2018 IEEE Photonics Conference (IPC 2018)

Reston, Virginia, USA
30 September – 4 October 2018

IEEE Catalog Number: CFP18LEO-POD
ISBN: 978-1-5386-5359-3

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP18LEO-POD
ISBN (Print-On-Demand):	978-1-5386-5359-3
ISBN (Online):	978-1-5386-5358-6
ISSN:	2374-0140

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

IEEE Photonics Conference (IPC 2018)

Welcome to the
31st Annual Conference of the IEEE Photonics Society
30 September - 4 October 2018
Hilton Regency Reston
Reston, Virginia, USA

Table of Contents

MC1: New Applications of Semiconductor Lasers 8:30AM-10:00AM

Session Chair: Luke J. Mawst, *University of Wisconsin-Madison, Madison, WI, USA*

MC1.1: Narrow Linewidth Stimulated Brillouin Scattering (SBS) Lasers (Page 11) **(Invited)** – 8:30AM - 9:00AM
Daniel J. Blumenthal *(University of California at Santa Barbara)*
Sarat Gundavarapu *(University of California at Santa Barbara)*
Grant M. Brodnik *(University of California at Santa Barbara)*
Debapam Bose *(University of California at Santa Barbara)*
Ryan Behunin *(Northern Arizona University)*
Peter Rakich *(Yale University)*
Karl D. Nelson *(Honeywell International USA)*
Matthew Puckett *(Honeywell International USA)*
Jianfeng Wu *(Honeywell International USA)*

MC1.2: Automotive LIDAR (Page NA) **(Invited)** – 9:00AM - 9:30AM
Lute Maleki *(GM Cruise, USA)*

MC1.3: A TeraMAC Neuromorphic Photonic Processor (Page 13) 9:30AM - 9:45AM
Mitchell A. Nahmias *(Princeton University)*
Hsuan-Tung Peng *(Princeton University)*
Thomas Ferreira de Lima *(Princeton University)*
Chaoran Huang *(Princeton University)*
Alexander N. Tait *(Princeton University)*
Bhavin J. Shastri *(Princeton University)*
Paul R. Prucnal *(Princeton University)*

MC1.4: Temporal Dynamics of an Integrated Laser Neuron (Page 15) 9:45AM - 10:00AM
Hsuan-Tung Peng *(Princeton University)*
Mitchell A. Nahmias *(Princeton University)*
Thomas Ferreira de Lima *(Princeton University)*
Alexander N. Tait *(Princeton University)*
Bhavin J. Shastri *(Princeton University)*
Paul R. Prucnal *(Princeton University)*

MD1: Photonic Integration 8:30AM-9:45AM

Session Chair: Tolga Tekin, *Fraunhofer IZM Institute, Berlin, Germany*

MD1.1: Local Quantum Well Intermixing for Fabricating High-Speed Electroabsorption Modulator (Page 17) 8:30AM - 8:45AM
Chih-Hsien Chen *(National Sun Yat-Sen University)*
Po-Yun Wang *(National Sun Yat-Sen University)*
Rih-You Chen *(National Sun Yat-sen University)*
Cong-Long Chen *(National Sun Yat-Sen University)*
Yang-Jeng Chen *(National Sun Yat-Sen University)*
Yi-Jen Chiu *(National Sun Yat-sen University)*

MD1.2: Active-Passive Integration Using a-Si Waveguides for Substrate Removed Electro-Optic Modulators (Page 19) 8:45AM - 9:00AM
Prashanth Bhasker *(University of California at Santa Barbara)*
Selim Dogru *(University of California at Santa Barbara)*
Nadir Dagli *(University of California at Santa Barbara)*

MD1.3: Foundry for InP Based Photonic Integration (Page 21) **(Invited)** – 9:00AM - 9:30AM
Luc Augustin *(SMART Photonics B.V.)*

MD1.4: Method for Polarization-Resolved Measurement of Electroabsorption (Page 23) 9:30AM - 9:45AM
Dzmitry Pustakhod *(Eindhoven University of Technology)*
Kevin Williams *(Eindhoven University of Technology)*
Xaveer Leijtens *(Eindhoven University of Technology)*

ME1: Optical Coherence Tomography 8:30AM-10:00AM

Session Chair: Martin Villiger, *Massachusetts General Hospital, MA, USA*

ME1.1: Digital Aberration Correction for Optical Coherence Tomography (Page NA) **(Invited)** – 8:30AM - 9:00AM
Rainer Leitgeb *(Medical University of Vienna)*

ME1.2: Imaging of Conjunctival Lymphatics Vessels Using Multi-Wavelength Optical Coherence Tomography (Page N/A) 9:00AM - 9:15AM
Ashley Francke *(Simon Fraser University)*
Morgan Heisler *(Simon Fraser University)*
Peijun Gong *(University of Western Australia)*
Paula Yu *(Lions Eye Institute & University of Western Australia)*
Dong An *(Lions Eye Institute & University of Western Australia)*
David D. Sampson *(University of Western Australia)*
Dao-Yi Yu *(Lions Eye Institute & University of Western Australia)*
Marinko V. Sarunic *(Simon Fraser University)*

ME1.3: Color OCT: Combined Optical Coherence Tomography and RGB Imaging through a Double-Clad Fiber Coupler (Page 39) 9:15AM - 9:30AM

Xavier Attendu *(École Polytechnique de Montreal)*
Mathias Strupler *(École Polytechnique de Montreal)*
Nicolas Godbout *(École Polytechnique de Montreal & Castor Optics)*
Caroline Boudoux *(École Polytechnique de Montreal & Castor Optics)*

ME1.4: Circular Ranging Optical Coherence Tomography Using a Fourier-Domain Mode-Locked Frequency Comb (Page 41) 9:30AM - 9:45AM
Norman Lippok *(Harvard Medical School & Massachusetts General Hospital (MGH))*
Meena Siddiqui *(Harvard Medical School & Massachusetts General Hospital (MGH))*
Benjamin J. Vakoc *(Harvard Medical School & Massachusetts General Hospital (MGH) & MIT)*
Brett E. Bouma *(Harvard Medical School & Massachusetts General Hospital (MGH) & MIT)*

ME1.5: Real-Time Delivery and Monitoring of Endoscopic Laser Therapy Using a Double Clad Fiber in an Optical Coherence Tomography System (Page 43) 9:45AM - 10:00AM
Raphael Maltais-Tariant *(Polytechnique de Montreal)*
Caroline Boudoux *(Polytechnique de Montreal)*
Néstor Uribe-Patarroyo *(Harvard Medical School and Massachusetts General Hospital)*

MF1: Emerging Microresonator Devices 8:30AM-10:00AM
Session Chair: Frank Vollmer, *University of Exeter, Exeter, UK*

MF1.1: Explore Whispering-Gallery Resonators for a Versatile Sensor Platform (Page NA) **(Tutorial)** – 8:30AM - 9:30AM
Lan Yang

MF1.2: SNAP Resonators Introduced by Bending of Optical Fibers (Page 45) 9:30AM - 9:45AM
D. Bochek *(Novosibirsk State University)*
N. A. Toropov *(Aston University)*
I. Vatnik *(Novosibirsk State University)*
M. Sumetsky *(Aston University)*

MF1.3: Inelastic Resonant Transmission of a Single Photon through Optical Cavities with the Amplitude Approaching Unity (Page 47) 9:45AM - 10:00AM
M. Sumetsky *(Aston University)*

MG1: Microwave Photonics Technologies for Defense 8:30AM-10:00AM
Session Chair: Thas Nirmalathas, *University of Melbourne, Melbourne, Austria*

MG1.1: Microwave Photonics in the Industry (Page 49) **(Invited)** – 8:30AM - 9:00AM
Edward I. Ackerman *(Photonic Systems, Inc.)*

MG1.2: Trends in Defense System Architectures and the Impact of Photonics (Page NA) **(Invited)** – 9:00AM - 9:30AM
Paul Matthews *(Northrop Grumman Corporation)*

MG1.3: Efficient Antennas and Their Impact on Microwave Photonics Signal Processing (Page 51) **(Invited)** – 9:30AM - 10:00AM
Rodney Waterhouse *(Pharad LLC)*
Dalma Novak *(Pharad LLC)*

MH1: Attosecond Science 8:30AM-10:15AM
Session Chair: Eiji J. Takahashi, *RIKEN Center for Advanced Photonics, Saitama, Japan*

MH1.1: Precision Measurements with Attosecond Pulse Trains (Page NA) **(Invited)** – 8:30AM - 9:00AM
Cord L. Arnold *(Lund University)*
Marcus Isinger *(Lund University)*
Richard Squibb *(University of Gothenburg)*
David Busto *(Lund University)*
Shiyang Zhong *(Lund University)*
Anne Harth *(Max-Planck-Institut für Kernphysik Heidelberg)*
David Kroon *(MAX-IV Laboratory)*
Saikat Nandi *(Lund University)*
Miguel Miranda *(Posto University)*
Marcus Dahlström *(Lund Universty)*
Eva Lindroth *(Stockholm University)*
Raimund Feifel *(University of Gothenburg)*
Mathieu Gisselbrecht *(Lund University)*
Anne L'Huillier *(Lund University)*

MH1.2: Attosecond-Resolved Photoionization of Chiral Molecules (Page NA) **(Invited)** – 9:00AM - 9:30AM
Antoine Comby *(Université de Bordeaux - CNRS - CEA, CELIA)*

MH1.3: Sub-μJ, 25 eV Bandwidth Continuum Soft X-Ray Harmonic Generated by a TW-Scale Three-Channel Waveform Synthesizer (Page 53) 9:30AM - 9:45AM
Bing Xue *(RIKEN Center for Advanced Photonics, RIKEN)*
Yuuki Tamaru *(RIKEN Center for Advanced Photonics, RIKEN & Tokyo University of Science)*
Yuxi Fu *(RIKEN Center for Advanced Photonics, RIKEN)*
Oliver D. Mücke *(Deutsches Elektronen-Synchrotron DESY & Universität Hamburg)*
Akira Suda *(Tokyo University of Science)*
Kastumi Midorikawa *(RIKEN Center for Advanced Photonics, RIKEN)*

Eiji J. Takahashi *(RIKEN Center for Advanced Photonics, RIKEN)*

MH1.4: Diffraction and Microscopy with Attosecond Electron Pulses (Page NA) **(Invited)** – 9:45AM - 10:15AM
Yuya Morimoto *(Ludwig-Maximilians-Universität München)*
Peter Baum *(Ludwig-Maximilians-Universität München)*

MI1: Perils, Pitfalls and Pleasures: Turning Research Into a Real Product 9:00AM-10:00AM
Session Chair: Maura Raburn

MA2: High Density SDM Transmission 10:30AM-11:45AM
Session Chair: Tetsuya Hayashi, *Sumitomo Electric Industries, Ltd., Yokohama, Kanagawa, Japan*

MA2.1: Mode-Selective 45-Mode Spatial Multiplexer and Recent Applications of Multi-Plane Light Conversion (Page NA) **(Invited)** – 10:30AM - 11:00AM
Satyanarayana Bade *(CAILabs)*
Bertrand Denolle *(CAILabs)*
Gauthier Trunet *(CAILabs)*
Nicolas Riguet *(CAILabs)*
David Allioux *(CAILabs)*
Pu Jian *(CAILabs)*
Olivier Pinel *(CAILabs)*
Guillaume Labroille *(CAILabs)*

MA2.2: 10Pbit/s SDM/WDM Transmission (Page 55) **(Invited)** – 11:00AM - 11:30AM
Daiki Soma *(KDDI Research, Inc.)*
Takehiro Tsuritani *(KDDI Research, Inc.)*
Itsuro Morita *(KDDI Research, Inc.)*

MB2: Novel Photodetectors 10:30AM-12:00PM
Session Chair: Joe C. Campbell, *University of Virginia, Charlottesville, VA, USA*

MB2.1: III-V Photodiodes on Silicon for Analog Applications (Page 57) **(Invited)** – 10:30AM - 11:00AM
Andreas Beling *(University of Virginia)*

MB2.2: Internal Quantum Efficiency Dependence on Thickness of NiSi Schottky Barrier Photodetectors (Page 59) 11:00AM - 11:15AM
Joshua Duran *(Air Force Research Laboratory - Sensors Directorate)*
Andrew Sarangan *(University of Dayton)*

MB2.3: Ge-on-Si Waveguide Photodiode Array for High-Power Applications (Page 61) 11:15AM - 11:30AM
Keye Sun *(University of Virginia)*
Robert Costanzo *(University of Virginia)*
Ta-Ching Tzu *(University of Virginia)*
Qianhuan Yu *(University of Virginia)*
Steven M. Bowers *(University of Virginia)*
Andreas Beling *(University of Virginia)*

MB2.4: PbSe PhotoFETs: Levereging Bandstructure and Voltage Control for High Performance (Page 63) 11:30AM - 11:45AM
Samiran Ganguly *(University of Virginia)*
Sung-Shik Yoo *(Northrop Grumman Corp.)*
Avik W. Ghosh *(University of Virginia)*

MB2.5: Depletion Engineered Heterojunction p+-n HgCdTe Infrared Photodetector Structures (Page 65) 11:45AM - 12:00PM
Can Livanelioglu *(Middle East Technical University)*
Yigit Ozer *(Middle East Technical University)*
Serdar Kocaman *(Middle East Technical University)*

MC2: Nanowire Lasers and VCSELs & SL Tutorial 10:30AM-12:00PM
Session Chair: Nelson Tansu, *Lehigh University, Bethlehem, PA, USA*

MC2.1: Semiconductor Nanolasers (Page NA) **(Tutorial)** – 10:30AM - 11:15AM
Cun-Zheng Ning *(Arizona State University)*

MC2.2: High Resolution Active Beam Scanner Based on VCSEL Amplifier (Page 67) 11:15AM - 11:30AM
Zeuku Ho *(Tokyo Institute of Technology)*
Keisuke Shimura *(Tokyo Institute of Technology)*
Keisuke Kondo *(Tokyo Institute of Technology)*
Xiaodong Gu *(Tokyo Institute of Technology)*
Akihiro Matsutani *(Tokyo Institute of Technology)*
Fumio Koyama *(Tokyo Institute of Technology)*

MC2.3: Electrically-Controlled Spiking Regimes in Vertical-Cavity Surface Emitting Lasers (Page 69) 11:30AM - 11:45AM
Joshua Robertson *(University of Strathclyde)*
Ewan Wade *(University of Strathclyde)*
Antonio Hurtado *(University of Strathclyde)*

MC2.4: 23 GHz Bandwidth and 25 mW Peak Optical Output Power with 980 nm Oxide Aperture VCSELs (Page 71)
11:45AM - 12:00PM
Nasibeh Haghighi *(Technische Universtität Berlin)*
Gunter Larisch *(Technische Universtität Berlin)*
Ricardo Rosales *(Technische Universität Berlin)*
James A. Lott *(Technische Universtität Berlin)*

ME2: Single Particle Optics and Optofluidics 10:30AM-12:00PM

Session Chair: Rainer Leitgeb, *Medical University of Vienna, Vienna, Austria*

ME2.1: Laser-Tweezed Gold Nanorod Motors and Their Application for DNA Probing (Page NA) **(Invited)** – 10:30AM - 11:00AM
Lei Shao *(Chinese University of Hong Kong)*

ME2.2: 2D Electro-Optical Trapping and Analysis of Single Particles on an Integrated Optofluidic Chip (Page 73)
11:00AM - 11:15AM
M. Rahman *(University of California, Santa Cruz)*
M. A. Stott *(Brigham Young University)*
Y. Li *(University of California, Santa Cruz)*
A. R. Hawkins *(Brigham Young University)*
H. Schmidt *(University of California, Santa Cruz)*

ME2.3: Multimode Interference Waveguide-Based 7X Multiplexed Detection of Nucleic Acids for Antibiotic-Resistant Bacterial Screening (Page 75) 11:15AM - 11:30AM
G. G. Meena *(University of California, Santa Cruz)*
M. A. Stott *(Brigham Young University)*
O. Brown *(Brigham Young University)*
R. Robison *(Brigham Young University)*
A. R. Hawkins *(Brigham Young University)*
H. Schmidt *(University of California, Santa Cruz)*

ME2.4: Circular Nanoplasmonic Interferometer for Detection of Immune-Cell Secretion (Page 77) 11:30AM - 11:45AM
Yifeng Qian *(Lehigh University)*
Xie Zeng *(Lehigh University)*
Yongkang Gao *(NeoPhotonics)*
Hang Li *(Lehigh University)*
Sushil Kumar *(Lehigh University)*
Qiaoqiang Gan *(State University of New York, Buffalo)*
Xuanhong Cheng *(Lehigh University)*
Filbert Bartoli *(Lehigh Univerisity)*

