

RAPID

Research and Applications of Photonics in Defense

10-12 August 2020
Virtual Conference
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General Co-Chair:

Monica Allen, Ph.D.

Air Force Research Laboratory, USA

General Co-Chair:

Jeffery Allen, Ph.D.

Air Force Research Laboratory, USA





Monday, 10 August

- 8am **Keynote/Plenary Session**
Chaired by: John Henry (United States)
- 8am **AFRL Munitions Directorate Welcome**
» [David Lambert](#) (United States)¹ (1. Air Force Research Laboratory, Munitions Directorate)
- 8:15am **Powering the World's Greatest Air Force Today and Tomorrow (Keynote)**
» [Gen. Arnold W. Bunch Jr.](#) (United States)¹ (1. Commander, Air Force Materiel Command, Wright-Patterson Air Force Base)
- 8:45am **Advancing Photonic Device Design and Quantum Measurements with Machine Learning (Plenary)**
» [Alexandra Boltasseva](#) (United States)¹ (1. School of Electrical & Computer Engineering and Purdue Quantum Science and Engineering Institute, Purdue University)
- 9:15am **High Complexity and Chiarlity of Inorganic Nanostructures (Plenary)**
» [Nicholas Kotov](#) (United States)¹ (1. University of Michigan)
- 9:45am **Photonic Integrated Soliton Microcombs (Plenary)**
» [Tobias Kippenberg](#) (Switzerland)¹ (1. École polytechnique fédérale de Lausanne)
- 10:45am **Women in Photonics / Women in Science and Engineering Session**
Chaired by: Adriane Moura (United States)
- 10:45am **Overcoming Barriers to Creativity (Plenary)**
» [Michelle Ewy](#) (United States)¹ (1. Air Force Research Laboratory)
- 12pm **STEM Session**
Chaired by: Brian Mitchell (United States)

12pm

Innovation Through STEM: Maintaining the Workforce of Today, While Building the Workforce of 2040

» [Ralph Tillinghast](#) (United States)¹, Natalia Canas-Estrada (United States)² (1. Lab Director - Collaboration Innovation Lab - Army Futures Command, U.S. Army, Picatinny Arsenal NJ, 2. Associate Vice President of STEM Outreach IEEE Photonics Society)

Tuesday, 11 August

- 8am **TuA1: Ultrafast and Nonlinear Nanophotonics**
Chaired by: Hayk Harutyunyan (United States) and Monica Allen (United States)
- 8am **TuA1.1 - Metasurface enabled integrated nanophotonic interfaces to quantum systems (Invited)**
» [Amit Agrawal](#) (United States)¹ (1. National Institute of Standards and Technology)
- 8:30am **TuA1.2 - Strongly Coupled Quantum-Dot Plasmonic-Nanoparticle Assemblies for Low-Power Optical Nonlinearities (Invited)**
» [Matthew Pelton](#) (United States)¹ (1. UMBC (University of Maryland, Baltimore County))
- 9am **TuA1.3 - Generation of hot electrons in plasmonic nanostructures and metamaterials (Invited)**
» [Alexander Govorov](#) (United States)¹ (1. Ohio University)
- 9:30am **TuA1.4 - Interaction of intense laser pulses with resonant metasurfaces: from high harmonics generation to laser-assisted nano-fabrication (Invited)**
» [Gennady Shvets](#) (United States)¹ (1. Cornell University)
- 8am **TuB1: Optical MEMS/NEMS**
Chaired by: Lavern Starman (United States) and Harris Hall (United States)



Continued from **Tuesday, 11 August**

- 8am **TuB1.1 - A Ring-laser Gyro Based on Stimulated Brillouin Scattering in Silicon Nitride Waveguides (Invited)**
 » [Karl Nelson](#) (United States)¹, Matthew Pucket (United States)¹, Jianfeng Wu (United States)¹ (1. Honeywell Aerospace)
- 8:30am **TuB1.2 - Vanadium Dioxide Thin Films in Micrometer-sized Photonic Devices (Invited)**
 » [Nelson Sepulveda](#) (United States)¹ (1. Michigan State University)
- 9am **TuB1.3 - MEMS conception to production at GE Research (Invited)**
 » [Oliver Boomhower](#) (United States)¹ (1. General Electric Research)
- 9:30am **TuB1.4 - Large Angle Micromirror for Beam-steering Applications (Invited)**
 » [David Torres](#) (United States)¹ (1. Air Force Research Laboratory)
- 8am **TuC1: Nonlinear Optical and Photonic Materials for High Power Lasers and Applications**
 Chaired by: Shekhar Guha (United States) and Carl Liebig (United States)
- 8am **TuC1.1 - Decade spanning radiofrequency emission from ultrashort laser generated plasmas (Invited)**
 » [Jennifer Elle](#) (United States)¹, Alexander Englesbe (United States)², Travis Garrett (United States)¹, Anna Janicek (United States)³, Adrian Lucero (United States)⁴, Andreas Schmitt-Sody (United States)⁵, Erin Thornton (United States)⁶ (1. Air Force Research Laboratory, 2. US Naval Research Laboratory, 3. Leidos, 4. Air Force, 5. air, 6. University of North Texas)
- 8:30am **TuC1.2 - Cr:ZnSe Laser – CW and Ultrashort Pulses (Invited)**
 » [Ajoy Kar](#) (United Kingdom)¹ (1. Heriot Watt University)

- 9am **TuC1.3 - Nonlinear refractive index pulsewidth dependence in the atmosphere**
 » [Natalia Munera](#) (United States)¹, Salimeh Tofighi (United States)¹, David Hagan (United States)¹, Eric W. Van Stryland (United States)¹ (1. CREOL, the College of Optics and Photonics, University of Central Florida, UCF)
- 8am **TuD1: Novel Materials for Photonics**
 Chaired by: John Boeckl (United States) and Tyson Back (United States)
- 8am **TuD1.1 - Growth of Single-Crystalline and Large-Area h-BN for Single Photon Emission (Invited)**
 » [Shamsul Arafin](#) (United States)¹, Shantanu Saha (United States)¹ (1. The Ohio State University)
- 8:30am **TuD1.2 - Silicon Carbide on Insulator (SiCOI) Technology for Integrated Photonics and Phononics (Invited)**
 » [Phillip Feng](#) (United States)¹ (1. University of Florida)
- 9am **TuD1.3 - Imaging and spectroscopy of functional thin-films for energy materials (Invited)**
 » [Andre Luis Fernandes Cauduro](#) (United States)¹, Nadine Witkowski (France)², Andreas K. Schmid (United States)³, Morten Madsen (Denmark)⁴ (1. Sandia National Laboratories, 2. Institut des Nanosciences de Paris, Sorbonne Universite, 3. Lawrence Berkeley National Laboratory, 4. University of Southern Denmark)
- 8am **TuE1: Lasers/Emitters**
 Chaired by: Sukrith Dev (United States) and Daniel Wasserman (United States)
- 8am **TuE1.1 - Stable MAPbBr3 Perovskite Laser Under Continuous Wave Optical Pumping at Room Temperature (Invited)**
 » [Qing Gu](#) (United States)¹ (1. The University of Texas at Dallas)
- 8:30am **TuE1.2 - Applications of Non-Hermitian Coupled VCSEL Arrays (Invited)**
 » [Kent Choquette](#) (United States)¹ (1. University of Illinois at Urbana-Champaign)



