

# RAPID

Research and Applications of Photonics in Defense

Virtual Conference  
2-4 August 2021  
[www.ieee-rapid.org](http://www.ieee-rapid.org)



**General Co-Chair:**  
Monica Allen, Ph.D.  
Air Force Research Laboratory, USA

**General Co-Chair:**  
Jeffery Allen, Ph.D.  
Air Force Research Laboratory, USA





# 2021 Program-at-a-Glance

*ALL TIMES ARE IN CENTRAL DAYLIGHT TIME				Monday, 2 August			
<b>MA1: Keynote &amp; Plenary Session</b>							
<b>Welcome Remarks:</b> David Lambert, <i>Air Force Research Laboratory, Munitions Directorate, USA</i>							
<b>Keynote Speaker:</b> Dr. Bindu Nair, <i>Director of Basic Research, Office of the Secretary of Defense (OSD), USA</i>							
<b>Plenary Speaker:</b> Dr. Yuri Kivshar, <i>Nonlinear Physics Center, Research School of Physics, Australian National University, Australia</i>							
<b>Plenary Speaker:</b> Dr. Andrea Alù, <i>City University of New York, USA</i>							
<b>10:45 am-11:00 am</b> BREAK							
<b>MB1: STEM / Women in Photonics / Women in Science Session</b>							
<b>Plenary Speaker:</b> Dr. Shery Welsh, <i>Director, Air Force Office of Scientific Research (AFOSR), USA</i>							
<b>Plenary Speaker:</b> Dr. George Fischer, <i>U.S. Army CCDC-AC, FCDD-Weapon Systems and Technology Directorate, USA</i>							
<b>12:00 pm-1:00 pm</b> BREAK							
<b>ANP - Advanced Nanophotonics Platform</b>		<b>ETP - Enabling Technologies in Photonics</b>			<b>OMPEES - Optical Metamaterials, Plasmonics and Engineered Electromagnetic Structures</b>		
<b>1:00 pm-2:30 pm</b> <b>MC1: Emerging Materials for Plasmonics</b>		<b>1:00 pm-2:45 pm</b> <b>MD1: Bioinspired and Bioprincipis Photonics</b>			<b>1:00 pm-3:30 pm</b> <b>ME1: Dynamic Control of Plasmonic Nanostructures</b>		

*ALL TIMES ARE IN CENTRAL DAYLIGHT TIME				
Tuesday, 3 August				
ANP - Advanced Nanophotonics Platform	AOP - Applications of Photonics	ETP - Enabling Technologies in Photonics	FPM: Functional Photonic Materials	HMB - Humanstate Measurement and Biosensing
<b>8:00 am-9:00 am</b> <b>TuA1:</b> Ultrafast and Nonlinear Nanophotonics	<b>8:00 am-10:00 am</b> <b>TuB1:</b> Blast Imaging	<b>8:00 am-10:00 am</b> <b>TuC1:</b> Optical MEMS/NEMS	<b>8:00 am-10:15 am</b> <b>TuD1:</b> Hybrid Organic-Inorganic Materials and Devices	<b>8:00 am-9:30 am</b> <b>TuE1:</b> Biosensing Methods
<b>BREAK</b>				
<b>10:15 am-12:15 pm</b> <b>TuA2:</b> Active Plasmonics and Nanophotonics	<b>10:15 am-11:45 am</b> <b>TuB2:</b> Displays, Holography and Projection I	<b>10:15 am-12:15 pm</b> <b>TuC2:</b> Optical Sensing and Computational Imaging Systems	<b>10:15 am-12:15 pm</b> <b>TuD2:</b> Infrared Organic Materials and Properties	<b>10:15 am-12:15 pm</b> <b>TuE2:</b> Materials and Devices for Biosensing
<b>BREAK</b>				
<b>1:15 pm- 2:45 pm</b> <b>TuA3:</b> Integrated Quantum Photonics I	<b>1:15 pm-2:45 pm</b> <b>TuB3:</b> Displays, Holography and Projection II	<b>1:15 pm- 3:15 pm</b> <b>TuC3:</b> RF Photonics and Microwave Devices I	<b>1:15 pm- 2:45 pm</b> <b>TuD3:</b> Non-epitaxial Optoelectronics Materials and Devices	<b>1:15 pm-2:15 pm</b> <b>TuE3:</b> Human State Measurement
<b>BREAK</b>				
<b>3:30 pm-5:30 pm</b> <b>TuA4:</b> Integrated Quantum Photonics II	<b>3:30 pm-5:30 pm</b> <b>TuB4:</b> Integrated Quantum Photonics II	<b>3:30 pm-5:30 pm</b> <b>TuC4:</b> RF Photonics and Microwave Devices II	<b>3:30 pm-4:30 pm</b> <b>TuD4:</b> Nonlinear Organic Materials	<b>3:30 pm-4:30 pm</b> <b>TuE4:</b> Human Analyst Augmentation

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**WEDNESDAY, 4 AUGUST**

<b>LDPM - Low-dimensional Photonic Materials</b>	<b>MMAP - Materials and Manufacturing for Advanced Photonics</b>	<b>OEDDIP: Optical Emitters, Detectors and Devices</b>	<b>OIST - Optical Imaging and Sensing Technology</b>	<b>OMPEES - Optical Metamaterials, Plasmonics and Engineered Electromagnetic Structures</b>	<b>PDS - Photonics for Defense Systems</b>
<b>8:00 am-8:45 am</b> <b>WA1:</b> Modeling and Simulation for Advanced Photonics	<b>8:00 am-9:30 am</b> <b>WB1:</b> Novel Materials for Photonics	<b>8:00 am-9:45 am</b> <b>WC1:</b> Lasers/Emitters	<b>8:00 am-9:15 am</b> <b>WD1:</b> Spectral, Polarimetric, and Multimodal Imaging	<b>8:00 am-10:15 am</b> <b>WE1:</b> Plasmonic Devices and Applications	<b>8:00 am-10:15 am</b> <b>WE1:</b> Instrumentation and Control for Test and Evaluation
<b>BREAK</b>					
<b>10:15 am-11:45 am</b> <b>WA2:</b> Synthesis and Fabrication of 2D Materials	<b>10:15 am-12:15 pm</b> <b>WB2:</b> Semiconductor Materials and Quantum Nanoscience	<b>10:15 am-12:15 pm</b> <b>WC2:</b> UV Optoelectronics	<b>10:15 am-11:45 am</b> <b>WD2:</b> RF and Optical Target Imaging, Identification, and Pattern Recognition	<b>10:30 am-1:00 pm</b> <b>WE2:</b> Optical Metamaterials Based Devices and Applications	<b>10:15 am-12:15 pm</b> <b>WF2:</b> Photonics and Future Warfighter Operational Concepts
<b>BREAK</b>					
<b>1:15 pm-2:15 pm</b> <b>WA3:</b> Two Dimensional and Topological Materials	<b>1:15 pm- 3:15 pm</b> <b>WB3:</b> Optical Metasurfaces and Applications I	<b>1:15 pm- 2:45 pm</b> <b>WC3:</b> High Peak and Average Power Lasers	<b>1:15 pm-3:30 pm</b> <b>WD3:</b> Optical Detectors and Focal Plane Arrays I	<b>1:15 pm- 3:15 pm</b> <b>WE3:</b> Resonant Photonic Lattices	<b>1:15 pm-3:15 pm</b> <b>WF3:</b> EO/IR/LADAR
<b>BREAK</b>					
<b>2:30 pm-3:30 pm</b> <b>WA4:</b> Two-Dimensional Materials & Topological Photonics	<b>3:30 pm-4:30 pm</b> <b>WB4:</b> Optical Metasurfaces and Applications II	<b>3:30 pm-5:15 pm</b> <b>WC4:</b> Terahertz Photonics	<b>3:45 pm-5:45 pm</b> <b>WD4:</b> Optical Detectors and Focal Plane Arrays II	<b>3:30 pm-5:00 pm</b> <b>WE4:</b> Chiral and Nonlinear Nano/metamaterials	<b>3:30 pm-5:30 pm</b> <b>WF4:</b> Devices and Systems for Sensors



Monday, 2 August

9am	<b>MA1: Keynote &amp; Plenary Session</b> Chaired by: John Henry Williams (United States)
9am	<b>MA1.1 - RAPID 2021 Welcome Message</b> » <u>Dr. David Lambert</u> (United States) <sup>1</sup> (1. Air Force Research Laboratory, Munitions Directorate)
9:15am	<b>MA1.2 - Opportunities to Engage on Basic Research with the DoD (Keynote)</b> » <u>Dr. Bindu Nair</u> (United States) <sup>1</sup> (1. OSD-Office of Basic Research)
9:45am	<b>MA1.3 - Metaphotonics and Metasurfaces Empowered by Mie Resonances (Plenary)</b> » <u>Dr. Yuri Kivshar</u> (Australia) <sup>1</sup> (1. Australian National University)
10:15am	<b>MA1.4 - Exotic Wave-Matter Interactions in Metamaterials Based on Broken Symmetries (Plenary)</b> » <u>Dr. Andrea Alù</u> (United States) <sup>1</sup> (1. City University of New York)
10:45am	<b>Break</b>
11am	<b>MB1: STEM / Women in Photonics / Women in Science</b> Chaired by: Adriane Moura (United States) and Brian Mitchell (United States)
11am	<b>MB1.1 - Yes...We Science! (Plenary)</b> » <u>Dr. Shery Welsh</u> (United States) <sup>1</sup> (1. Air Force Research Laboratory)
11:30am	<b>MB1.2 - Picatinny STEM; Maximizing the Impact of Outreach (Plenary)</b> » <u>Dr. George Fischer</u> (United States) <sup>1</sup> (1. U.S. Army CCDC-AC, FCDD-Weapon Systems and Technology Directorate)
12pm	<b>Break</b>