ME2.5: Multi-Channel Velocity Multiplexing on a PDMS Based Optofluidic Chip (Page 79) 11:45AM - 12:00PM
J. A. Black *(University of California Santa Cruz)*
V. Ganjalizadeh *(University of California Santa Cruz)*
J. W. Parks *(University of California, Santa Cruz)*
H. Schmidt *(University of California, Santa Cruz)*

MF2: Microresonator and Photonic Crystal Devices 10:30AM-12:00PM

Session Chair: Marko Loncar, *Harvard University, Cambridge, MA, USA*

MF2.1: Low-Power High-Speed Resonance-Based Integrated Photonic Modulators (Page NA) **(Invited)** – 10:30AM - 11:00AM
Amir H. Hosseinnia *(Georgia Institute of Technology)*
Tianren Fan *(Georgia Institute of Technology)*
Hesam Moradinejad *(Georgia Institute of Technology)*
Majid Sodagar *(Georgia Institute of Technology)*
Seyediman Taghavi *(Georgia Institute of Technology)*
Ali A. Eftekhar *(Georgia Institute of Technology)*
Ali Adibi *(Georgia Institute of Technology)*

MF2.2: 40 Gb/s Carrier Depletion-Based Silicon Micro-Ring Modulators (Page 81) 11:00AM - 11:15AM
Yang-Jeng Chen *(National Sun Yat-Sen University)*
Rih-You Chen *(National Sun Yat-Sen University)*
Tzu-Hsiang Yen *(National Sun Yat-Sen University)*
Cong-Long Chen *(National Sun Yat-Sen University)*
Yung-Jr Hung *(National Sun Yat-Sen University)*
Yi-Jen Chiu *(National Sun Yat-Sen University)*

MF2.3: FSR-Free Microring Coupling-Based Modulator (Page 83) 11:15AM - 11:30AM
Ajay Mistry *(University of British Columbia)*
Mustafa Hammood *(University of British Columbia)*
Lukas Chrostowski *(University of British Columbia)*
Nicolas A. F. Jaeger *(University of British Columbia)*

MF2.4: Band-to-Band Transition Based On-Chip Optical Modulator (Page 85) 11:30AM - 11:45AM
Alperen Govdeli *(Middle East Technical University)*
Murat Can Sarihan *(Middle East Technical University)*
Utku Karaca *(Middle East Technical University)*
Serdar Kocaman *(Middle East Technical University)*

MF2.5: Integrated Optomechanical Resonators in Double-Layer Crystalline Silicon Platforms (Page 87) 11:45AM - 12:00PM
Razi Dehghannasiri *(Georgia Institute of Technology)*
Hesam Moradinejad *(Georgia Institute of Technology)*
Tianren Fan *(Georgia Institute of Technology)*
Amir H. Hosseinnia *(Georgia Institute of Technology)*
Ali A. Eftekhar *(Georgia Institute of Technology)*
Ali Adibi *(Georgia Institute of Technology)*

MG2: Microwave Photonics Technologies for Radar 10:30AM-12:00PM

Session Chair: Christina Lim, *University of Melbourne, Melbourne, Australia*

MG2.1: Microwave Photonics in Radar (Page 89) **(Invited)** – 10:30AM - 11:00AM
Antonella Bogoni *(Scuola Superiore Sant'Anna & CNIT)*
Leonardo Lembo *(Scuola Superiore Sant'Anna & Vallauri Institute)*
Giovanni Serafino *(Scuola Superiore Sant'Anna)*
Paolo Ghelfi *(CNIT)*
Filippo Scotti *(CNIT)*

MG2.2: Millimeter-Wave Radars Using Radio-Over-Fibers (Page 91) **(Invited)** – 11:00AM - 11:30AM
Tetsuya Kawanishi *(Waseda University / National Institute of Information and Communications Technology (NICT))*

MG2.3: Universal MWP Signal Processors - Architectures and Technologies (Page NA) **(Invited)** – 11:30AM - 12:00PM
Cun-Zheng Ning *(Arizona State University)*
Jose Capmany *(Valencia University)*

MH2: Laser-based Accelerators and Colliders 10:30AM-12:00PM

Session Chair: Olive D. Mucke, *Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany*

MH2.1: Multi-GeV Electron Bunch Acceleration from Laser Plasma Acceleration at BELLA (Page NA) **(Invited)** – 10:30AM - 11:00AM
Wim Leemans *(LBNL)*

MH2.2: Evaluation of Efficient Laser Plasma Acceleration Driven by a Relativistic Mid-Infrared Laser Field (Page 93) 11:00AM - 11:15AM
Eiji J. Takahashi *(RIKEN Center for Advanced Photonics, RIKEN)*
Shin-ichi Masuda *(High Energy Accelerator Research Organization (KEK))*
Eisuke Miura *(National Institute of Advanced Industrial Science and Technology (AIST))*

MH2.3: Extremely High-Order Multiphoton Thomson Scattering: Synchrotron Hard X-Rays from Ultra-Intense Laser Light (Page 95) **(Invited)** – 11:15AM - 11:45AM
Donald Umstadter *(University of Nebraska-Lincoln)*

MH2.4: A High Energy Photon Collider as a Next-to-Next New Physics Laboratory: Beyond the LHC and ILC Era. Prospective New Scenarios in Particles Physics (Page 97) 11:45AM - 12:00PM
Huber Nieto-Chaupis *(Universidad de Ciencias y Humanidades)*

MI2: Realities of Photonics: From Design to Fabrication to Packaging 10:30AM-12:00PM

Session Chair: Maura Raburn

MA3: OC Tutorial 1:30PM-2:30PM

Session Chair: Hussam Batshon, *TE Subcom, Morristown, NJ, USA*

MA3.1: Information-Theoretic Tools for Optical Communications Engineers (Page 99) **(Tutorial)** – 1:30PM - 2:30PM
Erik Agrell *(Chalmers University of Technology)*
Marco Secondini *(TeCIP Institute)*

MB3: High Speed Photodetectors and Systems 1:30PM-3:00PM

Session Chair: Jo Shien Ng, *University of Sheffield, Sheffield, UK*

MB3.1: Performance and Applications of 25G/50G Ge/Si Avalanched Photodiodes (Page NA) **(Invited)** – 1:30PM - 2:00PM
Dong Pan *(SiFotonics)*

MB3.2: Zero-Bias GaAsSb/InP Photodiode with 40 GHz Bandwidth (Page 105) 2:00PM - 2:15PM
Qianhuan Yu *(University of Viriginia)*
Ze Wang *(University of Virginia)*
Keye Sun *(University of Virginia)*
Fengxin Yu *(University of Virginia)*
Jizhao Zang *(University of Virginia)*
Joe C. Campbell *(University of Virginia)*
Andreas Beling *(University of Virginia)*

MB3.3: Optimum Design Criteria on Speed and Responsivity of InP/GaAsSb Electron-Injection Detector (Page N/A) 2:15PM - 2:30PM
Min-Su Park *(Northwestern University)*
Mohsen Razaei *(Northwestern University)*
Chee Leong Tan *(University of Malaya)*

Hooman Mohseni *(Northwestern University)*

MB3.4: 45-Gbaud, 32-Pixel 2D-PDA for Multi-Core Fiber-Based Optical Wireless Communication (Page 109) **(Invited)** – 2:30PM - 3:00PM
Toshimasa Umezawa *(National Institute of Information and Communications Technology (NICT))*
Takahide Sakamoto *(National Institute of Information and Communications Technology (NICT))*
Atsushi Kanno *(National Institute of Information and Communications Technology (NICT))*
Atsushi Matsumoto *(National Institute of Information and Communications Technology (NICT))*
Naokatsu Yamamoto *(National Institute of Information and Communications Technology (NICT))*
Tetsuya Kawanishi *(National Institute of Information and Communications Technology (NICT) & Waseda University)*

MC3: Wide Bandgap Lasers 1:30PM-3:00PM

Session Chair: Jerry Meyer, *Naval Research Laboratory, CA, USA*

MC3.1: AlGaN-Based Deep UV Lasers: Challenges and Prospects (Page NA) **(Invited)** – 1:30PM - 2:00PM
Michael Kneissl *(TU Berlin)*
Christian Kuhn *(TU Berlin)*
Martin Martens *(TU Berlin)*
Martin Guttmann *(TU Berlin)*
Anton Muhin *(TU Berlin)*
Bettina Neuschulz *(TU Berlin)*
Jörg Jeschke *(Ferdinand-Braun-Institut, Leibniz-Institut für Hoechstfrequenztechnik)*
Luca Sulmoni *(TU Berlin)*
Tim Wernicke *(TU Berlin)*
Markus Weyers *(Ferdinand-Braun-Institut, Leibniz-Institut für Hoechstfrequenztechnik)*

MC3.2: Gain Properties of InGaN Quantum Wells with AlGaInN Barriers (Page 111) 2:00PM - 2:15PM
Hanlin Fu *(Lehigh University)*
Wei Sun *(Lehigh University)*
Onoriode Ogidi-Ekoko *(Lehigh University)*
Nelson Tansu *(Lehigh University)*

MC3.3: Dilute-As InGaNAs Quantum Wells for Red-Emitting Lasers (Page 113) 2:15PM - 2:30PM
Damir Borovac *(Lehigh University)*
Wei Sun *(Lehigh University)*
Chee-Keong Tan *(Clarkson University)*
Nelson Tansu *(Lehigh University)*

MD3: Award Winning Photonics Science and Technology I 1:30PM-2:45:00 PM

Session Chair: Carmen Menoni, *Colorado State University, Fort Vollins, CO, USA*

MD3.1: William Streifer Scientific Achievement Award - What We Learned about Mutimode Fibers while Performing Communication Experiments (Page NA) **(Invited)** – 1:30PM - 2:00PM
Roland Ryf *(Nokia Bell Labs)*

MD3.2: Quantum Electronics Award - Fibre-Based Sources for Spectral and Temporal Versatility (Page NA) **(Tutorial)** – 2:00PM - 2:45PM
James Roy Taylor *(Imperial College London)*

ME3: Computational Imaging and Image Computation 1:30PM-3:00PM

Session Chair: Giuliano Scarcelli, *University of Maryland, College Park, MD, USA*

ME3.1: Compressed Ultrafast Photography and Microscopy: Redefining the Limit of Passive Ultrafast Imaging (Page NA) **(Invited)** – 1:30PM - 2:00PM
Liang Gao *(University of Illinois)*

ME3.2: Lensless Inline Holographic Microscope with Insufficient Spatial and Temporal Coherence (Page 115) 2:00PM - 2:15PM
Jigang Wu *(University of Michigan - Shanghai Jiao Tong University)*
Shaodong Feng *(University of Michigan - Shanghai Jiao Tong University)*

ME3.3: Automated Identification of Bacteria Using Three-dimensional Holographic Imaging and Convolutional Neural Network (Page 117) 2:15PM - 2:30PM
Geon Kim *(KAIST)*
YoungJu Jo *(KAIST)*
Hyungjoo Cho *(Seoul National University)*
Gunho Choi *(Yonsei University)*
Beom-Soo Kim *(Korea University)*
Hyun-seok Min *(KAIST)*
YongKeun Park *(KAIST)*

ME3.4: Accurate Representation of Microscopic Scatterers in Realistic Simulation of OCT Image Formation (Page 119) 2:30PM - 2:45PM
Pawel Ossowski *(Nicolaus Copernicus University)*
Andrea Curatolo *(Instituto de Optica "Daza de Valdes" & University of Western Australia)*
David Sampson *(University of Surrey & University of Western Australia)*
Peter R. T. Munro *(University College London & University of Western Australia)*

MF3: Miroresonator Devices 1:30PM-2:45:00 PM
Session Chair: Ali Adibi, *Georgia Institute of Technology, Atlanta, GA, USA*

MF3.1: Integrated High-Q LiNbO3 Resonators and Applications (Page NA) **(Invited)** – 1:30PM - 2:00PM
Marko Loncar *(Harvard University)*

MF3.2: Nanoscale Accurate Heterogeneous Integration of Waveguide Devices by Transfer Printing (Page 121) 2:00PM - 2:15PM
B. Guilhabert *(University of Strathclyde)*
J. McPhillimy *(University of Strathclyde)*
C. Klitis *(University of Glasgow)*
M. D. Dawson *(University of Strathclyde)*
M. Sorel *(University of Glasgow)*
M. J. Strain *(University of Strathclyde)*

MF3.3: Low-Loss Silicon-Photonic Devices for Mid-infrared Applications (Page 123) 2:15PM - 2:30PM
A. Nitkowski *(LGS Innovations)*
P. Bollond *(LGS Innovations)*
M. Dinu *(LGS Innovations)*
S. Cabot *(LGS Innovations)*
J. Le Grange *(LGS Innovations)*
J. Jaques *(LGS Innovations)*
I. Kang *(LGS Innovations)*
Chia-Ming Chang *(Nokia Bell Labs)*
Po Dong *(Nokia Bell Labs)*
Xianshu Luo *(Advanced Micro Foundry Pte)*
Guo-Qiang Lo *(Advanced Micro Foundry Pte)*

MF3.4: High-Q Microresonators at Near-Infrared/Near Visible Wavelengths on A 3C-SiC-on-Insulator (SiCOI) Platform (Page 125) 2:30PM - 2:45PM
Tianren Fan *(Georgia Institute of Technology)*
Ali A. Eftekhar *(Georgia Institute of Technology)*
Ali Adibi *(Georgia Institute of Technology)*

MH3: Silicon Photonics 1:30PM-3:00PM
Session Chair: Peter Schunemann, *BAE Systems, Inc., Arlington, VA, USA*

MH3.1: Nonlinear Optics in Semiconductor Optical Fibers (Page 127) **(Invited)** – 1:30PM - 2:00PM
Anna C. Peacock *(University of Southampton)*

MH3.2: In Situ Fabrication of Far-Detuned Optical Fiber Wavelength Converters (Page 129) 2:00PM - 2:15PM
Md Imtiaz Alamgir *(McGill University)*
Nurmemet Abudukelimu *(McGill University)*
Martin Rochette *(McGill University)*

MH3.3: Ultra-Rich-Silicon... (Page NA) **(Invited)** – 2:15PM - 2:45PM
Dawn Tan
Kelvin Ooi *(SUTD)*
Doris Ng *(A*STAR Data Storage Institute)*
Ju Won Choi *(SUTD)*
Ezgi Sahin *(SUTD)*
Peng Xing *(SUTD)*
George Chen *(SUTD)*
Byoung Uk Sohn *(SUTD)*

MH3.4: Crack-Free Silicon-Nitride-on-Insulator Nonlinear Circuits for Continuum Generation in the C-Band (Page 131) 2:45PM - 3:00PM
Houssein El Dirani *(CEA-LETI)*
Marco Casale *(CEA-LETI)*
Sébastien Kerdiles *(CEA-LETI)*
Carole Socquet-Clerc *(CEA-LETI)*
Xavier Letartre *(Institut des Nanotechnologies de Lyon)*
Christelle Monat *(Institut des Nanotechnologies de Lyon)*
Corrado Sciancalepore *(CEA-LETI)*

MI3: The Global Startup Scene 1:30PM-3:00PM
Session Chair: Dalma Novak, *Pharad, Hanover, MD, USA*

MA4: Steps Toward Practicality of SDM 3:30PM-4:45:00 PM
Session Chair: Yoshinari Awaji, *NICT, Koganei, Tokyo, Japan*

MA4.1: Toward the Practical Use of the Multi-Core Fiber in Optical Communications (Page NA) **(Invited)** – 3:30PM - 4:00PM
Tetsuya Hayashi *(Sumitomo Electric Industries, Ltd.)*

MA4.2: Suppression of Group-Delay Spread in Coupled Two-LP-Mode Four-Core Fiber (Page 135) 4:00PM - 4:15PM
Takanori Sato *(Hokkaido University)*

Kazuki Yoshida *(Hokkaido University)*
Takeshi Fujisawa *(Hokkaido University)*
Taiji Sakamoto *(NTT Corporation)*
Takashi Matsui *(NTT Corporation)*
Kyozo Tsujikawa *(NTT Corporation)*
Kazuhide Nakajima *(NTT Corporation)*
Kunimasa Saitoh *(Hokkaido University)*

MA4.3: Switching Paradigms for SDM-WDM Networks (Page NA) **(Invited)** – 4:15PM - 4:45PM
Dan Marom *(Hebrew University of Jerusalem)*

MB4: High Power & UTC Detectors 3:30PM-5:00PM

Session Chair: Joshua Duran, *Air Force Research Laboratory - Sensors Directorate, Dayton, OH, USA*

MB4.1: High-Power Photonic Phased Array Antennas (Page 137) **(Invited)** – 3:30PM - 4:00PM
Matthew R. Konkol *(Phase Sensitive Innovations, Inc.)*
Victoria A. Carey *(University of Delaware)*
Shouyuan Shi *(University of Delaware)*
Christopher A. Schuetz *(Phase Sensitive Innovations, Inc.)*
Dennis W. Prather *(University of Delaware)*