Continued from **Tuesday, 11 August**

9am **TuE1.3 - Far-Field Thermal Emission from Optical Antennas on an Epsilon-Near-Zero Substrate**
 » [Irfan Khan](#) (United States)¹, Owen Dominguez (United States)¹, Junchi Lu (United States)², Leland Nordin (United States)³, Daniel Wasserman (United States)³, Anthony Hoffman (United States)¹ (1. University of Notre Dame, 2. University of Notre, 3. University of Texas at Austin)

9:30am **TuE1.4 - Step-index Si-Ge-core silica-cladded optical fibers**
 » [Mustafa Ordu](#) (Turkey)¹, [Ahmet Akosman](#) (United States)², Jicheng Guo (United States)³, Shyamsunder Erramilli (United States)⁴, Siddharth Ramachandran (United States)⁵, Soumendra Basu (United States)⁶ (1. UNAM - National Nanotechnology Research Center and Institute of Materials Science and Nanotechnology Bilkent University, 2. School of Engineering, Roger Williams University, 3. Argonne National Laboratory, 4. Division of Materials Science and Engineering, Boston University, 5. Department of Electrical and Computer Engineering, Boston University, 6. Department of Mechanical Engineering, Boston University)

8am **TuF1: Hybrid Organic-Inorganic Materials & Devices**
 Chaired by: Aditya Mohite (United States) and Matthew Sfeir (United States)

8am **TuF1.1 - Lithographic patterning of single-crystal hybrid perovskite microstructures by surface-engineered deliquescence and efflorescence (Invited)**
 » [James Cahoon](#) (United States)¹ (1. University of North Carolina at Chapel Hill)

8:30am **TuF1.2 - Amplifying the Prospects of Upconverting Nanoparticles and Their Hybrids (Invited)**
 » [James Schuck](#) (United States)¹, Yung Doug Suh (Korea, Republic of)², Bruce E. Cohen (United States)³, Emory M. Chan (United States)³ (1. Columbia University, 2. Korea Research Institute of Chemical Technology (KRICT), 3. The Molecular Foundry, LBNL)

9am **TuF1.3 - Novel Nanomaterials and Synthetic Insights Enabled by Surface Chemistry (Invited)**
 » [Matthew Jones](#) (United States)¹ (1. Rice University)

9:30am **TuF1.4 - Photoactive Gold Organometallics Bearing Substituted 2,7-Fluorenyl Moieties**
 » [Thomas Gray](#) (United States)¹ (1. Case Western Reserve University)

8am **TuG1: Instrumentation and Control for Test and Evaluation**
 Chaired by: Robert Orgusaar (United States)

8am **TuG1.1 - Testing, Instrumentation, and Results to make the world's first usable 1Kx1K Infrared LED Scene Projector Systems (Invited)**
 » [Hamzah Ahmed](#) (United States)¹, Aaron Landwehr (United States)², Chris Jackson (United States)², Tyler Browning (United States)², Peyman Barakhshan (United States)³, Miguel Hernandez (United States)², Alexis Deputy (United States)², Tianne Lassiter (United States)², Casey Campbell (United States)⁴, Jaclyn Singh (United States)², Benjamin Steenkamer (United States)⁴, Rodney McGee (United States)⁴, Andrea Waite (United States)², Fouad Kiamilev (United States)², John Prineas (United States)⁵, Matt Bellus (United States)⁶, Logan Nichols (United States)⁶ (1. University of Delaware, Chip Design Systms, 2. University of Delaware, 3. 1993, 4. chip design systems, 5. University of Iowa, Firefly Photonics, 6. Firefly Photonics)

8:30am **TuG1.2 - Non-Electrical Topside (NET) Optical Fiber helps Mitigate Boundary Interactions**
 » [John Mazurowski](#) (United States)¹ (1. Penn State Applied Research Laboratory)

9am **TuG1.3 - Confidence Modeling and Tracking of Recycled Integrated Circuits, Enabled by Blockchain**
 » [Jason Vosatka](#) (United States)¹, Andrew Stern (United States)¹, Monir Hossain (United States)¹, Fahim Rahman (United States)¹, Jeffery Allen (United States)², Monica Allen (United States)², Farimah Farahmandi (United States)¹, Mark Tehranipoor (United States)¹ (1. University of Florida, 2. AFRL)

10:30am **TuA2: Active Plasmonics and Nanophotonics**
 Chaired by: Amit Agrawal (United States) and Palash Bharadwaj (United States)



Continued from **Tuesday, 11 August**

- 10:30am **TuA2.1 - Spatiotemporal Control of Light with Time-Variant Metasurfaces (Invited)**
 » [Xingjie Ni](#) (United States)¹, Xuexue Guo (United States)¹, Yimin Ding (United States)¹, Yao Duan (United States)¹ (1. The Pennsylvania State University)
- 11am **TuA2.2 - Revealing Light-Matter Interactions at the Nano-Scale using Single-Molecule Super-Resolution Microscopy (Invited)**
 » [Esther Wertz](#) (United States)¹ (1. Rensselaer Polytechnic Institute)
- 11:30am **TuA2.3 - Optical systems based on cascaded metasurfaces (Invited)**
 » [Andrew McClung](#) (United States)¹, Mahdad Mansouree (United States)¹, Sarath Samudrala (United States)¹, Mahsa Torfeh (United States)¹, Babak Mirzapourbeinekalaye (United States)¹, Amir Arbabi (United States)¹ (1. University of Massachusetts Amherst)
- 10:30am **TuB2: Microwave Optics and RF Photonics**
 Chaired by: Benjamin Braaten (United States) and Joseph Deroba (United States)
- 10:30am **TuB2.1 - Frequency Agnostic RF-Photonic Low Noise Amplifiers (Invited)**
 » [Dennis Prather](#) (United States)¹ (1. University of Delaware)
- 11am **TuB2.2 - Photonics Research at the JHU Applied Physics Laboratory (Invited)**
 » [Thomas Clark](#) (United States)¹ (1. The Johns Hopkins University)
- 11:30am **TuB2.3 - A Broadly Tunable Silicon Photonic Transceiver for Radar and Electronic Warfare**
 » [Daniel Onori](#) (Canada)¹, José Azaña (Canada)¹ (1. Institut National de la Recherche Scientifique (INRS))