1pm	<b>MC1: Emerging Materials for Plasmonics</b> Chaired by: Milan Palei (United States) and Chitrleema Chakraborty (United States)
1pm	<b>MC1.1 - Photodegradation Protection in 2D In-Plane Heterostructures Revealed by Hyperspectral Nanoimaging: The Role of Nanointerface 2D Alloys (Invited)</b> » <u>Yohannes Abate</u> (United States) <sup>1</sup> (1. University of Georgia)
1:30pm	<b>MC1.2 - Coherent Multi-frequency Thermal Emission Leveraging Phonon Polaritons (Invited)</b> » <u>Thomas Folland</u> (United States) <sup>1</sup> (1. University of Iowa)
2pm	<b>MC1.3 - Erbium-doped Indium Tin Oxide for Resonance Tuning and Photoluminescence Enhancement</b> » <u>Evan Smith</u> (United States) <sup>1</sup> , Joshua Hendrickson (United States) <sup>2</sup> , Christopher Stevens (United States) <sup>1</sup> , Shiva Vangala (United States) <sup>2</sup> (1. KBR, Inc., 2. AFRL Sensors Directorate)
1pm	<b>MD1: Bioinspired and Bioprincipis Photonics</b> Chaired by: Curt Grigsby (United States)
1pm	<b>MD1.1 - Design and Applications of Bioinspired Polarization and Spectral Sensors (Invited)</b> » <u>Viktor Gruev</u> (United States) <sup>1</sup> , Steven Blair (United States) <sup>2</sup> , Missael Garcia (United States) <sup>2</sup> , Tyler Davis (United States) <sup>2</sup> , Justin Haque (United States) <sup>2</sup> , Zudong Nickel (United States) <sup>2</sup> , Zhongmin Zhu (United States) <sup>1</sup> , Yingkai Chen (United States) <sup>1</sup> (1. University of Illinois at Urbana-Champaign, 2. UIUC)
1:30pm	<b>MD1.2 - Better Optics through Imperfection (Invited)</b> » <u>Stephen Kuebler</u> (United States) <sup>1</sup> , Alexander Cockerham (United States) <sup>1</sup> , Shaimum Shahriar (United States) <sup>1</sup> , Chun Xia (United States) <sup>1</sup> , Chad Horton (United States) <sup>2</sup> , Michael McMahon (United States) <sup>1</sup> , Jesus Gutierrez (United States) <sup>3</sup> , Noel Martinez (United States) <sup>3</sup> , Maunuel F. Martinez (United States) <sup>3</sup> , Edgar Bustamante (United States) <sup>3</sup> , Raymond Rumpf (United States) <sup>4</sup> , Javier Pazos (United States) <sup>5</sup> , Jimmy Touma (United States) <sup>6</sup> (1. University of Central Florida, CREOL, 2. University of Central Florida, 3. University of Texas at El Paso, 4. University Texas at El Paso, 5. Electro Magnetic Applications, 6. Air Force Research Laboratory, Eglin AFB)



Continued from **Monday, 2 August**

- 2pm **MD1.3 - Additive Manufacturing of Freeform Optics for Defense Applications (Invited)**  
 » [George Williams](#) (United States)<sup>1</sup>, Hooman Akhavan (United States)<sup>1</sup>, Charles Dupuy (United States)<sup>1</sup>, Paul Harmon (United States)<sup>1</sup> (1. NanoVox LLC)
- 2:30pm **MD1.4 - Bioinspired Photonics: Camouflage Strategies from Marine Hatchetfish for Optical RF Steganography**  
 » [Qidi Liu](#) (United States)<sup>1</sup>, Mable Fok (United States)<sup>1</sup> (1. University of Georgia)
- 1pm **ME1: Dynamic Control of Plasmonic Nanostructures**  
 Chaired by: Jake Fontana (United States) and Scott Bukosky (United States)
- 1pm **ME1.1 - Emergent Dynamic Optical Technologies at DARPA (Invited)**  
 » [Rohith Chandrasekar](#) (United States)<sup>1</sup> (1. DARPA, DSO)
- 1:30pm **ME1.2 - Dynamic Control of 2D and 3D Plasmonic Arrays (Invited)**  
 » [George Schatz](#) (United States)<sup>1</sup> (1. Northwestern University)
- 2pm **ME1.3 - Reconfigurable Photonic Metamolecules and Metamaterials for Chiroptical Technology (Invited)**  
 » [Yuebing Zheng](#) (United States)<sup>1</sup> (1. The University of Texas at Austin)
- 2:30pm **ME1.4 - Light-induced Deformation of Hybrid Polymer/crystal Photomechanical Materials (Invited)**  
 » [Ryan Hayward](#) (United States)<sup>1</sup> (1. University of Colorado Boulder)
- 3pm **ME1.5 - Dynamic Photonics with Unconventional Materials (Invited)**  
 » [Marina Leite](#) (United States)<sup>1</sup> (1. University of California Davis)

**Tuesday, 3 August**

- 8am **TuA1: Ultrafast and Nonlinear Nanophotonics**  
 Chaired by: Hayk Harutyunyan (United States) and Jeffery Allen (United States)
- 8am **TuA1.1 - Engineering Bound States in the Continuum in Metaphotonics (Invited)**  
 » [Dr. Yuri Kivshar](#) (Australia)<sup>1</sup> (1. Australian National University)
- 8:30am **TuA1.2 - Ultrafast and Nonlinear Semiconductor Metasurfaces (Invited)**  
 » [Igal Brener](#) (United States)<sup>1</sup> (1. Sandia National Laboratories)
- 8am **TuB1: Blast Imaging**  
 Chaired by: Subith Vasu (United States) and Martin Schmidt (United States)
- 8am **TuB1.1 - Laser and Imaging Diagnostics for Fragmentation and Post-Detonation Fireball Combustion in Sub-Scale Explosive Devices (Invited)**  
 » [Daniel Guildenbecher](#) (United States)<sup>1</sup> (1. Sandia National Labs)
- 8:30am **TuB1.2 - High-Speed Long-Wavelength Detector Architectures (Invited)**  
 » [Yinan Wang](#) (United States)<sup>1</sup>, [Leland Nordin](#) (United States)<sup>2</sup>, [Aaron Muhowski](#) (United States)<sup>1</sup>, [Corey White](#) (United States)<sup>3</sup>, [Abhilasha Kamboj](#) (United States)<sup>1</sup>, [Priyanka Petluru](#) (United States)<sup>1</sup>, [Seth Bank](#) (United States)<sup>1</sup>, [Daniel Wasserman](#) (United States)<sup>3</sup> (1. The University of Texas at Austin, 2. University of Texas at Austin, 3. The University of Texas at Austin)
- 9am **TuB1.3 - Higher Time-resolution LASEM with Upgraded Diagnostics for Lab-scale Characterization of Energy Release Rates (Invited)**  
 » [Jennifer Gottfried](#) (United States)<sup>1</sup> (1. U.S. Army Combat Capabilities Development Command)



Continued from **Tuesday, 3 August**

9:30am **TuB1.4 - MONOLITHIC MULTI-QCL FOR TEMPERATURE MEASUREMENTS IN DETONATIONS**  
 » [Kyle Thurmond](#) (United States)<sup>1</sup>, [Luke Milbocker](#) (United States)<sup>1</sup>, [ARKADIY LYAKH](#) (United States)<sup>2</sup>, [Subith Vasu](#) (United States)<sup>1</sup> (1. University of Central Florida, 2. University of Central Florida, CREOL)

8am **TuC1: Optical MEMS/NEMS**  
 Chaired by: [Harris Hall](#) (United States) and [Lavern Starman](#) (United States)

8am **TuC1.1 - MEMS Back-Scanning Mirrors for Step-Stare Scanning for Chirped Pulse Coherent LIDAR (Invited)**  
 » [Andrew Oliver](#) (United States)<sup>1</sup>, [David Dickensheets](#) (United States)<sup>1</sup> (1. Montana State University)

8:30am **TuC1.2 - Rapid 3D Fabrication of Micro-optical Components for Tailored Imaging and Sensing Applications (Invited)**  
 » [Anthony Salerni](#) (United States)<sup>1</sup>, [Daniel Ruiz-Cadalso](#) (United States)<sup>2</sup>, [Cosme Furlong](#) (United States)<sup>2</sup> (1. Chemistry and Biochemistry Department. Worcester Polytechnic Institute, 2. Mechanical Engineering Department. Worcester Polytechnic Institute)

9am **TuC1.3 - Micromechanically Enabled Microcavity on Optical Fiber Tips (Invited)**  
 » [Hengky Chandralalim](#) (United States)<sup>1</sup>, [Jeremiah Williams](#) (United States)<sup>1</sup>, [Jonathan Smith](#) (United States)<sup>1</sup>, [Joseph Suelzer](#) (United States)<sup>2</sup>, [Nicholas Usechak](#) (United States)<sup>2</sup> (1. The U.S. Air Force Institute of Technology, 2. Air Force Research Laboratory)

9:30am **TuC1.4 - MEMS THz-to-IR Band Converter Using Cr/SiNx Structures (Invited)**  
 » [Fabio Alves](#) (United States)<sup>1</sup>, [Dragoslav Grbovic](#) (United States)<sup>1</sup> (1. Naval Postgraduate School)

8am **TuD1: Hybrid Organic-Inorganic Materials and Devices**  
 Chaired by: [Matthew Sfeier](#) (United States)

8am **TuD1.1 - Volumetric 3D Printing Powered by Upconversions Nanocapsules (Invited)**  
 » [Sam Sanders](#) (United States)<sup>1</sup> (1. Quadratic 3D, Inc.)

8:30am **TuD1.2 - Organic Small Molecule Integrated Photonics (Invited)**  
 » [Andrea Armani](#) (United States)<sup>1</sup> (1. University of Southern California)

9am **TuD1.3 - A New Way of Doping of Organic Interlayers for Perovskite Solar Cells Using CO2 (Invited)**  
 » [Andre Taylor](#) (United States)<sup>1</sup> (1. New York University)

9:30am **TuD1.4 - Stretchy and Aligned Colloidal Plasmonics (Invited)**  
 » [Catherine Murphy](#) (United States)<sup>1</sup> (1. University of Illinois at Urbana-Champaign)

10am **TuD1.5 - Superstructures and Hybrid Material Platforms for Optoelectronic Neuromorphic Synapses (Invited)**  
 » [Jayan Thomas](#) (United States)<sup>1</sup> (1. University of Central Florida)

8am **TuE1: Biosensing Methods**  
 Chaired by: [Jorge Chavez](#) (United States) and [Josh Hagen](#) (United States)

8am **TuE1.1 - Development and Photophysical Characterization of Biodegradable Optical Oxygen Sensors (Invited)**  
 » [Kayla Presley](#) (United States)<sup>1</sup>, [Jack Ly](#) (United States)<sup>1</sup>, [Daniel Cybyk](#) (United States)<sup>2</sup>, [Bonnie Reinsch](#) (United States)<sup>2</sup>, [John Lannutti](#) (United States)<sup>2</sup>, [Matthew Dalton](#) (United States)<sup>3</sup>, [Tod Grusenmeyer](#) (United States)<sup>3</sup> (1. Air Force Research Laboratory; UES, Inc., 2. Ohio State University, 3. Air Force Research Laboratory)

8:30am **TuE1.2 - X-ray Footprinting as a Tool for Characterizing Biomarker Recognition Elements (Invited)**  
 » [David Lodowski](#) (United States)<sup>1</sup>, [Rohit Jain](#) (United States)<sup>1</sup>, [Erik Farquhar](#) (United States)<sup>1</sup>, [Mark Chance](#) (United States)<sup>1</sup> (1. Case Western Reserve University)



Continued from **Tuesday, 3 August**

9am **TuE1.3 - Rapid Multi Sensor Fusion and Integration Using AI-enabled Machine Vision for Real-Time Operator Physiological Status (Invited)**  
 » David Fries (United States)<sup>1</sup>, [Jeffrey Phillips](#) (United States)<sup>1</sup>, Madison McInnis (United States)<sup>1</sup>, Connor Tate (United States)<sup>1</sup> (1. Florida Institute for Human and Machine Cognition)

9am **Break**

9:30am **Break**

10am **Break**

10am **Break**

10:15am **TuA2: Active Plasmonics and Nanophotonics**  
 Chaired by: Amit Agraval (United States) and Palash Bharadwaj (United States)

10:15am **TuA2.1 - Thermoplasmonic Trapping of Plasmonic Nanostructures: Single-Molecule Detection (Invited)**  
 » [G V Pavan Kumar](#) (India)<sup>1</sup> (1. IISER Pune)