MB4.2: Phase Noise and Performance Optimization in MUTC Photodetectors Using the Drift-Diffusion Equations (Page 139) 4:00PM - 4:15PM
Seyed Ehsan Jamali Mahabadi *(University of Maryland)*
Franklyn J. Quinlan *(National Institute of Standards and Technology)*
Thomas F. Carruthers *(University of Maryland)*
Curtis R. Menyuk *(University of Maryland)*

MB4.3: Large-Area High-Power Modified Uni-Traveling Carrier Photodiodes (Page 141) 4:15PM - 4:30PM
Fengxin Yu *(University of Virginia)*
Keye Sun *(University of Virginia)*
Andreas Beling *(University of Virginia)*

MB4.4: High Output Power Millimeter Wave GaAsSb-InP UTC Photoreceiver MMICs (Page 143) **(Invited)** – 4:30PM - 5:00PM
Christopher Coleman *(Keysight Technologies)*
Gregory Lee *(Keysight Technologies)*
Tom Low *(Keysight Technologies)*
Dieter Vook *(Keysight Technologies)*
Barry Wu *(Keysight Technologies)*
Douglas M. Baney *(Keysight Technologies)*

MC4: Quantum Cascade and High Power Lasers 3:30PM-5:00PM

Session Chair: Michael Kneissl, *TU Berlin, Berlin, Germany*

MC4.1: Frequency Combs in Quantum-Cascade Lasers (Page NA) **(Invited)** – 3:30PM - 4:00PM
Jérôme Faist *(ETH Zurich)*

MC4.2: High-Power MOCVD-Grown Quantum Cascade Lasers (Page 145) 4:00PM - 4:30PM
L. J. Mawst *(University of Wisconsin-Madison)*
C. Sigler *(University of Wisconsin-Madison)*
C. Boyle *(University of Wisconsin-Madison)*
J. D. Kirch *(University of Wisconsin-Madison)*
K. Oresick *(University of Wisconsin-Madison)*
H. Kim *(University of Wisconsin-Madison)*
D. Lindberg III *(Intraband, LLC)*
T. Earles *(Intraband LLC)*
D. Botez *(University of Wisconsin-Madison)*

MC4.3: Influence of Lateral Refractive Index Profiles on the Divergence Angle of Gain-Guided Broad-Area Laser Diode Bars (Page 147) **(Invited)** – 4:30PM - 4:45PM
Carlo Holly *(TRUMPF Photonics, Inc.)*
Xiaohang Liu *(TRUMPF Photonics, Inc.)*
Stefan Heinemann *(TRUMPF Photonics, Inc.)*
Stewart McDougall *(TRUMPF Photonics, Inc.)*
Hagen Zimer *(TRUMPF Photonics, Inc.)*

MC4.4: Modulation of Master Oscillator Power Amplifier for Free Space Optical Communications at 1.5 µm (Page 149) 4:45PM - 5:00PM
Cécil Pham *(III-V Lab)*
Frédéric Van Dijk *(III-V Lab)*
Olivier Parillaud *(III-V Lab)*
Eric Vinet *(III-V Lab)*
Yannick Robert *(III-V Lab)*
Michel Garcia *(III-V Lab)*
Alexandre Larrue *(III-V Lab)*
Mickaël Faugeron *(Thales Alenia Space)*
Angélique Rissons *(ISAE Supaéro)*

ME4: Advanced Microscopy 3:30PM-5:00PM
Session Chair: Norman Lippok, *Harvard Medical School, Boston, MA, USA*

ME4.1: Mapping the Microbiome with Super Resolution Microscopy (Page NA) **(Invited)** – 3:30PM - 4:00PM
Jochem Deen *(Swiss Federal Institute of Technology)*

ME4.2: Oblique-Sectional Single-Molecule Microscopy (Page 151) 4:00PM - 4:15PM
Jeongmin Kim *(University of California at Berkeley)*
Michal Wojcik *(University of California, Berkeley)*
Yuan Wang *(University of California, Berkeley)*
Ke Xu *(University of California, Berkeley)*
Xiang Zhang *(University of California, Berkeley)*

ME4.3: A Handheld MEMS-Scanned In Vivo Optical-Sectioning Microscope for Early Detection and Surgical Guidance (Page 153) 4:15PM - 4:30PM
Chengbo Yin *(University of Washington)*
Linpeng Wei *(University of Washington)*
Sanjeewa Abeytunge *(Memorial Sloan Kettering Cancer Center)*
Gary Peterson *(Memorial Sloan Kettering Cancer Center)*
Adam K. Glaser *(University of Washington)*
Michael J. Mandella *(Michigan State University)*
Milind Rajadhyaksha *(Memorial Sloan Kettering Cancer Center)*
Jonathan T. C. Liu *(University of Washington)*

ME4.4: WITHDRAWN

ME4.5: Absolute Three-Dimensional Measurement of Refractive Index Via Photon-Phonon Phase Matching (Page 157) 4:45PM - 5:00PM
Antonio Fiore *(University of Maryland)*
Giuliano Scarcelli *(University of Maryland)*

MF4: Nonlinear Microresonators 3:30PM-5:00PM
Session Chair: Scott Papp, *National Institute of Standards and Technology, Gaithersburg, MD, USA*

MF4.1: Microresonator Isolators Based on the Nonreciprocity of the Kerr Effect (Page NA) **(Invited)** – 3:30PM - 4:00PM
Pascal Del'Haye *(National Physical Laboratory)*

MF4.2: Self-Injection Locking of Laser Diodes to Microresonators and Microcombs (Page NA) **(Invited)** – 4:00PM - 4:30PM
Michael Gorodetsky *(USA)*

MF4.3: Cavity Optomechanical Photothermal Sensors (Page 159) 4:30PM - 4:45PM
Marcel W. Pruessner *(US Naval Research Laboratory)*
Doewon Park *(US Naval Research Laboratory)*
Todd H. Stievater *(US Naval Research Laboratory)*
Dmitry A. Kozak *(US Naval Research Laboratory)*
William S. Rabinovich *(US Naval Research Laboratory)*

MF4.4: Influence of Nonlinear Losses on Spontaneous Four Wave Mixing in InP Membrane Micro-Ring Resonator (Page 161) 4:45PM - 5:00PM
Rakesh Ranjan Kumar *(Chinese University of Hong Kong)*
Ming Feng *(Chinese University of Hong Kong & Nankai University)*
Marina Raevskaia *(Eindhoven University of Technology)*
Vadim Pogoretskii *(Eindhoven University of Technology)*
Yuqing Jiao *(Eindhoven University of Technology)*
Hon Ki Tsang *(Chinese University of Hong Kong)*

MH4: High-Energy Sources and Applications 3:30PM-5:00PM
Session Chair: Cord L. Arnold, *Lund University, Lund, Sweden*

MH4.1: High Energy THz Pulses for Electron Acceleration (Page 239) **(Invited)** – 3:30PM - 4:00PM
Franz Kaertner *(CFEL)*

MH4.2: High Repetition Rate Petawatt Laser and High-Contrast Ultra-High Intensity Second Harmonic Beamline (Page 163) **(Invited)** – 4:00PM - 4:30PM
Yong Wang *(Colorado State University)*
Shoujun Wang *(Colorado State University)*
Alex Rockwood *(Colorado State University)*
Bradley M. Luther *(Colorado State University)*
Reed Hollinge *(Colorado State University)*
Alden Curtis *(Colorado State University)*
Chase Calvi *(Colorado State University)*
Carmen S. Menoni *(Colorado State University)*
Jorge J. Rocca *(Colorado State University)*

MH4.3: Development of High Energy, Picosecond Lasers with Kilowatt Average Power (Page 165) 4:30PM - 4:45PM
Cory M. Baumgarten *(Colorado State University)*
Han Chi *(Colorado State University)*
Kristian Dehne *(XUV Lasers, Inc.)*

Elzbieta Jankowska *(Colorado State University)*
Herman Bravo *(XUV Lasers Inc.)*
Liang Yin *(Colorado State University)*
Hanchen Wang *(Colorado State University)*
Alex Meadows *(Colorado State University)*
Gabriel Murray *(Colorado State University)*
Carmen S. Menoni *(Colorado State University)*
Brendan A. Reagan *(XUV Lasers Inc.)*
Jorge J. Rocca *(Colorado State University)*

MH4.4: Bidirectional Mode-Locked Thulium-Doped Laser (Page 167) 4:45PM - 5:00PM
Nurmemet Abudukelimu *(McGill University)*
M. Imrul Kayes *(McGill University)*
Alexandre Rekik *(McGill University)*
Martin Rochette *(McGill University)*

MI4: Tech Titans: Words of Wisdom, War Stories and Crystal Balls 3:30PM-5:00PM
Session Chairs: Maura Raburn & Simon Poole

TuA1: Optical Transceivers 8:30AM-10:00AM
Session Chair: TBD

TuA1.1: Scalable High-Performance Multi-Format Optical Transceivers (Page NA) **(Invited)** – 8:30AM - 9:00AM
P. S. Bedrosian *(MIT Lincoln Laboratory)*
J. P. Wang *(MIT Lincoln Laboratory)*
David Caplan *(MIT Lincoln Laboratory)*

TuA1.2: 4 x 25 Gbit/s Silicon Photonics Tunable Receiver Using Transfer Printed III-V Photodiodes (Page 169) 9:00AM - 9:15AM
Grigorij Muliuk *(Ghent University - IMEC)*
Kasper Van Gasse *(Ghent University - IMEC)*
Mahmoud Shahin *(Ghent University - IMEC)*
Jochem Verbist *(Ghent University - IMEC)*
Antonio José Trindade *(X-Celeprint Limited)*
Brian Corbett *(Tyndall National Institute)*
Dries Van Thourhout *(Ghent University - IMEC)*
Günther Roelkens *(Ghent University - IMEC)*

TuA1.3: Joint Tx and Rx Skew Calibration in Coherent Transceivers Based on Rx-Side DSP (Page 171) 9:15AM - 9:30AM
Pavel Skvortcov *(Aston University)*
Christian Sanchez-Costa *(Aston University)*
Ian Phillips *(Aston University)*
Wladek Forysiak *(Aston University)*

TuA1.4: Flexible Transponder Based on Probabilistic Shaped QAM (Page NA) **(Invited)** – 9:30AM - 10:00AM
Qian Hu *(Nokia Bell Labs)*
Fred Buchali *(Nokia Bell Labs)*
Henning Buelow *(Nokia Bell Labs)*

TuB1: PSSI Tutorial 8:30AM-10:00AM
Session Chair: Andrew Sarangan, *University of Dayton, Dayton, OH, USA*

TuB1.1: III-V Semiconductor Unipolar Barrier Infrared Detectors (Page 173) **(Tutorial)** – 8:30AM - 10:00AM
David Z. Ting *(California Institute of Technology)*

TuC1: Integration Technologies 8:30AM-10:00AM
Session Chair: Frédéric Grillot, *Université Paris-Saclay, Paris, France*

TuC1.1: Photonic Integration with Quantum Cascade Lasers (Page NA) **(Invited)** – 8:30AM - 9:00AM
Mikhail Belkin *(University of Texas at Austin)*

TuC1.2: InAs Quantum Dot Lasers on Silicon Emitting at Telecom Wavelengths (Page 241) **(Invited)** – 9:00AM - 9:30AM
Kei May Lau *(HKUST)*

TuC1.3: Photonics Silicon Foundry (Page NA) **(Invited)** – 9:30AM - 10:00AM
Michael Liehr *(AIM Photonics)*

TuD1: Silicon Photonics and Packaging 8:30AM-9:45AM
Session Chair: Luc M. Augustin, *SMART Photonics B.V., Eindhoven, The Netherlands*

TuD1.1: Subwavelength Silicon Photonic Structures (Page NA) **(Invited)** – 8:30AM - 9:00AM
Jens Schmid *(National Research Council Canada)*

TuD1.2: Compliant Polymer Interface Demonstration with Standard Plug-In Connection to Fiber Cables (Page 175) 9:00AM - 9:15AM

Tymon Barwicz *(IBM T.J. Watson Research Center)*
Kengo Watanabe *(Furukawa Electric Co.)*
Richard Langlois *(IBM Bromont)*
Katsuki Suematsu *(Furukawa Electric Co.)*
Nathalie Normand *(IBM Bromont)*
Shotaro Takenobu *(Asahi Glass Co.)*
Alexander Janta-Polczynski *(IBM Bromont)*
Bo Peng *(IBM T.J. Watson Research Center)*
Yoichi Taira *(IBM T.J. Watson Research Center)*
Hidetoshi Numata *(IBM Research - Tokyo)*
Swetha Kamlapurkar *(IBM T.J. Watson Research Center)*
Sebastian Engelmann *(IBM T.J. Watson Research Center)*
Nicolas Boyer *(IBM Bromont)*

TuD1.3: A Thermally Tunable Superstructure Grating Filter in Silicon Photonics (Page 177) 9:15AM - 9:30AM
Zifei Wang *(McGill University)*
Lawrence R. Chen *(McGill University)*

TuD1.4: A Continuously Tunable SOI Microring Filter with Temperature Tracking (Page 179) 9:30AM - 9:45AM
Yang Ren *(University of Alberta)*
David Perron *(University of Alberta)*
Fnu Aurangozeb *(University of Alberta)*
Zhiping Jiang *(Huawei Canada Research Centre)*
Masum Hossain *(University of Alberta)*
Vien Van *(University of Alberta)*

TuE1: Photothermal, Fluorescence Liftime, and Brillouin Imaging 8:30AM-10:00AM
Session Chair: Jigang Wu, *University of Michigan - Shanghai Jiao Tong University Joint Institute, Shanghai, China*

TuE1.1: Dental Thermo-Photonic Imaging (Page NA) **(Invited)** – 8:30AM - 9:00AM
Nima Tabatabaei *(York University)*

TuE1.2: Real-Time Time-Resolved Optical Measurements Using a Digital Adaptive Filter (Page 181) 9:00AM - 9:15AM
Saurabh Gupta *(Colorado State University)*
Arya Chowdhury Mugdha *(Colorado State University)*
William Hudson *(Colorado State University)*
Victoria Palmer *(Colorado State University)*
Kevin L. Lear *(Colorado State University)*
Jesse W. Wilson *(Colorado State University)*

TuE1.3: Noncontact Characterization of Nuclear Mechanics within Intact Cells Using Brillouin Microscopy (Page 183) 9:15AM - 9:30AM
Jitao Zhang *(University of Maryland)*
Miloš Nikolić *(University of Maryland)*
Xuefei A. Nou *(University of Maryland)*
Hanyoup Kim *(Canon U.S. Life Sciences, Inc.)*
Giuliano Scarcelli *(University of Maryland)*

TuE1.4: Label-Free Photothermal Imaging for Tissue Studies (Page NA) **(Invited)** – 9:30AM - 10:00AM
Michelle Y. Sander *(Boston University)*

TuF1: Microresonator Sensors and Metrology 8:30AM-10:00AM
Session Chair: Pascal Del'Haye, *National Physical Laboratory, England, UK*

TuF1.1: Exploring the Nanoscale with Optoplasmonic Sensors (Page NA) **(Invited)** – 8:30AM - 9:00AM
Frank Vollmer *(UK)*

TuF1.2: Photonic-Chip Frequency Combs for Optical Synthesis and Metrology (Page NA) **(Invited)** – 9:00AM - 9:30AM
Scott Papp *(National Institute of Standards and Technology)*

TuF1.3: Noninvasive and Portable Diagnoses for Brain and Heart Disorder: Angle-Distinguishable Infrared Spectroscopy Based Upon a Three Dimensional Resonant Toroid Version of Whispering Gallery Modes (Page 185) 9:30AM - 9:45AM
O'Dae Kwon *(POSTECH (Pohang Univ. of Sci. & Tech.))*

TuF1.4: Metal Organic Framework-Coated Optical VOC Gas Sensor (Page 187) 9:45AM - 10:00AM
Yangyang Zhao *(George Washington University)*
Mona Zaghloul *(George Washington University)*
Yigal Lilach *(George Washington University)*
Kurt Benkstein *(National Institute of Standards and Technology)*
Steve Semancik *(National Institute of Standards and Technology)*

TuG1: Nanophotonic Light Emission 8:30AM-10:00AM
Session Chair: Alessandro Salandrino, *University of Kansas, Lawrence, KS, USA*

TuG1.1: The Next Generation of Colloidal Quantum Emitters for Nanophotonics (Page NA) **(Invited)** – 8:30AM - 9:00AM
David J. Norris *(ETH Zurich)*

TuG1.2: Optical Antenna NanoLED Based Interconnect Design (Page 189) 9:00AM - 9:15AM