- 12pm **TuB2.4 - On the use of Multiple Beam-Shifters Developed using Transformation Electromagnetics to Control Propagation Characteristics (Invited)**
 » [Dipankar Mitra](#) (United States)¹, Jerika Cleveland (United States)¹, Jacob Lewis (United States)¹, Benjamin Braaten (United States)¹, Jeffery Allen (United States)², Monica Allen (United States)² (1. North Dakota State University, 2. Air Force Research Laboratory Munitions Directorate)
- 10:30am **TuC2: High Peak and Average Power Laser Technology Solid State**
 Chaired by: Enam Chowdhury (United States) and Anthony Valenzuela (United States)
- 10:30am **TuC2.1 - Toward Rep-Rated Multi-kJ Lasers with Report on Performance of the L4 Laser at ELI-Beamlines (Invited)**
 » [Todd Ditmire](#) (United States)¹ (1. University of Texas at Austin)
- 11am **TuC2.2 - Efficient Quasi-Phase Matched Xe-Filled Hollow-Core Fiber OPA**
 » [Trevor Courtney](#) (United States)¹, Christian Keyser (United States)², Cesar Lopez-Zelaya (United States)³ (1. SAIC, 2. AFRL/RW, 3. CREOL, the College of Optics and Photonics, University of Central Florida, UCF)
- 10:30am **TuD2: Semiconductor Materials and Quantum Nanoscience**
 Chaired by: Kurt Eyink (United States) and Parag Deotare (United States)
- 10:30am **TuD2.1 - Nano-Phototransistors Integrated on Silicon (Invited)**
 » [Hooman Mohseni](#) (United States)¹ (1. Northwestern University)
- 11am **TuD2.2 - Towards Single Photon Counting at Room Temperature with Digital Alloy Avalanche Photodiodes (Invited)**
 » [Seth Bank](#) (United States)¹, Xingjun Xue (United States)², Stephen March (United States)¹, Yuan Yuan (United States)², Andrew Jones (United States)², Ann Rockwell (United States)¹, Joe Campbell (United States)² (1. University of Texas at Austin, 2. University of Virginia)
- 11:30am **TuD2.3 - Unusual Infrared Optical Response of Quantum Materials (Invited)**
 » [Li Yang](#) (United States)¹ (1. Washington University in St Louis)



Continued from **Tuesday, 11 August**

12pm **TuD2.4 - Novel Group IV Materials for Infrared Sensing Through Pulsed Laser Melting**
 » [Jeffrey Warrender](#) (United States)¹, Philippe K. Chow (United States)¹, Shao-Qi Lim (Australia)², Gordon Grzybowski (United States)³, Bruce Clafin (United States)³, Jim Williams (Australia)² (1. U.S. Army CCDC-Armament Center, 2. The Australian National University, 3. Wright-Patterson AFB)

10:30am **TuE2: Epitaxial Growth, Fabrication and Characterization**
 Chaired by: Shamsul Arafin (United States) and Eric Shaner (United States)

10:30am **TuE2.1 - Mismatched Epitaxy of Infrared Device Materials Using Graphene-mediated Lateral Overgrowth (Invited)**
 » [Jason Kawasaki](#) (United States)¹ (1. University of Wisconsin - Madison)

11am **TuE2.2 - Tensile-strained self-assembly: Tunable nanomaterials for infrared optoelectronics and quantum optics (Invited)**
 » [Paul Simmonds](#) (United States)¹ (1. Boise State University)

11:30am **TuE2.3 - Minority Carrier Lifetime Characterization of Optically Thin InAs/InAsSb Type-II Strained Layer Superlattice (Invited)**
 » [Lilian Casias](#) (United States)¹, Jonathon Olesberg (United States)¹, Clark Kadlec (United States)², Michael Goldflam (United States)¹, Preston Webster (United States)¹, John Klem (United States)¹, Eric Shaner (United States)¹ (1. Sandia National Laboratories, 2. Sand)

12pm **TuE2.4 - High-efficiency GaAsP/Si tandem solar cells (Invited)**
 » [Larry Minjoo Lee](#) (United States)¹ (1. University of Illinois Urbana Champaign)

10:30am **TuF2: Infrared Organic Materials and Properties**
 Chaired by: Jarrett Vella (United States) and Jason Azoulay (United States)

10:30am **TuF2.1 - Computational Design of Low Bandgap Organic Optoelectronic Materials (Invited)**
 » [Neeraj Rai](#) (United States)¹, Md Abdus Sabuj (United States)¹, Chandra Sarap (United States)¹, Chinmoy Saha (United States)¹ (1. Mississippi State University)

11am **TuF2.2 - A Magnetic Donor-Acceptor Conjugated Polymer (Invited)**
 » [Daniel Adams](#) (United States)¹, Alexander London (United States)¹, Jason Azoulay (United States)¹ (1. School of Polymer Science and Engineering, University of Southern Mississippi)

10:30am **TuG2: Special Ops Interests**
 Chaired by: Mark Schmitt (United States) and Alex Gracia (United States)

10:30am **TuG2.1 - Multilateral Missile Defense: A National Security Application of Rapid Transmission Control System Engineering**
 » [Damon Coletta](#) (United States)¹ (1. United States Air Force Academy)

11am **TuG2.2 - Trust Assessment for Electronic Components using Laser and Emission-based Microscopy**
 » [Andrew Stern](#) (United States)¹, Jason Vosatka (United States)¹, Shahin Tajik (United States)¹, Farimah Farahmandi (United States)¹, Mark Tehranipoor (United States)¹ (1. University of Florida)

11:30am **TuG2.3 - Incoherent Fourier Ptychographic Super-resolution Projection and Imaging System**
 » [Shawn Divitt](#) (United States)¹, Samuel Park (United States)², Dennis Gardner (United States)³, Abbie Watnik (United States)² (1. Jacobs Corporation, 2. US Naval Research Laboratory, 3. The MITRE Corporation)

1:30pm **TuA3: Machine Learning/AI for Photonics**
 Chaired by: Alexandra Boltasseva (United States) and Emily Doucette (United States)

1:30pm **TuA3.1 - Accelerating the Design of Photonic Metamaterials by Artificial Intelligence (Invited)**
 » [Yongmin Liu](#) (United States)¹ (1. Northeastern University)



Continued from **Tuesday, 11 August**

- 2pm **TuA3.2 - Pushing the boundaries of nanophotonics through inverse design (Invited)**
 » [Dries Verduynde](#) (United States)¹, Logan Su (United States)¹, Neil Sapra (United States)¹, Kiyoul Yang (United States)¹, Geun Ho Ahn (United States)¹, Jinhie Skarda (United States)¹, Rahul Trivedi (United States)¹, Jelena Vuckovic (United States)¹ (1. Stanford University)
- 2:30pm **TuA3.3 - AI Powered THz Testing Technology for Ensuring Hardware Cybersecurity**
 » [Naznin Akter](#) (United States)¹, Mustafa Karabiyik (United States)¹, Anthony Wright (United States)¹, Michael Shur (United States)², Nezh Pala (United States)¹ (1. Florida International University, 2. Electronics for The Future, Inc.)
- 3pm **TuA3.4 - Non-spherical Particle Size and Shape Estimation Using Machine Learning**
 » [Chi Young Moon](#) (United States)¹, Caitlyn Edwards (United States)¹, Alka Panda (United States)¹, Gwibo Byun (United States)¹, K. Todd Lowe (United States)¹ (1. Virginia Tech)

1:30pm **TuB3: Signal Processing, Machine Learning, and Large-scale Data Science**
 Chaired by: Breton Minnehan (United States) and John Murray-Bruce (United States)

- 1:30pm **TuB3.1 - A Theory of Exact Interferometric Inversion for Passive Imaging (Invited)**
 » [Birsan Yazici](#) (United States)¹, Bariscan Yonel Yonel (United States)¹ (1. Rensselaer Polytechnic Institute)
- 2pm **TuB3.2 - Computing Images from Weak Optical Signals (Invited)**
 » [Vivek Goyal](#) (United States)¹ (1. Boston University)

1:30pm **TuC3: Secondary Source Development from USPL (GHz-THz to x/gamma Rays to MeV Electrons and Protons)**
 Chaired by: Jeremy Pigeon (United States) and Eric Rosenthal (United States)