10:45am **TuA2.2 - Dispersion-engineered Metasurfaces: Fundamentals and Applications (Invited)**  
 » [WeiTing Chen](#) (United States)<sup>1</sup> (1. ams Sensors USA)

11:15am **TuA2.3 - Seeing a Bright Future for Flat Optics: Materials Engineering Solutions for Commercializing Metasurface-based Optical Components (Invited)**  
 » Sage Doshay (United States)<sup>1</sup>, Guannan Chen (United States)<sup>1</sup>, David Sell (United States)<sup>1</sup>, Yongan Xu (United States)<sup>1</sup>, Yue Chen (United States)<sup>1</sup>, Hans Yang (United States)<sup>1</sup>, Wei Wu (United States)<sup>1</sup>, Lei Jiang (United States)<sup>1</sup>, Jinxin Fu (United States)<sup>1</sup>, [Rutger Thijssen](#) (United States)<sup>1</sup>, Paul Gallagher (United States)<sup>1</sup>, Ludovic Godet (United States)<sup>1</sup>, Robert Visser (United States)<sup>1</sup> (1. Applied Materials)

11:45am **TuA2.4 - Chiral and Anisotropic Nanophotonics Materials - Exploiting in the Interaction of Biological Matter with Light (Invited)**  
 » [Lisa Poulikakos](#) (United States)<sup>1</sup>, Zaid Haddadin (United States)<sup>1</sup>, Trinity Pike (United States)<sup>1</sup>, Jebin Moses (United States)<sup>1</sup>, Aniket Puri (United States)<sup>1</sup>, Mark Lawrence (United States)<sup>2</sup>, David Barton (United States)<sup>3</sup>, Stefanie Jeffrey (United States)<sup>4</sup>, Jennifer Dionne (United States)<sup>4</sup> (1. UCSD, 2. Washington University in St. Louis, 3. Harvard University, 4. Stanford University)

10:15am **TuB2: Displays, Holography and Projection I**  
 Chaired by: Fouad Kiamilev (United States) and Justin Meadows (United States)

10:15am **TuB2.1 - IR Scene Projection by Optical Down-Conversion (Invited)**  
 » [Hisham Menkara](#) (United States)<sup>1</sup>, Zhitao Kang (United States)<sup>2</sup>, Christopher James (United States)<sup>2</sup> (1. PhosphorTech Corporation, 2. Georgia Tech Research Institute)

10:45am **TuB2.2 - Antimonide Mid-Infrared LEDs for Thermal Scene Projection (Invited)**  
 » [John Prineas](#) (United States)<sup>1</sup> (1. University of Iowa)

11:15am **TuB2.3 - Is Mini-LED Ready for Prime Time? (Invited)**  
 » [Shin-Tson Wu](#) (United States)<sup>1</sup> (1. University of Central Florida)

10:15am **TuC2: Optical Sensing and Computational Imaging Systems**  
 Chaired by: John Murray-Bruce (United States) and Michael Rucci (United States)

10:15am **TuC2.1 - Enhancing Situational Awareness through Multiple Infrared Sensing Modalities and Machine Learning (Invited)**  
 » [Michael Eismann](#) (United States)<sup>1</sup> (1. Air Force Research Laboratory, Sensors Directorate)

10:45am **TuC2.2 - "Designing Cameras to Detect the "Invisible" : Towards Domain-Specific Computational Imaging (Invited)**  
 » [Felix Heide](#) (United States)<sup>1</sup> (1. Princeton University)





Continued from **Tuesday, 3 August**

- 11:15am **TuC2.3 - Optimizing Sensor Design Using a Time-limited Search Model for Moving Sensor**  
 » [Jennifer Hewitt](#) (United States)<sup>1</sup>, C. Kyle Renshaw (United States)<sup>2</sup>, Orges Furxhi (United States)<sup>3</sup>, Ronald Driggers (United States)<sup>4</sup> (1. CREOL, UCF, 2. UCF, 3. IMEC USA, 4. University of Arizona)
- 11:30am **TuC2.4 - Applying Gaussian Mixture Models to Detect Fish from Airborne LiDAR Measurements**  
 » [Trey Scofield](#) (United States)<sup>1</sup>, Jackson Belford (United States)<sup>1</sup>, James H. Churnside (United States)<sup>2</sup>, Michael R. Roddewig (United States)<sup>1</sup>, Joseph A. Shaw (United States)<sup>1</sup>, Bradley M. Whitaker (United States)<sup>1</sup> (1. Montana State University, 2. National Oceanic and Atmospheric Administration)
- 11:45am **TuC2.5 - Automated Detection of Insects in Lidar Data**  
 » [Trevor Vannoy](#) (United States)<sup>1</sup>, Kyle Rust (United States)<sup>1</sup>, Joseph Aist (United States)<sup>1</sup>, Riley Logan (United States)<sup>1</sup>, Elizabeth Rehbein (United States)<sup>1</sup>, Joseph A. Shaw (United States)<sup>1</sup>, Bradley M. Whitaker (United States)<sup>1</sup> (1. Montana State University)
- 12pm **TuC2.6 - Mid-Wave and Long-Wave Infrared Signature Model and Measurements of Power Lines Against Atmospheric Path Radiance**  
 » [Patrick Leslie](#) (United States)<sup>1</sup>, Orges Furxhi (United States)<sup>2</sup>, Robert Short (United States)<sup>3</sup>, Robert Grimming (United States)<sup>4</sup>, Ronald Driggers (United States)<sup>1</sup> (1. University of Arizona, 2. IMEC USA, 3. Redstone Test Center, 4. University of Central FI)
- 10:15am **TuD2: Infrared Organic Materials and Properties**  
 Chaired by: Jarrett Vella (United States) and Jason Azoulay (United States)
- 10:15am **TuD2.1 - Organic Up-conversion Imager for Infrared Light Imaging (Invited)**  
 » [NING LI](#) (United States)<sup>1</sup>, Tse Nga Ng (United States)<sup>1</sup> (1. University of California San Diego)

- 10:45am **TuD2.2 - Functional and Conformal Polymer Coatings via Initiated Chemical Vapor Deposition (Invited)**  
 » [Laura Bradley](#) (United States)<sup>1</sup> (1. University of Massachusetts Amherst)
- 11:15am **TuD2.3 - Topology and Ground State Control in Open-Shell Conjugated Polymers with Narrow Bandgaps (Invited)**  
 » [Kevin Mayer](#) (United States)<sup>1</sup> (1. University of Southern Mississippi)
- 11:45am **TuD2.4 - Linear Refractive Index Measurement From Visible to Infrared Region Using Common Path Interferometry**  
 » [Hao-Jung Chang](#) (United States)<sup>1</sup>, Natalia Munera (United States)<sup>1</sup>, Christian Keyser (United States)<sup>2</sup>, Scott Webster (United States)<sup>1</sup>, Eric W. Van Stryland (United States)<sup>1</sup>, David J. Hagan (United States)<sup>1</sup> (1. CREOL, The College of Optics and Photonics, University of Central Florida, 2. Air Force Research Laboratory)
- 10:15am **TuE2: Materials and Devices for Biosensing**  
 Chaired by: Ivan Lima (United States)
- 10:15am **TuE2.1 - Biosensing of Exosomal Collective Attributes for Cancer Screening (Invited)**  
 » [Dali Sun](#) (United States)<sup>1</sup>, Tony Hu (United States)<sup>2</sup> (1. North Dakota State University, 2. Tulane University School of Medicine)
- 10:45am **TuE2.2 - Porous silicon Optical Biosensors: Advances to Achieve Lower Detection Limits in Complex Media (Invited)**  
 » [Sharon Weiss](#) (United States)<sup>1</sup> (1. Vanderbilt University)
- 11:15am **TuE2.3 - Low-cost and Rapid micro-RNA Assay for Identification of Pancreatic Cancer**  
 » [Logeeshan Velmanickam](#) (United States)<sup>1</sup>, David Chang (United States)<sup>2</sup>, Ganepola Ganepola (United States)<sup>3</sup>, Dharmakeerthi Nawarathna (United States)<sup>1</sup> (1. North Dakota State University, 2. Valley Hospital, Paramus, NJ, 3. Department of Surgery, The Valley Hospital, Ridgewood, NJ,)



Continued from **Tuesday, 3 August**

11:45am **TuE2.4 - Characterization of the Binding Affinity of a Cancer Biomarker and Its Antibody Using Dielectrophoresis**  
 » Fleming Dackson Gudagunti (United States)<sup>1</sup>, Srilakshmi Gundlakunta (United States)<sup>1</sup>, Dharmakeerthi Nawarathna (United States)<sup>1</sup>, Ivan Lima (United States)<sup>1</sup> (1. North Dakota State University)

11:45am **Break**

12:15pm **Break**

12:15pm **Break**

12:15pm **Break**

12:15pm **Break**

1:15pm **TuA3: Integrated Quantum Photonics I**  
 Chaired by: Amit Agraval (United States) and Marcelo Devanco (United States)

1:15pm **TuA3.1 - Scalable Quantum Networks with Artificial Atoms (Invited)**  
 » Dirk Englund (United States)<sup>1</sup> (1. Massachusetts Institute of Technology)

1:45pm **TuA3.2 - Integrated Quantum Photonics Roadmap (Invited)**  
 » Galan Moody (United States)<sup>1</sup> (1. University of California at Santa Barbara)

2:15pm **TuA3.3 - Manipulating Quantum States of Photons on Integrated Photonic Chips (Invited)**  
 » Qiang Lin (United States)<sup>1</sup> (1. University of Rochester)

1:15pm **TuB3: Displays, Holography and Projection II**  
 Chaired by: Fouad Kiamilev (United States) and Justin Meadows (United States)

1:15pm **TuB3.1 - Next Generation Data Link for IRSP Systems**  
 » Daniel May (United States)<sup>1</sup>, Aaron Landwehr (United States)<sup>1</sup>, Tyler Browning (United States)<sup>1</sup>, Chase Cotton (United States)<sup>1</sup>, Fouad Kiamilev (United States)<sup>1</sup> (1. University of Delaware)

1:30pm **TuB3.2 - Further Enhancements to the PDP Architecture and State-of-the-art Results for High-speed IRSP Operation**  
 » Tyler Browning (United States)<sup>1</sup>, Daniel May (United States)<sup>2</sup>, Aaron Landwehr (United States)<sup>1</sup>, Fouad Kiamilev (United States)<sup>1</sup> (1. University of Delaware, 2. Univ)

1:45pm **TuB3.3 - Development of a Scalable Testing Platform for Read-In Integrated Circuit LED Wafers**  
 » Jaclyn Singh (United States)<sup>1</sup>, Fouad Kiamilev (United States)<sup>1</sup>, Miguel Hernandez (United States)<sup>1</sup>, Aaron Landwehr (United States)<sup>1</sup>, Tyler Browning (United States)<sup>1</sup> (1. University of Delaware)

2pm **TuB3.4 - Hardware Modifications for Controlling Duty Cycle to Reduce LED Power in Existing Infrared LED Scene Projectors**  
 » Alexis Deputy (United States)<sup>1</sup>, Fouad Kiamilev (United States)<sup>1</sup>, Andrea Waite (United States)<sup>1</sup> (1. University of Delaware)