Nicolas M. Andrade *(University of California, Berkeley)*
Krishna T. Settaluri *(University of California, Berkeley)*
Seth Fortuna *(University of California, Berkeley)*
Sean Hooten *(University of California, Berkeley)*
Kevin Han *(University of California, Berkeley)*
Eli Yablonovitch *(University of California, Berkeley)*
Vladimir Stojanovic *(University of California, Berkeley)*
Ming C. Wu *(University of California, Berkeley)*

TuG1.3: Electrical Tuning of Exciton-Polaritons in Monolayer WS2 (Page 191) 9:15AM - 9:30AM
Biswanath Chakraborty *(City University of New York)*
Jie Gu *(City University of New York)*
Zheng Sun *(University of Pittsburgh)*
Mandeep Khatoniar *(City University of New York)*
Rezlind Bushati *(City University of New York)*
Alexandra Bohemke *(City University of New York)*
Rian Koots *(City University of New York)*
Vinod M. Menon *(City University of New York)*

TuG1.4: AlGaN Nanowire Photonic Crystals: Design, Epitaxy, and High Efficiency Deep UV LEDs (Page 193) 9:30AM - 9:45AM
Xianhe Liu *(University of Michigan & McGill University)*
Binh H. Le *(McGill University)*
Kishwar Mashooq *(University of Michigan)*
Zetian Mi *(University of Michigan)*

TuG1.5: Ultraviolet-A LED Based on Quantum-Disks-In-AlGaN-Nanowires-Optimization and Device Reliability (Page 195) 9:45AM - 10:00AM
Bilal Janjua *(King Abdullah University of Science and Technology)*
Davide Priante *(King Abdullah University of Science and Technology)*
Aditya Prabaswara *(King Abdullah University of Science and Technology)*
Lafi Alanazi *(King Abdulaziz City for Science and Technology)*
Chao Zhao *(King Abdullah University of Science and Technology)*
Abdullah A. Alhamoud *(King Abdullah University of Science and Technology & King Abdulaziz City for Science and Technology)*
Mohd Sharizal Alias *(King Abdullah University of Science and Technology)*
Abdulrahman M. Albadri *(King Abdulaziz City for Science and Technology)*
Ahmed Y. Alyamani *(King Abdulaziz City for Science and Technology)*
Tien Khee Ng *(King Abdullah University of Science and Technology)*
Boon S. Ooi *(King Abdullah University of Science and Technology)*

TuH1: Solid-State & Fiber Lasers 8:30AM-10:00AM
Session Chair: Eric O. Potma, *University of California, Irvine, Irvine, CA, USA*

TuH1.1: Time and Frequency Measurement (Page NA) **(Invited)** – 8:30AM - 9:00AM
Thomas Sudmeyer *(University of Nauchatel)*

TuH1.2: Zirconium Boride as a High Fluence Saturable Absorber for Q-Switched Fiber Lasers (Page 207) 9:00AM - 9:15AM
Haroldo T. Hattori *(University of New South Wales Canberra)*
Ahasanul Haque *(University of New South Wales Canberra)*
Ziyuan Li *(Australian National University)*
Benjamin Olbricht *(Coupled Optics LCC)*

TuH1.3: Continuous Wave Operation of a Yb3+-Ho3+ Co-Doped LuVO4 Laser at 2076 nm (Page N/A) 9:15AM - 9:30AM
Xining Yang *(Harbin University of Science and Technology & Heilongjiang Institute of Technology)*
Linjun Li *(Harbin University of Science and Technology & Heilongjiang Institute of Technology)*
Yingjie Shen *(Yantai University)*
Long Zhou *(Harbin University of Science and Technology)*
Yuqiang Yang *(Harbin University of Science and Technology)*
Wei Wang *(Harbin University of Science and Technology)*
Yunfeng Bai *(Heilongjiang Institute of Technology)*
Wenqiang Xie *(Heilongjiang Institute of Technology)*
Guangchao Ye *(Heilongjiang Institute of Technology)*
Xiaoyang Yu *(Harbin University of Science and Technology)*

TuH1.4: Collisions of Moving Gap Solitons in Coupled Bragg Gratings with Cubic-Quintic Nonlinearity (Page 213) 9:30AM - 9:45AM
Md. Jahedul Islam *(Khulna University of Engineering & Technology)*
Javid Atai *(University of Sydney)*

TuH1.5: Dynamics of Colliding Solitons in a Coupler with Separated Nonuniform Bragg Grating and Nonlinearity (Page 215) 9:45AM - 10:00AM
Tanvir Ahmed *(Rajshahi University of Engineering & Technology)*
Javid Atai *(University of Sydney)*

TuA2: Modulation and Detection 10:30AM-12:00PM
Session Chair: Qian Hu, *Nokia Bell Labs, Stuttgart, Germany*

TuA2.1: Stokes-Vector Receivers and Their Performance Analysis (Page 217) **(Invited)** – 10:30AM - 11:00AM
Kazuro Kikuchi *(National Institution for Academic Degrees and Quality Enhancement of Higher Education)*

TuA2.2: Frequency Comb Based Kramers-Kronig Detection (Page 219) 11:00AM - 11:15AM
Qiulin Zhang *(Chinese University of Hong Kong)*
Chester Shu *(Chinese University of Hong Kong)*

TuA2.3: Bidirectional 4-PAM to Double Per-Fiber Capacity in 2-km Intra-Datacenter Links (Page 221) 11:15AM - 11:30AM
Dario Pilori *(Politecnico di Torino)*
Luca Bertignono *(Politecnico di Torino)*
Antonino Nespola *(Istituto Superiore Mario Boella)*
Fabrizio Forghieri *(Cisco Photonics Italy S.r.l.)*
Marco Mazzini *(Cisco Photonics Italy S.r.l.)*
Roberto Gaudino *(Politecnico di Torino)*

TuA2.4: 400 Gb/s Data Center Interconnects: Coherent Detection vs. Direct Detection (Page NA) **(Invited)** – 11:30AM - 12:00PM
David Plant *(McGill University / Ciena)*

TuB2: Imaging Sensors 10:30AM-12:00PM

Session Chair: Tobias Tiecke, *Facebook*

TuB2.1: Computational-Pixel Image Sensors (Page NA) **(Invited)** – 10:30AM - 11:00AM
Michael W. Kelly *(Copious Imaging LLC)*
Justin Baker *(Copious Imaging LLC)*
Curtis Colonero *(Copious Imaging LLC)*
Christopher David *(Copious Imaging LLC)*

TuB2.2: Multiple Sampling Photodiode Readout that Overcomes ADC Resolution Limit (Page 233) 11:00AM - 11:15AM
Lucas J. Koerner *(University of St. Thomas)*
Savannah M. Johnson *(University of St. Thomas)*
Lucas S. Manke *(University of St. Thomas)*

TuB2.3: LED-Based Photometric Stereo-Imaging Employing Frequency-Division Multiple Access (Page 235) 11:15AM - 11:30AM
Johannes Herrnsdorf *(University of Strathclyde)*
Jonathan McKendry *(University of Strathclyde)*
Mark Stonehouse *(University of Strathclyde)*
Laurence Broadbent *(Aralia Systems)*
Glynn C. Wright *(Aralia Systems)*
Martin D. Dawson *(University of Strathclyde)*
Michael J. Strain *(University of Strathclyde)*

TuB2.4: Photon-Counting CMOS Image Sensor (Page NA) **(Invited)** – 11:30AM - 12:00PM
Eric R. Fossum *(Darmouth University)*

TuC2: Ultrafast Lasers 10:30AM-12:00PM

Session Chair: TBD

TuC2.1: Utilizing the Complex Dynamics of InAs/GaAs Quantum Dot Lasers for Ultrafast Devices (Page 237) **(Invited)** – 10:30AM - 11:00AM
F. Grillot *(Université Paris-Saclay & University of New Mexico)*
H. Huang *(Université Paris-Saclay)*
L.-C. Lin *(National Tsing Hua University)*
F.-Y. Lin *(National Tsing Hua University)*
D. Arsenijevic *(TU Berlin)*
D. Bimberg *(TU Berlin & CIOMP)*

TuC2.2: WITHDRAWN

TuC2.3: Ultrafast Semiconductor Lasers: Pulse Generation and Stabilization (Page 247) **(Invited)** – 11:15AM - 11:45AM
Paolo Bardella *(Politecnico di Torino)*
Lorenzo L. Columbo *(Politecnico di Torino)*
Mariangela Gioannini *(Politecnico di Torino)*
Oleg Nikiforov *(Technische Universität Darmstadt)*
Thomas Walther *(Technische Universität Darmstadt)*
Andreas Klehr *(Ferdinand-Braun-Institut)*
Andrea Knigge *(Ferdinand-Braun-Institut)*
Stefan Meinecke *(Technische Universität Darmstadt)*
Lina Jaurigue *(Technische Universität Darmstadt)*
Kathy Lüdge *(Technische Universität Darmstadt)*
Julien Javaloyes *(Universitat de les Illes Balears)*
Luke F. Lester *(Virginia Polytechnic Institute and State University)*
Christoph Weber *(Technische Universität Darmstadt)*
Dominik Auth *(Technische Universität Darmstadt)*
Sebastian Stutz *(Technische Universität Darmstadt)*
Martin Birkholz *(Technische Universität Darmstadt)*
Lukas Drzewietzki *(Technische Universität Darmstadt)*

Stefan Breuer *(Technische Universität Darmstadt)*

TuC2.4: Low Linewidth Enhancement Factor and High Optical Feedback Resistance of p-Doped Silicon Based Quantum Dot Lasers (Page 249) 11:45AM - 12:00PM
J. Duan *(Université Paris-Saclay)*
H. Huang *(Université Paris-Saclay)*
D. Jung *(University of California Santa Barbara)*
J. Norman *(University of California Santa Barbara)*
J. E. Bowers *(University of California Santa Barbara)*
F. Grillot *(Université Paris-Saclay & University of New Mexico)*

TuD2: Optical Modulators 10:30AM-11:45AM

Session Chair: Jens Schmid, *National Research Council Canada, Ottowa, ON, Canada*

TuD2.1: Monolithic Integration of Si/BaTiO3 Electro-Optic Modulators on a Silicon Photonics Platform (Page 251) 10:30AM - 10:45AM
Felix Eltes *(IBM Reseach - Zurich)*
Daniele Caimi *(IBM Reseach - Zurich)*
Christian Mai *(IHP)*
Georg Winzer *(IHP)*
Despoina Petousi *(IHP)*
Stefan Lischke *(IHP)*
Lukas Czornomaz *(IBM Reseach - Zurich)*
Lars Zimmermann *(IHP)*
Jean Fompeyrine *(IBM Reseach - Zurich)*
Stefan Abel *(IBM Reseach - Zurich)*

TuD2.2: Impedance Matching for High-Speed InP Integrated Electro-Absorption Modulators (Page 253) 10:45AM - 11:00AM
M. Trajkovic *(Eindhoven University of Technology)*
F. Blache *(III-V Lab)*
K. Mekhazni *(III-V Lab)*
H. Debregeas *(III-V Lab)*
E. den Haan *(SMART Photonics B.V.)*
L. M. Augustin *(SMART Photonics B.V.)*
K. A. Williams *(Eindhoven University of Technology)*
X. J. M. Leijtens *(Eindhoven University of Technology)*

TuD2.3: NASA Integrated Photonics (Page 255) 11:00AM - 11:15AM
Michael Krainak *(NASA Goddard Space Flight Center)*
Mark Stephen *(NASA Goddard Space Flight Center)*
Jonathan Klamkin *(NASA Goddard Space Flight Center)*
Keren Bergman *(Columbia University)*
Michal Lipson *(Columbia University)*
Shayan Mookherjea *(University of California, San Diego)*
Paul Leisher *(Lawrence Livermore National Laboratory)*
Seng-Tiong Ho *(Northwestern University)*
Behzad Moleshi *(IFOS Inc.)*
James Harris *(Stanford University)*
Andrey Matsko *(OEwaves Inc.)*
Anatoly Savchenkov *(OEwaves Inc.)*
S. J. B. Yoo *(University of California Davis)*
Mark Lucente *(Nanohmics Inc.)*
George Nehmetallah *(Catholic University)*
Leif Johansson *(Freedom Photonics Inc.)*

TuD2.4: 3D System-in-Package Technologies (Page NA) **(Invited)** – 11:15AM - 11:45AM
Tekin Tolga *(Fraunhofer IZM Institute)*

TuE2: Imaging Through Scattering and Aberrating Tissues 10:30AM-12:00PM

Session Chair: Peter R. T. Munro, *University College London, England, UK*

TuE2.1: Optical Imaging in Complex Biological Media: A Tutorial (Page NA) **(Tutorial)** – 10:30AM - 11:15AM
Sylvain Gigan *(Laboratoire Kastler Brossel)*

TuE2.2: Adaptive Optics for Brillouin Micro-Spectroscopy (Page 257) 11:15AM - 11:30AM
Eitan Edrei *(University of Maryland)*
Giuliano Scarcelli *(University of Maryland)*

TuE2.3: 4π Microscopy Immune to Sample-Induced Dephasing (Page 259) 11:30AM - 11:45AM
Alejandro Diaz Tormo *(Ghent University)*
Dmitry Khalenkow *(Ghent University)*
Andre G. Skirtach *(Ghent University)*
Nicolas Le Thomas *(Ghent University)*

TuE2.4: Reciprocity in Measuring Multimode Fiber Transmission (Page 261) 11:45AM - 12:00PM
Szu-Yu Lee *(Harvard Medical School and Massachusetts General Hospital & Massachusetts Institute of Technology)*
Brett E. Bouma *(Harvard Medical School and Massachusetts General Hospital & Massachusetts Institute of Technology)*
Martin Villiger *(Harvard Medical School and Massachusetts General Hospital)*

TuF2: Modelling of Microresonator Structures 10:30AM-12:00PM
Session Chair: Misha Sumetsky, *Aston University, Birmingham, UK*

TuF2.1: Energy Transport in Lossy Resonators by Optical Admittance Methods (Page 263) 10:30AM - 10:45AM
Pyry Kivisaari *(Aalto University School of Science)*
Mikko Partanen *(Aalto University School of Science)*
Jani Oksanen *(Aalto University School of Science)*

TuF2.2: Digital Photonic Even Parity Bit Generator (Page 265) 10:45AM - 11:00AM
F. K. Law *(University Teknologi Brunei (UTB))*
M. Rakib Uddin *(University Teknologi Brunei (UTB))*
Nur Musyiirah Masir *(University Teknologi Brunei (UTB))*
Yong Hyub Won *(KAIST)*

TuF2.3: Broader Analysis of Scattering from a Subwavelength Dielectric Sphere (Page 267) 11:00AM - 11:15AM
S. Jamilan *(Michigan Technological University)*
E. Semouchkina *(Michigan Technological University)*

TuF2.4: Dynamical FDTD Method for Coupled Integrated Resonators (Page 269) 11:15AM - 11:30AM
Anil Aslan *(Middle East Technical University)*
Serdar Kocaman *(Middle East Technical University)*

TuG2: Plasmonics 10:30AM-12:00PM
Session Chair: Thomas P. Purdy, *National Institute of Standards and Technology, Gaithersburg, MD, USA*

TuG2.1: Plasmonic Parametric Resonance (Page 271) **(Invited)** – 10:30AM - 11:00AM
Alessandro Salandrino *(University of Kansas)*

TuG2.2: Plasmonic Nanoarcs - Tunable Plasmonic Elements for Non-Linear Optical Metamaterials (Page 273)
11:00AM - 11:15AM
Kunyi Zhang *(University of Maryland)*
Oded Rabin *(University of Maryland)*

TuG2.3: Surface Plasmon Polariton Modes on Coupled Square-Cylinder Silver Nanowires on Silica Substrate (Page N/A)
11:15AM - 11:30AM
Hsin-Mao Hsu *(National Taiwan University)*
Hung-Chun Chang *(National Taiwan University)*

TuG2.4: Titanium Nitride Surface Plasmon Coupling for Enhanced IQE in GaN:Eu Red Light Emitters (Page 277)
11:30AM - 11:45AM
Ioannis E. Fragkos *(Lehigh University)*
Nelson Tansu *(Lehigh University)*

TuG2.5: Efficient Optical Trapping of Nanoparticle via Plasmonic Bowtie Notch (Page 279) 11:45AM - 12:00PM
Yi-Chang Lin *(National Chiao Tung University)*
Po-Tsung Lee *(National Chiao Tung University)*

TuH2: Combs & Nanophotonics 10:30AM-12:00PM
Session Chair: Thomas Sudmeyer, *University of Neuchâtel, Neuchâtel, Switzerland*

TuH2.1: Chip-Based Frequency Combs (Page NA) **(Invited)** – 10:30AM - 11:00AM
Alexander Gaeta *(Columbia University)*