1:30pm **TuC3.1 - Strong terahertz pulse generation from mid-infrared laser-produced air plasma (Invited)**
 » [Dogeun Jang](#) (United States)¹, Robert Schwartz (United States)¹, Daniel Woodbury (United States)¹, Jesse Griff-McMahon (United States)¹, Abdurrahman Younis (United States)¹, Howard Milchberg (United States)¹, [Kiyong Kim](#) (United States)¹ (1. University of Maryland at College Park)

2pm **TuC3.2 - Long-wave IR Femtosecond Supercontinuum Generation with Cr:ZnS Lasers (Invited)**
 » [Sergey Vasilyev](#) (United States)¹ (1. IPG Photonics)

2:30pm **TuC3.3 - Electromagnetic Pulse Generation From Ultra Short Pulse Laser Induced Plasma (Invited)**
 » [Michael Ross](#) (United States)¹ (1. NAVWAR)

3pm **TuC3.4 - keV-MeV x-ray source and applications from laser-plasma accelerators using a picosecond, kilojoule class laser**
 » [Paul King](#) (United States)¹ (1. Lawrence Livermore National Laboratory)

1:30pm **TuD3: Scalable Manufacturing and Rapid Prototyping for Photonics**
 Chaired by: Hjalti Sigmarsson (United States) and Edward Kinzel (United States)

1:30pm **TuD3.1 - Shaping Material Interactions for High Resolution Laser Printing Applications (Invited)**
 » [Craig Arnold](#) (United States)¹ (1. Princeton University)

2pm **TuD3.2 - Multi-material Additive Manufacturing of RF Devices and Systems (Invited)**
 » [Mark Mirotznik](#) (United States)¹ (1. University of Delaware)

2:30pm **TuD3.3 - Additive Manufacturing of Glass Optics (Invited)**
 » [Rebecca Dylla-Spears](#) (United States)¹ (1. Lawrence Livermore National Laboratory)



Continued from **Tuesday, 11 August**

3pm **TuD3.4 - Experimental Demonstration of Broadband Self-Collimation Effect in 3d Hexagonal Lattice Fabricated Using a Low-Refractive-Index Polymer**

» Chun Xia (United States)¹, [Stephen Kuebler](#) (United States)¹, Noel Martinez (United States)², Manuel Martinez (United States)², Raymond Rumpf (United States)², Jimmy Touma (United States)³ (1. CREOL, the College of Optics and Photonics, University of Central Florida, UCF, 2. EMLab, University of Texas at EL Paso, 3. AFRL)

1:30pm **TuE3: Integrated Photonics and Optical Devices**

Chaired by: Weimin Zhou (United States) and Arka Mazumdar (United States)

1:30pm **TuE3.1 - Foundry Compatible Integrated Metasurface (Invited)**

» [Tingyi Gu](#) (United States)¹ (1. The University of Delaware)

2pm **TuE3.2 - Design of Si Photonic Integrated Circuits for Advanced Signal Routing and Processing in RF Photonic Systems (Invited)**

» [Sang-Yeon Cho](#) (United States)¹, Stephen Anderson (United States)¹, Weimin Zhou (United States)¹ (1. Army Research Laboratory)

2:30pm **TuE3.3 - Integrated Photonic Laser Frequency Tracker for Space-Borne Optical Metrology Applications**

» [Peter Weigel](#) (United States)¹, William Jones (United States)¹, Eric Kittlaus (United States)¹, Lukasz Sterczewski (United States)¹, Alireza Azizi (United States)¹, Siamak Forouhar (United States)¹ (1. Jet Propulsion Laboratory)

3pm **TuE3.4 - Quantum Integrated Photonics (Invited)**

» [Michael Fanto](#) (United States)¹ (1. Air Force Research Laboratory)

1:30pm **TuF3: Nonlinear Organic Materials**

Chaired by: Ryan O'Donnell (United States) and Tod Grusenmeyer (United States)

1:30pm

TuF3.1 - Design and Characterization of Nonlinear Photoacoustic Contrast Agents (Invited)

» [Chandra Yelleswarapu](#) (United States)¹, Jonathan Rochford (United States)² (1. University of Massachusetts Boston, 2. University of Massachusetts Boston)

2pm

TuF3.2 - Large Third-Order Nonlinearities in Atomic Layer Deposition Grown Nitrogen-Enriched TiO₂ Nanoscale Films (Invited)

» [Anthony Johnson](#) (United States)¹, Robinson Kuis (United States)¹, Theodosia Gougousi (United States)¹, Isaac Basaldua (United States)¹, Paul Burkins (United States)², Jaron Kropp (United States)¹ (1. U. Maryland Baltimore County (UMBC), 2. U. Maryland Baltimore County)

1:30pm

TuG3: EO/IR/LADAR (Part 1)

Chaired by: Brian Stadler (United States) and David Rabb (United States)

1:30pm

TuG3.1 - Active Imaging at US Army NVESD (Invited)

» [Margaret Shea](#) (United States)¹ (1. US Army CCDC C5ISR Center)

2pm

TuG3.2 - Spectral Shearing LIDAR (Invited)

» [Jason Stafford](#) (United States)¹, David Rabb (United States)¹, Kyle Watson (United States)², Brett Spivey (United States)², Ryan Galloway (United States)³ (1. Air Force Research Laboratory, 2. JASR Systems, 3. Montana State University)

2:30pm

TuG3.3 - Polarimetric Lidar Feature Selection for Material Classification

» [Jarrod Brown](#) (United States)¹, Rodney Roberts (United States)², Christian Saludez (United States)¹, Darrell Card (United States)¹ (1. Air Force Research Laboratory, 2. Dept. of Electrical and Computer Engineering, Florida State University)



Continued from **Tuesday, 11 August**

- 3pm **TuG3.4 - Monolithic piezoelectric control of soliton microcombs**
 » [Jungju Liu](#) (Switzerland)¹, [Hao Tian](#) (United States)², [Erwan Lucas](#) (Switzerland)¹, [Arslan Raja](#) (Switzerland)¹, [Grigory Lihachev](#) (Switzerland)¹, [Rui Wang](#) (Switzerland)¹, [Jijun He](#) (Switzerland)¹, [Tianyi Liu](#) (Switzerland)¹, [Miles Anderson](#) (Switzerland)¹, [Wenle Weng](#) (Switzerland)¹, [Sunil Bhawe](#) (United States)², [Tobias Kippenberg](#) (Switzerland)¹ (1. EPFL, 2. School of Electrical & Computer Engineering and Purdue Quantum Science and Engineering Institute, Purdue University)
- 4pm **TuA4: Emerging Material Platforms for Plasmonics**
 Chaired by: [Anthony Hoffman](#) (United States) and [Stephanie Law](#) (United States)
- 4pm **TuA4.1 - Ultrafast infrared modulation Based on Optically Controlled Graphene-Integrated Metasurfaces (Invited)**
 » [Yu Yao](#) (United States)¹, [Ali Basiri](#) (United States)¹ (1. Arizona State University)
- 4:30pm **TuA4.2 - All-Epitaxial Plasmonic Optoelectronics for the Mid-Infrared (Invited)**
 » [Leland Nordin](#) (United States)¹, [Abhilasha Kamboj](#) (United States)², [Priyanka Petluru](#) (United States)², [Kun Li](#) (United States)², [Andrew Briggs](#) (United States)², [Evan Simmons](#) (United States)³, [Viktor Podolskiy](#) (United States)³, [Seth Bank](#) (United States)², [Daniel Wasserman](#) (United States)¹ (1. University of Texas at Austin, 2. The University of Texas at Austin, 3. Umass Lowell)
- 5pm **TuA4.3 - Is There an Enhancement Limit for a Lossless Plasmonic Medium? (Invited)**
 » [Greg Sun](#) (United States)¹, [Jacob Khurgin](#) (United States)² (1. University of Massachusetts Boston, 2. Johns Hopkins University)
- 4pm **TuD4: Liquid Crystal Technology**
 Chaired by: [Michael McConney](#) (United States) and [Nelson Tabiryan](#) (United States)

