

2023 Joint HERMES and Physics of Sensing Program Review

Drs. John Luginsland / Michael Yakes | November 13-17, 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
8:00	Login / Sign in	
8:30	Welcome/Logistics	John Juginsland, AFOSR
8:40	Guest Speaker 1	TBD
9:00	Space Domain Awareness in Cislunar Space	Dan Scheeres, Colorado
9:25	Remote sensing via multi-path optical interference of reflected light	Lauren Zarzar, Penn St.
9:50	Adaptive Data-Driven Actionable Intelligence for SSA in an Evidential Framework	Mrinal Kumar, Ohio St.
10:20	BREAK	
10:50	Innovative Single-Pixel Imaging Regularized by Event Data (InSPIRED)	Anthony Giljum, AFRL RV
11:15	Non-imaging advanced scene characterization	Nick Vamivakas, Rochester
11:40	Ultra-broadband speckle imaging for space domain awareness	Stuart Jefferies, Georgia St.
12:05	LUNCH	
1:20	Reconfigurable Leaky-Wave Antenna for Terahertz Beam Forming (PO: Luginsland)	Daniel Mittleman, Brown University
1:45	Agile, Low-Power, Reconfigurable, and Large-Scale Wireless Terahertz Backscatter Networks	Yasaman Ghasempour, Trustees of Princeton University
2:10	Self-winding Helices as Slow-Wave Structures for Millimeter-through-THz Vacuum Electronic Devices	Francesca Cavallo, University of New Mexico
2:35	Quantum-Regime X-Ray Emission Technologies	Sergio Carbajo, University Of California, Los Angeles
3:00	BREAK	
3:30	Photo-emission-gated vacuum electron sources for x-ray communications	John Booske, University of Wisconsin System

3:55	Ultrawideband Agile Waveform Amplification for Electromagnetic Spectrum Maneuver and Space-based High Data-Rate Communications	Nader Behdad, University of Wisconsin System
4:20	Performance Limits of Hot Electron Photocathodes for THz Applications	Rehan Kapadia, University of Southern California
MEETING ADJOURN		

Agenda Day 2 Tuesday, November 14, 2023		
Time	Topic	Speaker
8:00	Login / Sign in	
8:30	Welcome/Logistics	Michael Yakes, AFOSR
8:40	DOE Perspective in High Energy Density Physics Modeling	Kris Beckwith, SNL
9:00	Deterministic to Statistical Modeling of Electrical Contact and Electron Transport in Anisotropic Materials	Peng Zhang, Michigan State University
9:25	Characterizing Electron Emission for Nanoemitter Arrays Using Theory and Molecular Level Simulations	Allen Garner, Purdue University
9:50	Extending Crossed-Field Device Physics	Jim Browning, Boise State University
10:20	BREAK	
10:50	HPM Frequency, Phase, and Mode-Locking of Recirculating Planar Magnetron	Ronald Gilgenbach, Regents of The University of Michigan
11:15	AFOSR YIP: Compact Pulsed Power Systems Using GaN Devices and High-Efficiency Magnetic Structures	Alex Hanson, University of Texas at Austin
11:40	Innovative nonlinear transmission line technologies to enable modular, scalable HPM systems	Jacob Stephens, Texas Tech University System
12:05	LUNCH	
1:20	Profiling of Atmospheric Turbulence using Time-Lapse Imagery of Non-Cooperative Targets from Multiple Spatially Separated Cameras	Bose-Pillai Santasri, AFIT
1:45	All-Optical Transformations Performed Using Diffractive Materials	Aydogan Oscan, UCLA
2:10	Spectral NLOS imaging: towards photo-realistic NLOS reconstructions	Velten Andreas, Wisconsin
2:35	Autonomous Distributed Angles-Only Orbit Determination using Multiple Observers	D'Amico Simone, Stanford

3:00	BREAK	
3:30	Resident Space Object Characterization by Fusing Polarized and Unpolarized Light Curves	Crassidis John, Buffalo
3:55	Optimizing Entanglement to attain Quantum Limit of Long-Baseline Imaging	Guha Saikat, Arizona
4:20	Atomically precise exfoliation of single-crystalline oxide thin-films and its pyroelectric properties	Kim Jeehwan, MIT
	MEETING ADJOURN	