TuH2.2: Ultra-Dense, CEO-Stabilized Optical Frequency Comb with Programmable FSR Using Spectral Self-Imaging (Page N/A) 11:00AM - 11:15AM
Mohamed Seghilani *(INRS-EMT, University of Quebec)*
Xiao-Zhou Li *(INRS-EMT, University of Quebec)*
Reza Maram *(INRS-EMT, University of Quebec)*
Luis Romero Cortés *(INRS-EMT, University of Quebec)*
José Azaña *(INRS-EMT, University of Quebec)*

TuH2.3: Vector-Field Nonlinear Microscopy of Nano-Objects (Page NA) **(Invited)** – 11:15AM - 11:45AM
Martti Kauranen *(Tampere University of Technology)*
Léo Turquet *(Tampere University of Technology)*
Godofredo Bautista *(Tampere University of Technology)*

TuH2.4: Tunable Quasi-Phase-Matching in Ion Implanted Silicon Waveguides (Page N/A) 11:45AM - 12:00PM
N. S. Balakleyskiy *(National Research University of Electronic Technology)*
I. V. Mel'nikov *(Moscow Institute of Physics and Technology (State University))*

TuA3: Award Winning Photonics Science and Technology II 1:30PM-3:00PM
Session Chair: Carmen Menoni, *Colorado State University, Fort Collins, CO, USA*

TuA3.1: Engineering Achievement Award - Advances in Radio over Fiber Technologies (Page NA) **(Invited)** – 1:30PM - 2:00PM
Dalma Novak *(Pharad)*

TuA3.2: Aron Kressel Award - Interband Cascade Lasers: An Ongoing Journey (Page NA) **(Invited)** – 2:00PM - 2:30PM
Rui Q. Yang *(University of Oklahoma)*

TuA3.3: Cells, Tissues, and Biomaterials: Seeing Them All (Page NA) **(Invited)** – 2:30PM - 3:00PM

Yu Shrike Zhang *(Bringham & Women's Medical Center, Harvard Medical School)*

TuB3: Colloidal Detectors and Sensors 1:30PM-3:00PM

Session Chair: Ganesh Balakrishnan, *University of New Mexico, Albuquerque, NM, USA*

TuB3.1: Colloidal Quantum Dots for Infrared Detection and Emission (Page NA) **(Invited)** – 1:30PM - 2:00PM
Philippe Guyot-Sionnest *(University of Chicago)*

TuB3.2: Polarization Sensitive Plasmonic Photodetector Based on HgTe Quantum Dots (Page 285) 2:00PM - 2:15PM
Bingqing Zhu *(Chinese University of Hong Kong)*
Mengyu Chen *(Chinese University of Hong Kong)*
Stephen V. Kershaw *(City University of Hong Kong)*
Andrey L. Rogach *(City University of Hong Kong)*
Ni Zhao *(Chinese University of Hong Kong)*
Hon Ki Tsang *(Chinese University of Hong Kong)*

TuB3.3: Detection of Copper & Mercury Ions Using LSPR Based U-Bent Fiber Optic Sensor (Page N/A) 2:15PM - 2:30PM
Anjali Khatri *(Indian Institute of Technology Bombay)*
Soumyo Mukherji *(Indian Institute of Technology Bombay)*

TuB3.4: Design of Resonant Optical Cavities for Ultrasound Detection Using Rigorous Electromagnetic Modelling (Page 291) 2:30PM - 2:45PM
Dylan M. Marques *(University College London)*
James A. Guggenheim *(University College London)*
Rehman Ansari *(University College London)*
Edward Zhang *(University College London)*
Paul C. Beard *(University College London)*
Peter R. T. Munro *(University College London)*

TuB3.5: Simultaneous Measurement of Multiple Fiber Bragg Grating Sensors Using Microwave Photonics (Page 293) 2:45PM - 3:00PM
Maria I. Comanici *(McGill University)*
Parisa Moslemi *(McGill University)*
Lawrence R. Chen *(McGill University)*
Jingjing Hu *(Dalian University of Technology)*

TuC3: Novel Lasers 1:30PM-3:15:00 PM

Session Chair: Stefan Breuer, *Technische Universitat Darmstadt, Berlin, Germany*

TuC3.1: Low Threshold Current and High-Speed Operation of Membrane Lasers (Page 295) **(Invited)** – 1:30PM - 2:00PM
Shigehisa Arai *(Tokyo Institute of Technology)*
Nobuhiko Nishiyama *(Tokyo Institute of Technology)*
Tomohiro Amemiya *(Tokyo Institute of Technology)*

TuC3.2: Selective Area Growth in Generic Integration for Extended Range Tunable Laser Source (Page 297) 2:00PM - 2:15PM
F. Lemaître *(Eindhoven University of Technology & III-V Lab)*
S. Latkowsky *(Eindhoven University of Technology)*
C. Fortin *(III-V Lab)*
N. Lagay *(III-V Lab)*
R. Pajković *(Eindhoven University of Technology)*
E. Smalbrugge *(Eindhoven University of Technology)*
J. Decobert *(III-V Lab)*
H. Ambrosius *(Eindhoven University of Technology)*
K. Williams *(Eindhoven University of Technology)*

TuC3.3: Recent Progress on Interband Cascade Laser Research (Page NA) **(Invited)** – 2:15PM - 2:45PM
Jerry Meyer *(Naval Research Laboratory)*

TuC3.4: Design of Chirped Gratings Using Interferometric Lithography (Page 299) 2:45PM - 3:00PM
Steve Benoit *(Colorado State University)*
S. R. J. Brueck *(University of New Mexico)*

TuC3.5: Direct Measurement of Directional Emission from Monolayer WS2 Laser with Heterostructure Photonic Crystal Cavities (Page 313) 3:00PM - 3:15PM
Xiaochen Ge *(University of Texas at Arlington)*
Momchil Minkov *(Stanford University)*
Shanhui Fan *(Stanford University)*
Xiuling Li *(University of Illinois Urbana-Champaign)*
Weidong Zhou *(University of Texas at Arlington)*

TuD3: Chalcogenide and Microstructured Fibers 1:30PM-3:00PM

Session Chair: Wladek Forysiak, *Aston University, Birmingham, UK*

TuD3.1: Tailoring the Nonlinear Gain of Chalcogenide Glass for Mid-infrared Applications (Page NA) **(Invited)** – 1:30PM - 2:00PM
Martin Rochette *(McGill University)*

TuD3.2: All-Chalcogenide Single-Mode Couplers (Page 315) 2:00PM - 2:15PM
Mohsen Rezaei *(McGill University)*
Martin Rochette *(McGill University)*

TuD3.3: Chalcogenide Fabry-Perot Fiber Tunable Filter (Page 317) 2:15PM - 2:30PM
Kaixuan Zhang *(McGill University & Polytechnique Montréal)*
Yves-Alain Peter *(Polytechnique Montréal)*
Martin Rochette *(McGill University)*

TuD3.4: From Third Harmonic to Triplet Generation in Microstructured Fibers (Page 319) **(Invited)** – 2:30PM - 3:00PM
N. Y. Joly *(University of Erlangen-Nuremberg & Max-Planck Institute for the Science of Light)*
J. Hammer *(Max-Planck Institute for the Science of Light & University of Erlangen-Nuremberg)*
R. Pennetta *(Max-Planck Institute for the Science of Light)*
A. Cavanna *(Max-Planck Institute for the Science of Light)*
X. Jiang *(Max-Planck Institute for the Science of Light)*
M. H. Frosz *(Max-Planck Institute for the Science of Light)*
M. V. Chekhova *(Max-Planck Institute for the Science of Light & University of Erlangen-Nuremberg & Moscow State University)*

TuE3: Radio-over-Fiber for 5G and Novel Devices 1:30PM-3:00PM

Session Chair: Maurizio Burla, *ETH Zurich, Zurich, Switzerland*

TuE3.1: Low Latency PON and RoF for 5G Wireless Systems (Page 321) **(Invited)** – 1:30PM - 2:00PM
Hwan Seok Chung *(Electronics and Telecommunications Research Institute (ETRI))*

TuE3.2: Integrated Balanced Microwave Photonic Canceller (Page 323) 2:00PM - 2:15PM
Eric C. Blow *(Princeton University)*
Prannay Kaul *(Princeton University)*
Paul R. Prucnal *(Princeton University)*

TuE3.3: THz Photonic Transmitters with Type-II Hybrid Absorber UTC-PDs and Dual-Ridged Horn Antennas for High-Power and Extremely Wide Fractional Bandwidth Performances (Page 325) 2:15PM - 2:30PM
Jhih-Min Wun *(National Central University)*
Nan-Wei Chen *(Yuan Ze University)*
Jin-Wei Shi *(National Central University)*

TuE3.4: Seamless Waveform Transport Technology in 5G and IoT Era (Page 327) **(Invited)** – 2:30PM - 3:00PM
Atsushi Kanno *(National Institute of Information and Communications Technology)*

TuF3: Nitride Materials and Devices 1:30PM-3:00PM

Session Chair: Zetian Mi, *McGill University, Montreal, QC, Canada*

TuF3.1: Nitride Single Photon Sources (Page 329) **(Invited)** – 1:30PM - 2:00PM
T. Zhu *(University of Cambridge)*
J. C. Jarmann *(University of Cambridge)*
Christopher X. Ren *(University of Cambridge)*
Fengzai Tang *(University of Cambridge)*
C. C. Kocher *(University of Oxford)*
T. J. Puchtler *(University of Oxford)*
Benjamin P. L. Reid *(University of Oxford)*
T. Wang *(University of Oxford)*
Saroj K. Patra *(University College Cork)*
Stefan Schulz *(University College Cork)*
Robert A. Taylor *(University of Oxford)*
R. A. Oliver *(University of Cambridge)*

TuF3.2: Electrical Control of Middle-Wavelength Infrared Thermal Emission Using GaN/AlGaN Photonic Crystals (Page 331) 2:15PM - 2:30PM
Dongyeon Daniel Kang *(Kyoto University)*
Takuya Inoue *(Kyoto University)*
Takashi Asano *(Kyoto University)*
Susumu Noda *(Kyoto University)*

TuF3.3: Investigation of Band Anticrossing Parameters for Dilute-Anion III-Nitride Alloys (Page 333) 2:30PM - 2:45PM
Justin C. Goodrich *(Lehigh University)*
Damir Borovac *(Lehigh University)*
Chee-Keong Tan *(Clarkson University)*
Nelson Tansu *(Lehigh University)*

TuF3.4: High Temperature Photoluminsence of InGaN-Based MQWs on Patterned Sapphire Substrates (Page 335) 2:45PM - 3:00PM
Abbas Sabbar *(University of Arkansas)*
Syam Madhusoodhanan *(University of Arkansas)*
Sattar Al-Kabi *(University of Arkansas)*
Binzhong Dong *(HC SemiTek (Suzhou))*
Jiangbo Wang *(HC SemiTek (Suzhou))*
Stanley Atcitty *(Sandia National Laboratories)*
Robert Kaplar *(Sandia National Laboratories)*
H. Alan Mantooth *(University of Arkansas)*
Shui-Qing Yu *(University of Arkansas)*

Zhong Chen *(University of Arkansas)*

TuG3: Silicon Photonics 1:30PM-3:00PM

Session Chair: Robinjeet Singh, *University of Maryland & National Institute of Standards and Technology, Gaithersburg, MD, USA*

TuG3.1: Improvement of Sidewall Roughness of Submicron SOI Waveguides by Hydrogen Plasma and Annealing (Page 337) 1:30PM - 1:45PM
Cyril Bellegarde *(University Grenoble Alpes & CEA, LETI, LTM)*
Erwine Pargon *(University Grenoble Alpes & CEA, LETI, LTM)*
Corrado Sciancalepore *(University Grenoble Alpes & LETI)*
Camille Petit-Etienne *(University Grenoble Alpes & CEA, LETI, LTM)*
Vincent Hugues *(University Grenoble Alpes & LETI)*
Daniel Robin-Brosse *(University Grenoble Alpes & LETI)*
Jean-Michel Hartmann *(University Grenoble Alpes & LETI)*
Philippe Lyan *(University Grenoble Alpes & LETI)*

TuG3.2: Dual-Mode Silicon Photonic Crystal Nanocavity Modulator with Indium Oxide Gate (Page 341) 1:45PM - 2:00PM
Erwen Li *(Oregon State University)*
Qian Gao *(Oregon State University)*
Spencer Liverman *(Oregon State University)*
Alan X. Wang *(Oregon State University)*

TuG3.3: Coherent-Perfect-Absorption-Based DPSK Demodulator for Silicon Photonics (Page 343) 2:00PM - 2:15PM
Asif Ahmed *(Columbia University)*
Hao Yang *(Columbia University)*
Jacob M. Rothenberg *(Columbia University)*
Brian Souhan *(United States Military Academy)*
Zhao Wang *(McMaster University)*
Nathan C. Abrams *(Columbia University)*
Kirk A. Ingold *(United States Military Academy)*
Christopher C. Evans *(Physical Sciences Inc.)*
Joel M. Hensley *(Physical Sciences Inc.)*
Keren Bergman *(Columbia University)*
Richard R. Grote *(University of Pennsylvania)*
Andrew P. Knights *(McMaster University)*
Jerry I. Dadap *(Columbia University)*
Richard M. Osgood, Jr. *(Columbia University)*

TuG3.4: Intensity and Spatial Dependence of Saturation Effects in Resonant Third Harmonic Generation from Amorphous Silicon Nanodisk Arrays (Page 345) 2:15PM - 2:30PM
Keshav Kumar Jha *(Indian Institute of Science)*
Rabindra Biswas *(Indian Institute of Science)*
Lal Krishna A S *(Indian Institute of Science)*
Jayanta Deka *(Indian Institute of Science)*
Sruti Menon *(Indian Institute of Science)*
Varun Raghunathan *(Indian Institute of Science)*

TuG3.5: Hybrid Numerical-Analytical Effective Index Method for Designing Large Geometry Ridge Waveguides (Page 347) 2:30PM - 2:45PM
Priyanka Roy *(IIT Bombay)*
Pallabi Das *(IIT Bombay)*
Siddharth Tallur *(IIT Bombay)*

TuG3.6: Modeling and Analysis of SOI Grating Coupler for Bio-Sensing Applications (Page 349) 2:45PM - 3:00PM
Venkatesha M *(Sai Vidya Institute of Technology)*
Vismaya K R *(Sai Vidya Institute of Technology)*
Prashanth A U *(Sai Vidya Institute of Technology)*
Meda Vyshnavi V *(Sai Vidya Institute of Technology)*
Narayan K *(Sai Vidya Institute of Technology)*

TuH3: Imaging & Microscopy 1:30PM-3:00PM

Session Chair: Martti Kauranen, *Tampere University of Technology, Tampere, Finland*

TuH3.1: Mid-Infrared Upconversion - Trends and Applications (Page NA) **(Invited)** – 1:30PM - 2:00PM
Christian Pedersen *(Denmark Technical University)*

TuH3.2: Ultrafast, High Power, High Repetition Rate, Simultaneous Generation of 1D and 2D Airy Beams and Their Frequency Doubling Characteristics (Page N/A) 2:00PM - 2:15PM
Raghwinder S. Grewal *(Physical Research Laboratory)*
Anirban Ghosh *(Physical Research Laboratory)*
G. K. Samanta *(Physical Research Laboratory)*

TuH3.3: Coherent Vibrational Spectroscopy in the Single Molecule Limit (Page 353) **(Invited)** – 2:15PM - 2:45PM
Eric O. Potma *(University of California, Irvine)*

TuH3.4: Generation of High Power, Ultrafast Asymmetric Vortices with Broad Orbital Angular Momentum Spectrum (Page N/A) 2:45PM - 3:00PM
A Srinivasa Rao *(Physical Research Laboratory)*

Sabir Ul Alam *(Physical Research Laboratory)*
Anirban Ghosh *(Physical Research Laboratory)*
Pravin Vaity *(Physical Research Laboratory)*
G. K. Samanta *(Physical Research Laboratory)*

Tul4: Plenary I 3:30PM-5:00PM

Session Chair: Amr Helmy, *University of Toronto, Toronto, ON, Canada*

Tul4.1: Breaking Spectral and Performance Barriers for Diode Lasers with Material Innovation (Page 357) **(Plenary)** – 3:30PM - 4:15PM
Manijeh Razeghi *(Northwestern University)*

Tul4.2: Implantable, Insertable and Wearable Micro-Optical Devices for Early Detection of Cancer (Page 359) **(Plenary)** – 4:15PM - 5:00PM
Christopher H. Contag *(Stanford University)*