- 4pm **TuD4.1 - Using Liquid Crystals To Control Tamm Plasmons**
 » [Victor Reshetnyak](#) (Ukraine)¹, [Timothy J. Bunning](#) (United States)², [Dean Evans](#) (United States)² (1. Taras Shevchenko National University of Kyiv, 2. Air Force Research Laboratory)
- 4:30pm **TuD4.2 - Two-beam energy exchange in a hybrid photorefractive cholesteric cell with a helicoidal polymer network**
 » [Victor Reshetnyak](#) (Ukraine)¹, [Igor Pinkevych](#) (Ukraine)¹, [Michael McConney](#) (United States)², [Dean Evans](#) (United States)² (1. Taras Shevchenko National University of Kyiv, 2. Air Force Research Laboratory)
- 5pm **TuD4.3 - Controlling light with thermo-photonics (Invited)**
 » [Luciano De Sio](#) (Italy)¹, [Filippo Pierini](#) (Poland)², [Nelson Tabiryan](#) (United States)³, [Timothy J. Bunning](#) (United States)⁴ (1. Sapienza University of Rome, 2. Institute of Fundamental Technological Research, 3. Beam Engineering for Advanced Measurements co, 4. Air Force Research Laboratory)
- 4pm **TuF4: Charge Transport in Organic Materials**
 Chaired by: [James Cahoon](#) (United States) and [Sean Roberts](#) (United States)
- 4pm **TuF4.1 - Repackaging Light with Hybrid Organic:Inorganic Materials (Invited)**
 » [Sean Roberts](#) (United States)¹ (1. University of Texas at Austin)
- 4pm **TuG3: EO/IR/LADAR (Part 2)**
 Chaired by: [Brian Stadler](#) (United States) and [David Rabb](#) (United States)
- 4pm **TuG3.5 - A Simple Dual-Frequency Coherent Noise Ladar**
 » [Daniel Onori](#) (Canada)¹, [José Azaña](#) (Canada)¹ (1. Institut National de la Recherche Scientifique (INRS))
- 4:30pm **TuG3.6 - Microresonator Soliton Based Massively Parallel Coherent LiDAR**
 » [Anton Lukashchuk](#) (Switzerland)¹, [Johann Riemensberger](#) (Switzerland)¹, [Maxim Karpov](#) (Switzerland)¹, [Erwan Lucas](#) (Switzerland)¹, [Wenle Weng](#) (Switzerland)¹, [Jungju Liu](#) (Switzerland)¹, [Tobias Kippenberg](#) (Switzerland)¹ (1. EPFL)



Continued from **Tuesday, 11 August**

4:30pm **TuE4: UV Optoelectronics**
 Chaired by: Babak Nikoobakht (United States) and Nelson Tansu (United States)

4:30pm **TuE4.1 - High Brightness UV Light Sources with Sub- μ m² Footprint (Invited)**
 » [Babak Nikoobakht](#) (United States)¹, Robin P. Hansen (United States)¹, Yuqin Zong (United States)¹, Amit Agrawal (United States)², Michael Shru (United States)³, Jerry Tersoff (United States)⁴ (1. National Institute of Standards and Technology, 2. National Institute of Standards and Technology, University of Maryland, 3. Rensselaer Polytechnic Institute, 4. IBM T. J. Watson Research Center)

5pm **TuE4.2 - High Performance AlGaN UV-C LEDs and Laser Diodes (Invited)**
 » [Zetian Mi](#) (United States)¹ (1. University of Michigan)

5:30pm **TuE4.3 - Applications of Deep Ultraviolet Light Emitting Diodes (Invited)**
 » [Michael Shur](#) (United States)¹ (1. Rensselaer Polytechnic Institute)

5:30pm **TuG4: Blast/Shock Wave Imaging and Spectroscopic Techniques**
 Chaired by: Martin Schmidt (United States) and Subith Vasu (United States) and William Lewis (United States)

5:30pm **TuG4.1 - Single-shot, spatially resolved temperature measurements and MHz-rate broadband imaging in a detonation channel (Invited)**
 » [Stephen Grib](#) (United States)¹, Andrew Caswell (United States)¹, Chris Fugger (United States)², Paul Hsu (United States)², Naibo Jiang (United States)², Kevin Cho (United States)³, Sukesh Roy (United States)², S. Alexander Schumaker (United States)¹ (1. Air Force Research Laboratory, 2. Spectral Energies, LLC, 3. Innovative Scientific Solutions Inc.)

6pm **TuG4.2 - Ultrafast laser-absorption spectroscopy for multi-parameter measurements in fireballs of energetic materials (Invited)**
 » [Christopher Goldenstein](#) (United States)¹, Vishnu Radhakrishna (United States)¹, Ryan Tancin (United States)¹ (1. Purdue University)

Wednesday, 12 August

8am **WA1: Devices and Systems for Sensors**
 Chaired by: Fred Long (United States) and George Fischer (United States)

8am **WA1.1 - 1550 nm Geiger Mode Avalanche Photodiode Focal Plane Arrays for Eye-safe Laser Radar (Invited)**
 » [Kyle McNicholas](#) (United States)¹ (1. MIT Lincoln Laboratories)

8:30am **WA1.2 - Photonic Crystal for Beam Tuning Application**
 » [Rudra Gnawali](#) (United States)¹, Andrew Volk (United States)², Imad Agha (United States)³, Tamara Payne (United States)¹, Jimmy Touma (United States)⁴ (1. Applied Optimization, Inc., 2. Applied Optimzation, Inc., 3. University of Dayton, 4. AFRL)

9am **WA1.3 - Nanophotonic Supercontinuum Based Mid-Infrared Dual-Comb Spectroscopy**
 » [Wenle Weng](#) (Switzerland)¹, Hairun Guo (Switzerland)¹, Junqiu Liu (Switzerland)¹, Fan Yang (Switzerland)¹, Wolfgang Haensel (Germany)², Camille-Sophie Bres (Switzerland)¹, Luc Thevenaz (Switzerland)¹, Ronald Holzwarth (Germany)², Tobias Kippenberg (Switzerland)¹ (1. EPFL, 2. Menlo Systems GmbH)

8am **WB1: Materials and Devices for Biosensing**
 Chaired by: Brett Wenner (United States) and Ivan Lima (United States)

8am **WB1.1 - Antibody Microarrays for Point of Care Detection from a Single Drop of Blood (Invited)**
 » [Ashutosh Chilkoti](#) (United States)¹ (1. Duke University)



