

RAPID

Research and Applications of Photonics in Defense

12-14 September 2022
Miramar Beach, FL, USA
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



Welcome to the annual IEEE Research and Applications of Photonics in Defense Conference (RAPID) to be held in September 2022. We are excited to be back in person this year and look forward to the camaraderie and interactions that have been missed during the past two years. The conference has continued to grow and represent a diverse set of research and ideas from across the world. This is the fifth IEEE RAPID conference and will once again bring together government, academia, and industry in a global forum to present new fundamental basic research, innovative technologies and build collaborations to solve critical security and defense challenges. This international conference is broad in scope covering such areas as photonic materials, device physics, modeling and simulations, algorithms, and test and evaluation to name a few. With the breadth of topics covered, this conference seeks to attract diverse participation and collaboration from academia, industry, defense, and government agencies that will promote security interests with opportunities to increase technical depth and breadth as well as networking with peers. We are also happy to share that this year's program will also feature a Women in Science and Engineering and STEM luncheon together with a Workforce Development and Networking session in addition to the technical tracks. In a world where technology is rapidly changing, collaborations and multidisciplinary work is the only way to solve research challenges and foster the next generation of scientific discovery.



Monica Allen, Ph.D.
RAPID 2022 General Co-Chair



Jeffery Allen, Ph.D.
RAPID 2022 General Co-Chair

**2022 IEEE Research and Applications of Photonics in Defense Conference (RAPID)
Technical Program Committee**

General Co-Chairs:

Jeffery Allen, Ph.D., *Air Force Research Laboratory, USA*
Monica Allen, Ph.D., *Air Force Research Laboratory, USA*

ANP - Advanced Nanophotonics Platform

Topic Chair:

Hayk Harutyunyan, *Emory University, USA*

Committee Members:

Mark Adams, *Auburn University, USA*
Amit Agrawal, *National Institute of Standards and Technology, USA*
Marcelo Devanco, *National Institute of Standards and Technology, USA*
Anthony Hoffman, *Notre Dame University, USA*
Stephanie Law, *University of Delaware, USA*
Tomer Lewi, *Bar-Ilan University, Israel*
Gennady Shvets, *Cornell University, USA*

AOP - Applications of Photonics

Topic Chair:

Monica Allen, *Air Force Research Laboratory, USA*

Committee Members:

Andrew DeBlase, *Spectral Energies, USA*
Jennifer Gottfried, *Army DEVCOM, USA*
Andreas Keipert, *Air Force 47th Cyberspace Test Squadron, USA*
Fouad Kiamilev, *University of Delaware, USA*
Justin Meadows, *Air Force Research Laboratory, USA*
James Phillips, *Air Force 47th Cyberspace Test Squadron, USA*
Martin Schmidt, *Air Force Research Laboratory, USA*
Subith Vasu, *University of Central Florida, USA*
Jason Vosatka, *Air Force 47th Cyberspace Test Squadron, USA*
Patrick Walsh, *University of Dayton Research Institute, USA*

ETP - Enabling Technologies in Photonics

Topic Chair:

Jeffery Allen, *Air Force Research Laboratory, USA*

Committee Members:

Mithun Bhowmick, *Miami University, USA*
Joseph Deroba, *Army C5ISR, USA*
John Murray-Bruce, *University of South Florida, USA*
Babak Nikoobakht, *National Institute of Standards and Technology, USA*
Michael Reshchikov, *Virginia Commonwealth University, USA*
Michael Rucci, *Air Force Research Laboratory, USA*
Michael Saville, *Wright State University, USA*
Weimin Zhou, *Army Research Laboratory, USA*

FPM - Functional Photonic Materials

Topic Chair:

Sukrith Dev, *Air Force Research Laboratory, USA*

Committee Members:

Jason Azoulay, *University of Southern Mississippi, USA*

Stefan Badescu, *Air Force Research Laboratory, USA*

Benjamin Diroll, *Argonne National Laboratory, USA*

Ricky Gibson, *Air Force Research Laboratory, USA*

Alexander Khanikaev, *City University of New York, USA*

Galan Moody, *University of California at Santa Barbara, USA*

Amber Reed, *Air Force Research Laboratory, USA*

Simeon Trendafilov, *Air Force Research Laboratory, USA*

Jarrett Vella, *Air Force Research Laboratory, USA*

HMB - Human State Measurement and Biosensing

Topic Co-Chairs:

Patrick Bradshaw, *Air Force Research Laboratory, USA*

Curt Grigsby, *Air Force Research Laboratory, USA*

Committee Members:

Jorge Chavez-Benavides, *Air Force Research Laboratory, USA*

Joel Bixler, *Air Force Research Laboratory, USA*

Nathaniel Bridges, *Air Force Research Laboratory, USA*

Jason Foley, *Air Force Research Laboratory, USA*

Josh Hagen, *West Virginia University, USA*

Steve Kim, *Air Force Research Laboratory, USA*

Ivan Lima, *North Dakota State University, USA*

Anil Raj, *Institute for Human and Machine Cognition, USA*

Sharon Weiss, *Vanderbilt University, USA*

MMAP - Materials and Manufacturing for Advanced Photonics

Topic Chair:

Monica Allen, *Air Force Research Laboratory, USA*

Committee Members:

John Boeckl, *Air Force Research Laboratory, USA*

Parag Deotare, *University of Michigan, USA*

Kurt Eyink, *Air Force Research Laboratory, USA*

Shashi Karna, *Army Research Laboratory, USA*

Edward Kinzel, *Notre Dame University, USA*

Mariacristina Rumi, *Air Force Research Laboratory, USA*

Hjalti Sigmarsson, *Oklahoma University, USA*

Jonathan Slagle, *Air Force Research Laboratory, USA*

Peter Stevenson, *Air Force Research Laboratory, USA*

Ventsislav Valev, *University of Bath, United Kingdom*

OEDDIP - Optical Emitters, Detectors and Devices

Topic Chair:

Jeffery Allen, *Air Force Research Laboratory, USA*

Committee Members:

Max Andrews, *Technische Universitat Wien, Austria*

Eric Buckthal, *Air Force Research Laboratory, USA*

Enam Chowdhury, *The Ohio State University, USA*

Bryan Holtsberry, *Army DEVCOM, USA*

Margaret Kim, *University of Alabama, USA*

Eric Rosenthal, *Naval Research Laboratory, USA*

Andreas Schmitt-Sody, *Air Force Research Laboratory, USA*

Daniel Short, *Army DEVCOM, USA*

Anthony Valenzuela, *US Army Space and Missile Defense Command, USA*

Weidong Zhou, *The University of Texas at Arlington, USA*

OIST - Optical Imaging and Sensing Technology

Topic Chair:

Stephen Davis, *Air Force Research Laboratory, USA*

Committee Members:

Gamini Ariyawansa, *Air Force Research Laboratory, USA*

Matthew Burfeindt, *Naval Research Laboratory, USA*

Jerome Cuenca, *Air Force Research Laboratory, USA*

Jacob Martin, *Air Force Research Laboratory, USA*

Elizabeth Steenbergen, *Raytheon, USA*

David Ting, *NASA Jet Propulsion Laboratory, USA*

Daniel Wasserman, *The University Texas at Austin, USA*

Jason Zeibel, *US Army Futures Command, USA*

OMPEES - Optical Metamaterials, Plasmonics and Engineered Electromagnetic Structures

Topic Chair:

Ben Braaten, *North Dakota State University, USA*

Committee Members:

Ivan Avrutsky, *Wayne State University, USA*

Scott Bukosky, *Air Force Research Laboratory, USA*

Dipankar Mitra, *North Dakota State University, USA*

Varun Raghunathan, *Indian Institute of Sciences, India*

Charles Rohde, *Naval Research Laboratory, USA*

Sayan Roy, *South Dakota School of Mines, USA*

Shiva Vangala, *Air Force Research Laboratory, USA*

PDS - Photonics for Defense Systems

Topic Chair:

Jon Harris, *Air Force Research Laboratory, USA*

Committee Member:

George Fischer, *U.S. Army Combat Capabilities Development Command, USA*

Bradley Houck, *Air Force 96th Test Wing, USA*

Kirk Ingold, *United States Military Academy Westpoint, USA*

Frederick Long, *U.S. Army Combat Capabilities Development Command, USA*

Brett Pokines, *Air Force Research Laboratory, USA*

Mark Schmitt, *Air Force Research Laboratory, USA*

Brian Stadler, *Air Force Research Laboratory, USA*

Andre Van Rynbach, *Air Force Research Laboratory, USA*



2022 Program-at-a-Glance

*ALL TIMES ARE IN CENTRAL DAYLIGHT TIME

Monday, 12 September

Registration & Exhibits 8:00 am-4:00 pm
Emerald Foyer

12:00 pm-1:15 pm	<p>MA1: Women in Photonics/Women in Science and Engineering Luncheon <i>*Pre-registration Required*</i> Plenary: Ms. Lisa Sanders, <i>USSOCOM Director of Science and Technology, USA</i></p>	<i>Emerald E</i>	
<p>1:15 pm-1:30 pm – BREAK - Emerald Foyer</p>			
1:30 pm-3:45 pm	<p>MB1: Keynote & Plenary Session</p>		<i>Emerald C/D</i>
	<p>Welcome Remarks: David Lambert, <i>Air Force Research Laboratory, Munitions Directorate, USA</i></p>		
	<p>Keynote: Dr. Victoria Coleman, <i>Chief Scientist of the United States Air Force, USA</i></p>		
	<p>Plenary: Dr. Timothy Bunning, <i>Chief Technology Officer, Air Force Research Laboratory, USA</i></p>		
	<p>Plenary: Prof. Yeshaiahu (Shaya) Fainman, <i>Professor, University of California San Diego, USA</i></p>		
<p>Plenary: Prof. Benjamin Eggleton, <i>Director of The University of Sydney Nano Institute, Australia</i></p>			
<p>3:45 pm-4:00 pm – BREAK - Emerald Foyer</p>			
4:00 pm-4:30 pm	<p>MC1: Workforce Development and Networking Plenary: Mr. Rodney Allen, <i>Air Force Research Laboratory, USA</i></p>		<i>Emerald C/D</i>

***ALL TIMES ARE IN CENTRAL DAYLIGHT TIME** **Tuesday, 13 September** **Registration & Exhibits 8:00 am-4:00 pm**
Emerald Foyer

<i>Emerald A</i>	<i>Emerald B</i>	<i>Coastal A</i>	<i>Coastal B</i>	<i>Coastal C</i>	<i>Emerald C</i>
8:00 am-10:00 am TuA1: Active Plasmonics and Nanophotonics	8:00 am-10:00 am TuB1: Optical Methods for Characterizing Propulsion Systems	8:00 am-10:00 am TuC1: Microwave Optics and RF Photonics	8:00 am-10:00 am TuD1: Infrared Organic Materials & Properties	8:00 am-9:30 am TuE1: High Power Laser Matter Interaction 9:30 am-10:00 am TuE2: Pulse Laser Technology and Applications	8:00 am-10:00 am TuF1: Human Machine Symbiosis