WA1: Free-space Optical Communications 8:30AM-10:00AM

Session Chair: Ivan B. Djordjevic, *University of Arizona, Tucson, AZ, USA*

WA1.1: 3-Gbps Free Space Optical Link Based on Integrated Indium Phosphide Transmitter (Page 361) 8:30AM - 8:45AM
Hongwei Zhao *(University of California, Santa Barbara)*
Sergio Pinna *(University of California, Santa Barbara)*
Bowen Song *(University of California, Santa Barbara)*
Ludovico Megalini *(University of California, Santa Barbara)*
Simone Tommaso Šuran Brunelli *(University of California, Santa Barbara)*
Larry Coldren *(University of California, Santa Barbara)*
Jonathan Klamkin *(University of California, Santa Barbara)*

WA1.2: Dual-Color Micro-LED Transmitter for Visible Light Communication (Page 363) 8:45AM - 9:00AM
J. F. C. Carreira *(University of Strathclyde)*
E. Xie *(University of Strathclyde)*
J. J. D. McKendry *(University of Strathclyde)*
B. J. E. Guilhabert *(University of Strathclyde)*
I. M. Watson *(University of Strathclyde)*
E. Gu *(University of Strathclyde)*
M. D. Dawson *(University of Strathclyde)*
R. Bian *(University of Edinburgh)*
H. Haas *(University of Edinburgh)*

WA1.3: Understanding LiFi Effect on LED Light Quality (Page 365) 9:00AM - 9:15AM
Evangelos Pikasis *(University of Edinburgh)*
Wasiu O. Popoola *(University of Edinburgh)*

WA1.4: Experimental Demonstration of User Allocation in a Subcarrier Multiplexing-Based Multiuser LiFi System (Page 367) 9:15AM - 9:30AM
Mounir Mohammedi Merah *(Universty of Versailles Saint-Quentin)*
Luc Chassagne *(University of Versailles Saint-Quentin)*
Hongyu Guan *(University of Versailles Saint-Quentin)*

WA1.5: 0.5-Gb/s OFDM-Based Laser Data and Power Transfer Using a GaAs Photovoltaic Cell (Page 369) 9:30AM - 9:45AM
John Fakidis *(University of Edinburgh)*
Stefan Videv *(University of Edinburgh)*
Henning Helmers *(Fraunhofer Institute for Solar Energy Systems)*
Harald Haas *(University of Edinburgh)*

WB1: Optical Transciever Technology 8:30AM-10:00AM

Session Chair: Judson Ryckman, *Clemson University, Clemson, SC, USA*

WB1.1: Optical Integration: The Path to Terabit Transceivers (Page NA) **(Invited)** – 8:30AM - 9:00AM
John E. Bowers *(University of California Santa Barbara)*

WB1.2: Compact and High-Speed Ge Franz-Keldysh I/Q Modulator Used with Kramers-Kronig Receiver (Page 373) 9:00AM - 9:15AM
Yeyu Tong *(Chinese University of Hong Kong)*
Qiulin Zhang *(Chinese University of Hong Kong)*
Xinru Wu *(Chinese University of Hong Kong)*
Chi-Wai Chow *(National Chiao Tung University)*
Chester Shu *(Chinese University of Hong Kong)*
Hon Ki Tsang *(Chinese University of Hong Kong)*

WB1.3: 40-Gbit/s 850-nm VCSEL-Based Full-CMOS Optical Link with Power-Data Rate Adaptivity (Page 375) 9:15AM - 9:30AM
Mahdi Khafaji *(Technische Universität Dresden)*
Laszlo Szilagyi *(Technische Universität Dresden)*
Jan Pliva *(Technische Universität Dresden)*

Ronny Henker *(Technische Universität Dresden)*
Frank Ellinger *(Technische Universität Dresden)*

WB1.4: Monolithic Silicon Photonic Transceivers (Page NA) **(Invited)** – 9:30AM - 10:00AM
Chi Xiong *(IBM)*

WC1: Thermal Photonics and Optomechanics 8:30AM-10:00AM

Session Chair: Mo Li, *University of Minnesota, Minneapolis, MN, USA*

WC1.1: Measuring Thermal Acoustic Radiation with an Optomechanical Antenna (Page 379) 8:30AM - 8:45AM
Robinjeet Singh *(National Institute of Standards and Technology)*
Thomas P. Purdy *(National Institute of Standards and Technology)*

WC1.2: Physical Stability Analysis for Optical MEMS Phase Shifters (Page 381) 8:45AM - 9:00AM
Yigit Özer *(Middle East Technical University)*
Serdar Kocaman *(Middle East Technical University)*

WC1.3: Single Crystalline Aluminum Nitride for Visible Nonlinear Photonics (Page NA) **(Invited)** – 9:00AM - 9:30AM
Hong Tang *(Yale University)*
Alexander Bruch *(Yale University)*

WC1.4: Engineering Both Far-Field and Near-Field Thermal Radiation with Metamaterials (Page NA) **(Invited)** – 9:30AM - 10:00AM
Liping Wang *(Arizona State University)*

WD1: New Fiber Designs & OFT Tutorial 8:30AM-10:00AM

Session Chair: Michael Brodsky, *US Army Research Laboratory, MD, USA*

WD1.1: Novel Material Approach to Advanced Optical Fibers and Fiber Lasers (Page NA) **(Tutorial)** – 8:30AM - 9:30AM
John Ballato *(Clemson University)*

WD1.2: Recent Advances in Antiresonant Fibre Technology (Page NA) **(Invited)** – 9:30AM - 10:00AM
Francesco Poletti *(Southhampton University)*

WE1: Microwave Photonics Devices and Comb Generations 8:30AM-10:00AM

Session Chair: William Loh, *Massachusetts Institute of Technology, Cambridge, MA, USA*

WE1.1: On-Chip Optical Frequency Comb Generation for RF Photonic Applications (Page 383) **(Invited)** – 8:30AM - 9:00AM
Xiaoxiao Xue *(Tsinghua University)*
Xiaoping Zheng *(Tsinghua University)*
Andrew M. Weiner *(Purdue University)*

WE1.2: The Effects of Intracavity Phase Modulation and Extracavity Optical Filtering on Amplitude Noise of Mode-Locked Pulse Trains (Page 385) 9:00AM - 9:15AM
Sarper Ozharar *(Bahçeşehir University)*
Ibrahim Ozdur *(Abdullah Gul University)*

WE1.3: Optically Controlled Microwave Attenuator Based on InP/InGaAs Photovaractor (Page 387) 9:15AM - 9:30AM
Jizhao Zang *(University of Virginia)*
Jesse Morgan *(University of Virginia)*
Andreas Beling *(University of Virginia)*
Joe C. Campbell *(University of Virginia)*

WE1.4: Kerr Combs for Single-Span Long-Haul Analog Optical Links (Page 389) 9:30AM - 9:45AM
Mohammed S. Alshaykh *(Purdue University)*
Yi Xuan *(Purdue University)*
Daniel E. Leaird *(Purdue University)*
Jason D. McKinney *(U.S. Naval Research Laboratory)*
Minghao Qi *(Purdue University)*
Andrew M. Weiner *(Purdue University)*

WF1: Next-generation Data Centers 8:30AM-10:00AM

Session Chair: Ioannis Roudas, *Montana State University-Bozeman, Bozeman, MT, USA*

WF1.1: Optical Interconnect Architectures for Data Centers (Page 391) **(Invited)** – 8:30AM - 9:00AM
Pawel Wiatr *(Uppsala University)*
Di Yuan *(Uppsala University)*
Lena Wosinska *(KTH Royal Institute of Technology)*
Jiajia Chen *(KTH Royal Institute of Technology)*

WF1.2: Novel Optical Fibers for Future Data Centers Optical Interconnects (Page NA) **(Invited)** – 9:00AM - 9:30AM
Ming-Jun Li *(Corning Research and Development)*

WG1: III-V Materials and Devices 8:30AM-10:00AM

Session Chair: Kei May Lau, *Hong Kong University of Science and Technology (HKUST), Clear Water Bay, Hong Kong*

WG1.1: Monolithic Integration of III/V-Based Functionalities to CMOS-Based Si-micro- and nanoelectronics (Page 393) **(Invited)** – 8:30AM - 9:00AM
Wolfgang Stolz *(Philipps University & NAsP III/V GmbH)*

WG1.2: Far-Infrared Emission from an Electrically-Injected Semiconductor Device (Page 395) 9:00AM - 9:15AM
Junchi Lu *(Notre Dame University)*
Leland Nordin *(University of Texas at Austin)*
Owen Dominguez *(University of Notre Dame)*
Lina Cao *(University of Notre Dame)*
Jingshan Wang *(University of Notre Dame)*
Patrick Fay *(University of Notre Dame)*
Daniel Wasserman *(University of Texas at Austin)*
Anthony Hoffman *(Notre Dame University)*

WG1.3: Advanced Light Management in Photovoltaics Using Dielectric Nano-Resonator Arrays (Page 397) 9:15AM - 9:30AM
Dongheon Ha *(National Institute of Standards and Technology & University of Maryland)*
Nikolai B. Zhitenev *(National Institute of Standards and Technology)*

WG1.4: Interplay of Strain Compensation and Relaxation in High-Performance InGaAs Quantum Well Lasers (Page 399) 9:30AM - 9:45AM
Wei Sun *(Lehigh University)*
Honghyuk Kim *(University of Wisconsin-Madison)*
Luke J. Mawst *(University of Wisconsin-Madison)*
Nelson Tansu *(Lehigh University)*

WG1.5: APD Performance Enhancement: Minigap Engineering in Digital Alloys (Page 401) 9:45AM - 10:00AM
Sheikh Z. Ahmed *(University of Virginia)*
Yaohua Tan *(University of Virginia & Synopsys)*
Jiyuan Zheng *(University of Virginia)*
Joe C. Campbell *(University of Virginia)*
Avik W. Ghosh *(University of Virginia)*

WH1: Photonics in Space 8:30AM-10:00AM

Session Chair: Quinlin McCormick, *NASA, USA*

WH1.1: Lasers as the Future Means of Free-Space Communications (Page NA) **(Invited)** – 8:30AM - 9:00AM
Hossin Abdeldayem *(NASA Goddard Space Flight Center)*

WH1.2: Space Laser Instruments and Systems (Page NA) **(Invited)** – 9:00AM - 9:30AM
Michael Krainak *(NASA Goddard Space Flight Center)*

WA2: Optical Amplification and Processing 10:30AM-12:00PM

Session Chair: David Caplan, *MIT Lincoln Laboratory, Lexington, MA, USA*

WA2.1: Recent Technologies on Multicore EDFA (Page 403) **(Invited)** – 10:30AM - 11:00AM
Ryuichi Sugizaki *(Furukawa Electric Co., Ltd.)*
Koichi Maeda *(Furukawa Electric Co., Ltd.)*
Shigehiro Takasaka *(Furukawa Electric Co., Ltd.)*
Masayoshi Tsukamoto *(Furukawa Electric Co., Ltd.)*

WA2.2: Temporal Noise Mitigation in a Talbot Amplifier (Page 405) 11:00AM - 11:15AM
Reza Maram *(INRS-EMT, University of Quebec & McGill University)*
Mohamed Seghilani *(INRS-EMT, University of Quebec)*
Jinwoo Jeon *(INRS-EMT, University of Quebec)*
Xiao-Zhou Li *(INRS-EMT, University of Quebec)*
Luis Romero Cortés *(INRS-EMT, University of Quebec)*
James Van Howe *(INRS-EMT, University of Quebec & Augustana College)*
José Azaña *(INRS-EMT, University of Quebec)*

WA2.3: In-Band Non-Invasive Multiplexing of Data Signals through Reversible Linear Spectral Compression (Page 407) 11:15AM - 11:30AM
Luis Romero Cortes *(INRS-EMT, University of Quebec)*
Reza Maram *(INRS-EMT, University of Quebec)*
José Azaña *(INRS-EMT, University of Quebec)*

WA2.4: Polarization Multiplexing and Demultiplexing Technique for Large Capacity Small Optical Module by Using Optical Interleaver (Page 409) 11:30AM - 11:45AM
Toshiya Matsuda *(NTT Corporation)*
Toru Homemoto *(NTT Corporation)*
Kazuyuki Matsumura *(NTT Corporation)*

WA2.5: Optical Comparator for 4-Bit and 6-Bit QPSK-Modulated Signals by Using Optical Delayed Interferometer (Page 411) 11:45AM - 12:00PM
Yohei Aikawa *(Okinawa College)*

WB2: Novel Packaging and Waveguide Technology 10:30AM-11:45AM

Session Chair: Jonathan Doylend, *Intel Corporation, Santa Clara, CA, USA*

WB2.1: Low Loss Fiber to Chip Packaging (Page NA) **(Invited)** – 10:30AM - 11:00AM
Jaime Cardenas *(University of Rochester)*

WB2.2: Low-Loss Wafer-Scale Silicon Photonic Interposer Utilizing Inverse-Taper Coupler (Page 423) 11:00AM - 11:15AM
Yichi Zhang *(University of California, Davis)*
Kuanping Shang *(University of California, Davis)*
Yu Zhang *(University of California, Davis)*
S. J. Ben Yoo *(University of California, Davis)*

WB2.3: Group IV Compounds Modulators and Mid Index Waveguides for Enhanced CMOS Photonics (Page 425) **(Invited)** – 11:15AM - 11:45AM
Frederic Gardes *(University of Southampton)*
Thalia D. Bucio *(University of Southampton)*
Lorenzo Mastronardi *(University of Southampton)*
Mehdi Banakar *(University of Southampton)*
Alexandre Bazin *(University of Southampton)*
Ali Khokhar *(University of Southampton)*
Cosimo Lacava *(University of Southampton)*
Periklis Petropoulos *(University of Southampton)*
Callum Littlejohns *(Nanyang Technological University)*
Kapil Debnath *(Indian Institute of Technology)*

WD2: Novel Applications 10:30AM-12:00PM

Session Chair: Nicolas Y. Joly, *Max-Planck Institute for the Science of Light, Erlangen, Germany*

WD2.1: Electronically Controlled All-Fiber Graphene Devices (Page NA) **(Invited)** – 10:30AM - 11:00AM
Dong-il Yeom *(Ajou University)*

WD2.2: Near-Infrared Optical Image Transport through an All-Solid Tellurite Transversely Disordered Optical Fiber (Page N/A) 11:00AM - 11:15AM
Tong Hoang Tuan *(Toyota Technological Institute)*
Shunei Kuroyanagi *(Toyota Technological Institute)*
Takenobu Suzuki *(Toyota Technological Institute)*
Yasutake Ohishi *(Toyota Technological Institute)*

WD2.3: Investigations on FM-to-AM Modulation Compensation Using All-Fibered Multi-Wavelength Tunable Filter (Page N/A) 11:15AM - 11:30AM
Mengqiu Fan *(China Academy of Engineering Physic)*
Xiaocheng Tian *(China Academy of Engineering Physic)*
Zhaoyu Zong *(China Academy of Engineering Physic)*
Dandan Zhou *(China Academy of Engineering Physic)*
Na Zhu *(China Academy of Engineering Physic)*
Dangpeng Xu *(China Academy of Engineering Physic)*

WD2.4: Optical Phased Array LiDAR (Page NA) **(Invited)** – 11:30AM - 12:00PM
Chris Poulton *(Analog Photonics)*

WE2: Transmitter/Receiver for Microwave Photonics Applications 10:30AM-12:00PM

Session Chair: Meredith Hutchinson, *Navel Research Lab, Washingon, DC, USA*

WE2.1: Microwave Photonics in the Industry (Page NA) **(Invited)** – 10:30AM - 11:00AM
Edward I. Ackerman *(Photonic Systems, Inc.)*

WE2.2: High-Power Flip-Chip Bonded Modified Uni-Traveling Carrier Photodiodes with -2.6 dBm RF Output Power at 160 GHz (Page 433) 11:00AM - 11:15AM
Jesse S. Morgan *(University of Virginia)*
Keye Sun *(University of Virginia)*
Qinglong Li *(University of Virginia)*
Steven Estrella *(Freedom Photonics LLC)*
Maddy Woodson *(Freedom Photonics LLC)*
Kenneth Hay *(Freedom Photonics LLC)*
Milan Mashanovitch *(Freedom Photonics LLC)*
Andreas Beling *(University of Virginia)*

WE2.3: Volterra Modeling of Wideband Behavior of MZM and Photodiode IMD2 (Page 435) 11:15AM - 11:30AM
Caitlin R. S. Williams *(Hastings College)*
Meredith N. Hutchinson *(Naval Research Lab)*
Tegan E. Wilson *(Carleton College)*
Jonathan M. Nichols *(Naval Research Lab)*

WE2.4: Low-Noise Dual-Frequency VECSELs for Microwave Photonics and Metrology Applications (Page NA) **(Invited)** – 11:30AM - 12:00PM
Isabelle Sagnes *(Centre de Nanosciences et de Nanotechnologies)*
Fabien Bretenaker *(Laboratoire Aime Cotton)*
Hui Liu *(Laboratoire Aime Cotton)*