Continued from **Wednesday, 12 August**

- 8:30am **WB1.2 - Universal Biosensor for Multiple Biomarker Detection for Medical Applications (Invited)**
 » [Dharmakeerthi Nawarathna](#) (United States)¹, Logeeshan Velmanickam (United States)², Vidura Jayasooriya (United States)², Madhava Sarma Vemuri (United States)², Umamaheswara Rao Tida (United States)² (1. 1Department of Electrical and Computer Engineering, Biomedical Engineering Program, North Dakota State University, 2. Department of Electrical and Computer Engineering, North Dakota State University, Fargo, ND, 58102)
- 9am **WB1.3 - Dielectrophoresis Based Sensor for Heparin Detection**
 » [Fleming Gudagunti](#) (United States)¹, Pranothi Mulinti (United States)², Srilakshmi Gundlakunta (United States)¹, Dharmakeerthi Nawarathna (United States)¹, Amanda Brooks (United States)², Ivan Lima (United States)¹ (1. Department of Electrical and Computer Engineering, North Dakota State University, Fargo, ND, 58108-6050, 2. Department of Pharmaceutical Sciences, North Dakota State University, Fargo, ND, 58108-6050)
- 9:30am **WB1.4 - Achieving over million-fold fluorescence enhancement for biosensing applications**
 » [Dharmakeerthi Nawarathna](#) (United States)¹, Logeeshan Velmanickam (United States)², Ivan Lima (United States)² (1. Department of Electrical and Computer Engineering, Biomedical Engineering Program, North Dakota State University, 2. Department of Electrical and Computer Engineering, North Dakota State University, Fargo, ND, 58102)
- 8am **WC1: Two Dimensional and Topological Materials**
 Chaired by: Amber Reed (United States) and Galan Moody (United States)
- 8am **WC1.1 - Scalable Synthetic Strategies towards 2D Transition Metal Dichalcogenides Quantum Materials and Heterostructures (Invited)**
 » [Nick Glavin](#) (United States)¹ (1. Air Force Research Laboratory)
- 8:30am **WC1.2 - Visualization of Topological States of Matter Using Microwave Impedance Microscopy (Invited)**
 » [Monica Allen](#) (United States)¹ (1. University of California, San Diego)

- 9am **WC1.3 - An Ab Initio Approach to Predicting and Controlling Quantum Systems (Invited)**
 » [Prineha Narang](#) (United States)¹ (1. Harvard University)
- 8am **WD1: Integrated Quantum Photonics**
 Chaired by: Amit Agrawal (United States) and Marcelo Devanco (United States)
- 8am **WD1.1 - Mimicking magnetic effects in a quantum dot with light (Invited)**
 » [Edward Flagg](#) (United States)¹ (1. West Virginia University)
- 8:30am **WD1.2 - Nanophotonic transducers for quantum photonic interconnects (Invited)**
 » [Kartik Srinivasan](#) (United States)¹ (1. National Institute of Standards and Technology)
- 9am **WD1.3 - Towards Quantum Networks with Erbium Ions and Integrated Silicon Nanophotonics (Invited)**
 » [Jeffrey Thompson](#) (United States)¹ (1. National Institute of Standards and Technology)
- 8am **WE1: RF and Optical Target Imaging, Identification, and Pattern Recognition**
 Chaired by: Jerome Cuenca (United States) and Matthew Burfeindt (United States)
- 8am **WE1.1 - A New Modified Transmission Eigenvalue Problem for Electromagnetic Scattering**
 » [Samuel Cogar](#) (United States)¹, Peter Monk (United States)² (1. Rutgers University, New Brunswick, 2. University of Delaware)
- 8:30am **WE1.2 - Massively-parallel Fourier-optical Convolutional Filtering towards Real-time Processing (Invited)**
 » [Volker Sorger](#) (United States)¹ (1. George Washington Univ)
- 9am **WE1.3 - Speckle-free imaging of dynamic targets without motion blur using pulsed laser arrays**
 » [Austin Steinforth](#) (United States)¹, J. Gary Eden (United States)¹ (1. University of Illinois)



Continued from **Wednesday, 12 August**

9:30am **WE1.4 - Enhancement of Linear Sampling Method Imaging of Conducting Targets Using a Boundary Condition Constraint**
 » [Matthew Burfeindt](#) (United States)¹, [Hatim Alqadah](#) (United States)¹ (1. US Naval Research Laboratory)

8am **WF1: Resonant Photonic Lattices: Principles and Applications**
 Chaired by: [Robert Magnusson](#) (United States) and [Ivan Avrutsky](#) (United States)

8am **WF1.1 - Multicontrollable Metasurfaces (Invited)**
 » [Akhlesh Lakhtakia](#) (United States)¹ (1. Pennsylvani State University)

8:30am **WF1.2 - Static and Dynamic Modification of Thermal Emission for Thermal Regulation (Invited)**
 » [Michelle Povinelli](#) (United States)¹, [Ahmed Morsy](#) (United States)¹, [Romil Audhkhasi](#) (United States)¹, [Aravind Krishnan](#) (United States)¹ (1. University of Southern California)

9am **WF1.3 - Hydrogenated silicon films for low-loss resonant reflectors operating in the visible region (Invited)**
 » [Halldor Svavarsson](#) (Iceland)¹, [Muhammad Taha Sultan](#) (Iceland)¹, [Kyu Jin Lee](#) (United States)², [Subrata Das](#) (United States)², [Robert Magnusson](#) (United States)² (1. Reykjavik University, 2. University of Texas at Arlington)

9:30am **WF1.4 - Guided-Mode Resonance Enhanced Mid-Wave Infrared Detector**
 » [Abhilasha Kamboj](#) (United States)¹, [Leland Nordin](#) (United States)², [Priyanka Petluru](#) (United States)¹, [Daniel Wasserman](#) (United States)² (1. The University of Texas at Austin, 2. University of Texas at Austin)

10am **WF1.5 - Resonant Reflection by Waveguide Gratings with Structured Period**
 » [Ivan Avrutsky](#) (United States)¹ (1. Wayne State University)

10:30am **WA2: T&E Forum**
 Chaired by: [Andreas Keipert](#) (United States) and [David Beargie](#) (United States)

10:30am **WB2: Biosensing Methods**
 Chaired by: [Jorge Chavez-Benavides](#) (United States) and [Josh Hagen](#) (United States)

10:30am **WB2.1 - Rapid electrochemical detection for SARS-CoV-2 and cardiac troponin I using low-cost, disposable and modular biosensor system (Invited)**
 » [Minghan Xian](#) (United States)¹, [Patrick Carey IV](#) (United States)¹, [Chaker Fares](#) (United States)¹, [Fan Ren](#) (United States)¹, [Siang-Sin Shan](#) (Taiwan)², [Yu-Te Liao](#) (Taiwan)², [Josephine F. Esquivel-Upshaw](#) (United States)¹, [Stephen Pearton](#) (United States)¹ (1. University of Florida, 2. National Chiao Tung University)

11am **WB2.2 - Novel Point of Care Strategies for Biomarker Detection (Invited)**
 » [Daewoo Han](#) (United States)¹, [Prajokta Ray](#) (United States)¹, [Shima Dalirirad](#) (United States)¹, [Andrew Steckl](#) (United States)¹ (1. University of Cincinnati)

