

2022 Physics of Sensing Program Review

Dr. Michael Yakes | November 29 - December 1, 2022 | Arlington, VA
hybrid

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

Agenda Day 1 | Tuesday, November 29, 2022

Time	Topic	Speaker
8:30-9:00	Zoom login/ In-person Check in	
9-9:25	Welcome/Introduction	Michael Yakes, AFOSR
9:25-9:50	Electromagnetic Field Sensing Through Superradiance in 2D Materials	Shangxi Huang, Rice
9:50-10:15	HOTNMS: Harnessing Optomechanical effects for Tailoring Noise properties of Mechanical Sensors	Swati Singh, Delaware
10:15-10:40	Accurate Space Weather Aging and Optical Characterization of Spacecraft Materials	Ryan Hoffmann, AFRL/RV
10:40-10:55	BREAK	
10:55-11:20	Touchless Sensing of Electrostatic Potential and Material Characterization Using Neighboring Spacecraft	Hanspeter Schaub, Colorado
11:20-11:45	Computationally-driven search for new infra-red absorbing semiconductors with long carrier lifetime	Geoffrey Hautier, Dartmouth
11:45-1:00	LUNCH	
1-1:25	Optimizing Entanglement to attain Quantum Limit of Long-Baseline Imaging	Saikat Guha, Arizona
1:25-1:50	Imaging in Heterogeneous Media with the Noise Collector	Alexi Novikov, Penn St.
1:50-2:15	All-Optical Transformations Performed Using Diffractive Materials	Aydogan Ozcan, UCLA
2:15-2:30	BREAK	
2:30-2:55	Effects of non-Kolmogorov turbulence and aerosols on long-range, optical propagation through the atmosphere	Andreas Muschinski, NWRA
2:55-3:20	Imaging theory and mitigation in extreme turbulence-induced anisoplanatism	Jeremy Bos, Michigan Tech
3:20-3:45	Light Curve Inversion for Characterization of Objects with Concavities	Carolyn Frueh, Purdue
	MEETING ADJOURN	

Agenda Day 2 | Wednesday, November 30, 2022

Time	Topic	Speaker
8:30-9:00	Zoom login/ In-person Check in	
9-9:25	On the Problem of Deep Turbulence: Expanding the Field of View, Bandpass, and Observing Conditions of the Fresnel WFS	Justin Crepp, Norte Dame
9:25-9:50	Profiling of Atmospheric Turbulence using Time-Lapse Imagery of Non-Cooperative Targets from Multiple Spatially Separated Cameras	Santasri Bose-Pillai, AFIT
9:50-10:15	Spectral NLOS imaging: towards photo-realistic NLOS reconstructions	Andreas Velten, Wisconsin-Madison
10:15-10:40	Non-imaging advanced scene characterization	Anthony Vamivakas, Rochester
10:40-10:55	BREAK	
10:55-11:20	Ultra-broadband speckle imaging for space domain awareness	Stuart Jefferies, Georgia State
11:20-11:45	Fundamental Bounds of Information in Photon Starved Passive Multidimensional Imaging and Recognition in the Presence of Environmental Degradation	Bahram Javidi, Connecticut
11:45-1:00	LUNCH	
1-1:25	SHADOW IMAGING: Research in Fundamental Issues for a New Capability in Space Domain Awareness	Peter McMahon-Crabtree, AFRL/RV
1:25-1:50	Resident Space Object Characterization by Fusing Polarized and Unpolarized Light Curves	John Crassidis, Buffalo
1:50-2:15	NEW: Analysis of Modified Microfacet BRDF Models for Polarimetric Optical Scatter	Todd Small, AFIT
2:15-2:30	BREAK	
2:30-2:55	Optical Imaging and Sensing in a Scattering Environment	Kevin Webb, Purdue
2:55-3:20	Rotation, Shift and Scale Invariant Ultrafast Automatic Image Recognition Using an Opto-Electronic Correlator	Selim Shahriar, Northwestern
3:20-3:45	Imaging in the deep and intermittent turbulent atmosphere using fractal and log-normal beta models with conventional and modified imaging algorithms	Rao Gudimetla, AFRL/RD
	MEETING ADJOURN	

Agenda Day 3 | Thursday, December 1, 2022

Time	Topic	Speaker
8:30-9:00	Zoom login/ In-person Check in	
9-9:25	Adaptive Data-Driven Actionable Intelligence for SSA in an Evidential Framework	Mrinal Kumar, Ohio St.
9:25-9:50	TBD	
9:50-10:15	Multi-Fidelity Uncertainty Propagation to Track Maneuvering Spacecraft	Brandon Jones, Texas-Austin
10:15-10:40	Remote sensing via multi-path optical interference of reflected light	Lauren Zarzar, Penn St.
10:40-10:55	BREAK	
10:55-11:20	Atomically precise exfoliation of single-crystalline oxide thin-films and its pyroelectric properties	Jeehwan Kim, MIT
11:20-11:45	End-to-End Design of Low-cost Computational Telescopes	Laura Waller, UC-Berkeley
11:45-1:00	LUNCH	
1-1:25	A comprehensive sensor data processing infrastructure for local domain awareness of space objects	Andrew Sinclair, AFRL/RV
1:25-1:50	Autonomous Distributed Angles-Only Orbit Determination using Multiple Observers	Simone D'Amico, Stanford
1:50-2:15	Statistically Inferred Multi-Modal Photon Information Content Quantification and Assessment Via Quanta Photogrammetry	Moriba Jah, Texas-Austin
2:15-2:30	BREAK	
2:30-2:55	Center for Space Situational Awareness Research (CSSAR)	Francis Chun, Air Force Academy
2:55-3:20	Advanced Orbit Prediction for Resident Space Objects through Physics-based Learning	Xiaoli Bai, Rutgers
3:20-3:45	Space Domain Awareness in Cislunar Space	Daniel Scheeres, Colorado
	MEETING ADJOURN	