Gregory Gredat *(Laboratoire Aime Cotton)*
Syamsundar De *(Laboratoire Kastler-Brossel)*
Fabienne Goldfarb *(Laboratoire Aime Cotton)*
Ghaya Baili *(Thales Research and Technology)*
Francois Gutty *(Thales Research and Technology)*
Sophie Bouchoule *(Centre de Nanosciences et de Nanotechnologies)*

WF2: Probabilistic Shaping 10:30AM-11:30AM

Session Chair: Ivan B. Djordjevic, *University of Arizona, Tucson, AZ, USA*

WF2.1: Probabilistic Constellation Shaping: Key Enabler for Maximizing Transmission Capacity and Reach (Page NA) **(Tutorial)** – 10:30AM - 11:30AM
Sethumadhavan Chandrasekhar *(Nokia Bell Labs)*

WG2: Novel Photonic Materials and Metamaterials 10:30AM-12:00PM

Session Chair: Alexey Belyanin, *Texas A&M University, College Station, TX, USA*

WG2.1: Optics of Materials with Dirac and Weyl Fermions (Page NA) **(Invited)** – 10:30AM - 11:00AM
Alexey Belyanin *(Texas A&M University)*

WG2.2: Influence of Finite Grating Size on Guided Mode Resonance Transmission Filters (Page 437) 11:00AM - 11:15AM
Martin Scherr *(University of Michigan)*
Michael Barrow *(University of Michigan)*
Jamie Phillips *(University of Michigan)*

WG2.3: Nonvolatile Tunable Integrated Mid-Infrared GST-SiC Metasurfaces (Page 439) 11:15AM - 11:30AM
Xi Wu *(Georgia Institute of Technology)*
Tianren Fan *(Georgia Institute of Technology)*
Taylor G Allen *(Georgia Institute of Technology)*
Sajjad Abdollahramezani *(Georgia Institute of Technology)*
Ali A. Eftekhar *(Georgia Institute of Technology)*
Matteo Bosi *(IMEM-CNR Institute)*
Joseph W Perry *(Georgia Institute of Technology)*
Ali Adibi *(Georgia Institute of Technology)*

WG2.4: Chromium for High Fluence Bowtie Nano-Antennas (Page 441) 11:30AM - 11:45AM
Monir Morshed *(University of New South Wales)*
Ziyuan Li *(Australian National University)*
Benjamin C. Olbricht *(Coupled Optics LCC)*
Lan Fu *(Australian National UNiversity)*
Ahasanul Haque *(University of New South Wales)*
Li Li *(Australian National University)*
Haroldo T. Hattori *(University of New South Wales)*

WG2.5: Hybrid Toroidal Modes in Planar Core-Shell Metamaterial Structures (Page 443) 11:45AM - 12:00PM
Naznin Akter *(Florida International University)*
Mustafa Karabiyik *(Florida International University)*
Nezih Pala *(Florida International University)*

WH2: MicroLEDs and Display Technologies 10:30AM-12:00PM

Session Chair: Nicolas Laurand, *University of Strathclyde, Glasgow, Scotland, UK*

WH2.1: High Brightness GaN Microdisplays for Augmented Reality Applications (Page NA) **(Invited)** – 10:30AM - 11:00AM
François Templier *(CEA LETI)*

WH2.2: Integration of Micro-LED Array on CMOS by Transfer Printing (Page 445) 11:00AM - 11:15AM
J. F. C. Carreira *(University of Strathclyde)*
B. J. E. Guilhabert *(University of Strathclyde)*
J. J. D. McKendry *(University of Strathclyde)*
E. Xie *(University of Strathclyde)*
K. Mathieson *(University of Strathclyde)*
I. M. Watson *(University of Strathclyde)*
E. Gu *(University of Strathclyde)*
M. D. Dawson *(University of Strathclyde)*
R. K. Henderson *(University of Edinburgh)*

WH2.3: Flexible Inorganic LEDs with Semiconductor Nanowires (Page NA) **(Invited)** – 11:15AM - 11:45AM
Maria Tchernycheva *(University Paris Sud.)*
Nan Guan *(University Paris Sud.)*
Lorenzo Mancini *(University Paris Sud.)*
Nuno Amador *(University Paris Sud.)*
François Julien *(University Paris Sud.)*
Akanksha Kapoor *(Université Grenoble Alpes)*
Catherine Bougerol *(Université Grenoble Alpes)*
Joël Eymery *(Université Grenoble Alpes)*
Christophe Durand *(Université Grenoble Alpes)*

WH2.4: Holographic Display with an Enhanced Viewing Angle by Using a Non-Periodic Photon Sieve (Page 447) 11:45AM - 12:00PM
Jongchan Park *(Korea Advanced Institute of Science and Technology)*
KyeoReh Lee *(Korea Advanced Institute of Science and Technology)*
YongKeun Park *(Korea Advanced Institute of Science and Technology & Tomocube, Inc.)*

WA3: DSP and Equalization 1:30PM-3:00PM

Session Chair: Gabriella Bosco, *Politecnico di Torino, Torino, Italy*

WA3.1: Impact of Transceiver Subsystems on Digital Back Propagation Performance (Page 281) **(Invited)** – 1:30PM - 2:00PM
Lidia Galdino *(University College London)*

WA3.2: 10-Gb/s Transmission Over 10-m SI-POF with M-PAM and Multilayer Perceptron Equalizer (Page 449) 2:00PM - 2:15PM
Isaac N. Osahon *(University of Edinburgh)*
Majid Safari *(University of Edinburgh)*
Wasiu O. Popoola *(University of Edinburgh)*

WA3.3: Assessment of RB Noise in Bidirectional RoF Based on Different O-OFDM SSB Systems (Page 453) 2:15PM - 2:30PM
Dhananjay Patel *(Sardar Vallabhbhai National Institute of Technology)*
Siddharth Tallur *(Indian Institute of Technology, Bombay)*
Upena Dalal *(Sardar Vallabhbhai National Institute of Technology)*

WA3.4: Machine-Learning-Based Nonlinearity Equalization Techniques for Coherent Optical Communication Systems (Page NA) **(Invited)** – 2:30PM - 3:00PM
Elias Giacoumidis *(Dublin City University)*

WB3: Spin Photonics 1:30PM-3:00PM

Session Chair: Zhaowei Liu, *University of California, San Diego, San Diego, CA, USA*

WB3.1: Chiral Interaction between Spin-Momentum Locked Photons and Surface Electrons in Topological Insulators (Page 455) **(Invited)** – 1:30PM - 2:00PM
Li He *(University of Minnestoa)*
Mo Li *(University of Minnestoa)*

WB3.2: Suppression of Rayleigh Backscattering in Resonators (Page 457) 2:00PM - 2:15PM
Seunghwi Kim *(University of Illinois at Urbana-Champaign)*
Jacob M. Taylor *(University of Maryland & National Institute of Standards and Technology)*
Gaurav Bahl *(University of Illionis at Urbana-Champaign)*

WB3.3: Silicon Nitride Echelle Grating Spectrometer for Operation Near 1.55 µm (Page 459) 2:15PM - 2:30PM
Shengjie Xie *(University of Maryland)*
Yang Meng *(University of Maryalnd)*
Joss Bland Hawthorn *(University of Sydney)*
Sylvain Veilleux *(University of Maryland)*
Mario Dagenais *(University of Maryland)*

WB3.4: Hot Atomic Vapor and Nanophotonics (Page NA) **(Invited)** – 2:30PM - 3:00PM
Uriel Levy

WC3: SS Integrated Photonics & Information Security 1:30PM-2:45:00 PM

Session Chair: Amy Foster, *Johns Hopkins University, Baltimore, MD, USA*

WC3.1: Silicon-Based All-Optical Logic Gates and Memories for Low-Latency, High-Speed Cryptography (Page 461) **(Invited)** – 1:30PM - 2:00PM
Imad Agha *(University of Dayton)*

WC3.2: Silicon Photonic Cryptographic Engines (Page 463) 2:00PM - 2:15PM
Bryan T. Bosworth *(Johns Hopkins University)*
Brian C. Grubel *(Johns Hopkins University)*
Michael R. Kossey *(Johns Hopkins University)*
A. Brinton Cooper *(Johns Hopkins University)*
Mark A. Foster *(Johns Hopkins University)*
Amy C. Foster *(Johns Hopkins University)*

WC3.3: Physical-Layer Security in Free-Space Optical Communications Using Bessel-Gaussian Beams (Page 465) 2:15PM - 2:30PM
Tyan-Lin Wang *(University of Arizona)*
Ivan B. Djordjevic *(University of Arizona)*

WC3.4: Photonic Physical Unclonable Functions Using Silicon Nitride Spiral Waveguides (Page 467) 2:30PM - 2:45PM
Hongcheng Sun *(Johns Hopkins University)*
Milad Alemohammad *(Johns Hopkins University)*
Bryan T. Bosworth *(Johns Hopkins University)*
Mark A. Foster *(Johns Hopkins University)*
Amy C. Foster *(Johns Hopkins University)*

WD3: Modes and Propagation 1:30PM-3:00PM
Session Chair: Martin Rochette, *McGill University, Montreal, QC, Canada*

WD3.1: Few-Mode Fibers for Mode Division Multiplexing (Page NA) **(Invited)** – 1:30PM - 2:00PM
Ming-Jun Li *(Corning Research and Development)*

WD3.2: Mode Selection for Measuring Modal Dispersion in Stokes Space (Page 469) 2:00PM - 2:15PM
M. R. Dadras *(Montana State University-Bozeman)*
I. Roudas *(Montana State University-Bozeman)*
J. Kwapisz *(Montana State University-Bozeman)*

WD3.3: Passive Timing Stabilization over a 33-km Single Mode Fiber Link Using Temporal Imaging (Page 471) 2:15PM - 2:30PM
Jasper R. Stroud *(Johns Hopkins University)*
Olukayode Okusaga *(Johns Hopkins University Applied Physics Lab)*
Gregory Weaver *(Johns Hopkins University Applied Physics Lab)*
Nelli Mosavi *(Johns Hopkins University Applied Physics Lab)*
Mark A. Foster *(Johns Hopkins University)*

WD3.4: PDL-Induced Entanglement Degradation in Fibers with PMD (Page 473) **(Invited)** – 2:30PM - 3:00PM
D. E. Jones *(U.S. Army Research Laboratory)*
B. T. Kirby *(U.S. Army Research Laboratory)*
M. Brodsky *(U.S. Army Research Laboratory)*

WE3: THz Photonics & MWP Tutorial 1:30PM-3:00PM
Session Chair: Richard de Salvo, *Harris Corporation, Melbourne, FL, USA*

WE3.1: THz Over Fiber for High Capacity Wireless Transmission (Page 475) **(Tutorial)** – 1:30PM - 3:00PM
Alwyn Seeds *(University College London)*
Katarzyna Balakier *(University College London)*
Chris Graham *(University College London)*
Xiaoli Lin *(University College London)*
Cyril Renaud *(University College London)*
Martyn Fice *(University College London)*
Haymen Shams *(University College London)*

WF3: Constelaltion Shaping 1:30PM-3:00PM
Session Chair: Ivan B. Djordjevic, *University of Arizona, Tucson, AZ, USA*

WF3.1: Low-Complexity Distribution Matcher Based on Hadamard Matrix Combined with Geometrical Shaping for PAM-4 IM-DD Transmission Systems (Page 477) **(Invited)** – 1:30PM - 2:00PM
Nebojsa Stojanovic *(Huawei Technologies Duesseldorf GmbH)*
Cristian Prodaniuc *(Huawei Technologies Duesseldorf GmbH)*

WF3.2: Hybrid Probabilistic-Geometric Shaping in Optical Communication Systems (Page 479) **(Invited)** – 2:00PM - 2:30PM
Zhen Qu *(University of Arizona)*
Ivan B. Djordjevic *(University of Arizona)*

WF3.3: Optimizing the Achievable Rates of Tricky Channels: A Probabilistic Shaping for OPC Channel Example (Page 481) **(Invited)** – 2:30PM - 3:00PM
Metodi P. Yankov *(Fingerprint Cards A/S & Technical University of Denmark)*
Francesco Da Ros *(Technical University of Denmark)*
Edson Porto da Silva *(Technical University of Denmark)*
Søren Forchhammer *(Technical University of Denmark)*
Michael Galili *(Technical University of Denmark)*
Leif K. Oxenløwe *(Technical University of Denmark)*

WG3: Flexible Photonic Materials 1:30PM-2:45:00 PM
Session Chair: Alexey Belyanin, *Texas A&M University, College Station, TX, USA*

WG3.1: Photonic Device Integration Using Elastomer Stamp Printing (Page NA) **(Invited)** – 1:30PM - 2:00PM
Chris Bower *(X-Celeprint)*

WG3.2: Valley Selective Optical Emission of 2D Excitons Using Chiral Metasurface (Page 483) 2:00PM - 2:15PM
S. Guddala *(City University of New York (CUNY))*
R. Bushati *(City University of New York (CUNY))*
V. M. Menon *(City University of New York (CUNY))*
Mengyao Li *(City University of New York (CUNY))*
A. B. Khanikaev *(City University of New York (CUNY))*

WG3.3: Electrical Tuning and Switching Effect in Graphene-Assisted Polarization-Insensitive Terahertz Metadevices (Page 485) 2:15PM - 2:30PM
Riad Yahiaoui *(Howard University)*
Thomas A. Searles *(Howard University)*

WG3.4: A Patternable, Anti-Reflective Light Blocking Layer Using a Nano-Particle Suspension in Photoresist (Page 487) 2:30PM - 2:45PM

Matthew Hamblin *(Brigham Young University)*
Thane Downing *(Brigham Young University)*
Sophia Anderson *(Brigham Young University)*
Aaron Hawkins *(Brigham Young University)*
Holger Schmidt *(University of California, Santa Cruz)*

WH3: Phosphors and Long Wavelength GaN Materials 1:30PM-3:00PM

Session Chair: Yajie Dong, *University of Central Florida, Orlando, FL, USA*

WH3.1: Narrow Band Emitting LED Phosphors for Wide Color Gamut Displays & Energy Efficient SSL (Page 489) **(Invited)** – 1:30PM - 2:00PM
James Murphy *(General Electric)*

WH3.2: InGaN-GaNAs Interface Quantum Well with AlGaN Interlayer for Amber-Red Emitters (Page N/A) 2:00PM - 2:15PM
Chee-Keong Tan *(Clarkson University)*
Damir Borovac *(Lehigh University)*
Wei Sun *(Lehigh University)*
Nelson Tansu *(Lehigh University)*

WH3.3: Experimental Studies of Delta-InN Incorporation in InGaN Quantum Well for Long Wavelength Emission (Page 491) 2:15PM - 2:30PM
Ioannis E. Fragkos *(Lehigh University)*
Damir Borovac *(Lehigh University)*
Wei Sun *(Lehigh University)*
Renbo Song *(Lehigh University)*
Jonathan J. Wierer, Jr. *(Lehigh University)*
Nelson Tansu *(Lehigh University)*

WI4: Plenary II 3:30PM-5:00PM

Session Chair: Amr Helmy, *University of Toronto, Toronto, ON, Canada*

WI4.1: TBD (Page NA) **(Plenary)** – 3:30PM - 4:15PM
Ian Walmsley *(University of Oxford)*

WI4.2: Ultrafast Lasers for Multi-Photon Microscopy (Page NA) **(Plenary)** – 4:15PM - 5:00PM
Jim Kafka *(MKS Instruments, Inc.)*

WP: Poster Session 6:00PM-8:00PM

Session Chair: Carmen Menoni, *Colorado State University, Fort Collins, CO, USA*

WP1: All-In-One Optofluidic Platform for Differential Diagnostics of Multiple Biomarkers with Single Molecule Sensitivity (Page 493) 6:00PM - 8:00PM
A. Jain *(University of California Santa Cruz)*
G. G. Meena *(University of California Santa Cruz)*
J. W. Parks *(University of California Santa Cruz)*
A. Stambaugh *(University of California Santa Cruz)*
J. L. Patterson *(Texas Biomedical Research Institute)*
A. R. Hawkins *(Brigham Young University)*
H. Schmidt *(University of California Santa Cruz)*

WP2: Applying Voltage-Current-Converter Circuitry for Increasing Gray Levels in Dual-Panel Active-Matrix Organic Light-Emitting Display Architecture (Page 495)
Henglong Yang *(National Taipei University of Technology (Taipei Tech))*
Anne-Chin Lin *(Natioanl Taipei University of Technology (Taipei Tech))*

WP3: Fourier Transforms for Wavelength-Selective Optical Packet Switching with Wavelength Translation (Page N/A)
Robert T. Weverka *(Fathom Computing)*

