

# 2023 Physics of Sensing Program Review

Dr. Michael Yakes | November 13-16, 2023 | Arlington, VA - hybrid

Basic Research Innovation Collaboration Center (BRICC)  
4100 N Fairfax Drive, Suite 450 | Arlington VA 22203

## Agenda Day 1 | Monday, November 13, 2023

Time	Topic	Speaker
12:30	<b>Check-in /Zoom Log-in</b>	
1:00	Space Domain Awareness in Cislunar Space	Dan Scheeres, Colorado
1:30	Remote sensing via multi-path optical interference of reflected light	Lauren Zarzar, Penn St.
2:00	Adaptive Data-Driven Actionable Intelligence for SSA in an Evidential Framework	Mrinal Kumar, Ohio St.
2:30	<b>BREAK</b>	
3:00	Innovative Single-Pixel Imaging Regularized by Event Data (InSPIRED)	Anthony Giljum, AFRL RV
3:30	Non-imaging advanced scene characterization	Nick Vamivakas, Rochester
4:00	<b>MEETING ADJOURN</b>	

## Agenda Day 2 | Tuesday, November 14, 2023

Time	Topic	Speaker
8:00	<b>Check-in /Zoom Log-in</b>	
8:30	Profiling of Atmospheric Turbulence using Time-Lapse Imagery of Non-Cooperative Targets from Multiple Spatially Separated Cameras	Santasri Bose-Pillai, AFIT
9:00	All-Optical Transformations Performed Using Diffractive Materials	Aydogan Ozcan, UCLA
9:30	Spectral NLOS imaging: towards photo-realistic NLOS reconstructions	Andreas Velten, Wisconsin
10:00	<b>BREAK</b>	

<b>10:30</b>	Resident Space Object Characterization by Fusing Polarized and Unpolarized Light Curves	John Crassidis, Buffalo
<b>11:00</b>	Optimizing Entanglement to attain Quantum Limit of Long-Baseline Imaging	Saikat Guha, Arizona
<b>11:30</b>	LAser guide Star Sensor Integrated Extreme Adaptive optics (LASSIE)	Lauren Schatz, AFRL RD
<b>12:00</b>	<b>LUNCH</b>	
<b>1:00</b>	Super-Resolution Imaging and Sensing with Relative Motion in Structured Illumination and Multiply-Scattered Light	Kevin Webb, Purdue
<b>1:30</b>	On the Problem of Deep Turbulence: Expanding the Field of View, Bandpass, and Observing Conditions of the Fresnel WFS	Justin Crepp, Notre Dame
<b>2:00</b>	The influence of boundary effects and type of environment on turbulence profiles	Miranda Van Irsel, Dayton
<b>2:30</b>	<b>BREAK</b>	
<b>3:00</b>	Ultra-broadband speckle imaging for space domain awareness	Stuart Jefferies, Georgia St.
<b>3:30</b>	Multi-Fidelity Uncertainty Propagation to Track Maneuvering Spacecraft	Brandon Jones, Texas
<b>4:00</b>	<b>MEETING ADJOURN</b>	

<b>Agenda Day 3   Wednesday, November 15, 2023</b>		
<b>Time</b>	<b>Topic</b>	<b>Speaker</b>
<b>8:00</b>	<b>Check-in /Zoom Log-in</b>	
<b>8:30</b>	HOTNMS: Harnessing Optomechanical effects for Tailoring Noise properties of Mechanical Sensors	Swati Singh, Delaware
<b>9:00</b>	A Comprehensive Sensor Data Processing Infrastructure for Local Domain Awareness of Space Objects	Andy Sinclair, AFRL RV
<b>9:30</b>	Electromagnetic Field Sensing Through Superradiance in 2D Materials	Shengxi Huang, Rice
<b>10:00</b>	<b>BREAK</b>	
<b>10:30</b>	Center for Space Situational Awareness Research (CSSAR)	Francis Chun, USAFA
<b>11:00</b>	The Science of Non-Resolved Space Object Signatures for Space Domain Awareness	Miguel Velez- Reyes, UTEP

<b>11:30</b>	Fundamental Bounds of Information in Photon Starved Passive Multidimensional Imaging and Recognition in the Presence of Environmental Degradation	Bahram Javidi, Connecticut
<b>12:00</b>	<b>LUNCH</b>	
<b>1:00</b>	Photonic nanocomposite films made by pulsed laser deposition	Abdalla Darwish, Dillard
<b>1:30</b>	Unravelling dependencies on turbulence strength and propagation geometry in models of optical scintillation	Jeremy Bos, Michigan Tech
<b>2:00</b>	Computationally-driven search for new infra-red absorbing semiconductors with long carrier lifetime	Geoffroy Hautier, Dartmouth
<b>2:30</b>	<b>BREAK</b>	
<b>3:00</b>	BRICC's Technology Transfer and Transition Capabilities	Sunny Shariar, VT-ARC
<b>3:30</b>	Sensing with Fractal, Diffraction-encoded Beams	Luat Vuong, UC-Riverside
<b>4:00</b>	<b>MEETING ADJOURN</b>	

<b>Agenda Day4   Thursday, November 16, 2023</b>		
<b>Time</b>	<b>Topic</b>	<b>Speaker</b>
<b>8:00</b>	<b>Check-in /Zoom Log-in</b>	
<b>8:30</b>	SHADOW IMAGING: Research in Fundamental Issues for a New Capability in Space Domain Awareness	Peter McMahan-Crabtree, AFRL RV
<b>9:00</b>	Ultrafast Automatic Event Recognition Using Multiphoton Atomic Transitions	Selim Shariar, Northwestern
<b>9:30</b>	A fine-wire sensor array for ground-based and airborne in-situ measurements of optical turbulence in the atmosphere	Andreas Muschinski, NWRA
<b>10:00</b>	<b>BREAK</b>	
<b>10:30</b>	Color Resolved Spacecraft Observations as a Tool for Sensing Material Identity and Chemical State	Ryan Hoffman, AFRL RV
<b>11:00</b>	End-to-End Design of Low-cost Computational Telescopes	Laura Waller, UC Berkeley
<b>11:30</b>	Improved BRDF Measurement and Modeling with Out-of- Plane and Wavelength Dependence	Todd Small, AFIT

<b>12:00</b>	<b>LUNCH</b>	
<b>1:00</b>	Statistically Inferred Multi-Modal Photon Information Content Quantification and Assessment Via Quanta Photogrammetry	Moriba Jah, Texas
<b>1:30</b>	Dynamics of Charge and Energy Transport in 2D/3D Mixed-dimensional Heterostructures enabled by Remote Epitaxy and Layer Resolved Splitting	Kyusang Lee, VA
<b>2:00</b>	Touchless Charge Control of Neighboring Spacecraft in Geostationary and Cislunar Space	Hanspeter Schaub, Colorado
<b>2:30</b>	<b>BREAK</b>	
<b>3:00</b>	Autonomous Distributed Angles-Only Orbit Determination using Multiple Observers	Simone D'Amico, Stanford
<b>3:30</b>	High-resolution Imaging in Heterogeneous Media	Alexei Novikov, Penn St.
<b>4:00</b>	Atomically precise exfoliation of single-crystalline oxide thin-films and its pyroelectric properties	Jeehwan Kim, MIT
<b>4:30</b>	<b>MEETING ADJOURN</b>	