low-Cost Rapid Quantification of Biomarkers in Blood...137

»[Ebrahim Aljohani](#) (United States)¹,[Sarat Gundavarapu](#) (United States)¹,[Cole Chapman](#) (United States)¹,[Armando Paredes](#) (United States)¹,[Guojun Chen](#) (United States)¹,[Chi-Chen Lin](#) (United States)¹,[Andrea Romig](#) (United States)¹,[Kyle Preston](#) (United States)¹,[Alexander Vinitzky](#) (United States)¹,[Alana Gonzales](#) (United States)¹,[Eric Hsu](#) (United States)¹,[Jordan Cobb](#) (United States)¹,[Yulia Rybakova](#) (United States)¹,[Michael Dubrovsky](#) (United States)¹,[Diedrik Vermeulen](#) (United States)¹(1. SiPhox Inc.)

2:15pm

FC3 - A silicon photonics multi-functional integrated optical circuit for interferometric fiber optics gyroscope...139

»[Tzu-Jung Kuo](#) (Taiwan)¹,[Sin-Yun Lu](#) (Taiwan)¹,[Wei-Xuan Chen](#) (Taiwan)¹,[Yen-Chieh Wang](#) (Taiwan)¹,[Yung-Jr Hung](#) (Taiwan)¹(1. National Sun Yat-sen University)

2:30pm

FC4 - High Resolving Power and Highly Compact Arrayed Waveguide Grating with Reusable Delay Lines (RDL-AWG)...141

»[Yang Zhang](#) (United States)¹,[Pradip Gatkine](#) (United States)²,[Sylvain Veilleux](#) (United States)¹,[Mario Dagenais](#) (United States)¹(1. University of Maryland College Park, 2. California Institute of Technology)

Continued from **Friday, 7 April**

2:45pm **FC5 - Simulation, Fabrication and Characterization of a Si3N4 based Three Stigmatic Point Array Waveguide Grating with Multiple Input Channels by Using Aberration Theory...143**

»[Wei-Lun Hsu](#) (United States)¹, [Jiahao Zhan](#) (United States)¹, [Yang Zhang](#) (United States)¹, [Sylvain Veilleux](#) (United States)¹, [Mario Dagenais](#) (United States)¹ (1. University of Maryland College Park)

3pm **FC6 (Invited) - Siliconizing the fiber optic gyroscope to commercialize GPS denied navigation...N/A**

»[Avi Feshali](#) (United States)¹ (1. Anello Photonics)

3:30pm **Break & Exhibits**
Alexandria Ballroom

4pm **FD -
FD - Photonic Integration and Architecture - III**
Arlington Ballroom
Chaired by: James Zhou (China)

4pm **FD1 (Invited) - Superlattice Integration with Silicon Photonics...145**

»[Richard Soref](#) (United States)¹, [Francesco De Leonardis](#) (Italy)² (1. University of Massachusetts at Boston, 2. Politecnico di Bari)

4:30pm **FD2 - Soliton Generation in a Gallium Phosphide Photonic-Crystal Fabry-Perot Microresonator...147**

»[Alberto Nardi](#) (Switzerland)¹, [Alisa Davydova](#) (Switzerland)², [Nikolai Kuznetsov](#) (Switzerland)², [Charles Möhl](#) (Switzerland)¹, [Miles Anderson](#) (Switzerland)², [Johann Riemensberger](#) (Switzerland)², [Tobias Kippenberg](#) (Switzerland)², [Paul Seidler](#) (Switzerland)¹ (1. IBM Research Europe, Zurich, 2. Swiss Federal Institute of Technology Lausanne (EPFL))

4:45pm

FD3 (Invited) - Non-Magnetic Isolators and Acousto-Optics in Silicon...N/A

»Peter Rakich (United States)¹, Yishu Zhou (United States)¹, Nils Otterstrom (United States)², Shai Gertler (United States)¹, Margaret Pavlovich (United States)¹, Haotian Cheng (United States)¹, Eric Kittlaus (United States)³, Andrew Starbuck (United States)², Andrew Leenheer (United States)², Andrew Pomerene (United States)², Douglas Trotter (United States)², Christina Dallo (United States)², Kate Musick (United States)², Eduardo Garcia (United States)², Robert Reyna (United States)², Andrew Holterhoff (United States)², Michael Gehl (United States)², Ashok Kodigala (United States)², Matt Eichenfield (United States)², Anthony Lentine (United States)² (1. Yale University, 2. Sandia National Labs, 3. Jet Propulsion Laboratory)

5:15pm

Closing Remarks

Arlington Ballroom

Chaired by: Haisheng Rong (United States)