10:00 am-10:15 am - BREAK - Emerald Foyer

10:15 am-12:15 pm TuA2: Emerging Materials Platforms for Pasmonics	10:15 am-11:45 am TuB2: Innovations in Test & Evaluation Forum	10:15 am-12:15 pm TuC2: Interferometric Analysis Methods	10:15 am-12:15 pm TuD2: Modeling and Simulation for Advanced Photonics	10:15 am-12:00 pm TuE3: Laser/Emitters	10:15 am-12:00 pm TuF2: Recent Advances, Discoveries and Future Opportunities in Photonic Nano-materials
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12:15 pm-1:30 pm - STEM Luncheon *Pre-registration Required* *Emerald E*
Plenary: Dr. George Fischer, Army Combat Capabilities Development Command, USA

1:30 pm-3:30 pm TuA3: Integrated Quantum Photonics	1:30 pm-3:30 pm TuB3: Blast/Shock Wave Imaging and Spectroscopic Techniques-I	1:30 pm-3:30 pm TuC3: Optical Sensing and Computational Imaging Systems	1:30 pm-3:15 pm TuD3: Non-Epitaxial Optoelectronic Devices	1:30 pm-3:00 pm TuE4: High Peak and Average Power Laser Technology Solid State	1:30 pm-2:45 pm TuF3: Devices and Systems for Sensors
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3:30 pm-3:45 pm - BREAK - Emerald Foyer

3:45 pm-5:15 pm TuA4: Ultrafast and Nonlinear Nanophotonics	3:45 pm-5:15 pm TuB4: Blast/Shock Wave Imaging and Spectroscopic Techniques-II	3:45 pm-5:45 pm TuC4: UV Optoelectronics	3:45 pm-5:15 pm TuD4: Two-Dimensional Materials & Topological Photonics	3:45 pm-4:45 pm TuE5: Terahertz Photonics	
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7:00 pm-9:00 pm
Welcome Reception - Barefoot's Deck

*ALL TIMES ARE IN CENTRAL DAYLIGHT TIME

Wednesday, 14 September

Registration & Exhibits 8:00 am-4:00 pm
Emerald Foyer

<i>Emerald A</i>	<i>Emerald B</i>	<i>Coastal A</i>	<i>Coastal B</i>	<i>Coastal C</i>	<i>Emerald C</i>
8:00 am-9:45 am WA1: Biosensing Methods	8:00 am-9:30 am WB1: Novel Materials for Photonics	8:00 am-10:00 am WC1: Spectral, Polarimetric, and Multimodal Imaging	8:00 am-10:00 am WD1: Optical Metamaterials Based Devices and Applications	8:00 am-10:00 am WE1: Instrumentation for Test and Evaluation of Nonlinear Plasma Effects In Space Physics Applications	8:00 am-10:00 am WF1: Displays and Holography I
10:00 am-10:15 am - BREAK - Emerald Foyer					
10:15 am- 12:15 pm WA2: Human State Measurement	10:15 am- 12:15 pm WB2: Scalable Manufacturing and Rapid Prototyping for Photonics	10:15 am-12:15 pm WC2: RF and Optical Target Imaging, Identification, and Pattern Recognition	10:15 am-11:45 am WD2: Resonant Photonic Lattices: Principles and Applications	10:15 am-12:15 pm WE2: Photonics and Future Warfighter Operational Concepts	10:15 am-11:45 am WF2: Displays and Holography II
12:15 pm-1:15 pm - LUNCH BREAK – On Own					
1:15 pm-2:45 pm WA3: Materials and Devices for Biosensing	1:15 pm-3:00 pm WB3: Semiconductor Materials and Quantum Nanoscience	1:15 pm-3:15 pm WC3: Optical Detectors and Focal Plane Arrays	1:15 pm-2:45 pm WD3: Dynamic Control of Self-assembled Plasmonic Nanostructures	1:15 pm-3:15 pm WE3: EO/IR/LADAR	
3:15 pm-3:30 pm - BREAK - Emerald Foyer					
3:30 pm-5:00 pm WA4: Methods and Systems for High Speed Imaging and Sensing of Biological Systems	3:30 pm-5:00 pm WB4: Recent Advances, Discoveries and Future Opportunities in Photonic Nano-Materials	3:30 pm-5:30 pm WC4: Optical Detectors/Sensors	3:30 pm-6:00 pm WD4: Optical Metasurfaces and Applications	3:30 pm-5:30 pm WE4: Devices and Systems for Sensors	



Monday, 12 September

- 12pm **MA1: Women in Photonics/Women in Science and Engineering Luncheon**
Emerald E
Chaired by: Adriane Moura (United States)
- 12pm **(Plenary) USSOCOM Science and Technology Overview**
» [Ms. Lisa Sanders](#) (United States)¹ (1. USSOCOM Director of Science and Technology)
- 1:30pm **Keynote & Plenary - MB1: Keynote & Plenary Session**
Emerald C/D
Chaired by: Phillip Flater (United States)
- 1:30pm **RAPID 2022 Welcome Remarks**
» [Dr. David Lambert](#) (United States)¹ (1. Air Force Research Laboratory, Munitions Directorate)
- 1:45pm **(Keynote) Photonics in Battle**
» [Dr. Victoria Coleman](#) (United States)¹ (1. Chief Scientist of the United States Air Force)
- 2:15pm **(Plenary) My Day Job and My Weekend Job: AFRL Photonics and LC-based Photonic Materials**
» [Dr. Timothy Bunning](#) (United States)¹ (1. Air Force Research Laboratory)
- 2:45pm **(Plenary) Chip-scale Nanophotonic Devices and Circuits**
» [Prof. Yeshiahu \(Shaya\) Fainman](#) (United States)¹ (1. Department Electrical and Computer Engineering, University of California San Diego)

- 3:15pm **(Plenary) New Frontiers in Photonic Smart Sensors for Situational Awareness**
» [Prof. Benjamin Eggleton](#) (Australia)¹ (1. Director of The University of Sydney Nano Institute)
- 4pm **MC1: Workforce Development and Networking Session**
Emerald C/D
Chaired by: John Henry Williams (United States)
- 4pm **(Plenary) Maximizing Impact through Professional Development**
» [Mr. Rodney Allen](#) (United States)¹ (1. Air Force Research Laboratory)

Tuesday, 13 September

- 8am **ANP - Advanced Nanophotonics Platform I - TuA1: Active Plasmonics and Nanophotonics**
Emerald A
Chaired by: Amit Agrawal (United States) and Gennady Shvets (United States)
- 8am **TuA1.1 - (Invited) Symmetry and topology in photonic nanostructures**
» [Abdoulaye Ndao](#) (United States)¹ (1. Boston University)
- 8:30am **TuA1.2 - (Invited) Active Nanophotonics with Nonvolatile Response: The Case for Phase-Change Materials**
» Yi-Siou Huang (United States)¹, Chuanyu Lian (United States)¹, Hongyi Sun (United States)¹, Heshan Yu (United States)¹, Ichiro Takeuchi (United States)¹, [Carlos Ríos](#) (United States)¹ (1. University of Maryland, College Park)
- 9am **TuA1.3 - (Invited) Suppression of radiative and electronic loss channels in graphene plasmonics**
» [Tingyi Gu](#) (United States)¹ (1. University of Delaware)



Continued from **Tuesday, 13 September**

9:30am **TuA1.4 - (Invited) Programmable lasers from reconfigurable colloidal assemblies**
 » [Giorgio Volpe](#) (United Kingdom)¹ (1. University College London)

8am **AOP - Applications of Photonics I -
 TuB1: Optical Methods for Characterizing Propulsion Systems**
Emerald B
 Chaired by: Patrick Walsh (United States) and Andrew DeBlase (United States)

8am **TuB1.1 - (Invited) Laser Diagnostic Applications in Hypersonic Ground-Test Facilities at Sandia**
 » [Sean Kearney](#) (United States)¹ (1. Sandia National Laboratories)

8:30am **TuB1.2 - (Invited) Coaxial Laser Absorption and Optical Emission Spectroscopy of High-Pressure Aluminum Monoxide**
 » [Kyle Daniel](#) (United States)¹, Christopher Murzyn (United States)¹, David Allen (United States)¹, Kyle Lynch (United States)¹, Charley Downing (United States)¹, Justin Wagner (United States)¹ (1. Sandia National Labs)

9am **TuB1.3 - (Invited) Visualizing the inferno: towards better understanding of high-speed combustors and detonations for propulsion using imaging and laser diagnostics up to megahertz rates**
 » [Chris Fugger](#) (United States)¹ (1. Spectral Energies LLC)

9:30am **TuB1.4 - HIGH-SPEED MEASUREMENTS OF DETONATION WAVE-INDUCED BREAKUP AND COMBUSTION OF NITROMETHANE DROPLETS**
 » [Daniel Dyson](#) (United States)¹, Sydney Briggs (United States)¹, Nicolas Berube (United States)¹, Artem Arakelyan (United States)¹, Subith Vasu (United States)² (1. UCF, 2. University of Central Florida, Orlando, FL 32816)

8am **ETP - Enabling Technologies in Photonics I -
 TuC1: Microwave Optics and RF Photonics**
Coastal A
 Chaired by: Weimin Zhou (United States)

8am **TuC1.1 - (Invited) Silicon nitride integrated photonics: from chip-scale frequency combs, frequency agile lasers to parametric amplifiers**
 » [Tobias Kippenberg](#) (Switzerland)¹ (1. Swiss Federal Institute of Technology Lausanne (EPFL))

8:30am **TuC1.2 - (Invited) Low-Noise Chip-Based Photonic Oscillators**
 » [Joel Guo](#) (United States)¹, Chao Xiang (United States)¹, Charles McLemore (United States)², LUE WU (United States)³, Warren Jin (United States)¹, Kerry Vahala (United States)³, Scott Diddams (United States)², Franklyn Quinlan (United States)², John Bowers (United States)¹ (1. UCSB, 2. NIST Boulder, 3. California Institute of Technology)

9am **TuC1.3 - (Invited) Photonic Oscillators: past, present and future**
 » [Lute Maleki](#) (United States)¹ (1. OEwaves, Inc.)