2:15pm **TuB3.5 - Transitioning the worlds first 1Kx1K Infrared LED Scene Projector Systems from Research and Development (R&D) to Production Level**  
 » Hamzah Ahmed (United States)<sup>1</sup>, Alexis Deputy (United States)<sup>1</sup>, Jaclyn Singh (United States)<sup>1</sup>, Miguel Hernandez (United States)<sup>1</sup>, Aaron Landwehr (United States)<sup>1</sup>, Christopher Jackson (United States)<sup>1</sup>, Tyler Browning (United States)<sup>1</sup>, Tianne Lassiter (United States)<sup>1</sup>, Casey Campbell (United States)<sup>1</sup>, Benjamin Steenkamer (United States)<sup>2</sup>, Rodney McGee (United States)<sup>1</sup>, Andrea Waite (United States)<sup>1</sup>, Fouad Kiamilev (United States)<sup>1</sup>, John Prineas (United States)<sup>3</sup>, Matt Bellus (United States)<sup>4</sup>, Logan Nichols (United States)<sup>4</sup> (1. University of Delaware, 2. Chip Design Systems LLC, 3. University of Iowa, 4. Firefly Photonics)



Continued from **Tuesday, 3 August**

2:30pm **TuB3.6 - Multi-Close Support Electronic's(CSE) Test Bed for Infrared Scene Projector Systems**

» [Tianne Lassiter](#) (United States)<sup>1</sup>, Garret Ejzak (United States)<sup>1</sup>, Aaron Landwehr (United States)<sup>1</sup>, Casey Campbell (United States)<sup>1</sup>, Tyler Browning (United States)<sup>1</sup>, Daniel May (United States)<sup>1</sup>, Miguel Hernandez (United States)<sup>1</sup>, Rodney McGee (United States)<sup>1</sup>, Andrea Waite (United States)<sup>1</sup>, Fouad Kiamilev (United States)<sup>1</sup> (1. University of Delaware)

1:15pm **TuC3: RF Photonics and Microwave Devices I**

Chaired by: Yifei Li (United States) and Sang-Yeon Cho (United States)

1:15pm **TuC3.1 - Analog Photonic Systems: Features & Techniques to Optimize Performance (Invited)**

» [Edward Ackerman](#) (United States)<sup>1</sup> (1. Photonic Systems, Inc.)

1:45pm **TuC3.2 - Ultra-narrow Linewidth Lasers and Microcombs Based on Self-injection Locking in Integrated Photonics (Invited)**

» [John Bowers](#) (United States)<sup>1</sup>, Lin Chang (United States)<sup>2</sup>, Kerry Vahala (United States)<sup>3</sup>, Boqiang Shen (United States)<sup>3</sup>, Tobias Kippenberg (Switzerland)<sup>4</sup>, Junqiu Liu (Switzerland)<sup>4</sup> (1. UCSB, 2. University of California Santa Barbara, 3. Caltech, 4. EPFL)

2:15pm **TuC3.3 - Microwave Photonics for Optimized Wideband Sensor Data Distribution (Invited)**

» [Charles Middleton](#) (United States)<sup>1</sup>, Micah Jenkins (United States)<sup>1</sup> (1. Critical Frequency Design)

2:45pm **TuC3.4 - Space Test of Photonic Integrated Materials and Devices (Invited)**

» [Tingyi Gu](#) (United States)<sup>1</sup>, Dennis Prather (United States)<sup>1</sup> (1. University of Delaware)

1:15pm **TuD3: Non-epitaxial Optoelectronics Materials and Devices**

Chaired by: Sukrith Dev (United States)

1:15pm **TuD3.1 - HgTe Colloidal Quantum Dot Infrared Detectors (Invited)**

» [Philippe Guyot-Sionnest](#) (United States)<sup>1</sup> (1. The University of Chicago)

1:45pm **TuD3.2 - Optoelectronics of Colloidal Quantum Wells: Laser and Near-Infrared Applications (Invited)**

» [Benjamin Diroll](#) (United States)<sup>1</sup> (1. Center for Nanoscale Materials, Argonne National Laboratory)

2:15pm **TuD3.3 - Luminescence Thermometry for Detection of Optical Cooling from Colloidal Quantum Dots Embedded in Dielectric Waveguides**

» Mark Reymatias (United States)<sup>1</sup>, Shruti Gharde (United States)<sup>1</sup>, Arjun Senthil (United States)<sup>1</sup>, Landon Schmucker (United States)<sup>1</sup>, Gema Alas (United States)<sup>1</sup>, Rafael Castro (United States)<sup>1</sup>, DeYannah Walker (United States)<sup>1</sup>, Adreanna Rael (United States)<sup>1</sup>, Nathan Withers (United States)<sup>1</sup>, Alexander Neumann (United States)<sup>1</sup>, Sergei Ivanov (United States)<sup>2</sup>, John Watt (United States)<sup>2</sup>, Dale Huber (United States)<sup>3</sup>, Gennady Smolyakov (United States)<sup>1</sup>, [Marek Osinski](#) (United States)<sup>1</sup> (1. University of New Mexico, 2. Los Alamos National Laboratory, 3. Sandia National Labs)

1:15pm **TuE3: Human State Measurement**

Chaired by: Steve Kim (United States) and Anil Raj (United States)

1:15pm **TuE3.1 - Soft Electronic and Microfluidic Devices for Human State Measurements (Invited)**

» [John Rogers](#) (United States)<sup>1</sup> (1. Northwestern University)

1:45pm **TuE3.2 - Physically-Secure Low-Power Human State Measurement using EQS-HBC and Edge-Analytics (Invited)**

» Arunashish Datta (United States)<sup>1</sup>, [Shreyas Sen](#) (United States)<sup>1</sup> (1. Purdue University)

2:15pm **Break**

2:45pm **Break**

2:45pm **Break**

Continued from **Tuesday, 3 August**2:45pm **Break**3:15pm **Break**

3:30pm **TuA4: Integrated Quantum Photonics II**  
 Chaired by: Amit Agraval (United States) and Marcelo Devanco (United States)

3:30pm **TuA4.1 - Nanophotonic Telecom Spin-photon Interface with Long-lived Qubits (Invited)**  
 » [Tian Zhong](#) (United States)<sup>1</sup> (1. The University of Chicago)

4pm **TuA4.2 - Silicon Quantum Photonic Integrated Circuits Comprising Superconducting Nanostripe Single-Photon Detectors**  
 » [Sami Nazib](#) (United States)<sup>1</sup>, [Troy Hutchins-Delgado](#) (United States)<sup>1</sup>, [Hosuk Lee](#) (United States)<sup>1</sup>, [Mark Reymatias](#) (United States)<sup>1</sup>, [Loic Djamen Tchabda](#) (United States)<sup>1</sup>, [Genyu Chen](#) (United States)<sup>2</sup>, [Erika Sommer](#) (United States)<sup>1</sup>, [Petra Peirce](#) (United States)<sup>1</sup>, [Benjamin Utzinger](#) (United States)<sup>1</sup>, [Aadit Sharma](#) (United States)<sup>1</sup>, [Nathan Withers](#) (United States)<sup>1</sup>, [John Nogan](#) (United States)<sup>3</sup>, [Tzu-Ming Lu](#) (United States)<sup>3</sup>, [Ivan Komissarov](#) (United States)<sup>2</sup>, [Roman Sobolewski](#) (United States)<sup>2</sup>, [Arash Mafi](#) (United States)<sup>1</sup>, [Marek Osinski](#) (United States)<sup>1</sup> (1. University of New Mexico, 2. University of Rochester, 3. Sandia National Labs)

4:30pm **TuA4.3 - Mie Resonance Based Quantum Optical Circuits Integrated with on-chip Single Photon Source Array for Quantum Information Processing**  
 » [Swarnabha Chattaraj](#) (United States)<sup>1</sup>, [Jiefei Zhang](#) (United States)<sup>2</sup>, [Siyuan Lu](#) (United States)<sup>3</sup>, [Anupam Madhukar](#) (United States)<sup>1</sup> (1. University of Southern California, 2. Univ of Southern California, 3. IBM Thomas J. Watson Research Center)

5pm **TuA4.4 - Assembling a Diamond MASER**  
 » [Anand Patel](#) (India)<sup>1</sup>, [Zainab Chowdhry](#) (India)<sup>2</sup>, [Anil Prabhakar](#) (India)<sup>1</sup>, [Vidya Praveen Bhallamudi](#) (India)<sup>3</sup> (1. Dept. of Electrical Engineering, Indian Institute of Technology, Madras, 2. Dept. of Physics, Indian Institute of Technology, Madras, 3. Dept. of Physics and Electrical Engineering, Indian Institute of Technology, Madras)

3:30pm **TuB4: Optical Methods for Characterizing Propulsion**  
 Chaired by: Will Lewis (United States) and Steven Chambreau (United States)

3:30pm **TuB4.1 - Controlled Chemistry Through Merging of Two Droplets in an Acoustic Levitator Via Low-Frequency Modulation of the Carrier Wave (Invited)**  
 » [Ralf I. Kaiser](#) (United States)<sup>1</sup>, [Stephen J Brotton](#) (United States)<sup>1</sup> (1. University of Hawaii at Manoa)

4pm **TuB4.2 - Laser Diagnostics Measurements in an Aircraft Combustor (Invited)**  
 » [Nicholas Rock](#) (United States)<sup>1</sup> (1. Spectral Energies, LLC)

4:30pm **TuB4.3 - Application of Advanced Laser Diagnostics for Measurements in High-Pressure Propulsion Test Rigs (Invited)**  
 » [Robert Lucht](#) (United States)<sup>1</sup>, [Carson Slabaugh](#) (United States)<sup>1</sup> (1. Purdue University)

5pm **TuB4.4 - Following Chemical Pathways with Isomeric Resolution: Photoionization Tools for Understanding Endothermic Fuel Conversion (Invited)**  
 » [David Osborn](#) (United States)<sup>1</sup>, [John Savee](#) (United States)<sup>2</sup>, [Nils Hansen](#) (United States)<sup>1</sup>, [Jonathan Frank](#) (United States)<sup>1</sup>, [Coleman Kronawitter](#) (United States)<sup>3</sup>, [Ambarish Kulkarni](#) (United States)<sup>3</sup> (1. Sandia National Labs, 2. KLA Corporation, 3. University of California Davis)

3:30pm **TuC4: RF Photonics and Microwave Devices II**  
 Chaired by: Yifei Li (United States) and Sang-Yeon Cho (United States)



