

2020 GHz-THz Electronics Program

Dr. Kenneth Goretta | October 19-22, 2020 | Virtual

Agenda Day 1 | October 19, 2020

Time	Topic	Speaker
9:30	Zoom Login	
9:55	Logistics	Ken Goretta, AFOSR
10:00	Magnetic excitations in a honeycomb magnet	Liuyan Zhao, U Michigan
10:20	High-temperature superconductors for advanced power systems	Tim Haugan, AFRL/RQ
10:40	MBE growth of interface superconductors	Jenny Hoffman, Harvard U
11:00	BREAK	
11:30	Retention at ambient of high-pressure-induced metastable superconducting phases in Sb crystals	Paul Chu, U Houston
11:50	Exploration and development of advanced superconducting materials	J-P Paglione, U Maryland
12:10	Magnetism and superconductivity in several low-dimensional chalcogenides	Bing Lv, U Texas at Dallas
12:30	LUNCH	
1300	Tunneling investigation of the in-plane anisotropy of unconventional superconductors	Shane Cybart, U California Riverside
13:20	ARPES studies of high-temperature and topological superconductors	Inna Vishik, U California Davis
13:40	Controlling superconductivity near competing phases with broken rotational and time reversal symmetries	Jiun-Haw Chu, U Washington
14:00	Enhancing superconductivity at atomically precise interfaces	Kyle Shen, Cornell U
14:30	BREAK	
15:00	High Tc SQUID application in PPMS cryogenics	Shozo Yoshizumi, Quantum Design
15:20	Superconducting quantum terahertz spectrometer	Kevin Pratt, Tristan Technologies
15:40	Theoretical/computational studies of high-Tc superconductivity from quantum magnetism	Jose Rodriguez, Cal State U Los Angel
16:00	Competing orders in nanostructured high-Tc superconductors	Riccardo Comin, MIT

16:20	Electrically detected electron nuclear double resonance in semiconductor devices	Pat Lenahan, Penn State U
16:40	Wrap-up	



Agenda Day 2 October 20, 2020		
Time	Topic	Speaker
9:10	Zoom Login	
9:30	Logistics	Ken Goretta, AFOSR
9:40	Theoretical investigation of ways to weaken pairbreaking fluctuations in highT _c superconductors	Alex Gurevich, Old Dominion U
10:00	Linear and non-linear magnetoelectric interactions in multiferroics	Gopal Srinivasan, Oakland U
10:20	Design and development of novel interface mediated thin film multiferroics	Ram Katiyar, U Puerto Rico
10:40	Nanostructures of magnetic Dirac metals for RF electronics	Ramesh Budhani, Morgan State U
11:00	BREAK	
11:20	Spintronic THz with Rashba effect and the magnetically-induced transparency in magnonics	Wei Zhang, Oakland U
11:40	Sub-THz coherent spin pumping from an antiferromagnet	Enrique del Barco, U Central Florida
12:00	Magnonic material and device for information processing	Luqiao Liu, MIT
12:20	Localization dynamics in perovskite nickelates	Shriram Ramanathan, Purdue U
12:40	BREAK	
13:10	Picoscale structural insight into electronic properties of monolayer FeSe	Charles Ahn, Yale U
13:30	Spectroscopic imaging of defects using radiation-actuated scanning electron microscopy	Arun Majumdar, Stanford U

13:50	Hyperspectral nanoimaging of defects & localized excitonic species by multimodal nanoimaging & spectroscopy	Yohannes Abate, U Georgia
14:10	Advances in computing charge carrier dynamics in oxides from first principles	Marco Bernardi, Caltech
14:30	Time-domain investigation of phonon decay & phonon-plasmon mode properties in wide bandgap semiconductors	Feruz Ganikinov, U Rhode Island
14:50	BREAK	
15:10	Exploiting active electronics and active origami to generate a programmable electromagnetic response	Kaushik Bhattacharya, Caltech
15:30	Center for physically reconfigurable and deployable multifunctional antennas	Stavros Georgakopoulos, Florida Int'l U
15:50	Electromagnetic fluids for tunable RF constructs	Chris Tabor / Aji Mattamana, AFRL
16:10	Tunable oxide power electronics with 2-D electron gas interfaces	Chang-Beom Eom, U Wisconsin
16:30	In situ and real time chemical analysis of complex oxide surface during pulsed laser deposition	Jayakanth Ravichandran, USC
16:50	Wrap-up	