9:30am **TuC1.4 - (Invited) High performance microwave signal generation by optical frequency division**
 » [Kerry Vahala](#) (United States)¹ (1. California Institute of Technology)

8am **FPM - Functional Photonic Materials I -
 TuD1: Infrared Organic Materials & Properties**
Coastal B
 Chaired by: Jarrett Vella (United States) and Jason Azoulay (United States)

8am **TuD1.1 - (Invited) Designs for Upconversion and Photomultiplication in Organic Shortwave Infrared Detectors**
 » [Tse Nga Ng](#) (United States)¹ (1. University of California)

8:30am **TuD1.2 - (Invited) Broad Spectral Switching Via Electrochromism Using Conjugated Electroactive and Conducting Polymers**
 » [John Reynolds](#) (United States)¹ (1. Georgia Institute of Technology)



Continued from **Tuesday, 13 September**

9am **TuD1.3 - (Invited) Unconventional photophysics in infrared absorbing polymers**
 » [Matthew Sfeir](#) (United States)¹, Peter Budden (United States)¹, Jasmine Lim (United States)², Naresh Eedugurala (United States)², Jason Azoulay (United States)² (1. City University of New York, 2. University of Southern Mississippi)

9:30am **TuD1.4 - (Invited) Infrared Photodetection using Conjugated Polymers**
 » [Jarrett Vella](#) (United States)¹ (1. Air Force Research Laboratory)

8am **OEDDIP - Optical Emitters, Detectors and Devices I - TuE1: High Power Laser Matter Interaction**
Coastal C
 Chaired by: Andreas Schmitt-Sody (United States) and Enam Chowdhury (United States)

8am **TuE1.1 - (Invited) Ultrashort pulse Laser-Matter interaction**
 » [Andrew Stickrath](#) (United States)¹ (1. Air Force Research Laboratory)

8:30am **TuE1.2 - (Invited) Towards all-optical ion accelerator by an innovative target scheme**
 » [Satya Kar](#) (United Kingdom)¹ (1. School of Mathematics and Physics, Queen's University Belfast, BT7 1NN)

9am **TuE1.3 - (Invited) Solid-state impact welding of engineering materials using laser ablation as a driver for high-speed flyer launch**
 » [Anupam Vivek](#) (United States)¹ (1. The Ohio State University)

8am **HMB - Human State Measurement and Biosensing I - TuF1: Human Machine Symbiosis**
Emerald C
 Chaired by: Nathaniel Bridges (United States)

8am **TuF1.1 - (Invited) Modelling the Training Process**
 » [Ivan Tashev](#) (United States)¹, R. Michael Winters (United States)¹, Yu-Te Wang (United States)¹, David Johnston (United States)¹, Alexander Reyes (United States)², Justin Estep (United States)² (1. Microsoft Research, 2. The Air Force Research Laboratory)

8:30am **TuF1.2 - (Invited) Development of Integration Tools for Multimodal Read/Write Brain Computer Interface**
 » [Michael Weisend](#) (United States)¹, Renee Shimizu (United States)¹, Larkin Folsom (United States)¹, Mikayla Nichols (United States)¹, Blin Richards (United States)¹, Calvin Schmidt (United States)¹, Jon Cafaro (United States)¹, Stephen Simons (United States)¹, Craig Anderson (United States)¹ (1. Teledyne Scientific and Imaging)

9am **TuF1.3 - (Invited) Acoustically driven ferromagnetic resonance for biomagnetic sensing**
 » [Dominic Labanowski](#) (United States)¹, Alina Hsin (United States)¹, Jim Blodgett (United States)¹, Sai Sanigepalli (United States)¹, Vanessa Guzman (United States)¹, Kumar Srinivasan (United States)¹, Taylor Williams (United States)¹, Kenny Gotlieb (United States)¹, Gabriel Gonzalez (United States)¹, Suyogya Karki (United States)¹, Sabit Karayev (United States)¹, Jonathan Katz (United States)¹, Josh Hubert (United States)¹ (1. Sonera Magnetics, Inc.)

9:30am **TuF1.4 - (Invited) Electromagnetic Head Phantom Development**
 » [Kevin Alexander](#) (United States)¹, Justin Estep (United States)², Nathaniel Bridges (United States)³ (1. Oak Ridge Institute for Science and Education, Air Force Research Laboratory, 2. The Air Force Research Laboratory, 3. Air Force Research Laboratory)

9:30am **OEDDIP - Optical Emitters, Detectors and Devices II - TuE2: Ultrashort Pulse Laser Technology and Applications**
Coastal C
 Chaired by: Bryan Holtsberry (United States) and Daniel Short (United States)

9:30am **TuE2.1 - (Invited) Simulation of Supercontinuum Generation from Ultrashort Pulsed Lasers in Various Media**
 » [Zachary Epstein](#) (United States)¹ (1. Johns Hopkins University Applied Physics Laboratory)



Continued from **Tuesday, 13 September**

- 10:15am **ANP - Advanced Nanophotonics Platform II - TuA2: Emerging Materials Platforms for Plasmonics**
Emerald A
Chaired by: Anthony Hoffman (United States)
- 10:15am **TuA2.1 - (Invited) Super-Mossian and Quantum Materials for Nanophotonics**
» [Gururaj Naik](#) (United States)¹ (1. Rice University)
- 10:45am **TuA2.2 - (Invited) Hybrid Plasmonic-Dielectric Material and Device Platforms for Dynamically Reconfigurable Metaphotonic Devices**
» Sajjad Abdollahramezani (United States)¹, [Ali Adibi](#) (United States)¹ (1. Georgia Tech)
- 11:15am **TuA2.3 - (Invited) Phase-Change Metamaterial Infrared Scene Projector**
» [James Ginn](#) (United States)¹, Andrew Warren (United States)¹, David Shrekenhamer (United States)², James Champlain (United States)³ (1. Plasmonics Inc., 2. Johns Hopkins Applied Physics Laboratory, 3. U.S. Naval Research Laboratory)
- 11:45am **TuA2.4 - Actively tunable angle-independent mid-infrared optical filters using GST Fabry-Perot resonators**
» [Dylan Morden](#) (United States)¹, Evan Smith (United States)², Ivan Avrutsky (United States)³, Shiva Vangala (United States)⁴, Joshua Hendrickson (United States)⁴, Imad Agha (United States)¹ (1. University of Dayton, 2. KBR, 3. Wayne state University, 4. Air Force Research Lab)
- 12pm **TuA2.5 - Frequency Modulation of Perfect Absorbing Metamaterial using Thin Conformal Coatings**
» [Micheal McLamb](#) (United States)¹, Victoria Stinson (United States)¹, Nuren Shuchi (United States)¹, Glenn D. Boreman (United States)¹, Tino Hofmann (United States)¹ (1. University of North Carolina at Charlotte)

- 10:15am **AOP - Applications of Photonics II - TuB2: Innovations in Test & Evaluation Forum**
Emerald B
Chaired by: Jason Vosatka (United States) and Andreas Keipert (United States)
- 10:15am **ETP - Enabling Technologies in Photonics II - TuC2: Interferometric Analysis Methods**
Coastal A
Chaired by: Michael Saville (United States) and Mithun Bhowmick (United States)
- 10:15am **TuC2.1 - (Invited) Thin Film Surface Reconstruction from Interferometry Curvature Measurements**
» [Fernando Soria](#) (United States)¹, Andrew Fordon (United States)¹, Yunjun Xu (United States)¹, Shawn Putnam (United States)¹ (1. University of Central Florida)
- 10:45am **TuC2.2 - (Invited) Photon Doppler velocimetry in interdisciplinary shock compression studies**
» [Mithun Bhowmick](#) (United States)¹, Xuan Zhou (United States)² (1. Miami University, 2. University of Texas at San Antonio)
- 11:15am **TuC2.3 - (Invited) Measurements of Reduced Scale Models for Testing 3D Synthetic Aperture Radar Algorithms**
» [Paul Sotirelis](#) (United States)¹, JR Jamora (United States)¹, Sean Gilmore (United States)², Adam Nolan (United States)³, Rick Hubbard (United States)³, Jeff Walrath (United States)³ (1. AFRL, 2. ADI, 3. Etegent)
- 11:45am **TuC2.4 - Comparison of Air-Wedge Shearing vs Mach-Zehnder Interferometric Methods for Plasma Parameter Measurements**
» [Matthew Rustad](#) (United States)¹, Andy Hamilton (United States)², James Caplinger (United States)², Vladimir Sotnikov (United States)² (1. Riverside Research, 2. Air Force Research Laboratory)
- 12pm **TuC2.5 - A Laboratory Imaging System at 600 GHz**
» [Andrew Huebner](#) (United States)¹, Michael Saville (United States)¹, Elliott Brown (United States)¹, Paul Sotirelis (United States)² (1. Wright State University, 2. Air Force Research Laboratory)



Continued from Tuesday, 13 September

10:15am **FPM - Functional Photonic Materials II - TuD2: Modeling and Simulation for Advanced Photonics**
Coastal B
Chaired by: Simeon Trendafilov (United States) and Alexander Khanikaev (United States)

10:15am **TuD2.1 - (Invited) Quantum Nonreciprocity with Nonlinearity and Weyl semimetals**
» [Alex Krasnok](#) (United States)¹ (1. Florida International University)

10:45am **TuD2.2 - (Invited) Modeling the Self-Capacitance of Individual Plates in a Multi-Conductor System using PEEC**
» [Henry Wolf](#) (United States)¹ (1. North Dakota State University)

11:15am **TuD2.3 - Generalized Constructural Framework for Two-Dimensional Colloidal Particle Systems**
» [Scott Bukosky](#) (United States)¹, [Evan Bursch](#) (United States)², [Sukrith Dev](#) (United States)¹, [Monica Allen](#) (United States)¹, [Jeffery Allen](#) (United States)¹ (1. Air Force Research Lab, 2. University of Notre Dame)

11:45am **TuD2.4 - Novel Photonic Crystals for Beam Control in the Near-Infrared Spectrum**
» [Rudra Gnawali](#) (United States)¹, [Andrew Volk](#) (United States)¹, [Amit Rai](#) (United States)², [Imad Agha](#) (United States)², [Jimmy Touma](#) (United States)³, [Tamara Payne](#) (United States)¹ (1. Applied Optimization Inc, 2. University of Dayton, 3. Air Force Research Lab)

12pm **TuD2.5 - Negative Refractive Index in Si-Based Fishnet Stack at Optical Frequencies**
» [Dominic Bosomtwi](#) (United States)¹, [Marek Osinski](#) (United States)¹ (1. University of New Mexico)

10:15am **OEDDIP - Optical Emitters, Detectors and Devices III - TuE3: Laser/Emitters**
Coastal C
Chaired by: Aaron Maxwell Andrews (Austria)

10:15am **TuE3.1 - (Invited) Power and brightness scaling of GaAs-based diode lasers and modules for direct and pump applications**
» [Martin Wilkens](#) (Germany)¹, [Marko Hübner](#) (Germany)², [Paul Crump](#) (Germany)³ (1. Ferdinand-Braun-Institut gGmbH, Leibniz-Institut fuer Hoechstfrequenztechnik, 2. Ferdinand-Braun-Institut gGmbH Leibniz-Institut für Höchstfrequenztechnik, 3. Ferdinand-Braun-Institut gGmbH, Leibniz-Institut fuer Hoechstfrequenztechnik)

10:45am **TuE3.2 - (Invited) Non-Hermitian Photonics: New Functionality by Symmetry, New Opportunity beyond Symmetry**
» [Liang Feng](#) (United States)¹, [Zihe Gao](#) (United States)¹ (1. University of Pennsylvania)