Continued from **Tuesday, 3 August**

- 3:30pm **TuC4.1 - Integrated Microwave Photonic Subsystems (Invited)**  
 » [Siva Yegnanarayanan](#) (United States)<sup>1</sup>, Dave Kharas (United States)<sup>1</sup>, Jason Plant (United States)<sup>1</sup>, Matthew Ricci (United States)<sup>1</sup>, Siddhartha Ghosh (United States)<sup>1</sup>, Cheryl Sorace-Agaskar (United States)<sup>1</sup>, Paul Juodawlakis (United States)<sup>1</sup> (1. MIT Lincoln Laboratory)
- 4pm **TuC4.2 - Coherent Amplitude-Modulated RF Photonic Link**  
 » [Jeffrey Rodriguez](#) (United States)<sup>1</sup>, Michael Benker (United States)<sup>2</sup>, Jason Poirier (United States)<sup>2</sup>, Yifei Li (United States)<sup>3</sup> (1. University of Massachusetts Dartmouth, Naval Undersea Warfare Center (NUWC/DIVNPT), 2. University of Massachusetts Dartmouth, 3. University of Massachusetts Dartmouth)
- 4:30pm **TuC4.3 - Data-Driven Complementary Power Measurement for Microwave Instantaneous Frequency Estimation**  
 » [Qidi Liu](#) (United States)<sup>1</sup>, Mable Fok (United States)<sup>1</sup> (1. University of Georgia)
- 5pm **TuC4.4 - Microresonator-switch-based Silicon-Photonic Truetime-delay Beamforming Circuit for RF Phased-array Antennas**  
 » [Sang-Yeon Cho](#) (United States)<sup>1</sup>, Stephen Anderson (United States)<sup>1</sup>, Weimin Zhou (United States)<sup>1</sup> (1. U. S. Army Research Laboratory)
- 3:30pm **TuD4: Nonlinear Organic Materials**  
 Chaired by: Tod Grusenmeyer (United States) and Ryan O'Donnell (United States)
- 3:30pm **TuD4.1 - Cross-sections for 2 Photon Excitation of Molecular Fluorophores Measured with Classical and Nonclassical Light (Invited)**  
 » [Ralph Jimenez](#) (United States)<sup>1</sup> (1. JILA/NIST)
- 4pm **TuD4.2 - Excited-State Properties of (Alkynyl)Gold(I) Fluorenyls**  
 » [Thomas Gray](#) (United States)<sup>1</sup> (1. Case Western Reserve University)

- 3:30pm **TuE4: Human Analyst Augmentation**  
 Chaired by: Regina Shia (United States) and Andy McKinley (United States)

- 3:30pm **TuE4.1 - Why Next Generation Eye Movement and Pupil Size Sensors Will Change Human-agent Teaming (Invited)**  
 » [Russell Cohen Hoffing](#) (United States)<sup>1</sup> (1. U.S. Army Combat Capabilities Development Command)

- 4pm **TuE4.2 - The Use of Eye Gaze and Head Pointing for Cursor Control on Large Area Displays (LADs) (Invited)**  
 » [Thomas Schnell](#) (United States)<sup>1</sup> (1. Operator Performance Laboratory (OPL))

**Wednesday, 4 August**

- 8am **WA1: Modeling and Simulation for Advanced Photonics**  
 Chaired by: Simeon Trendafilov (United States)

- 8am **WA1.1 - Rapidly Designing Multi-Functional Optical Elements with Artificial Neural Networks (Invited)**  
 » [Matthew Mills](#) (United States)<sup>1</sup>, Ighodalo Idehenre (United States)<sup>2</sup> (1. Air Force Research Laboratory, 2. AFRL)

- 8:30am **WA1.2 - Numerical Investigation of Confinement Losses in Semiconductor-core Optical Fibers**  
 » [Mustafa Waqar Syed](#) (Turkey)<sup>1</sup>, Ahmet Emin Akosman (United States)<sup>2</sup>, [Mustafa Ordu](#) (Turkey)<sup>1</sup> (1. Bilkent University, 2. Roger Williams University)

- 8am **WB1: Novel Materials for Photonics**  
 Chaired by: John Boeckl (United States) and Tyson Back (United States)

- 8am **WB1.1 - Scalable Synthetic Strategies Towards Sensors based on 2D Materials and Heterostructures (Invited)**  
 » [Nicholas Glavin](#) (United States)<sup>1</sup> (1. Air Force Research Laboratory)



Continued from **Wednesday, 4 August**

8:30am **WB1.2 - Electrical and Optical Properties of Vanadium Oxide Thin Films: Substrate Dependence Study (Invited)**

» [Andrew Sarangan](#) (United States)<sup>1</sup>, Dana Dement (United States)<sup>2</sup>, David Lombardo (United States)<sup>1</sup>, Kent Hallman (United States)<sup>2</sup>, Cong Deng (United States)<sup>1</sup>, Neset Akozbek (United States)<sup>3</sup> (1. University of Dayton, 2. Blue Halo, 3. Blue)

9am **WB1.3 - Optical 3D Printing of Transparent Fused Silica Glass (Invited)**

» [Frederik Kotz](#) (Germany)<sup>1</sup> (1. Glassomer GmbH)

8am **WC1: Lasers/Emitters**

Chaired by: Daniel Wasserman (United States) and Daehwan Jung (Korea, Republic of)

8am **WC1.1 - III-V Quantum Dot Devices on Silicon Platform (Invited)**

» [Huiyun Liu](#) (United Kingdom)<sup>1</sup> (1. University College of London)

8:30am **WC1.2 - Progress in High Brightness MWIR and LWIR Broad-area Quantum Cascade Lasers (Invited)**

» [ARKADIY LYAKH](#) (United States)<sup>1</sup> (1. University of Central Florida)

9am **WC1.3 - MBE Growth and Characterization of InAlGaAs/GaAs Quantum Dots**

» [Riazul Arefin](#) (United States)<sup>1</sup>, Seunghyun Lee (United States)<sup>1</sup>, Hyemin Jung (United States)<sup>1</sup>, Jaedu Ha (Korea, Republic of)<sup>2</sup>, Jong Su Kim (Korea, Republic of)<sup>2</sup>, Sanjay Krishna (United States)<sup>1</sup>, Shamsul Arafin (United States)<sup>1</sup> (1. Ohio State University, 2. Yeungnam University)

9:15am **WC1.4 - Random Laser Dynamics in Disordered and Semi-ordered Cavities**

» [Zachariah Peterson](#) (United States)<sup>1</sup> (1. Northwest Engineering Solutions)

9:30am

**WC1.5 - High Temperature DBR Laser Diodes for Quantum Sensing Applications**

» [Preston Young](#) (United States)<sup>1</sup>, Linglin Jiang (United States)<sup>2</sup>, Annie Xiang (United States)<sup>2</sup> (1. Photodigm Inc., 2. Photodigm Inc.)

8am

**WD1: Spectral, Polarimetric, and Multimodal Imaging**

Chaired by: Jason Zeibel (United States) and Jacob Martin (United States)

8am

**WD1.1 - Status of the IEEE P4001 Working Group for Standardization in Hyperspectral Imaging (Invited)**

» [Torbjorn Skauli](#) (Norway)<sup>1</sup>, John R. Gilchrist (United Kingdom)<sup>2</sup>, Christopher Durell (United States)<sup>3</sup> (1. University of Oslo, 2. Clyde Hyperspectral Imaging & Technology Ltd., 3. Labsphere, Inc.)

8:30am

**WD1.2 - Compact UAV Mounted Visible through Extended SWIR Hyperspectral Imager Developed for Earth Science, Climate and Agricultural Research (Invited)**

» [Bridget Tannian](#) (United States)<sup>1</sup>, Neil Goldstein (United States)<sup>1</sup>, Marsha Fox (United States)<sup>1</sup>, Megan Stark (United States)<sup>1</sup>, Richard Zacaroli (United States)<sup>2</sup>, Steve Richtsmeier (United States)<sup>1</sup> (1. Spectral Sciences, Inc., 2. Corning, Inc.)

9am

**WD1.3 - Full-Resolution Two-Color Infrared Detector**

» [Evan Anderson](#) (United States)<sup>1</sup>, DeAnna Campbell (United States)<sup>1</sup>, Jayson Briscoe (United States)<sup>1</sup>, Wesley Coon (United States)<sup>1</sup>, Charles Alford (United States)<sup>1</sup>, Michael Wood (United States)<sup>1</sup>, John Klem (United States)<sup>1</sup>, Phillip Gamache (United States)<sup>1</sup>, Mark Gunter (United States)<sup>1</sup>, Johnathan Olesberg (United States)<sup>1</sup>, Samuel Hawkins (United States)<sup>1</sup>, Lauren Rohwer (United States)<sup>1</sup>, Chad Stephenson (United States)<sup>1</sup>, David Peters (United States)<sup>1</sup>, Michael Goldflam (United States)<sup>1</sup> (1. Sandia National Labs)

8am

**WE1: Plasmonic Devices and Applications**

Chaired by: Monica Allen (United States)



Continued from **Wednesday, 4 August**

- 8am **WE1.1 - Plasmonic Response in Three-Dimensional Meta-Films (Invited)**  
 » [Michael Goldflam](#) (United States)<sup>1</sup>, Katherine Musick (United States)<sup>1</sup>, Paul Resnick (United States)<sup>1</sup>, Eric Whiting (United States)<sup>2</sup>, Sawyer Campbell (United States)<sup>2</sup>, Lei Kang (United States)<sup>2</sup>, Michael Sinclair (United States)<sup>1</sup>, Douglas Werner (United States)<sup>2</sup>, Bruce Burckel (United States)<sup>1</sup> (1. Sandia National Labs, 2. Pennsylvania State University)
- 8:30am **WE1.2 - 2D Materials for Flat Optics and IR Photonics (Invited)**  
 » [Jinghua Teng](#) (Singapore)<sup>1</sup> (1. Institute of Materials Research and Engineering (IMRE), A\*STAR)
- 9am **WE1.3 - Mid Infrared Surface Relief Photonic Devices using High-Index Contrast Amorphous Germanium Sub-wavelength Structures (Invited)**  
 » Lal Krishna A.S (India)<sup>1</sup>, [Varun Raghunathan](#) (India)<sup>1</sup> (1. ECE department, Indian Institute of Science)
- 9:30am **WE1.4 - Estimation of Complex Fields From Far-field Measurements Using Neural Networks (Invited)**  
 » [Sushil Mujumdar](#) (India)<sup>1</sup>, Sandip Mondal (India)<sup>1</sup> (1. Tata Institute of Fundamental Research, Mumbai)
- 9:45am **WE1.5 - Constructal Theory Modeling of Colloidal Particle Assembly (Invited)**  
 » [Scott Bukosky](#) (United States)<sup>1</sup>, Sukrith Dev (United States)<sup>1</sup>, Monica Allen (United States)<sup>1</sup>, Jeffery Allen (United States)<sup>1</sup> (1. Air Force Research Laboratory)
- 10am **WE1.6 - Chip-Scale and Tunable Flat-Top Surface Plasmon Polaritons Band-pass Filter at Optical Channels**  
 » [Seyed Morteza Ebadi](#) (Sweden)<sup>1</sup>, Jonas Örtengren (Sweden)<sup>1</sup> (1. Mid Sweden University)
- 8am **WF1: Instrumentation and Control for Test and Evaluation**  
 Chaired by: Jon Harris (United States) and Andreas Keipert (United States)