Agenda Day 3 | October 21, 2020

Time	Topic	Speaker
9:10	Zoom Login	
9:30	Logistics	Ken Goretta, AFOSR
9:40	Physics of surface charge doping: enabling hole conduction and improving carrier injection in 2-D materials	Saptarshi Das, Penn State U
10:00	Identification and manipulation of excitonic complexes in van der Waals heterostructures	Sufei Shi, RPI
10:20	Hybrid-materials valley optoelectronics for photon spin communication	David Muller, Cornell U
10:40	Planar 2-D heterojunctions between atomically thin dissimilar materials:	Mauricio Terrones, Penn State U

11:00	BREAK	
11:20	Sensors and Infra-red Photodetectors based on stacked LayErs of Two Dimensional Materials	Mukti Rana, Delaware State U
11:40	2-D-nitride material platforms for high-speed electronics	Joshua Robinson, Penn State U
12:00	Electron microscopy a& spectroscopy of 2-D hybrid material architectures for THz by STEM-EELS/E	Nabil Bassim, McMaster U
12:20	Quantum emitters and Moire superpotentials in van der Waals heterostructures	Berend Jonker, Naval Research Laboratory
12:40	LUNCH	
13:10	2-D and 3-D membranes for flexible radio frequency electronic devices	Nick Glavin / Mike Snure, AFRL
13:30	Charge transport across 2D-3D heterointerface junctions	Deep Jariwala, U Pennsylvania
13:50	Field emitter robust vacuum integrated nanoelectronics	Dimitris Pavlidis, Florida Int'l U
14:10	Empty state electronics	Tayo Akinwande, MIT
14:30	Fabrication, modelling and integration of nanoscale vacuum field effect transistors	Tyson Back, AFRL
14:50	BREAK	
15:10	Breaking symmetry by phase, helicity, and rectification for THz detection, spectroscopy, and interferometry	Michael Shur, RPI
15:30	Control of electron states in ballistic waveguides	Vladimr Mitin, U Buffalo
15:50	Physics of failure and radiation effects in emerging electronic materials and devices in space applications	Ron Schrimpf, Vanderbilt U
16:10	Scandium-based nitrides for next-generation sensors and microwave and millimeter-wave electronics	Amber Reed / John Cetnar, AFRL
16:30	Materials and device engineering for high-frequency UWBG AlGaIn electronics	Siddharth Rajan, Ohio State U
16:50	Wrap-up	

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Agenda Day 4 | October 22, 2020

Time	Topic	Speaker
9:30	Zoom Login	
9:50	Logistics	Ken Goretta, AFOSR
10:00	Electronic properties and interactions in emerging electronic systems: fundamentals of phonon effects	Mitra Dutta / Mike Stroschio, U Illinois-Chicago
10:20	Ultrawide bandgap heterostructures: growth, characterization, and modeli	Ravi Droopad, Texas State U
10:40	Development of MBE grown AlN/GaN digital alloys for RF and power electronics	Shin Mou, AFRL
11:00	The role of alloy disorder in the physical properties of group III nitrides	Jim Speck, U California Santa Barbara
11:20	BREAK	
11:50	Exploration of the AlN platform for electronics	Grace Xing, Cornell U
12:10	THz spectroscopy applied to the characterization of wide-bandgap semiconductors	Berardi Sensale-Rodriguez, U Utah
12:30	First-principles investigations of ScN-based interfaces and alloys	Chris Van de Walle, U California Santa Barbara
12:50	LUNCH	
13:20	Growth and doping of cubic BN	Michael Spencer, Morgan State U
13:40	Ion-assisted plasma MBE of cubic BN	David Storm, Naval Research Laboratory
14:00	DX in III-nitrides: a gap between DFT and experiment	Zlatko Sitar, North Carolina State U
14:20	Ultra-wide-bandgap alkaline earth stannates with high mobility	Bharat Jalan, U Minnesota
14:40	Fabrication and characterization of SrSnO ₃ field-effect transistors	Steve Koester, U Minnesota
15:00	BREAK	
15:20	BaSnO ₃ -based field-effect transistors	Darrell Schlom, Cornell U
15:40	Designing modulation-doped interfaces in high-mobility oxides via hybrid molecular beam epitaxy	Ryan Comes, Auburn U

16:00	Ferroelectric (HfZr)O ₂ and its integration on GaN	Peide Ye, Purdue U
16:20	Superacid interactions on semiconductor/oxide interfaces for device performance enhancement	Yuping Zeng, U Delaware
16:40	Wrap-up	