11:30am **WB2.3 - Plasmon-enhanced Fluorescence Approaches for Biosensing and Diagnostics (Invited)**
 » [Nathaniel Cady](#) (United States)¹ (1. SUNY Polytechnic Institute)

10:30am **WC2: Quantum Optics and Low-Dimensional Quantum Materials**
 Chaired by: [Yohannes Abate](#) (United States) and [Nathaniel Stern](#) (United States)

10:30am **WC2.1 - Modulating elementary excitations in two-dimensional solids using phase-change materials (Invited)**
 » [Richard Haglund](#) (United States)¹, [Yohannes Abate](#) (United States)², [Joshua Caldwell](#) (United States)¹ (1. Vanderbilt University, 2. University of Georgia)

11am **WC2.2 - Miniaturized Reconfigurable Nanophotonic Structures Incorporating Phase-change Materials (Invited)**
 » [Ali Adibi](#) (United States)¹ (1. Georgia Institute of Technology)



Continued from **Wednesday, 12 August**

11:30am **WC2.3 - Spin-photon interfaces in atomically thin semiconductors (Invited)**

» [Nick Vamivakas](#) (United States)¹ (1. nick.vamivakas@rochester.edu)

12pm **WC2.4 - Adjoint-optimized nanoscale light extractor for enhanced luminescence from color centers in diamond**

» [Ray Wambold](#) (United States)¹, [Zhaoning Yu](#) (United States)¹, [Yuzhe Xiao](#) (United States)¹, [Benjamin Bachman](#) (United States)², [Gabriel Jaffe](#) (United States)³, [Shimon Kolkowitz](#) (United States)³, [Jennifer Choy](#) (United States)⁴, [Mark Eriksson](#) (United States)³, [Robert Hamers](#) (United States)², [Mikhail Kats](#) (United States)¹ (1. Department of Electrical and Computer Engineering, University of Wisconsin – Madison, 2. Department of Chemistry, University of Wisconsin – Madison, 3. Department of Physics, University of Wisconsin – Madison, 4. Department of Engineering Physics, University of Wisconsin – Madison)

10:30am **WD2: Chiral and Nonlinear Nano/Meta-Materials**

Chaired by: [Alexander Govorov](#) (United States) and [Ventsislav Valev](#) (United Kingdom)

10:30am **WD2.1 - Peptide Encoded Chiral Plasmonic Nanoparticle with a Giant g factor (Invited)**

» [Ki Tae Nam](#) (Korea, Republic of)¹ (1. Department of Materials Science and Engineering, Seoul National University)

11am **WD2.2 - Nonlinear Chiral Response of Planar Plasmonic-Photonics Hybrid Metasurfaces (Invited)**

» [Hayk Harutyunyan](#) (United States)¹ (1. Emory University)

11:30am **WD2.3 - Detection of Virus Particles in Blood Serum Using Chiral Plasmons (Invited)**

» [Malcolm Kadodwala](#) (United Kingdom)¹ (1. University of Glasgow)

10:30am **WE2: Spectral, Polarimetric, and Multimodal Imaging**

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

10:30am **WE2.1 - Imaging Spectroscopy of Paintings (Invited)**

» [John Delaney](#) (United States)¹ (1. National Gallery of Art)

11am **WE2.2 - Set Representations for LWIR In-Scene Atmospheric Compensation (Invited)**

» [Nicholas Westing](#) (United States)¹, [Brett Borghetti](#) (United States)¹, [Kevin Gross](#) (United States)², [Jacob Martin](#) (United States)³, [Joseph Meola](#) (United States)³ (1. Air Force Institute of Technology, 2. Resonant Sciences, 3. Air Force Research Laboratory)

11:30am **WE2.3 - Compact Full-spectrum Hyperspectral Sensing (Invited)**

» [Michael Wilson](#) (United States)¹, [Jeffry Santman](#) (United States)², [Jeffrey Hafner](#) (United States)³ (1. US Naval Research Laboratory, 2. Corning Specialty Materials, 3. Defense Threat Reduction Agency)

11am **WF2: Optical Metamaterials Based Devices and Applications**

Chaired by: [Shivashankar Vangala](#) (United States) and [Gennady Shvets](#) (United States)

11am **WF2.1 - Symmetry and Topology in Nanophotonics (Invited)**

» [Liang Feng](#) (United States)¹ (1. University of Pennsylvania)

11:30am **WF2.2 - Resonant wavefront-shaping metasurfaces (Invited)**

» [Nanfang Yu](#) (United States)¹ (1. Columbia University)

1:30pm **WA3: Displays, Holography and Projection - I**

Chaired by: [Ronald Rapp](#) (United States) and [Fouad Kiamilev](#) (United States)

1:30pm **WA3.1 - Techniques and progress to expand the capabilities of existing Infrared Scene Projector performance to support the demands of hypersonic and emerging systems: The Road to Hot, Fast and Big IRSP Systems (Invited)**

» [Steve McHugh](#) (United States)¹ (1. Santa Barbara Infrared)



Continued from **Wednesday, 12 August**

2pm **WA3.2 - Mid-Infrared Cascaded Superlattice LEDs Improved Order of Magnitude from New Four-Layer Superlattices and Textured Interfaces (Invited)**

» [John Prineas](#) (United States)¹, David Montealegre (United States)², Alex Walhof (United States)³, Katrina Schrock (United States)², Weitao Dai (United States)² (1. University of Iowa, Firefly Photonics, 2. University of Iowa, 3. Firefly Photonics LLC)

2:30pm **WA3.3 - Mid-Wave Infrared Quantum Dot Light Emitting Diodes (Invited)**

» [Daniel Wasserman](#) (United States)¹, Aaron Muhowski (United States)¹, Andrew Briggs (United States)², Leland Nordin (United States)¹, Priyanka Petluru (United States)², Alec Skipper (United States)¹, Seth Bank (United States)² (1. University of Texas at Austin, 2. The University of Texas at Austin)

3pm **WA3.4 - Packaging Advanced Cryo-Cooled Emitter Arrays For Flight Motion Simulator Use (Invited)**

» [Jim Oleson](#) (United States)¹ (1. Oleson Convergent Solutions LLC)

1:30pm **WB3: Human State Measurement**

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

1:30pm **WB3.1 - Modernizing the Bioreceptor: Efforts towards Real-Time Performance Monitoring for the Warfighter (Invited)**

» [Matthew Coppock](#) (United States)¹ (1. CCDC Army Research Laboratory)

2pm **WB3.2 - Electronic Extracellular Matrix for Skin-Interfaced Soft Biosensors (Invited)**

» [Ahyeon Koh](#) (United States)¹ (1. The State University of New York-Binghamton University)

2:30pm **WB3.3 - Terahertz Bio-sensing of Human Fatigue and Viral Infections (Invited)**

» [Ivan Medvedev](#) (United States)¹, Daniel Tyree (United States)¹, Jennifer Martin (United States)², Katherine Excoffon (United States)¹, Christopher Neese (United States)³, Brent Foy (United States)¹ (1. Wright State University, 2. AFRL, 3. The Ohio State University)

3pm **WB3.4 - A Data-Driven Approach to Aid in Understanding Brainwave Activity During Hypoxia**