- 8am **WF1.1 - Non-Linear Futures of Test Science (Invited)**  
 » [Brett Pokines](#) (United States)<sup>1</sup> (1. AFOSR)
- 8:30am **WF1.2 - Traceable Authentication for Cybersecurity of Electronic Devices (TRACED) (Invited)**  
 » [Jason Vosatka](#) (United States)<sup>1</sup>, Jeffery Allen (United States)<sup>2</sup>, Monica Allen (United States)<sup>2</sup>, Mark Tehranipoor (United States)<sup>3</sup> (1. University of Florida, 2. Air Force Research Laboratory, 3. University of Flor)
- 9am **WF1.3 - Testing and Evaluation of an Improved Infrared Scene Projector**  
 » [Casey Campbell](#) (United States)<sup>1</sup>, Alexis Deputy (United States)<sup>1</sup>, Jaclyn Singh (United States)<sup>1</sup>, Fouad Kiamilev (United States)<sup>1</sup>, Hamzah Ahmed (United States)<sup>1</sup>, Rodney McGee (United States)<sup>1</sup> (1. University of Delaware)
- 9:15am **WF1.4 - Architectural Design of Close Support Electronics to Expand Functionality of Superlattice LED Infrared Scene Projectors**  
 » [Christopher Jackson](#) (United States)<sup>1</sup>, Miguel Hernandez (United States)<sup>1</sup>, Aaron Landwehr (United States)<sup>1</sup>, Tianne Lassiter (United States)<sup>1</sup>, Fouad Kiamilev (United States)<sup>1</sup> (1. University of Delaware)
- 9:30am **WF1.5 - Effect of temperature on a widely range GHz Passive Mode Locked Fiber Laser**  
 » [Mario Cortijo Munuera](#) (Spain)<sup>1</sup> (1. DAS Photonics)
- 9:45am **WF1.6 - Built-In-Test for Fiber Optic Links**  
 » [John Mazurowski](#) (United States)<sup>1</sup>, Charles Kuznia (United States)<sup>2</sup>, Mark Beranek (United States)<sup>3</sup> (1. Penn State Applied Research Laboratory, 2. Ultra-Communications Inc., 3. Naval Air Warfare Center Aircraft Division)
- 8:45am **Untitled Event**
- 9:15am **Break**
- 9:30am **Break**
- 9:45am **Break**

Continued from **Wednesday, 4 August**

- 10am **Break**
- 10:15am **WA2: Synthesis and Fabrication of 2D Materials**  
Chaired by: Nicholas Glavin (United States) and Michael Cai Wang (United States)
- 10:15am **WA2.1 - Heterostructures for Advanced Logic, Memory and Photonics (Invited)**  
» [Deep Jariwala](#) (United States)<sup>1</sup> (1. University of P)
- 10:45am **WA2.2 - 2D Nanomaterial Electrodes for Supercapacitors (Invited)**  
» [Jayan Thomas](#) (United States)<sup>1</sup>, Deepak Pandey (United States)<sup>1</sup>, Kowsik Sambath Kumar (United States)<sup>1</sup> (1. University of Central Florida)
- 11:15am **WA2.3 - Characterization and Analysis of Large-Area h-BN on Sapphire**  
» [Shantanu Saha](#) (United States)<sup>1</sup>, Anthony Rice (United States)<sup>2</sup>, Arnob Ghosh (United States)<sup>1</sup>, Syed Mohammad Najib Hasan (United States)<sup>1</sup>, Weicheng You (United States)<sup>1</sup>, Mary Crawford (United States)<sup>2</sup>, Luke Bissell (United States)<sup>3</sup>, Robert Bedford (United States)<sup>3</sup>, Shamsul Arafin (United States)<sup>1</sup> (1. Ohio State University, 2. Sandia National Labs, 3. Air Force Research Laboratory)
- 10:15am **WB2: Semiconductor Materials and Quantum Nanoscience**  
Chaired by: Kurt Eyink (United States) and Parag Deotare (United States)
- 10:15am **WB2.1- Single Photon Emitter Arrays for On-chip Quantum Photonics (Invited)**  
» [Anupam Madhukar](#) (United States)<sup>1</sup>, Jiefei Zhang (United States)<sup>2</sup>, Qi Huang (United States)<sup>2</sup>, Swarnabha Chattaraj (United States)<sup>1</sup>, Lucas Jordao (United States)<sup>1</sup>, Siyuan Lu (United States)<sup>3</sup> (1. University of Southern California, 2. Univ of Southern California, 3. IBM Thomas J. Watson Research Center)
- 10:45am **WB2.2- Photonic Engineering of Atomic Sensors (Invited)**  
» [Jennifer Choy](#) (United States)<sup>1</sup> (1. University of Wisconsin - Madison)

- 11:15am **WB2.3- Two-dimensional Electronic Order Stabilized in Clean Polytype Heterostructures (Invited)**  
» [Robert Hovden](#) (United States)<sup>1</sup>, Suk Hyun Sung (United States)<sup>1</sup>, Noah Schnitzer (United States)<sup>2</sup>, Steve Novakov (United States)<sup>1</sup>, Ismail El Baggari (United States)<sup>3</sup>, Jiseok Gim (United States)<sup>4</sup>, Nguyen Vu (United States)<sup>1</sup>, Todd Brintlinger (United States)<sup>5</sup>, Yuping Sun (China)<sup>6</sup>, Parag Deotare (United States)<sup>1</sup>, Kai Sun (United States)<sup>1</sup>, Liuyan Zhao (United States)<sup>1</sup>, Lena Kourkoutis (United States)<sup>2</sup>, John Heron (United States)<sup>1</sup> (1. University of Michigan, 2. Cornell University, 3. Harvard University, 4. gjiseok@umich.edu, 5. US Naval Research Laboratory, 6. Chinese Academy of Sciences)
- 11:45am **WB2.4 - Non-degenerate Two-photon Absorption Spectroscopy of Bulk Silicon**  
» [Sanaz Faryadras](#) (United States)<sup>1</sup>, Nicholas Cox (United States)<sup>1</sup>, David J. Hagan (United States)<sup>1</sup>, Eric W. Van Stryland (United States)<sup>1</sup> (1. CREOL, The College of Optics and Photonics, University of Central Florida)
- 10:15am **WC2: UV Optoelectronics**  
Chaired by: Babak Nikoobakht (United States)
- 10:15am **WC2.1 - UV-C and Far UV-C Optoelectronics: Current Status, Prospects and Challenges (Invited)**  
» [Zetian Mi](#) (United States)<sup>1</sup> (1. University of Michigan)
- 10:45am **WC2.2 - Biomedical and Biotechnology Applications of Deep Ultraviolet Light Emitting Diodes (Invited)**  
» [Michael Shur](#) (United States)<sup>1</sup> (1. Rensselaer Polytechnic Institute)
- 11:15am **WC2.3 - Properties of AlGaIn Based UVC Detectors (Invited)**  
» [Ronny Kirste](#) (United States)<sup>1</sup>, Pramod Reddy (United States)<sup>1</sup>, Seiji Mita (United States)<sup>1</sup>, Will Mecouch (United States)<sup>1</sup>, Ramon Collazo (United States)<sup>2</sup>, Zlatko Sitar (United States)<sup>2</sup> (1. Adroit Materials, 2. North Carolina State University)





Continued from **Wednesday, 4 August**

11:45am **WC2.4 - High-Performance GaN-Based Ultraviolet Photon Detection Technology**  
 » [Russell Dupuis](#) (United States)<sup>1</sup>, Shyh-Chiang Shen (United States)<sup>1</sup>, Theeradetch Detchprohm (United States)<sup>1</sup>, Marzieh Bakhtiary-Noodeh (United States)<sup>1</sup>, Minkyu Cho (United States)<sup>1</sup>, Hoon Jeong (United States)<sup>1</sup>, Zhiyu Xu (United States)<sup>1</sup>, Nepomuk Otte (United States)<sup>1</sup> (1. Georgia Institute of Technology)

12pm **WC2.5 - Excitonic Emission Dynamics at Cryogenic- and Above Room Temperature in High Brightness Sub-micron Fin LED and Lasers**  
 » [Babak Nikoobakht](#) (United States)<sup>1</sup>, Yuqin Zong (United States)<sup>1</sup>, Amit Agraval (United States)<sup>1</sup>, Michael Shur (United States)<sup>2</sup> (1. National Institute of Standards and Technology, 2. Rensselaer Polytechnic Insitute)

10:15am **WD2: RF and Optical Target Imaging, Identification, and Pattern Recognition**  
 Chaired by: Matthew Burfeindt (United States) and Jerome Cuenca (United States)

10:15am **WD2.1 - Low-coherence Lasers for High-resolution Imaging of Dynamic Targets (Invited)**  
 » [Austin Steinforth](#) (United States)<sup>1</sup>, J. Gary Eden (United States)<sup>1</sup> (1. University of Illinois)

10:45am **WD2.2 - Direct Sampling Algorithms Based on the Factorization Method for Inverse Scattering (Invited)**  
 » [Isaac Harris](#) (United States)<sup>1</sup> (1. Purdue University)

11:15am **WD2.3 - Receive-beamforming-enhanced Linear Sampling Method Imaging**  
 » [Matthew Burfeindt](#) (United States)<sup>1</sup>, Hatim Alqadah (United States)<sup>1</sup> (1. US Naval Research Laboratory)

10:15am **Break**

10:15am **WF2: Photonics and Future Warfighter Operational Concepts**  
 Chaired by: Mark Schmitt (United States) and Stephen Davis (United States)

10:15am **WF2.1 - Heterogeneous Integrated Sparse Optical Phased Array for Free-Space Optical Communications**  
 » [Hui Wu](#) (United States)<sup>1</sup>, Wuxiucheng Wang (United States)<sup>1</sup>, Ming Gong (United States)<sup>1</sup>, Andy Sacco (United States)<sup>2</sup>, Daniel Newman (United States)<sup>2</sup>, Daniel Sundberg (United States)<sup>2</sup>, David Naghski (United States)<sup>2</sup>, Bob Henchen (United States)<sup>2</sup> (1. University of Rochester, 2. L3Harris Space and Airborne Systems)

10:45am **WF2.2 - Hybrid Chalcogenide-Polymer Coherent Fiber Bundles for MWIR Imaging**  
 » [Cesar Lopez-Zelaya](#) (United States)<sup>1</sup>, Li Zhang (United States)<sup>1</sup>, Anthony Badillo (United States)<sup>1</sup>, Felix Tan (United States)<sup>1</sup>, Joshua Kaufman (United States)<sup>1</sup>, C. Kyle Renshaw (United States)<sup>1</sup> (1. UCF)

11:15am **WF2.3 - Silicon-on-insulator Metasurface Aberration Corrector Inverse Design for Mid-infrared Imaging**  
 » [Ko-Han Shih](#) (United States)<sup>1</sup>, C. Kyle Renshaw (United States)<sup>1</sup> (1. University of Central Florida, CREOL)

11:45am **WF2.4 - Future Applications of Photonics and Emerging Technologies for Security and Defense Using Drones in Africa**  
 » Kithinji Muriungi (Kenya)<sup>1</sup>, Elvis Oluoch (Kenya)<sup>2</sup>, [Chris Murimi](#) (Kenya)<sup>3</sup>, Beryl Chebet (Kenya)<sup>3</sup>, Samia Yahya (Kenya)<sup>3</sup>, George Mwenda (Kenya)<sup>4</sup>, Benard Ngoda (Kenya)<sup>3</sup>, Allan Kimeli (Kenya)<sup>3</sup> (1. KamsHub, 2. Engineers Board of Kenya, 3. Moi University, 4. Kenya Military Academy)