11:15am **TuE3.3 - High-speed free-space transmission at room temperature with an RF-mounted quantum cascade laser emitting in the long-wave infrared domain**
» [Olivier Spitz](#) (France)¹, [Alice Guillaume-Manca](#) (France)¹, [Ke Yang](#) (China)², [Pierre Didier](#) (France)¹, [Junqi Liu](#) (China)², [Elie Awwad](#) (France)¹, [Frédéric Grillot](#) (France)¹ (1. Telecom Paris, 2. Chinese Academy of Sciences)

11:30am **TuE3.4 - Hybridizing THz Time-Domain Spectroscopy with Artificial Intelligence for Conductivity Prediction of Various Nanowires**
» [M. Zeki Güngördü](#) (United States)¹, [Patrick Kung](#) (United States)¹, [Seongsin Margaret Kim](#) (United States)¹ (1. university of Alabama)

11:45am **TuE3.5 - Low-Noise Hybrid Photonic Integrated Violet and Blue Lasers for Quantum Applications**
» [Thomas Wunderer](#) (United States)¹, [Anat Siddharth](#) (Switzerland)², [Noble Johnson](#) (United States)¹, [Christopher Chua](#) (United States)¹, [Mark Teepe](#) (United States)¹, [Zhihong Yang](#) (United States)¹, [Max Batres](#) (United States)¹, [Patrick Maeda](#) (United States)¹, [Grigori Likhachev](#) (Switzerland)², [Tobias Kippenberg](#) (Switzerland)² (1. Palo Alto Research Center, 2. Swiss Federal Institute of Technology Lausanne (EPFL))

10:15am **MMAF - Materials and Manufacturing for Advanced Photonics I - TuF2: Recent Advances, Discoveries and Future Opportunities in Photonic Nano-materials**
Emerald C
Chaired by: Ventsislav Valev (United Kingdom) and Shashi Karna (United States)



Continued from Tuesday, 13 September

- 10:15am **TuF2.1 - (Invited) Low-Symmetry Nanophotonics**
 » [Alex Krasnok](#) (United States)¹ (1. Florida International University)
- 10:45am **TuF2.2 - (Invited) Self-Assembled Helical Microparticles for Chiral Photonics**
 » [Nicholas Kotov](#) (United States)¹ (1. University of Michigan)
- 11:15am **TuF2.3 - Metasurfaces with multipole Mie lattice resonances**
 » [Viktoria Babicheva](#) (United States)¹ (1. University of New Mexico)
- 11:30am **TuF2.4 - Design and Fabrication of a Meta-Lens with a Hexagonal Array of Intersecting-Wall Meta-Atoms for Operation in the Near-Infrared**
 » [Chad Horton](#) (United States)¹, Stephen Kuebler (United States)¹, Manuel Martinez (United States)², Edgar Bustamante (United States)², Raymond Rumpf (United States)², Jimmy Touma (United States)³ (1. University of Central Florida, Orlando, FL 32816, 2. University of Texas at El Paso, 3. Air Force Research Lab)
- 11:45am **TuF2.5 - Simulating Optical Response of Disordered Photonic Crystals Using the Discrete Fourier Transform**
 » [Alexander Cockerham](#) (United States)¹, Chun Xia (United States)¹, Stephen Kuebler (United States)¹, Jimmy Touma (United States)² (1. University of Central Florida, Orlando, FL 32816, 2. Air Force Research Lab)
- 12:15pm **STEM Luncheon**
Emerald E
 Chaired by: Brian Mitchell (United States) and George Fischer (United States)
- 12:15pm **(Plenary) Guide to Duplicating the Picatinny STEM Liquid Nitrogen Roadshow**
 » [George Fischer](#) (United States)¹, Pauline Kim (United States)² (1. U.S. Army Combat Capabilities Development Command, 2. Science Teacher, Sinai Akiba Academy)

- 1:30pm **ANP - Advanced Nanophotonics Platform III - TuA3: Integrated Quantum Photonics**
Emerald A
 Chaired by: Mark Adams (United States)
- 1:30pm **TuA3.1 - (Invited) GaP-on-diamond platform for quantum photonics**
 » [Kai-Mei Fu](#) (United States)¹ (1. University of Washington)
- 2pm **TuA3.2 - (Invited) Simulation Tools for Integrated Quantum Photonics**
 » [Ryan Camacho](#) (United States)¹ (1. Brigham Young University)
- 2:30pm **TuA3.3 - (Invited) New Platform of Single Photon Source Arrays for On-chip Quantum Photonics**
 » [Jiefei Zhang](#) (United States)¹, Qi Huang (United States)¹, Swarnabha Chattaraj (United States)¹, Lucas Jordao (United States)¹, Siyuan Lu (United States)², Anupam Madhukar (United States)¹ (1. University of Southern California, 2. IBM Thomas J. Watson Research Center)
- 3pm **TuA3.4 - (Invited) Optimizing the optical-spin interface of molecular color centers**
 » [Daniel Laorenza](#) (United States)¹, Sam Bayliss (United Kingdom)², Pratiti Deb (United States)³, Mykyta Onizhuk (United States)³, Giulia Galli (United States)³, David Awschalom (United States)³, Danna Freedman (United States)¹ (1. Massachusetts Institute of Technology, 2. University of Glasgow, 3. University of Chicago)
- 1:30pm **AOP - Applications of Photonics III - TuB3: Blast/Shock Wave Imaging and Spectroscopic Techniques-I**
Emerald B
 Chaired by: Subith Vasu (United States) and Jennifer Gottfried (United States)
- 1:30pm **TuB3.1 - (Invited) Automated & Acoustically Corroborated Shockwave Imaging and Spectroscopy of High-Energy Pulsed Laser Excitation and Reactions**
 » [Elliot Wainwright](#) (United States)¹, Jennifer Gottfried (United States)¹ (1. US DEVCOM Army Research Laboratory)



Continued from **Tuesday, 13 September**

2pm **TuB3.2 - (Invited) Imaging techniques for characterizing impact-induced fragmentation and reaction**
 » [David Frost](#) (Canada)¹, [Dihia Idrici](#) (Canada)¹, [Sam Goroshin](#) (Canada)¹ (1. McGill University)

2:30pm **TuB3.3 - (Invited) Nitromethane Temperature and Species Characterization using Laser Absorption Spectroscopy inside a Blast Chamber**
 » [Subith Vasu](#) (United States)¹, [Robert Greene](#) (United States)², [Nishan Khanal](#) (United States)², [Marc Etienne](#) (United States)², [Kyle Thurmond](#) (United States)³ (1. University of Central Florida, Orlando, FL 32816, 2. UCF, 3. Los Alamos National Laboratory)

3pm **TuB3.4 - (Invited) Characterization of Post-Detonation Fireballs at 1 MHz via Laser Absorption Measurements of Temperature, Pressure, and Carbon Monoxide**
 » [Christopher Goldenstein](#) (United States)¹ (1. Purdue University)

1:30pm **ETP - Enabling Technologies in Photonics III - TuC3: Optical Sensing and Computational Imaging Systems**
Coastal A
 Chaired by: [John Murray-Bruce](#) (United States) and [Michael Rucci](#) (United States)

1:30pm **TuC3.1 - (Invited) Utilizing Deep Neural Networks in Image Inverse Problems, applied to parallel MRI**
 » [Edward Reehorst](#) (United States)¹ (1. The Ohio State University)

2pm **TuC3.2 - (Invited) Quantitative blood flow imaging with synthetic multi-exposure speckle imaging**
 » [Ashwin Parthasarathy](#) (United States)¹, [Abdul Mohaimen Safi](#) (United States)¹ (1. University of South Florida)

2:30pm **TuC3.3 - 2D Relative Phase Reconstruction of Low-contrast Plasma Interferometry**
 » [Michael Saville](#) (United States)¹ (1. Wright State University)

3pm **TuC3.4 - Compressed Optical Streaking for Diffraction Limited Magnetic Field Video Recording**
 » [Mark Keppler](#) (United States)¹, [Xianglei Liu](#) (Canada)², [Zachary Steelman](#) (United States)³, [Philip Hemmer](#) (United States)⁴, [Vladislav Yakovlev](#) (United States)⁴, [Jinyang Liang](#) (Canada)², [Joel Bixler](#) (United States)⁵ (1. Texas A&M University and SAIC, 2. Institut National de la Recherche Scientifique, 3. Air F, 4. Texas A, 5. Air Force Research Lab)

1:30pm **FPM - Functional Photonic Materials III - TuD3: Non-Epitaxial Optoelectronic Devices**
Coastal B
 Chaired by: [Sukrith Dev](#) (United States) and [Benjamin Diroll](#) (United States)

1:30pm **TuD3.1 - (Invited) Enhanced emission from the bright exciton and locating the dark exciton in strained CdSe/CdxZn1-xSe QDs**
 » [Igor Fedin](#) (United States)¹, [Mateusz Goryca](#) (Poland)², [Dan Liu](#) (United States)³, [Sergei Tretiak](#) (United States)³, [Victor Klimov](#) (United States)³, [Scott Crooker](#) (United States)³ (1. The University of Alabama, 2. University of Warsaw, 3. Los Alamos National Laboratory)

2pm **TuD3.2 - (Invited) Perovskite Materials and Devices for Detection of Quanta**
 » [Jinsong Huang](#) (United States)¹ (1. University of North Carolina)

2:30pm **TuD3.3 - Intraband Colloidal Quantum Dots for Low-Cost Mid-Wavelength Infrared Detectors**
 » [Dong-Kyun Ko](#) (United States)¹ (1. New Jersey Institute of Technology)

2:45pm **TuD3.4 - Developing Mid-Wave Infrared Photodetectors for Thermal Imaging with Colloidal Quantum Dots**
 » [Matthew Ackerman](#) (United States)¹, [Edward Malachosky](#) (United States)¹ (1. QDIR, Inc)



Continued from Tuesday, 13 September

3pm **TuD3.5 - Strong Anti-Stokes Luminescence from Colloidal LiY1-xYbxF4 Nanoparticles**
 » [Shruti Gharde](#) (United States)¹, Mark Reymatias (United States)¹, Quang Tin Nguyen (United States)¹, Lillian Elam (United States)¹, Mia Baca (United States)¹, Sergei Ivanov (United States)², John Watt (United States)², Dale Huber (United States)³, Gennady Smolyakov (United States)¹, Marek Osinski (United States)⁴ (1. University of New Mexico, 2. Los Alamos National Laboratory, 3. Sandi National Labs, 4. University of New)

1:30pm **TuE4: High Peak and Average Power Laser Technology Solid State**
Coastal C
 Chaired by: Eric Rosenthal (United States) and Anthony Valenzuela (United States)

1:30pm **TuE4.1 - (Invited) High-power mid-IR Cr:ZnS-based ultrafast lasers and frequency combs**
 » [Sergey Mirov](#) (United States)¹, Sergey Vasilyev (United States)², Viktor Smolski (United States)², Jeremy Peppers (United States)², Igor Moskalev (United States)³, Mike Mirov (United States)³, Yuri Barnakov (United States)² (1. University of Alabama at Birmingham, 2. IPG Photonics SETC, 3. IPG)