» [Brittany Neilson](#) (United States)¹, Jeffrey Phillips (United States)², Dallas Snider (United States)³, Sabrina Drollinger (United States)⁴, Steven Linnville (United States)⁵, Ryan Mayes (United States)⁶ (1. Institute for Human Machine & Cognition, 2. Institute for Human & Machine Cognition, 3. University of West Florida, 4. Naval Aerospace Medical Institute, 5. Naval Medical Research Lab-Dayton, 6. United States Air Force School of Aerospace Medicine)

1:30pm **WD3: Dynamic Control of Self-assembled Plasmonic Nanostructures**

Chaired by: Scott Bukosky (United States) and Monica Allen (United States)

1:30pm **WD3.1 - Light-Directed Assembly of Photonic Nanostructures (Invited)**

» [Yuebing Zheng](#) (United States)¹ (1. The University of Texas at Austin)

2pm **WD3.2 - Nonlinear Optical Interactions of Topological Modes of Photonic Nanostructures (Invited)**

» [Nicolae Panoiu](#) (United Kingdom)¹ (1. University College London)

1:30pm **WE3: Optical Detectors and Focal Plane Arrays**

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

1:30pm **WE3.1 - Nanoantenna-Enhanced Resonant Detector Architecture for Improved Infrared Detector Performance (Invited)**

» [Michael Goldflam](#) (United States)¹ (1. Sandia National Laboratories)



Continued from **Wednesday, 12 August**

2pm **WE3.2 - Engineering the Spectral Response of Long-Wave Infrared Detectors**

» [Priyanka Petluru](#) (United States)¹, Zuoming Dong (United States)¹, Leland Nordin (United States)², Abhilasha Kamboj (United States)¹, Daniel Wasserman (United States)² (1. The University of Texas at Austin, 2. University of Texas at Austin)

1:30pm **WF3: Active Metasurfaces and Flat-optics**

Chaired by: Jason Valentine (United States) and Artur Davoyan (United States)

1:30pm **WF3.1 - Active dielectric and plasmonic metasurfaces: science and applications (Invited)**

» [Gennady Shvets](#) (United States)¹ (1. Cornell University)

2pm **WF3.2 - Diffractive Optical Neural Networks Designed by Deep Learning (Invited)**

» [Deniz Mengu](#) (United States)¹, Aydogan Ozcan (United States)¹ (1. UCLA)

2:30pm **WF3.3 - Transient Nonlinear Phase-Shift in Epsilon-Near-Zero Materials**

» [Sepehr Benis](#) (United States)¹, Natalia Munera (United States)², Eric W. Van Stryland (United States)³, David Hagan (United States)³ (1. CREOL, College of Optics and Photonics, UCF, 2. University of Central Florida, UCF, 3. CREOL, the College of Optics and Photonics, University of Central Florida, UCF)

3pm **WF3.4 - Designing Plasmonic Hot Carrier Extraction Devices for Uncooled Infrared Photodetection**

» [Gregory Forcherio](#) (United States)¹, Timothy Morgan (United States)¹, Scott Criswell (United States)², Dmitry Kozak (United States)³, Jason Valentine (United States)², Joshua Caldwell (United States)², Benjamin Conley (United States)¹ (1. Naval Surface Warfare Center, Crane, 2. Vanderbilt University, 3. US Naval Research Laboratory)

4pm **WA4: Displays, Holography and Projection - II**

Chaired by: Fouad Kiamilev (United States) and Ronald Rapp (United States)

4pm **WA4.1 - Architectural Enhancements of a Packetized Display Protocol for High-Speed IRSP Operation**

» [Tyler Browning](#) (United States)¹, Christopher Jackson (United States)¹, Aaron Landwehr (United States)¹, Andrea Waite (United States)¹, Daniel May (United States)¹, Fouad Kiamilev (United States)¹ (1. University of Delaware)

4:30pm **WA4.2 - Small Batch Fabrication and Weekly Rotational Testing of Closed System Electronics for Infrared LED Scene Projectors**

» [Jaclyn Singh](#) (United States)¹, Fouad Kiamilev (United States)¹, Miguel Hernandez (United States)¹, Tianne Lassiter (United States)¹, Alexis Deputy (United States)¹ (1. University of Delaware)

5pm **WA4.3 - Electronic & Mechanical Development of a Multi-platform Infrared LED Scene Projector System.**

» [Tianne Lassiter](#) (United States)¹, Garrett Ejzak (United States)¹, Andrea Waite (United States)¹, Miguel Hernandez (United States)¹, Fouad Kiamilev (United States)¹ (1. University of Delaware)

4pm **WB4: Human Analyst Augmentation**

Chaired by: Richard McKinley (United States) and Adrienne Ephrem (United States)

4pm **WB4.1 - Photobiomodulation and Cognitive Performance (Invited)**

» [Nathaniel Bridges](#) (United States)¹ (1. Air Force Research Laboratory)



Continued from **Wednesday, 12 August**

4:30pm **WB4.2 - MiRNA Testing to Identify Candidates for Individualized Weight Loss**
 » [Dharmakeerthi Nawarathna](#) (United States)¹, Vidura Jayasooriya (United States)², Logeeshan Velmanickam (United States)², Christopher Kotarsky (United States)³, Nathaniel Johnson (United States)⁴, Sean Mahoney (United States)⁴, Sherri Stastny (United States)⁴, Kyle Hackney (United States)⁴ (1. 1Department of Electrical and Computer Engineering, Biomedical Engineering Program, North Dakota State University, 2. Department of Electrical and Computer Engineering, North Dakota State University, Fargo, ND, 58102, 3. 3Department of Health, Nutrition and Exercise Sciences, North Dakota State University, Fargo, ND, 58102, 4. Department of Health, Nutrition and Exercise Sciences, North Dakota State University, Fargo, ND, 58102)

5pm **WB4.3 - Non-invasive Measurements of Cerebral Autoregulation and Intracranial Pressure (Invited)**
 » [Jana Kainerstorfer](#) (United States)¹ (1. Carnegie Mellon University)

5:30pm **WB4.4 - An EEG-based BCI for Visual Spatial Neglect Detection and Assessment (Invited)**
 » [Murat Akcakaya](#) (United States)¹ (1. University of Pittsburgh)

4pm **WC4: Synthesis and Fabrication of 2D Materials**
 Chaired by: Nick Glavin (United States) and Michael Wang (United States)

4pm **WC4.1 - Atomically-Thin Nanostructures and Interfaces for Electronics and Photonics (Invited)**
 » [Deep Jariwala](#) (United States)¹ (1. University of Pennsylvania)

4:30pm **WC4.2 - Fluidic assisted synthesis and assembly of 2D materials (Invited)**
 » [Bo Li](#) (United States)¹ (1. Villanova University)

4pm **WD4: Flexible Photonics and Electronics**
 Chaired by: Weidong Zhou (United States) and Ajit Roy (United States)

4pm **WD4.1 - Semiconductor nanomembrane based microwave flexible electronics and photonics (Invited)**

» [Zhenqiang Ma](#) (United States)¹, Weidong Zhou (United States)² (1. University of Wisconsin - Madison, 2. University of Texas - Arlington)

4:30pm **WD4.2 - Flexible Glass Applications & Process Scaling (Invited)**

» [Sean Garner](#) (United States)¹ (1. Corning)