WP4: Lighting as a Service that Provides Simultaneous 3D Imaging and Optical Wireless Connectivity (Page 499)
Johannes Herrnsdorf *(University of Strathclyde)*
Jonathan McKendry *(University of Strathclyde)*
Mark Stonehouse *(University of Strathclyde)*
Laurence Broadbent *(Aralia Systems)*
Glynn C. Wright *(Aralia Systems)*
Martin D. Dawson *(University of Strathclyde)*
Michael J. Strain *(University of Strathclyde)*

WP5: Synthesis, Microstructure and Quantum-Cutting Luminescence of Pr3+/Yb3+: NaGdF4@ Yb3+:NaYF4 Core/Shell Nanocrystals (Page N/A)
Yuansheng Wang *(Chinese Academy of Sciences)*

WP6: Plasmonic Enhancement in Anisotropic Thin Films of Rhenium Disulphide (ReS2) (Page 503)
Bablu Mukherjee *(Indian Institute of Technology Bombay)*
Sandipta Roy *(Indian Institute of Technology Bombay)*
Ergun Simsek *(Exponent, Inc.)*
Sayantan Ghosh *(Indian Institute of Technology Bombay)*
Venu G. Achanta *(Tata Institute of Fundamental Research)*
Saurabh Lodha *(Indian Institute of Technology Bombay)*

WP31: Microstructural Engineering of the Near-UV Photocurrent Production in VO2 Thin Film Based Detectors (Page 553)
J. A. Creeden *(College of William and Mary)*
S. E. Madaras *(College of William and Mary)*
D. B. Beringer *(College of William and Mary)*
M. R. Beebe *(College of William and Mary)*
I. Novikova *(College of William and Mary)*
R. A. Lukaszew *(College of William and Mary)*

WP32: Employing GRIN PC-Inspired Approach for Building Invisibility Cloak Media from Photonic Crystals (Page 555)
Saeid Jamilan *(Michigan Technological University)*
Elena Semouchkina *(Michigan Technological University)*

WP33: Shallow Surface Reliefs on Zn-Diffusion VCSELs for High-Speed and High-Power Single-Mode Performances (Page 557)
Zuhaib Khan *(National Central University)*
Chen-Lung Cheng *(National Central University)*
Kai-Lun Chi *(National Central University)*
Jin-Wei Shi *(National Central University)*

WP34: Transfer-Matrix Investigation of High Sensitivity Hybrid Glass/Polymer Long Period Fiber Gratings (Page 559)
Bjorn Paulson *(Yonsei University)*
Hojoong Jung *(Yonsei University)*
Seongjin Hong *(Yonsei University)*
Kyunghwan Oh *(Yonsei University)*
Sanghwa Lee *(Univerity of Ulsan and Asan Medical Center)*
Jun Ki Kim *(Univerity of Ulsan and Asan Medical Center)*

ThB1: Emerging Concepts in Optical Interconnects 8:30AM-10:00AM
Session Chair: Amy Foster, *Johns Hopkins University, Baltimore, MD, USA*

ThB1.1: Optical Interconnects for Extreme Computing (Page NA) **(Invited)** – 8:30AM - 9:00AM
Keren Bergman *(Columbia University)*

ThB1.2: Data Center Interconnects (Page NA) **(Invited)** – 9:00AM - 9:30AM
David Plant *(McGill University)*

ThC1: Secure Communications 8:30AM-10:00AM
Session Chair: Eduardo Temprana

ThC1.1: Integrated Quantum Cryptography: A New Tool in the Tool Chest (Page NA) **(Invited)** – 8:30AM - 9:00AM
Chris Erven *(University of Bristol)*

ThC1.2: Feasibility of Quantum Communications in Aquatic Scenario (Page 561) 9:00AM - 9:15AM
Silvia Tarantino *(Technical University of Denmark)*
Daniele Cozzolino *(Technical University of Denmark)*
Karsten Rottwitt *(Technical University of Denmark)*
Davide Bacco *(Technical University of Denmark)*

ThC1.3: Toward the Integration of CV Quantum Key Distribution in Deployed Optical Networks (Page N/A) 9:15AM - 9:30AM
Fotini Karinou *(Huawei Technologies Duesseldorf GmbH)*
Hans H. Brunner *(Huawei Technologies Duesseldorf GmbH)*
Chi-Hang Fred Fung *(Huawei Technologies Duesseldorf GmbH)*
Lucian C. Comandar *(Huawei Technologies Duesseldorf GmbH)*
Stefano Bettelli *(Huawei Technologies Duesseldorf GmbH)*
David Hillerkuss *(Huawei Technologies Duesseldorf GmbH)*
Maxim Kuschnerov *(Huawei Technologies Duesseldorf GmbH)*
Spiros Mikroulis *(Huawei Technologies Duesseldorf GmbH)*
Dawei Wang *(Huawei Technologies Duesseldorf GmbH)*
Changsong Xie *(Huawei Technologies Duesseldorf GmbH)*
Momtchil Peev *(Huawei Technologies Duesseldorf GmbH)*
Andreas Poppe *(Huawei Technologies Duesseldorf GmbH)*

ThC1.4: Polarization Entanglement Quantum Key Distribution with Covert Classical Communications (Page 567) 9:30AM - 9:45AM
John Gariano *(University of Arizona)*
Ivan Djordjevic *(University of Arizona)*

ThC1.5: Slepian-FBGs-Based Optical Covert Communications (Page 569) 9:45AM - 10:00AM
Ivan B. Djordjevic *(University of Arizona)*

ThD1: Fiber Sensing 8:30AM-10:00AM
Session Chair: Ming-Jun Li, *Corning Research and Development, Corning, NY, USA*

ThD1.1: Enabling Multicore and Single Core Fiber Sensing Using Enhanced Scatter Fibers (Page NA) **(Invited)** – 8:30AM - 9:00AM
Paul Westbrook *(OFS)*

ThD1.2: Heat Transfer Rate Measurements with a Four-Core Fiber Optic Sensor (Page N/A) 9:00AM - 9:15AM

Sema Güvenç Kılıç *(Boğaziçi University)*
Mehmet Naci Inci *(Boğaziçi University)*

ThD1.3: Dynamic Range Limits of Fiber Laser Sensors (Page 573) **(Invited)** – 9:15AM - 9:45AM
Brennan C. Pursley *(Sotera Defense Solutions)*
Peter W. Kampschroeder *(Naval Research Laboratory)*
Meredith Hutchinson *(Naval Research Laboratory)*
Geoffrey A. Cranch *(Naval Research Laboratory)*

ThE1: Microwave Photonics Subsystems 8:30AM-10:00AM

Session Chair: Jean Kalkavage, *Johns Hopkins Applied Physics Lab, Baltimore, MD, USA*

ThE1.1: Photonic-Assisted Multi-Frequency Phase-Coded Microwave Signal Generation (Page 575) 8:30AM - 8:45AM
Yang Chen *(East China Normal University)*
Shilong Pan *(Nanjing University of Aeronautics and Astronautics)*

ThE1.2: GHz-Bandwidth Optical Isolation through Acoustic Pumping of a Nanophotonic Circuit (Page 577) 8:45AM - 9:00AM
Donggyu B. Sohn *(University of Illinois at Urbana-Champaign)*
Seunghwi Kim *(University of Illionis at Urbana Champaign)*
Gaurav Bahl *(University of Illionis at Urbana Champaign)*

ThE1.3: Integrated Photonics Optical Beam Forming Networks (Page NA) **(Invited)** – 9:00AM - 9:30AM
Jonathan Klamkin *(University of California, Santa Barbara)*
Yuan Liu *(University of California, Santa Barbara)*

ThF1: High Capacity Flexible Optical Networks 8:30AM-10:00AM

Session Chair: Fatima Gunning, *Tyndall Photonics, Cork City, Ireland*

ThF1.1: Migrating from Fixed Grid to Flexible Grid Optical Networks (Page 579) **(Invited)** – 8:30AM - 9:00AM
Sifat Ferdousi *(University of California, Davis)*
Tanjila Ahmed *(University of California, Davis)*
Sabidur Rahman *(University of California, Davis)*
Xiaosong Yu *(University of California, Davis & Beijing University of Posts & Telecom)*
Massimo Tornatore *(University of California, Davis & Politecnico di Milano)*
Biswanath Mukherjee *(University of California, Davis)*

ThF1.2: Knowledge-Based Service Provisioning in Multi-Domain Elastic Optical Networks (Page 581) **(Invited)** – 9:00AM - 9:30AM
X. Chen *(University of California, Davis)*
R. Proietti *(University of California, Davis)*
M. Shamsabardeh *(University of California, Davis)*
G. Liu *(University of California, Davis)*
K. Zhang *(University of California, Davis)*
S. J. B. Yoo *(University of California, Davis)*

ThF1.3: Modal Dispersion and Mode-Dependent Loss in Multi-Mode Fibers: Modeling, Measurement and Compensation (Page NA) **(Invited)** – 9:30AM - 10:00AM
Joseph M. Kahn *(Stanford University)*
Karthik Choutagunta *(Stanford University)*
Sercan O. Arik *(Baidu Research)*
Keang-Po Ho *(Apple)*

ThG1: Metamaterials and Imaging 8:30AM-9:45AM

Session Chair: TBD

ThG1.1: Super-Resolution Imaging with Nanophotonic Structures (Page NA) **(Invited)** – 8:30AM - 9:00AM
Zhaowei Liu *(University of California, San Diego)*

ThG1.2: Electrically Tunable MnO2 Based Metasurface (Page 583) 9:00AM - 9:15AM
Ahasanul Haque *(University of New South Wales Canberra)*
Monir Morshed *(University of New South Wales Canberra)*
Ahmmed A. Rifat *(Australian National University)*
Ziyuan Li *(Australian National University)*
Li Li *(Australian National University)*
Andrey Miroshnichenko *(University of New South Wales Canberra)*
Haroldo T. Hattori *(University of New South Wales Canberra)*

ThG1.3: Propagation and Imaging Using Chiral Lenses Without and With Material Dispersion (Page N/A) 9:15AM - 9:30AM
Monish R. Chatterjee *(University of Dayton)*
Salaheddeen G. Bugoffa *(University of Dayton)*

ThH1: Perovskites, QDs and Hybrid Devices 8:30AM-10:00AM

Session Chair: Handong Sun, *Nanyang Technilogical University, Singapore*

ThH1.1: In-situ Fabricated Perovskite Quantum Dots for Display Technology (Page NA) **(Invited)** – 8:30AM - 9:00AM
Haizheng Zhong *(Beijing Institute of Technology)*

ThH1.2: Luminescence Dynamics of CsPbBr3 Quantum Dot-Based Color Converters (Page 587) 9:00AM - 9:15AM
Miguel F. Leitao *(University of Strathclyde)*
Nicolas Laurand *(University of Strathclyde)*
Martin D. Dawson *(University of Strathclyde)*

ThH1.3: Electrohydrodynamic-Jet Sprayed Quantum Dots for Solution-Processed QD Light-Emitting-Diodes (Page 589) 9:15AM - 9:30AM
Tuan Canh Nguyen *(Hoseo University)*
Woon-Seop Choi *(Hoseo University)*

ThH1.4: Hybrid GaN LED/Elastomer Membrane for Uniform Area Illumination (Page 591) 9:30AM - 9:45AM
F. Farrell *(University of Strathclyde)*
E. Xie *(University of Strathclyde)*
B. Guilhabert *(University of Strathclyde)*
A-M. Haughey *(Fraunhofer Centre for Applied Photonics)*
P. Connolly *(University of Strathclyde)*
M. D. Dawson *(University of Strathclyde)*
N. Laurand *(University of Strathclyde)*

ThH1.5: Improvement in the Radiative Efficiency of InGaN-Based Multiple Quantum Wells Using AlGaN Interlayers (Page 593) 9:45AM - 10:00AM
Syed Ahmed Al Muyeed *(Lehigh University)*
Wei Sun *(Lehigh University)*
Xiongliang Wei *(Lehigh University)*
Renbo Song *(Lehigh University)*
Daniel Koleske *(Sandia National Laboratories)*
Nelson Tansu *(Lehigh University)*
Jonathan J. Wierer, Jr. *(Lehigh University)*

Post Deadline 10:30AM-12:00PM

Session Chair: Carmen Menoni, *Colorado State University, Fort Collins, CO, USA*

PD1: Record-High Secret Key Rate for Joint Classical and Quantum Transmission Over a 37-Core Fiber (Page 595)
Beatrice Da Lio *(Technical University of Denmark)*
Davide Bacco *(Technical University of Denmark)*
Daniele Cozzolino *(Technical University of Denmark)*
Francesco Da Ros *(Technical University of Denmark)*
Xueshi Guo *(Technical University of Denmark)*
Yunhong Ding *(Technical University of Denmark)*
Yusuke Sasaki *(Fujikura Ltd.)*
Kazuhiko Aikawa *(Fujikura Ltd.)*
Shigehito Miki *(National Institute of Information and Communications Technology)*
Hirotaka Terai *(National Institute of Information and Communications Technology)*
Taro Yamashita *(Nagoya University)*
Jonas S. Neergaard-Nielsen *(Technical University of Denmark)*
Michael Galili *(Technical University of Denmark)*
Karsten Rottwitt *(Technical University of Denmark)*
Ulrik L. Andersen *(Technical University of Denmark)*
Leif K. Oxenløwe *(Technical University of Denmark)*
Toshio Morioka *(Technical University of Denmark)*

PD2: Hertz-Class Brillouin Lasing with Nanokelvin Thermal Sensing (Page 597)
William Loh *(MIT Lincoln Laboratory)*
Siva Yegnanarayanan *(MIT Lincoln Laboratory)*
Frederick O'Donnell *(MIT Lincoln Laboratory)*
Paul W. Juodawlkis *(MIT Lincoln Laboratory)*

PD3: Scalable and Reconfigurable Optical Tap-Delay-Line for Multichannel Equalization and Correlation of 20-Gbaud QPSK Signals Using Nonlinear Wave Mixing and a Microresonator Kerr Frequency Comb (Page 599)
Ari N. Willner *(University of Southern California, Los Angeles)*
Peicheng Liao *(University of Southern California, Los Angeles)*
Kaiheng Zou *(University of Southern California, Los Angeles)*
Arne Kordts *(École Polytechnique Fédérale de Lausanne (EPFL))*
Maxim Karpov *(École Polytechnique Fédérale de Lausanne (EPFL))*
Yinwen Cao *(University of Southern California, Los Angeles)*
Ahmed Almaiman *(University of Southern California, Los Angeles)*
Ahmad Fallahpour *(University of Southern California, Los Angeles)*
Fatemeh Alishahi *(University of Southern California, Los Angeles)*
Moshe Tur *(Tel Aviv University)*
Tobias Kippenberg *(École Polytechnique Fédérale de Lausanne (EPFL))*
Alan E. Willner *(University of Southern California, Los Angeles)*

PD4: High Efficiency SHG in Heterogenous Integrated GaAs Ring Resonators (Page 601)
Lin Chang *(University of California, Santa Barbara)*
Andreas Boes *(University of California, Santa Barbara and RMIT University)*
Paolo Pintus *(University of California, Santa Barbara)*
Jon D. Peters *(University of California, Santa Barbara)*
MJ. Kennedy *(University of California, Santa Barbara)*
Xiaowen Guo *(University of California, Santa Barbara)*

Nicolas Volet *(University of California, Santa Barbara)*
Supeng Yu *(National Institute of Standards and Technology)*
Scott A. Diddams *(National Institute of Standards and Technology)*
Scott B. Papp *(National Institute of Standards and Technology)*
John E. Bowers *(University of California, Santa Barbara)*

PD5: Electrically-Pumped 1.31 µm MQW Lasers by Direct Epitaxy on Wafer-Bonded InP-on-SOI Substrate (Page 603)
Yingtao Hu *(Hewlett-Packard Labs)*
Di Liang *(Hewlett-Packard Labs)*
Chong Zhang *(Hewlett-Packard Labs)*
Geza Kurczveil *(Hewlett-Packard Labs)*
Xue Huang *(Hewlett-Packard Labs)*
Kunal Mukherjee *(University of California, Santa Barbara)*
Raymond Beausoleil *(Hewlett-Packard Labs)*

PD6: Real-time Spectrogram Analysis of Continuous Optical Wavefields (Page 605)
Saikrishna Reddy Konatham *(Institut National de la Recherche Scientifique - Énergie, Matériaux, Télécommunications (INRS-EMT))*
Reza Maram *(Institut National de la Recherche Scientifique - Énergie, Matériaux, Télécommunications (INRS-EMT))*
José Azaña *(Institut National de la Recherche Scientifique - Énergie, Matériaux, Télécommunications (INRS-EMT))*