10:30am **WE2: Optical Metamaterials Based Devices and Applications**  
 Chaired by: Benjamin Braaten (United States) and Sayan Roy (United States) and Dipankar Mitra (United States)

10:30am **WE2.1 - Beam Pattern Reconfiguration of a Planar Yagi-Uda Antenna Using PIN Diodes (Invited)**  
 » [Grant Gourley](#) (United Kingdom)<sup>1</sup>, Maksim Kuznetsov (United Kingdom)<sup>1</sup>, Dimitris Anagnostou (United Kingdom)<sup>1</sup> (1. Heriot Watt University)



Continued from **Wednesday, 4 August**

- 11am **WE2.2 - Characteristic Mode Analysis for Analyzing and Optimizing Plasmonic Nanostructures (Invited)**  
» [Ahmed Hassan](#) (United States)<sup>1</sup>, Sumitra Dey (United States)<sup>1</sup> (1. University of Missouri-Kansas City)
- 11:30am **WE2.3 - An Electromagnetically Transparent and Microbial Corrosion Resistant Nanoscale Protective Coating (Invited)**  
» Ahsan Aqueeb (United States)<sup>1</sup>, Venkataramana Gadhamshetty (United States)<sup>1</sup>, [Sayan Roy](#) (United States)<sup>1</sup> (1. South Dakota School of Mines)
- 12pm **WE2.4 - Phased Array Scanning using Source Transformations (Invited)**  
» [Dipankar Mitra](#) (United States)<sup>1</sup> (1. North Dakota State University)
- 12:30pm **WE2.5 - On the Rotation of the Field from a Dipole using Transformation Electromagnetics**  
» [Dipankar Mitra](#) (United States)<sup>1</sup>, Benjamin Braaten (United States)<sup>1</sup>, Jeffery Allen (United States)<sup>2</sup>, Monica Allen (United States)<sup>2</sup> (1. North Dakota State University, 2. Air Force Research Laboratory)
- 11:45am **Break**
- 11:45am **Break**
- 12:15pm **Break**
- 12:15pm **Break**
- 12:15pm **Break**
- 1pm **Break**
- 1:15pm **WA3: Two Dimensional and Topological Materials**  
Chaired by: Galan Moody (United States) and Amber Reed (United States)

- 1:15pm **WA3.1 - Quantum Emitters in Two-dimensional Materials (Invited)**  
» [Chitraleema Chakraborty](#) (United States)<sup>1</sup> (1. Assistant Professor)
- 1:45pm **WA3.2 - Experimental Realization of Topological Quantum Materials (Invited)**  
» [Madhab Neupane](#) (United States)<sup>1</sup> (1. University of Central Florida)
- 1:15pm **WB3: Optical Metasurfaces and Applications I**  
Chaired by: Shiva Vangala (United States) and Jason Foley (United States)
- 1:15pm **WB3.1 - Infrared Metasurfaces in Meta-optics and Dynamic Reconfigurable Devices (Invited)**  
» [David Shrekenhamer](#) (United States)<sup>1</sup> (1. The Johns Hopkins University Applied Physics Laboratory)
- 1:45pm **WB3.2 - Multifunctional Resonant Wavefront-shaping Metasurfaces (Invited)**  
» [Nanfang Yu](#) (United States)<sup>1</sup> (1. COLUMBIA UNIVERSITY)
- 2:15pm **WB3.3 - All-Epitaxial Optoelectronic Metasurfaces (Invited)**  
» Leland Nordin (United States)<sup>1</sup>, Aaron Muhowski (United States)<sup>2</sup>, Priyanka Petluru (United States)<sup>2</sup>, Abhilasha Kamboj (United States)<sup>2</sup>, [Daniel Wasserman](#) (United States)<sup>3</sup> (1. University of Texas at Austin, 2. The University of Texas at Austin, 3. The University Texas at Austin)
- 2:45pm **WB3.4 - The Diffractive Deep Neural Network - A New Approach to Material Discovery (Invited)**  
» [Ighodalo Idehenre](#) (United States)<sup>1</sup>, Matthew Mills (United States)<sup>2</sup> (1. Air Force Research Laboratory, Materials Directorate, 2. Air Force Research Laboratory, Material Directorate)
- 1:15pm **WC3: High Peak and Average Power Lasers**  
Chaired by: Carl Liebig (United States) and Eric Rosenthal (United States) and Anthony Valenzuela (United States)



Continued from **Wednesday, 4 August**

1:15pm **WC3.1 - High Repetition Rate, High Energy, Ultrafast Lasers Based on Yb:YAG Cryo-cooled Amplifiers (Invited)**

» [Jorge Rocca](#) (United States)<sup>1</sup>, Yong Wang (United States)<sup>1</sup>, Han Chi (United States)<sup>1</sup>, Kristian Dehne (United States)<sup>2</sup>, Vladimir Chvykov (United States)<sup>1</sup>, Aaron Davenport (United States)<sup>1</sup>, Carmen Menoni (United States)<sup>3</sup> (1. Colorado State University, 2. XUV Lasers and Colorado State University, 3. Colorado State University and XUV Lasers)

1:45pm **WC3.2 - Optical Breakdown of Monolayer Transition-metal Dichalcogenides Induced by Femtosecond Laser (Invited)**

» [Tsing-Hua Her](#) (United States)<sup>1</sup>, Joel Solomon (United States)<sup>1</sup>, Hsin-Yu Yao (Taiwan)<sup>2</sup>, Li-Syuan Lu (Taiwan)<sup>3</sup>, Sabeeh Ahmad (United States)<sup>1</sup>, Wei-Chih Chiu (Taiwan)<sup>3</sup>, Che-Hao Chang (Taiwan)<sup>2</sup>, Shih-Chu Lin (Taiwan)<sup>3</sup>, Joseph Obeid (United States)<sup>1</sup>, Wen-Hao Chang (Taiwan)<sup>3</sup>, Chih-Wei Luo (Taiwan)<sup>3</sup> (1. The University of North Carolina at Charlotte, 2. National Tsing Hua University, 3. National Yang Ming Chiao Tung University)

2:15pm **WC3.3 - Anti-Resonant Hollow Core Fiber for High Power Laser Delivery**

» [Amy Van Newkirk](#) (United States)<sup>1</sup>, Julian Martinez Mercado (United States)<sup>2</sup>, Jose Antonio-Lopez (United States)<sup>3</sup>, Rodrigo Amezcua Correa (United States)<sup>4</sup>, Axel Schulzgen (United States)<sup>2</sup> (1. Penn State Applied Research Lab, 2. University of Central Florida, CREOL, 3. UCF, 4. CREOL, UCF)

1:15pm **WD3: Optical Detectors and Focal Plane Arrays I**

Chaired by: Elizabeth Steenbergen (United States) and David Ting (United States)

1:15pm **WD3.1 - Antimonide-Based Avalanche Photodiodes on InP Substrates (Invited)**

» [Sanjay Krishna](#) (United States)<sup>1</sup> (1. Ohio State University)

1:45pm **WD3.2 - Nano-Phototransistors Imaging Arrays (Invited)**

» [Hooman Mohseni](#) (United States)<sup>1</sup> (1. Northwestern University)

2:15pm **WD3.3 - Design of Infrared Thermoelectric Coupled Nanoantennas**

» Gergo Szakmany (United States)<sup>1</sup>, Alexei Orlov (United States)<sup>1</sup>, Gary Bernstein (United States)<sup>1</sup>, Wolfgang Porod (United States)<sup>1</sup>, [Edward Kinzel](#) (United States)<sup>1</sup> (1. University of Notre Dame)

2:45pm **WD3.4 - Mid-Infrared Photodetection Enhanced by Localized Surface Plasmon Resonance Assisted NiSi/Si Schottky Photodetectors**

» Hong-Jhang Syu (Taiwan)<sup>1</sup>, [Zih-Chun Su](#) (Taiwan)<sup>1</sup>, Ruei-Lien Sun (Taiwan)<sup>1</sup>, Hsin-Han Lai (Taiwan)<sup>1</sup>, Ching-Fuh Lin (Taiwan)<sup>1</sup> (1. Natinoal Taiwan University)

3:15pm **WD3.5 - Design of Solar Blind Photodetectors for Communication with Red Signal ( $\lambda = 650\text{nm}$ ) in Space. Part I**

» Sam Mil'shtein (United States)<sup>1</sup>, [Dhawal Asthana](#) (United States)<sup>1</sup>, Maksym Ushakov (United States)<sup>1</sup> (1. Advanced Electronic Technology Center, ECE Dept. UMass Lowell)

1:15pm **WE3: Resonant Photonic Lattices**

Chaired by: Ivan Avrutsky (United States)

1:15pm **WE3.1 - Nonlinearly-tunable Topological Photonic Lattices (Invited)**

» [Daniel Leykam](#) (Singapore)<sup>1</sup> (1. National University of Singapore)

1:45pm **WE3.2 - Gigantic Amplification and Directional Emission from Photopumped 2D-Material Metasurfaces (Invited)**

» [Pai-Yen Chen](#) (United States)<sup>1</sup> (1. University of Illinois at Chicago)

2:15pm **WE3.3 - Progress in LWIR Dielectric Metasurface Tunable Notch Filters (Invited)**

» [Neelam Gupta](#) (United States)<sup>1</sup>, Robert Magnusson (United States)<sup>2</sup>, Yeong Ko (United States)<sup>2</sup>, Kyu Lee (United States)<sup>2</sup>, Junyeob Song (United States)<sup>3</sup> (1. DEVCOM Army Research Laboratory, 2. UTA, 3. UD)



Continued from **Wednesday, 4 August**

2:45pm **WE3.4 - Coupled Modes in Metal-insulator-metal Plasmonic Structures (Invited)**  
 » [Ricky Gibson](#) (United States)<sup>1</sup>, Ivan Avrutsky (United States)<sup>2</sup>, Shiva Vangala (United States)<sup>1</sup>, Dennis Walker (United States)<sup>1</sup>, Joshua Hendrickson (United States)<sup>1</sup> (1. Air Force Research Laboratory, Sensors Directorate, 2. Wayne State University)

1:15pm **WF3: EO/IR/LADAR**  
 Chaired by: David Rabb (United States) and Brian Stadler (United States)

1:15pm **WF3.1 - Geiger-mode 3D Imaging Lidar: Connecting System Capabilities to Data Product Utility (Invited)**  
 » [Dale Fried](#) (United States)<sup>1</sup>, David Kelley (United States)<sup>2</sup>, Kimberly Reichel (United States)<sup>1</sup>, Brandon Call (United States)<sup>1</sup>, Christopher Reichert (United States)<sup>1</sup>, Andrew Eldredge (United States)<sup>1</sup>, Joshua Clayton (United States)<sup>1</sup> (1. 3DEO, Inc, 2. 3DEO, Inc.)