Agenda Day 3 Wednesday, November 15, 2023		
Time	Topic	Speaker
8:00	Login / Sign in	
8:30	Welcome/Logistics	Michael Yakes, AFOSR
8:40	UV Spectrum for Space Sensing	Bill Amatuchi, NRL
9:00	Astro/Grant	
9:25	Astro/Grant	
9:50	Astro/Grant	
10:20	BREAK	
10:50	End-to-End Design of Low-cost Computational Telescopes	Laura Waller, UC Berkeley
11:15	HOTNMS: Harnessing Optomechanical effects for Tailoring Noise properties of Mechanical Sensors	Swati Singh, Delaware
11:40	Computationally-driven search for new infra-red absorbing semiconductors with long carrier lifetime	Geoffroy Hautier, Dartmouth
12:05	LUNCH	
1:20-2:35	POSTER SESSION	
3:00	BREAK	
3:30	Energy Transfer Kinetics During Plasma-Surface Interactions	Patrick Hopkins, Rector & Visitors of The University of Virginia

3:55	Thermo-Hydrodynamics of a Strongly Coupled Plasma	Seth Putterman, University of California, Los Angeles
4:20	Simulation of Thermonuclear Fusion from Cavitation in a Compressible Fluid: Role of the Bulk Modulus under Extreme Conditions	Seth Putterman, University of California, Los Angeles
MEETING ADJOURN		

Agenda Day 4 Thursday, November 16, 2023		
Time	Topic	Speaker
8:00	Login / Sign in	
8:30	Welcome/Logistics	Michael Yakes, AFOSR
8:40	Guest Speaker 3	TBD
9:00	A study of nonlocal thermal transport by measuring electron distribution functions along a temperature gradient	Dustin Froula, University of Rochester
9:25	Next-Generation Nonlinear Optical Materials for Applications in the Infrared	Mercouri Kanatzidis, Northwestern University
9:50	Efficient Near-Infrared and Infrared Lasers Pumped and Controlled by Optical Spin Polarization, and Wavefront Phase Manipulation for far and Near-Field Imaging and Free Space Communications	J. Eden, University of Illinois
10:20	BREAK	
10:50	Understanding white-light-emitting semiconductors for incoherent and coherent light sources	Peijun Guo, Yale University
11:15	Extreme "Meta"-Optical Fiber Enabled by Gate-tunable Metasurfaces and Zero-index Materials	Lee, Howard University of California Irvine
11:40	Multiscale and Multiphysics Modeling of Quantum Cascade Lasers	Irena Knezevic, University of Wisconsin System
12:05	LUNCH	
1:20	A Comprehensive Sensor Data Processing Infrastructure for Local Domain Awareness of Space Objects	Andy Sinclair, AFRL RV
1:45	SHADOW IMAGING: Research in Fundamental Issues for a New Capability in Space Domain Awareness	Peter McMahan-Crabtree, AFRL RV
2:10	Electromagnetic Field Sensing through Superradiance in 2D Materials	Shengxi Huang, Rice

2:35	Color Resolved Spacecraft Observations as a Tool for Sensing Material Identity and Chemical State	Ryan Hoffman, AFRL RV
3:00	BREAK	
3:30	Laser Guide Star Assisted Extreme Adaptive Optics	Lauren Schatz, AFRL RD
3:55	Dynamics of Charge and Energy Transport in 2D/3D Mixed-dimensional Heterostructures enabled by Remote Epitaxy and Layer Resolved Splitting	Kyusang Lee, Virginia
4:20	Improved BRDF Measurement and Modeling with Out-of-Plane and Wavelength Dependence	Todd Small, AFIT
	MEETING ADJOURN	

Agenda Day 5 Friday, November 16, 2023		
Time	Topic	Speaker
8:00	Login / Sign in	
8:30	Welcome/Logistics	Michael Yakes, AFOSR
8:40	Guest Speaker 1	
9:00	Fundamental Bounds of Information in Photon Starved Passive Multidimensional Imaging and Recognition in the Presence of Environmental Degradation	Bahram Javidi, Connecticut
9:25	On the Problem of Deep Turbulence: Expanding the Field of View, Bandpass, and Observing Conditions of the Fresnel WFS	Justin Crepp, Notre Dame
9:50	Statistically Inferred Multi-Modal Photon Information Content Quantification and Assessment Via Quanta Photogrammetry	Moriba Jah, Texas
10:20	BREAK	
10:50	Development and demonstration of laser-based low-coherence light sources for speckle-free photography with picosecond temporal resolution	Alfred Vogel, Universitat Zu Lubeck
11:15	Development of Dual Wavelength Raman Spectroscopy and its application for hydration assessment	Anita Mahadevan-Jansen, Vanderbilt University
11:40	Energy Coupling and Transfer in Repetitive Nanosecond Pulsed Plasmas	Chunqi Jiang, Old Dominion University
12:05	REVIEW ADJOURN	