2pm **TuE4.2 - (Invited) Progress in Ultra-Short Pulse CO2 Lasers**
 » [Daniel Gordon](#) (United States)¹, Yu-hsin Chen (United States)¹, Aliaksandr Mamonau (United States)¹ (1. U.S. Naval Research Laboratory)

2:30pm **TuE4.3 - Edge-Illuminated Monochromatic Photovoltaic Array for Galvanically-Isolated Power-Over-Fiber**
 » [Seth Fortuna](#) (United States)¹, Erik Skogen (United States)¹, Junoh Choi (United States)¹, Bryan Kaehr (United States)¹, Andrew Pomerene (United States)¹, Charles Alford (United States)¹, Joshua Mondragon (United States)¹ (1. Sandia National Labs)

1:30pm **PDS - Photonics for Defense Systems I - TuF3: Devices and Systems for Sensors**
Emerald C
 Chaired by: Jeffery Allen (United States) and Nathan Anthony (United States)

1:30pm **TuF3.1 - On the Design of a Multiband Microstrip Patch Antenna by Introducing a Defected Ground Structure**
 » [Tasin Nusrat](#) (United States)¹, [Sayan Roy](#) (United States)¹ (1. South Dakota School of Mines)

2pm **TuF3.2 - Multiport Concentrators for Free Space Optical Applications**
 » [Christi Madsen](#) (United States)¹ (1. Texas A & M University)

2:15pm **TuF3.3 - Morpho Butterfly-Inspired Sensors Created by Multi-Photon Polymerization**
 » [Shaimum Shahriar](#) (United States)¹, Javier Pazos (United States)², Robin Howell (United States)³, Tyrone Morales (United States)¹, Desiree Aguilar (United States)¹, Stephen Kuebler (United States)¹, Jimmy Touma (United States)⁴ (1. University of Central Florida, Orlando, FL 32816, 2. Electro Magnetic Applications, 3. Univ, 4. Air Force Research Lab)

2:30pm **TuF3.4 - Numerical Exploration of Organic Liquid-filled Fibers**
 » Cesar Lopez-Zelaya (United States)¹, [Micah Raab](#) (United States)², Patrick Hemmer (United States)², Walker Larson (United States)², Trevor Courtney (United States)², Christian Keyser (United States)¹ (1. Air Force Research Lab, 2. SAIC)

3:45pm **ANP - Advanced Nanophotonics Platform IV - TuA4: Ultrafast and Nonlinear Nanophotonics**
Emerald A
 Chaired by: Hayk Harutyunyan (United States) and Tomer Lewi (Israel)



Continued from **Tuesday, 13 September**

3:45pm **TuA4.1 - (Invited) Nonlinear Effects in Mie Resonant Plasmonic Lattices**
 » Aoxue Han (United States)¹, Colm Dineen (United States)², Jerome Moloney (United States)³, Viktoriia Babicheva (United States)⁴ (1. James C. Wyant College of Optical Sciences, Also at Arizona Center for Mathematical Sciences, The University of Arizona, Tucson, AZ 85721, 2. Department of Mathematics, Also at Arizona Center for Mathematical Sciences, The University of Arizona, Tucson, AZ 85721, 3. James C. Wyant College of Optical Sciences, Department of Mathematics, Also at Arizona Center for Mathematical Sciences, The University of Arizona, Tucson, AZ 85721, 4. Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM 87106)

4:15pm **TuA4.2 - (Invited) Novel nonlinear chiral optical effects**
 » Ventsislav Valev (United Kingdom)¹ (1. University of Bath)

4:45pm **TuA4.3 - Second Harmonic Generation Enhancement from Amorphous Silicon-Gallium Nitride based Guided Mode Resonant Structures**
 » Sruti Menon (India)¹, Varun Raghunathan (India)¹ (1. Indian Institute of Science)

3:45pm **AOP - Applications of Photonics IV - TuB4: Blast/Shock Wave Imaging and Spectroscopic Techniques-II Emerald B**
 Chaired by: Subith Vasu (United States) and Jennifer Gottfried (United States)

3:45pm **TuB4.1 - (Invited) Visualization and Measurement of Explosive Fireball Internal Structure**
 » Nick Glumac (United States)¹ (1. University of Illinois)

4:15pm **TuB4.2 - (Invited) Extinction and Laser-Induced Incandescence Imaging of Carbon Soot in Post-Detonation Fireballs**
 » Daniel Guildenbecher (United States)¹ (1. Sandia National Labs)

4:45pm **TuB4.3 - DESIGN CONSIDERATIONS AND IMAGING SETUP FOR LIQUID FUEL DROPLET DETONATION WAVE EXPERIMENTS**
 » Nicolas Berube (United States)¹, Sydney Briggs (United States)¹, Daniel Dyson (United States)¹, Artem Arakelyan (United States)¹, Subith Vasu (United States)² (1. UCF, 2. University of Central Florida, Orlando, FL 32816)

5pm **TuB4.4 - The influence of alumina particle size on the fluid dynamics of a laser-induced plasma**
 » Clayton Miller (United States)¹, Elliot Wainwright (United States)², Jennifer Gottfried (United States)², Joseph Abraham (United States)³, Liang Wei (United States)³, Michelle Pantoya (United States)¹ (1. Texas Tech University, 2. US DEVCOM Army Research Laboratory, 3. Karagozian and Case)

3:45pm **ETP - Enabling Technologies in Photonics IV - TuC4: UV Optoelectronics Coastal A**
 Chaired by: Babak Nikoobakht (United States) and Michael Reshchikov (United States)

3:45pm **TuC4.1 - (Invited) III-Nitride Avalanche Photodiodes: An Enabling Technology Platform**
 » Shadi Shahedipour-Sandvik (United States)¹ (1. State University of New York Polytechnic Institute)

4:15pm **TuC4.2 - (Invited) Group III-Nitride Heterostructures for Deep Ultraviolet Optoelectronics: Current Status, Challenges, and other UV Materials**
 » Umit Ozgur (United States)¹ (1. Virginia Commonwealth University)

4:45pm **TuC4.3 - (Invited) Wide bandgap fin UV optical cavities**
 » Babak Nikoobakht (United States)¹, Jonathan Lee (United States)², Amit Agrawal (United States)³, Scott Wight (United States)³, Michael Shur (United States)⁴ (1. National Institute of Standards and Technology, 2. Ametek, 3. NIST, 4. Rensselaer Polytechnic Institute)



Continued from **Tuesday, 13 September**

- 5:15pm **TuC4.4 - Three-dimensionally shaped silicon nanostructures for ultraviolet plasmonics**
 » [Juhwan Kim](#) (Korea, Republic of)¹, Jang-Hwan Han (Korea, Republic of)¹, Gyurin Kim (Korea, Republic of)¹, Hyun Min Kim (Korea, Republic of)¹, Hyeon-Ho Jeong (Korea, Republic of)¹ (1. Gwangju Institute of Science and Technology)
- 5:30pm **TuC4.5 - OAM-Based Optical Wavelet for Real-Time Probing and Sensing**
 » [Justin Free](#) (United States)¹, Kunjian Dai (United States)¹, J. Keith Miller (United States)¹, Liam Vanderschaaf (United States)¹, Michael Cox (United States)¹, Richard J. Watkins (United States)¹, Eric Johnson (United States)¹ (1. Clemson University)
- 3:45pm **FPM - Functional Photonic Materials IV - TuD4: Two-Dimensional Materials & Topological Photonics**
Coastal B
 Chaired by: Stefan Badescu (United States) and Ricky Gibson (United States)
- 3:45pm **TuD4.1 - (Invited) Twisted van der Waals heterostructures: a new platform for photonic applications**
 » [Junho Choi](#) (United States)¹ (1. Los Alamos National Laboratory)
- 4:15pm **TuD4.2 - (Invited) Complex Skin Modes in Non-Hermitian Coupled Laser Arrays**
 » [Mercedeh Khajavikhan](#) (United States)¹, Yuzhou Liu (United States)¹, Omid Hemmatyar (United States)¹, Demetrios Christodoulides (United States)² (1. University of Southern California, 2. University of Central Florida, Orlando, FL 32816)
- 4:45pm **TuD4.3 - (Invited) Topological Optical Frequency Combs and Temporal Nested Solitons**
 » [Sunil Mittal](#) (United States)¹, Gregory Moille (United States)², Kartik Srinivasan (United States)², Yanne Chembo (United States)³, Mohammad Hafezi (United States)³ (1. Northeastern University, 2. University of Maryland, College Park / NIST, Gaithersburg, 3. University of Maryland, College Park)

3:45pm **OEDDIP - Optical Emitters, Detectors and Devices IV - TuE5: Terahertz Photonics**
Coastal C
 Chaired by: Eric Buckthal (United States) and Seongsin Margaret Kim (United States)

3:45pm **TuE5.1 - (Invited) Materials in Extreme Environments: Unlocking New Materials Physics Using Terahertz Time-domain Spectroscopy**
 » [David Hilton](#) (United States)¹ (1. Baylor University)

4:15pm **TuE5.2 - (Invited) Machine Learning in Terahertz Photonic Devices and Systems**
 » [Weilu Gao](#) (United States)¹ (1. University of Utah)

7pm **Welcome Reception**
Barefoot's Deck

Wednesday, 14 September

8am **HMB - Humanstate Measurement and Biosensing II - WA1: Biosensing Methods**
Emerald A
 Chaired by: Trevor Tilly (United States) and Rahul Rao (United States)

8am **WA1.1 - (Invited) Ultrasensitive and Minimally-invasive Bio-diagnostics**
 » [Srikanth Singamaneni](#) (United States)¹ (1. Washington University in St. Louis)

8:30am **WA1.2 - (Invited) Time-resolved measure of stress hormones in vivo by voltammetry and capacitive immunoprobe.**
 » [Corey Smith](#) (United States)¹, Nick Kluge (United States)¹, Shyue-An Chan (United States)¹ (1. Case Western Reserve University)



Continued from Wednesday, 14 September

9am **WA1.3 - Label-free Biomarker Detection Using Dielectrophoresis and Localized Surface Plasmonic Resonance**

» [Sameera Lakshan](#) (United States)¹, Dharmakeerthi Nawarathna (United States)¹ (1. North Dakota State University)

9:15am **WA1.4 - Label-Free Detection of Gamma-Aminobutyric Acid Biomarker Using Dielectrophoresis and Absorption**

» [Kai Nellerhoe](#) (United States)¹, Sameera Lakshan (United States)¹, Chengwen Sun (United States)¹, Dharmakeerthi Nawarathna (United States)¹ (1. North Dakota State University)

9:30am **WA1.5 - Porous Silicon Optical Biosensor for Malaria**

» [Rabeb Layouni](#) (United States)¹, Bradley Baker (United States)¹, Paul Laibinis (United States)¹, Sharon Weiss (United States)¹ (1. Vanderbilt University)

8am **MMAF - Materials and Manufacturing for Advanced Photonics II - WB1: Novel Materials for Photonics**

Emerald B

Chaired by: Peter Stevenson (United States) and John Boeckl (United States) and Mariacristina Rumi (United States) and Jonathan Slagle (United States)