1:45pm **WF3.2 - HgCdTe Avalanche Photodiodes for Active Sensing Applications (Invited)**  
 » [Pradip Mitra](#) (United States)<sup>1</sup> (1. Leonardo DRS, Electro-Optical Infrared Systems, Dallas, TX)

2:15pm **WF3.3 - Estimation of Optical Channel Signal Loss Following a Near-Surface Nuclear Detonation**  
 » [David Hooper](#) (United States)<sup>1</sup>, Alexander Miloshevsky (United States)<sup>2</sup>, Brandon Wilson (United States)<sup>1</sup>, Brian Williams (United States)<sup>1</sup>, Nicholas Peters (United States)<sup>1</sup> (1. Oak Ridge National Laboratory, 2. University of Tennessee)

2:30pm **WF3.4 - Chaos Synchronization in Mid-infrared Quantum Cascade Lasers for Private Free-space Communication**  
 » [Olivier Spitz](#) (France)<sup>1</sup>, Andreas Herdt (Germany)<sup>2</sup>, Grégory Maisons (France)<sup>3</sup>, Mathieu Carras (France)<sup>3</sup>, Wolfgang Elsässer (Germany)<sup>2</sup>, Frédéric Grillot (France)<sup>1</sup> (1. Télécom Paris, 2. Technische Universität Darmstadt, 3. mirSense)

2:45pm **WF3.5 - Stimulated Rotational Raman Scattering in Hydrogen-Filled Hollow-Core Photonic Crystal Fiber**  
 » [Trevor Courtney](#) (United States)<sup>1</sup>, Patrick Hemmer (United States)<sup>1</sup>, Rodrigo Amezcua Correa (United States)<sup>2</sup>, Christian Keyser (United States)<sup>3</sup> (1. SAIC, 2. CREOL, UCF, 3. Air Force Research Laboratory)

3pm **WF3.6 - High Efficiency End-fire 3-D Optical Phased Array Based on Multi-layers SiN/SiO Platform**  
 » [Dachuan Wu](#) (United States)<sup>1</sup>, Yasha Yi (United States)<sup>2</sup> (1. University of Michigan-Dearborn, 2. University of Michigan)

2:15pm **Break**

2:30pm **WA4: Two-Dimensional Materials & Topological Photonics**  
 Chaired by: Yohannes Abate (United States) and Nathaniel Stern (United States)

2:30pm **WA4.1 - Utilizing Geometry and Topology for Enabling Integrated Chiral Photonics (Invited)**  
 » [Ritesh Agarwal](#) (United States)<sup>1</sup> (1. University of Pennsylvania)

3pm **WA4.2 - Integrated Topological Quantum Photonics (Invited)**  
 » [Andrew Foster](#) (United Kingdom)<sup>1</sup>, Mahmoud Jalalimehrabad (United Kingdom)<sup>1</sup>, Rene Dost (United Kingdom)<sup>1</sup>, Edmund Clarke (United Kingdom)<sup>1</sup>, Maurice Skolnick (United Kingdom)<sup>1</sup>, Luke Wilson (United Kingdom)<sup>1</sup> (1. The University of Sheffield)

2:45pm **Break**

3:15pm **Break**

3:15pm **Break**

3:15pm **Break**

3:30pm **WB4: Optical Metasurfaces and Applications II**  
 Chaired by: Shiva Vangala (United States) and Jason Foley (United States)



Continued from **Wednesday, 4 August**

3:30pm **WB4.1 - Programmable Metastructures for Directional Light Emission**  
 » [Vahid Karimi](#) (United States)<sup>1</sup>, [Viktorii Babicheva](#) (United States)<sup>1</sup> (1. University of New Mexico)

4pm **WB4.2 - Hybrid Photonic Lattice with Mode Coupling and Rabi Splitting**  
 » [Dominic Bosomtwi](#) (United States)<sup>1</sup>, [Marek Osinski](#) (United States)<sup>1</sup>, [Viktorii Babicheva](#) (United States)<sup>1</sup> (1. University of New Mexico)

3:30pm **WC4: Terahertz Photonics**  
 Chaired by: [Margaret Kim](#) (United States) and [Eric Buckthal](#) (United States)

3:30pm **WC4.1 - Interfacing Superconducting Quantum Circuits with RF Photonics and Millimeter Waves (Invited)**  
 » [John Teufel](#) (United States)<sup>1</sup> (1. National Institute of Standards and Technology)

4pm **WC4.2 - Broadband Quantum Networking Opportunities with the Quantum Frequency Processor (Invited)**  
 » [Joseph Lukens](#) (United States)<sup>1</sup> (1. Oak Ridge National Laboratory)

4:30pm **WC4.3 - Dielectric Fiber-assisted Terahertz Communication Links: Perspectives and Challenges for Onboard and Secure Communications**  
 » [Kathirvel Nallappan](#) (Canada)<sup>1</sup>, [Yang Cao](#) (Canada)<sup>1</sup>, [Guofu Xu](#) (Canada)<sup>1</sup>, [Hichem Guerboukha](#) (Canada)<sup>1</sup>, [Chahe Nerguizian](#) (Canada)<sup>1</sup>, [Maksim Skorobogatiy](#) (Canada)<sup>1</sup> (1. Ecole Polytechnique de Montreal)

4:45pm **WC4.4 - Nanoplasmonic Multiband Band Pass Filters For THz Wireless Communications**  
 » [Thirupathiah Kola](#) (India)<sup>1</sup>, [Srinivas Konda](#) (India)<sup>2</sup>, [Kavitha Rani Balmuri](#) (India)<sup>2</sup>, [Koteswara Rao L](#) (India)<sup>1</sup>, [Madhukar G](#) (India)<sup>2</sup> (1. Department of Electronics and Communication Engineering, KLEF Hyderabad, 2. CMR Technical Campus, Hyderabad, Telangana)

5pm **WC4.5 - Wired Channel Modeling for Frequency Hopping System in Secure Terahertz Communications**  
 » [Kathirvel Nallappan](#) (Canada)<sup>1</sup>, [Maksim Skorobogatiy](#) (Canada)<sup>1</sup> (1. Ecole Polytechnique de Montreal)

3:30pm **Break**

3:30pm **WE4: Chiral and Nonlinear Nano/metamaterials**  
 Chaired by: [Ventsislav Valev](#) (United Kingdom) and [Alexander Govorov](#) (United States)

3:30pm **WE4.1 - Dielectric Nanoantennas for Ultrafast Non-linear Nanophotonics (Invited)**  
 » [Stefan Maier](#) (Germany)<sup>1</sup> (1. LMU Munich)

4pm **WE4.2 - Symmetry Breaking in the Formation of Chiral Lanthanide Phosphate Nanocrystals (Invited)**  
 » [Gil Markovich](#) (Israel)<sup>1</sup> (1. Tel Aviv University)

4:30pm **WE4.3 - Chemical and Mechanical Dissymmetries in Chiral Plasmonic Interactions (Invited)**  
 » [Hiromi Okamoto](#) (Japan)<sup>1</sup> (1. Institute for Molecular Science, National Institutes of Natural Sciences)

3:30pm **WF4: Devices and Systems for Sensors**  
 Chaired by: [Dr. George Fischer](#) (United States) and [Frederick Long](#) (United States)

3:30pm **WF4.1 - Quantum Parametric Mode Sorting: See Through Impossible (Invited)**  
 » [Yuping Huang](#) (United States)<sup>1</sup> (1. Stevens Institute of Technology)

4pm **WF4.2 - Next-Level Optics for Vis-SWIR: LGRIN Lenses from Peak Nano Optics (Invited)**  
 » [Richard Lepkowicz](#) (United States)<sup>1</sup>, [Guy Beadie](#) (United States)<sup>1</sup>, [Ramzi Zahreddine](#) (United States)<sup>1</sup> (1. Peak Nano Optics)



Continued from **Wednesday, 4 August**

4:30pm **WF4.3 - Integrated Magnetic-free Nitride Optical Isolator**  
 » [Hao Tian](#) (United States)<sup>1</sup>, Junqiu Liu (Switzerland)<sup>2</sup>, Anat Siddharth (Switzerland)<sup>2</sup>, Rui Ning Wang (Switzerland)<sup>2</sup>, Terence Blesin (Switzerland)<sup>2</sup>, Jijun He (Switzerland)<sup>2</sup>, Tobias Kippenberg (Switzerland)<sup>2</sup>, Sunil Bhawe (United States)<sup>1</sup> (1. Purdue University, 2. EPFL)

4:45pm **WF4.4 - Nuclear Disturbed Environmental Effects on Space-based Single Photon Detectors**  
 » [Brandon Wilson](#) (United States)<sup>1</sup>, Alexander Miloshevsky (United States)<sup>2</sup>, David Hooper (United States)<sup>1</sup>, Brian Williams (United States)<sup>1</sup>, Nicholas Peters (United States)<sup>1</sup> (1. Oak Ridge National Laboratory, 2. University of Tennessee)

5pm **WF4.5 - Light Effect Transistors for High-Speed and Low-Energy Electronic and Photonic Integrated Circuits**  
 » [Antardipan Pal](#) (United States)<sup>1</sup>, Yong Zhang (United States)<sup>1</sup>, Dennis Yau (United States)<sup>2</sup> (1. UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE, 2. Sinai Green Lab)

5:15pm **WF4.6 - A Tunable and Highly-Efficient Plasmonic Band-Stop Filter at Telecom Wavelengths**  
 » [Seyed Morteza Ebadi](#) (Sweden)<sup>1</sup>, Jonas Örtengren (Sweden)<sup>1</sup> (1. Mid Sweden University)

3:45pm **WD4: Optical Detectors and Focal Plane Arrays II**  
 Chaired by: Elizabeth Steenbergen (United States) and David Ting (United States)

3:45pm **WD4.1 - Proton irradiation effects on InGaAs/InAsSb mid-wave infrared pBpn detectors (Invited)**  
 » [Preston Webster](#) (United States)<sup>1</sup>, Rigo Carrasco (United States)<sup>1</sup>, James George (United States)<sup>1</sup>, David Garnham (United States)<sup>1</sup>, Diana Maestas (United States)<sup>1</sup>, Chris Morath (United States)<sup>1</sup> (1. Air Force Research Laboratory, Space Vehicles Directorate)

4:15pm **WD4.2 - III-V Superlattice/nBn IR detectors and FPAs (Invited)**  
 » [Meimei Tidrow](#) (United States)<sup>1</sup> (1. U.S. Army Future Command, C5ISR, NVESD)

4:45pm **WD4.3 - UV Silicon Detectors for Astronomy and Planetary Science (Invited)**  
 » [Michael Hoenk](#) (United States)<sup>1</sup> (1. NASA Jet Propulsion Laboratory, California Institute of Technology)

5:15pm **WD4.4 - Dissipative Quantum Transport Study of A Bi-Layer Graphene-CdTe-HgCdTe Heterostructure for MWIR Photodetector**  
 » [Samiran Ganguly](#) (United States)<sup>1</sup>, Farjana Tonni (United States)<sup>1</sup>, Sheikh Ahmed (United States)<sup>1</sup>, Parminder Ghuman (United States)<sup>2</sup>, Sachidanand Babu (United States)<sup>2</sup>, Nibir Dhar (United States)<sup>3</sup>, Ashok Sood (United States)<sup>4</sup>, Avik Ghosh (United States)<sup>1</sup> (1. University of Virginia, 2. NASA Earth Science Technology Office, 3. NVESD, 4. Magnolia Optical Technologies Inc.)