8am **WB1.1 - (Invited) Pulsed Laser Deposition and Characterization of Oxides for Optoelectronics**

» [Ramana Chintalapalle](#) (United States)¹ (1. University of Texas at El Paso)

8:30am **WB1.2 - (Invited) Crystal Growth of Functional Inorganic Materials**

» [P. Shiv Halasyamani](#) (United States)¹ (1. Department of Chemistry, University of Houston)

9am **WB1.3 - (Invited) Metasurface flat optics: a dynamic path for shaping light**

» Cosmin-Constantin Popescu (United States)¹, Carlos Ríos (United States)², Yifei Zhang (United States)¹, Fan Yang (United States)¹, Mikhail Shalaginov (United States)¹, Hung-I Lin (United States)¹, Sensong An (United States)¹, Paul Miller (United States)³, Christopher Roberts (United States)³, Hualiang Zhang (United States)⁴, Steven Vitale (United States)³, Juejun Hu (United States)¹, [Tian Gu](#) (United States)¹ (1. Massachusetts Institute of Technology, 2. University of Maryland, College Park, 3. Lincoln Laboratory, Massachusetts Institute of Technology, 4. University of Massachusetts Lowell)

8am **OIST - Optical Imaging and Sensing Technology I - WC1: Spectral, Polarimetric, and Multimodal Imaging**

Coastal A

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

8am **WC1.1 - (Invited) Ultra-Compact Hyperspectral Imaging System for On-the-Move Applications**

» [Paul Lucey](#) (United States)¹, Adam Bingham (United States)², Edward Knobbe (United States)² (1. University of Hawaii and Spectrum Photonics, 2. Spectrum Photonics)

8:30am **WC1.2 - (Invited) Full-Spectrum Mini-Hyperspectral Imaging (HSI) Sensor - Maui**

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

9am **WC1.3 - (Invited) Multi-Sensor Anomalous Change Detection: A Flexible Change Detection Approach for Images from Different Sensors**

» [Amanda Ziemann](#) (United States)¹, Christopher Ren (United States)¹, James Theiler (United States)¹ (1. Los Alamos National Laboratory)

9:30am **WC1.4 - High density Photonic Tensor Core for Matrix-Vector Multiplication**

» [Volker Sorger](#) (United States)¹ (1. Optelligence Company & GWU)



Continued from **Wednesday, 14 September**

9:45am **WC1.5 - Metasurface Device Based Polarimetry for Remote Underwater Imaging Technology**
 » [Seongsin Margaret Kim](#) (United States)¹, Patrick Kung (United States)¹, Sevgi Gurbuz (United States)¹, Anirban Swakshar (United States)¹, Adeoluwa Oladipupo (United States)¹, Nathan Hayes (United States)¹ (1. The University of Alabama)

8am **OMPEES - Optical Metamaterials, Plasmonics and Engineered Electromagnetic Structures I - WD1: Optical Metamaterials Based Devices and Applications**
Coastal B
 Chaired by: Ben Braaten (United States) and Dipankar Mitra (United States) and Sayan Roy (United States)

8am **WD1.1 - (Invited) Towards a better-connected world: Combining sensing technologies with Radio Frequency Identification (RFID)**
 » [Shuvashis Dey](#) (United States)¹ (1. North Dakota State University)

8:30am **WD1.2 - (Invited) Prospects of Machine Learning on Dielectric Spectroscopy of Engineered Electromagnetic Structures from Microwave to mmWave Applications.**
 » [Dipankar Mitra](#) (United States)¹, Sayan Roy (United States)² (1. University of Wisconsin-La Crosse, 2. South Dakota School of Mines)

9am **WD1.3 - One-Dimensional Photonic Crystals with Narrow-Band Defect Modes Fabricated by Direct Laser Writing**
 » [Victoria Stinson](#) (United States)¹, Serang Park (United States)¹, Micheal McLamb (United States)¹, Glenn D. Boreman (United States)¹, Tino Hofmann (United States)¹ (1. University of North Carolina at Charlotte)

9:15am **WD1.4 - Cylindrical-Lens-Embedded Photonic Crystal Based on Self-Collimation**
 » Chun Xia (United States)¹, Jesus Gutierrez (United States)², [Stephen Kuebler](#) (United States)¹, Raymond Rumpf (United States)³, Jimmy Touma (United States)⁴ (1. University of Central Florida, Orlando, FL 32816, 2. University of Texas at E, 3. University of Texas at El Paso, 4. Air Force Research Lab)

9:30am **WD1.5 - Mid-IR Metalens Based on MoS2 Nanopillars**
 » [Muhammad Mahmudul Hasan](#) (United States)¹, Nezhil Pala (United States)¹ (1. Florida International University)

9:45am **WD1.6 - High-Throughput Volumetric Microfabrication with Structured Light**
 » He Cheng (United States)¹, Pooria Golvari (United States)¹, Mingman Sun (United States)², Meng Zhang (United States)², Stephen Kuebler (United States)¹, [Xiaoming Yu](#) (United States)¹ (1. University of Central Florida, Orlando, FL 32816, 2. Kansas State University)

8am **PDS - Photonics for Defense Systems II - WE1: Instrumentation for Test and Evaluation of Nonlinear Plasma Effects In Space Physics Applications**
Coastal C
 Chaired by: Brett Pokines (United States) and Bradley Houck (United States)

8am **WE1.1 - (Invited) Exploiting Plasma Effects for Detection of Space Debris**
 » Abhijit Sen (India)¹, [Chris Crabtree](#) (United States)² (1. Institute for Plasma Research, 2. US Naval Research Laboratory)

8:30am **WE1.2 - (Invited) Low temperature plasma solutions to in-space propulsion and space debris detection**
 » [Daniel Eckhardt](#) (United States)¹ (1. Air Force Research Laboratory)

9am **WE1.3 - (Invited) Active Debris Removal by Induced Hypervelocity Impact of Injected Dust**
 » [Chris Crabtree](#) (United States)¹, Gurudas Ganguli (United States)¹, Alex Fletcher (United States)¹ (1. US Naval Research Laboratory)

9:30am **WE1.4 - (Invited) Impact of Low Frequency Plasma Turbulence on Propagation of High Frequency Waves**
 » [Vladimir Sotnikov](#) (United States)¹ (1. Air Force Research Laboratory)



Continued from **Wednesday, 14 September**

- 8am **AOP: Applications of Photonics V - WF1: Displays and Holography I**
Emerald C
Chaired by: Justin Meadows (United States) and Fouad Kiamilev (United States)
- 8am **WF1.1 - (Invited) Novel Mid Infrared LEDs and lasers using cascade technologies**
» [Lars Hildebrandt](#) (Germany)¹, Robert Weih (Germany)¹, Nicolas Schaefer (Germany)² (1. Nanoplus Nanosystems and Technologies GmbH, 2. nopl)
- 8:30am **WF1.2 - (Invited) Interband Cascade LEDs Grown on Silicon**
» [Jerry Meyer](#) (United States)¹, Chadwick Canedy (United States)¹, William Bewley (United States)¹, Stephanie Tomasulo (United States)¹, Chul Soo Kim (United States)¹, Mijin Kim (United States)², Charles Merritt (United States)³, Igor Vurgaftman (United States)¹, Thomas Rotter (United States)⁴, Ganesh Balakrishnan (United States)⁴, Terry Golding (United States)⁵ (1. U.S. Naval Research Laboratory, 2. Jacobs Corporation, 3. U.S. Naval Research Laboratory, Retired, 4. University of New Mexico, 5. Amethyst Research)
- 9am **WF1.3 - (Invited) Colloidal Quantum Dot Emitters for Infrared Scene Projection**
» [Dana Dement](#) (United States)¹, Zack Coppens (United States)¹ (1. CFD research)
- 9:30am **WF1.4 - Improving the Performance of Infrared LEDs Through Standardized Integrated Duty Cycle Control**
» [Alexis Deputy](#) (United States)¹, Fouad Kiamilev (United States)¹, Casey Campbell (United States)¹ (1. Chip Design Systems)
- 9:45am **WF1.5 - Digital FIR boosting to correct IRLED RIIC analog delay**
» [Tyler Browning](#) (United States)¹, Matt Greenlee (United States)², Michael Joyce (United States)², Aaron Landwehr (United States)¹, Fouad Kiamilev (United States)² (1. Chip Design Systems, 2. University of Delaware)

- 10:15am **HMB - Humanstate Measurement and Biosensing III - WA2: Human State Measurement**
Emerald A
Chaired by: Steve Kim (United States) and Anil Raj (United States)
- 10:15am **WA2.1 - (Invited) Aptamer sensors on and in the skin: the fastest path to enable monitoring of human biomarkers for health, toxins, and performance status.**
» Jason Heikenfeld (United States)¹, Mark Friedel (United States)¹, Zachary Watkins (United States)¹, [Adam McHenry](#) (United States)¹ (1. University of Cincinnati)
- 10:45am **WA2.2 - (Invited) Underwater Oculometry for Diver Physiology and Neurocognitive Assessment**
» Jeffrey Phillips (United States)¹, [Connor Tate](#) (United States)¹, Savannah Richardson (United States)¹, Kody Coleman (United States)¹, Madison McInnis (United States)² (1. Florida Institute for Human and Machine Cognition, 2. Florida Institute for Human and Machine Cognition)
- 11:15am **WA2.3 - (Invited) A Review of the Machine Learning Algorithms used with High Density Surface Electromyogram Sensors for Lower Extremity Exoskeletons and Prosthetics**
» [Robert Dizer](#) (United States)¹, Anil Raj (United States)² (1. University of West Florida, 2. Institute For Human and Machine Cognition)
- 11:45am **WA2.4 - (Invited) Computational analysis of cortical gyri sources for EEG and MEG**
» [Simeon Trendafilov](#) (United States)¹, Monica Allen (United States)², Jeffery Allen (United States)² (1. Air Force Research Laboratory, 2. Air Force Research Lab)
- 10:15am **MMA - Materials and Manufacturing for Advanced Photonics III - WB2: Scalable Manufacturing and Rapid Prototyping for Photonics**
Emerald B
Chaired by: Edward Kinzel (United States) and Hjalti Sigmarsson (United States)



Continued from **Wednesday, 14 September**

- 10:15am **WB2.1 - (Invited) 3D Laser Deposition of Inorganic Transparent Materials for Advanced Optics**
 » [Francois Chenard](#) (United States)¹, Oseas Alvarez (United States)¹, Andrew K. Buff (United States)¹, Atul Regmi (United States)², Yahya Bougdid (United States)³, Aravida Kar (United States)³, Ranganathan Kumar (United States)⁴ (1. IRflex Corporation, 2. CREOL, Materials Science and Engineering, 3. CREOL, The College of Optics and Photonics, 4. University of Central Florida)
- 10:45am **WB2.2 - (Invited) US Naval Investment in Additive Manufacturing for Advanced Optics**
 » [Daniel Gibson](#) (United States)¹, Chandraika Sugrim (United States)² (1. US Naval Research Laboratory, 2. US Naval Air Warfare Center)
- 11:15am **WB2.3 - (Invited) Digital Glass Forming of Optics**
 » [Todd Sparks](#) (United States)¹ (1. Product Innovation and Engineering)
- 11:45am **WB2.4 - Dual-scale Engineering of Broadband Ultrablack Structures via Ultrafast Laser Processing**
 » Milan Palei (United States)¹, Nishan Kadka (United States)¹, [John Haug](#) (United States)¹, Yucheng Yang (United States)¹, Mathew R. Rosenberger (United States)¹, Edward Kinzel (United States)¹, Anthony Hoffman (United States)¹ (1. University of Notre Dame)

10:15am **OIST - Optical Imaging and Sensing Technology II - WC2: RF and Optical Target Imaging, Identification, and Pattern Recognition**
Coastal A
 Chaired by: [Matthew Burfeindt](#) (United States) and [Jerome Cuenca](#) (United States)

10:15am **WC2.1 - (Invited) High-resolution imaging for synthetic aperture radar**
 » [Chrysoula Tsogka](#) (United States)¹, Arnold Kim (United States)¹ (1. University of California Merced)

10:45am **WC2.2 - (Invited) Stable Non-Iterative Reconstruction of Acoustic Speeds from Near-Field Data**
 » [Yang Yang](#) (United States)¹ (1. Michigan State University)

11:15am **WC2.3 - Ground penetrating radar imaging via the linear sampling method under a phase-encoded formulation**
 » [Matthew Burfeindt](#) (United States)¹, Hatim Alqadah (United States)¹ (1. US Naval Research Laboratory)

11:30am **WC2.4 - Template Matching Study on Synthetic Aperture RADAR and Synthetic Aperture LADAR Imagery**
 » [Jacob Ross](#) (United States)¹, Michael Raymer (United States)², Brian Rigling (United States)², Vincent Velten (United States)¹ (1. Air Force Research Lab, 2. Wright State University)

11:45am **WC2.5 - Target Pose Estimation from Dual-Plane Speckle Return**
 » [Derek Burrell](#) (United States)¹, Ronald Driggers (United States)¹ (1. The University of Arizona Wyant College of Optical Sciences)

12pm **WC2.6 - Turning Door Frames into Cameras for 3D Non-line-of-sight Imaging**
 » [Robinson Czakiowski](#) (United States)¹, John Murray-Bruce (United States)¹ (1. University of South Florida)

10:15am **OMPEES - Optical Metamaterials, Plasmonics and Engineered Electromagnetic Structures II - WD2: Resonant Photonic Lattices: Principles and Applications**
Coastal B
 Chaired by: [Ivan Avrutsky](#) (United States) and [Jeffery Allen](#) (United States)

10:15am **WD2.1 - (Invited) Optical Sensing and Cryptography Using Metasurface Laser-Absorber**
 » [Pai-Yen Chen](#) (United States)¹ (1. University of Illinois at Chicago)



Continued from **Wednesday, 14 September**

10:45am **WD2.2 - (Invited) Properties and principles of resonant optical lattices**
 » [Robert Magnusson](#) (United States)¹, Yeong Hwan Ko (United States)¹, Nasrin Razmjooei (United States)¹, Kyu Jin Lee (United States)², Fairouz Abdullah Simlan (United States)², Ren-Jie Chen (United States)², Joseph Buchanan-Vega (United States)², Pawarat Bootpakdeetam (United States)², Neelam Gupta (United States)³ (1. University of Texas at Arlington, 2. UT-Arlington, 3. Army Research Laboratory)

11:15am **WD2.3 - (Invited) Encrypted communication using infrared photonic resonances**
 » [Michelle Povinelli](#) (United States)¹, Romil Audhkhazi (United States)¹ (1. University of Southern California)

10:15am **PDS - Photonics for Defense Systems III - WE2: Photonics and Future Warfighter Operational Concepts**
Coastal C
 Chaired by: Mark Schmitt (United States) and Kirk Ingold (United States)

10:15am **WE2.1 - (Invited) Atomic Filter Based Standoff Detection**
 » [Richard Miles](#) (United States)¹ (1. Texas AM University)

10:45am **WE2.2 - (Invited) Integrated Photonics for Applications at Non-Traditional Wavelengths**
 » [Cheryl Sorace-Agaskar](#) (United States)¹ (1. MIT Lincoln Laboratory)

11:15am **WE2.3 - (Invited) Photonics Enabled Sensing Capabilities for Air Force Missions**
 » [Ryan Schultz](#) (United States)¹ (1. Air Force Research Lab)

11:45am **WE2.4 - (Invited) Recent Advances in Gun Launched Weapons Terminal Homing Imaging Methods**
 » [Tracy Sheppard](#) (United States)¹ (1. Army Research Laboratory)

10:15am **AOP - Applications of Photonics VI - WF2: Displays and Holography II**
Emerald C
 Chaired by: Justin Meadows (United States) and Fouad Kiamilev (United States)

10:15am **WF2.1 - CDS's Infrared LED Scene Projector System as a Platform Product**
 » [Hamzah Ahmed](#) (United States)¹, Alexis Deputy (United States)¹, Jaclyn Singh (United States)¹, Aaron Landwehr (United States)¹, Tyler Browning (United States)¹, Tianne Lassiter (United States)¹, Casey Campbell (United States)¹, Fouad Kiamilev (United States)¹, Matt Greenlee (United States)², Michael Joyce (United States)² (1. Chip Design Systems, 2. University of Delaware)

10:30am **WF2.2 - Multiple Close Support Electronics (CSE) Advancements for Infrared Scene Projector Systems**
 » [Tianne Lassiter](#) (United States)¹, Garret Ejzak (United States)¹, Aaron Landwehr (United States)², Casey Campbell (United States)², Tyler Browning (United States)², Rodney McGee (United States)², Fouad Kiamilev (United States)¹ (1. University of Delaware, 2. Chip Design Systems)

10:45am **WF2.3 - Fabrication of the Next Generation of Drive Electronics for Infrared Scene Projectors**
 » [Jaclyn Singh](#) (United States)¹, Fouad Kiamilev (United States)¹, Tianne Lassiter (United States)², Alexis Deputy (United States)³, Michael Joyce (United States)² (1. Chip Design Systems, 2. University of Delaware, 3. chi)

11am **WF2.4 - Development and Testing of Amplifier Circuits for Infrared Scene Projectors**
 » [Michael Joyce](#) (United States)¹, Jacklyn Singh (United States)², Tianne Lassiter (United States)², Matt Greenlee (United States)¹, Alex Chacko (United States)¹ (1. University of Delaware, 2. Chip Design Systems)



Continued from **Wednesday, 14 September**

11:15am **WF2.5 - Mitigating Striations on Infrared LEDs through Application of DAC Corrections**

» [Matt Greenlee](#) (United States)¹, Michael Joyce (United States)¹, Fouad Kiamilev (United States)¹, Casey Campbell (United States)², Alexis Deputy (United States)² (1. University of Delaware, 2. Chip Design Systems)

11:30am **WF2.6 - System Improvements for Infrared LED Scene Projectors Applied to Non-Uniformity Correction**

» [Casey Campbell](#) (United States)¹, Fouad Kiamilev (United States)², Alexis Deputy (United States)¹ (1. Chip Design Systems, 2. University of Delaware)

1:15pm **HMB - Human State Measurement and Biosensing IV - WA3: Materials and Devices for Biosensing**

Emerald A

Chaired by: Ivan Lima (United States) and Sharon Weiss (United States)

1:15pm **WA3.1 - (Invited) Recent Advances in the Synthesis and Applications of Bio-templated Photonic Nanoclusters**

» [Shashi Karna](#) (United States)¹ (1. Army Research Laboratory)

1:45pm **WA3.2 - (Invited) Flow rate profile based PFAS detection on smartphone- and paper-based microfluidics**

» [Jeong-Yeol Yoon](#) (United States)¹, Lane Breshears (United States)¹, Samantha Mata-Robles (United States)¹, Kelly Reynolds (United States)¹ (1. the university of arizona)

2:15pm **WA3.3 - (Invited) Neuronal Modeling Tool Using DynaSim**

» [Daniel Ewert](#) (United States)¹ (1. North Dakota State University)

1:15pm **MMAP - Materials and Manufacturing for Advanced Photonics IV - WB3: Semiconductor Materials and Quantum Nanoscience**

Emerald B

Chaired by: Kurt Eyink (United States) and Parag Deotare (United States)

1:15pm **WB3.1 - (Invited) Nanophotonic spin-mechanics for sensing and quantum interfaces**

» Paul Barclay (Canada)¹, [Joseph Losby](#) (Canada)¹ (1. University of Calgary)

1:45pm **WB3.2 - (Invited) Recent Advances in Topological Thin Films**

» Susanne Stemmer (United States)¹, [Arman Rashidi](#) (United States)¹ (1. University of California Santa Barbara)

2:15pm **WB3.3 - Interband and Intraband Optical Gain in Colloidal Nanoplatelets**

» [Benjamin Diroll](#) (United States)¹ (1. Argonne National Laboratory)

2:30pm **WB3.4 - Considerations for Electrically-Pumped Quantum Hall Effect Topological Laser Arrays**

» [Weicheng You](#) (United States)¹, Bradley Thompson (United States)², Piyush Shah (United States)³, Robert Bedford (United States)⁴, Ricky Gibson (United States)⁴, Shamsul Arafin (United States)¹, Stefan Badescu (United States)⁴ (1. The Ohio State University, 2. KBR Inc., 3. Apex Microdevices, 4. Air Force Research Laboratory)

2:45pm **WB3.5 - Wafer-level active plasmonic nano-chains**

» [Jang-Hwan Han](#) (Korea, Republic of)¹, Juhwan Kim (Korea, Republic of)¹, Doeun Kim (Korea, Republic of)¹, Jin Kyeong Lee (Korea, Republic of)¹, Hyeon-Ho Jeong (Korea, Republic of)¹ (1. Gwangju Institute of Science and Technology)

1:15pm **OIST - Optical Imaging and Sensing Technology III - WC3: Optical Detectors and Focal Plane Arrays**

Coastal A

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

1:15pm **WC3.1 - (Invited) Uncooled Infrared/Far-Infrared Thermopile Arrays for Remote-Sensing Imaging Radiometry**

» [Matt Kenyon](#) (United States)¹, Byeong Eom (United States)¹, Giacomo Mariani (United States)¹, Brian Drouin (United States)¹ (1. NASA Jet Propulsion Laboratory)



Continued from **Wednesday, 14 September**

1:45pm **WC3.2 - (Invited) Event based sensor performance in scientific applications**
 » [Zachry Theis](#) (United States)¹, Rob Shroll (United States)², Benjamin St. Peter (United States)², Peter McMahon-Crabtree (United States)³ (1. Air Force Research Lab, 2. Spectral Sciences, Inc., 3. Air Force Research Laboratory)

2:15pm **WC3.3 - (Invited) Characteristics of p-n Junction InAs/InAsSb Superlattice for Mid-Wavelength Infrared Detection**
 » [David Rhiger](#) (United States)¹ (1. Raytheon Vision Systems)

2:45pm **WC3.4 - InAs/InAsSb Type-II Stained Layer Superlattice Infrared Detectors and Focal Plane Arrays**
 » [David Ting](#) (United States)¹, Sam Keo (United States)¹, Arezou Khoshakhlagh (United States)¹, Alexander Soibel (United States)¹, Brian Pepper (United States)¹, Cory Hill (United States)¹, Anita Fisher (United States)¹, Sir Rafol (United States)¹, Yuki Maruyama (United States)¹, Sarath Gunapala (United States)¹, Thomas Pagano (United States)¹ (1. NASA Jet Propulsion Laboratory)

1:15pm **OMPEES - Optical Metamaterials, Plasmonics and Engineered Electromagnetic Structures III - WD3: Dynamic Control of Self-assembled Plasmonic Nanostructures**
Coastal B
 Chaired by: Charles Rohde (United States) and Scott Bukosky (United States) and Monica Allen (United States)

1:15pm **WD3.1 - (Invited) Controlling light with plasmonic materials**
 » [Jake Fontana](#) (United States)¹ (1. Naval)

1:45pm **WD3.2 - (Invited) On-Demand Assembly of Reconfigurable Optical Metamolecules and Metamaterials**
 » [Yuebing Zheng](#) (United States)¹ (1. The University of Texas at Austin)

2:15pm **WD3.3 - (Invited) Transient photonics with earth-abundant materials**
 » [Marina Leite](#) (United States)¹ (1. UCD)

1:15pm **PDS - Photonics for Defense Systems IV - WE3: EO/IR/LADAR**
Coastal C
 Chaired by: Andre Van Rynbach (United States) and Brian Stadler (United States)

1:15pm **WE3.1 - (Invited) Temporally Multiplexed Raman-Waveform Spectropolarimetric LiDAR**
 » [Trevor Courtney](#) (United States)¹, Patrick Hemmer (United States)², Richard Martin (United States)³, Christian Keyser (United States)⁴ (1. SAIC / AFRL, 2. SAIC, 3. Air Force Institute of Technology, 4. Air Force Research Lab)

1:45pm **WE3.2 - (Invited) Temporally Multiplexed Mueller Matrix Polarimetric LiDAR**
 » [Arielle Adams](#) (United States)¹, Christian Keyser (United States)¹, Richard Martin (United States)², Jarrod Brown (United States)¹, Chad Welsh (United States)¹, Darrell Card (United States)¹, Daniel Leaird (United States)³, Daniel Carvalho (United States)⁴ (1. Air Force Research Laboratory, 2. Air Force Institute of Technology, 3. Torch Technologies, 4. DCS Corporation)

2:15pm **WE3.3 - (Invited) Revolutionary Optical beam Steering**
 » [Paul McManamon](#) (United States)¹ (1. Exciting Technology LC)

2:45pm **WE3.4 - (Invited) Fundamental Advantages and Challenges of Active 3D Imaging Geiger-mode Lidar**
 » [Richard Marino](#) (United States)¹, Phil Gatt (United States)¹, Scott Bradley (United States)¹ (1. Lockheed Martin)

3:30pm **HMB - Human State Measurement and Biosensing V - WA4: Methods and Systems for High Speed Imaging and Sensing of Biological Systems**
Emerald A
 Chaired by: Joel Bixler (United States) and Jason Foley (United States)

3:30pm **WA4.1 - (Invited) Single-shot Photoluminescence Lifetime Imaging Thermography**
 » [Jinyang Liang](#) (Canada)¹ (1. Institut national de la recherche scientifique (INRS) - Université du Québec)



Continued from **Wednesday, 14 September**

4pm **WA4.2 - (Invited) Liquid-Cell and Multi-Pass Electron Microscopy of Proteins on 2D Material Surfaces**
 » [Lawrence Drummy](#) (United States)¹ (1. Air Force Research Laboratory)

4:30pm **WA4.3 - (Invited) Single-shot microscope for simultaneous determination of fifteen cellular biophysical parameters**
 » [Zachary Steelman](#) (United States)¹, Zachary Coker (United States)², Anna Sedelnikova (United States)², Jennifer Tran (United States)³, Stacey Martens (United States)¹, Mark Keppler (United States)², Allen Kiester (United States)¹, Bennett Ibey (United States)¹, Joel Bixler (United States)¹ (1. Air Force Research Lab, 2. SAIC, 3. University of Wisconsin - Madison)

3:30pm **MMAP - Materials and Manufacturing for Advanced Photonics V - WB4: Recent Advances, Discoveries and Future Opportunities in Photonic Nano-Materials**
Emerald B
 Chaired by: Ventsislav Valev (United Kingdom) and Shashi Karna (United States)

3:30pm **WB4.1 - (Invited) Nearfield Quantum Nanoplasmonics**
 » [Ortwin Hess](#) (Ireland)¹, John Donegan (Ireland)¹ (1. Trinity College Dublin, The University of Dublin)

4pm **WB4.2 - (Invited) Low threshold nanolasers based on topological resonant modes**
 » [Min-Soo Hwang](#) (Korea, Republic of)¹, Ha-Reem Kim (Korea, Republic of)¹, Hong-Gyu Park (Korea, Republic of)¹ (1. Korea University)

4:30pm **WB4.3 - (Invited) Shape and material engineered plasmonic nanostructures using shadow growth**
 » Jang-Hwan Han (Korea, Republic of)¹, Juhwan Kim (Korea, Republic of)¹, Gyurin Kim (Korea, Republic of)¹, Hyun Min Kim (Korea, Republic of)¹, [Hyeon-Ho Jeong](#) (Korea, Republic of)¹ (1. Gwangju Institute of Science and Technology)

3:30pm **OIST - Optical Imaging and Sensing Technology IV - WC4: Optical Detectors/Sensors**
Coastal A
 Chaired by: Daniel Wasserman (United States) and Gamini Ariyawansa (United States)

3:30pm **WC4.1 - (Invited) Center for Semiconductor Modeling (CSM) - Accelerating Technology Development through Understanding Fundamental and Technology Limitations in Materials and Devices**
 » [Enrico Bellotti](#) (United States)¹, Luca Dal Negro (United States)¹, Jonathan Schuster (United States)², Meredith Reed (United States)², Jagmohan Bajaj (United States)² (1. Boston University, 2. ARMY DEVCOM ARL)

4pm **WC4.2 - (Invited) Novel Approaches to Infrared Detection in CMOS**
 » [Rajeev Ram](#) (United States)¹ (1. MIT)

4:30pm **WC4.3 - Optical-Based Relative Electric Field Measurement in Dielectric Microwave Resonators**
 » [Sukrith Dev](#) (United States)¹, Nathan Anthony (United States)², Simeon Trendafilov (United States)¹, Monica Allen (United States)¹, Jeffery Allen (United States)¹ (1. Air Force Research Laboratory, 2. University of Central Florida, Orlando, FL 32816)

5pm **WC4.4 - Short-Wavelength InAs-Based Quantum Cascade Detector Operating at 2.7 μm**
 » Miriam Giparakis (Austria)¹, Hedwig Knötig (Austria)¹, Maximilian Beiser (Austria)¹, Hermann Detz (Austria)¹, Benedikt Schwarz (Austria)¹, Werner Schrenk (Austria)¹, Gottfried Strasser (Austria)¹, [Aaron Maxwell Andrews](#) (Austria)¹ (1. Technische Universität Wien)

5:15pm **WC4.5 - Cryogenic Optical Interconnects for Infrared Sensing Applications**
 » [Steven Estrella](#) (United States)¹, Thomas Dorch (United States)¹, Trevor Cooper (United States)¹, Daniel Renner (United States)¹ (1. Freedom Photonics LLC)



Continued from **Wednesday, 14 September**

3:30pm **OMPEES - Optical Metamaterials, Plasmonics and Engineered Electromagnetic Structures IV - WD4: Optical Metasurfaces and Applications**
Coastal B
Chaired by: Varun Raghunathan (India) and Shiva Vangala (United States) and Monica Allen (United States)

3:30pm **WD4.1 - (Invited) Software Defined Meta-Optics**
» [Arka Majumdar](#) (United States)¹ (1. University of Washington)

4pm **WD4.2 - (Invited) Infrared Meta-Sensors**
» [Daniel Wasserman](#) (United States)¹, [Aaron Muhowski](#) (United States)², [Abhilasha Kamboj](#) (United States)², [Leland Nordin](#) (United States)³, [Noah Mansfield](#) (United States)² (1. The University Texas at Austin, 2. UNIVERSITY OF TEXAS AT AUSTIN, 3. Stanford University)

4:30pm **WD4.3 - (Invited) Active nano-photonics: from reconfigurable meta-lenses to drug-screening metasurfaces**
» [Gennady Shvets](#) (United States)¹ (1. Cornell University)

5pm **WD4.4 - (Invited) Symmetric high-Q metasurface enabled by bound states in the continuum**
» [Hayk Harutyunyan](#) (United States)¹ (1. Emory University)

5:30pm **WD4.5 - (Invited) Effect of Substrate Waves on Antireflection Performance of Metasurfaces**
» [Yeong Hwan Ko](#) (United States)¹, [Robert Magnusson](#) (United States)¹ (1. University of Texas at Arlington)

3:30pm **PDS: Photonics for Defense Systems V - WE4: Devices and Systems for Sensors**
Coastal C
Chaired by: George Fischer (United States) and Frederick Long (United States)

3:30pm **WE4.1 - (Invited) Gradient Index Optics With Performance Enhanced By Additive Manufacturing**
» [George Williams](#) (United States)¹, [Charles Dupuy](#) (United States)¹, [Jeremy Brown](#) (United States)¹, [Samuel Grimm](#) (United States)², [Paul Harmon](#) (United States)¹ (1. NanoVox LLC, 2. NanoVox)

4pm **WE4.2 - (Invited) Additive Manufacturing of Miniaturized Optical Image systems**
» [Cheng Sun](#) (United States)¹ (1. Northwestern University)

4:30pm **WE4.3 - Effects on Communications Wavelengths from an Atmospheric Nuclear Detonation**
» [Brandon Wilson](#) (United States)¹, [Alexander Miloshevsky](#) (United States)², [David Hooper](#) (United States)¹, [Warren Grice](#) (United States)¹, [Nicholas Peters](#) (United States)¹ (1. Oak Ridge National Laboratory, 2. University of Tennessee)

4:45pm **WE4.4 - Performance Limits of an Optical Fiber Communication System with Third-Order Solitons**
» [Thiago DeMenezes](#) (United States)¹, [Ivan Lima](#) (United States)¹ (1. North Dakota State University)

5pm **WE4.5 - Mid-infrared optical phased array on an InP-based platform**
» [Jason Midkiff](#) (United States)¹, [Po-Yu Hsiao](#) (United States)¹, [Ray Chen](#) (United States)¹ (1. The University of Texas at Austin)