

2022 Materials with Extreme Properties and Condensed Matter Physics Joint Review

Drs. Ali Sayir/Jiwei Lu | June 13-17, 2022 | Arlington, VA (hybrid)

Agenda Day 1 | Monday, June 13, 2022

Time	Topic	Speaker
8:30	Check in / Login	
9:00	Welcome remarks	
9:15	High Performance Evaporators for Extreme Thermal Management	E. N. WANG MIT
9:45	Advancing Graph Techniques for Mathematical Modeling of Particle Shape and Packing	V. SUNDARARAGHAVAN UNIV. MICHIGAN
10:15	BREAK	
10:30	Field-Assisted and Interfacial-Liquid-Activated Materials Processing and Far-from-Equilibrium Microstructural Evolution	J. LUO UCSD
11:30	Optimizing reversal in magnetic nanowires (MNWs) for localized heating.	B. STADLER UNIVERSITY OF MINNESOTA
12:00	LUNCH	
13:00	Search for Deep Center Defects for Quantum Applications in ZnSe	D. IRVING NCSU
13:30	Quantum Sensing and Imaging of Quantum Materials	C.H. DU UCSD
14:00	Unraveling Ultrafast Dynamics of Magnetic Heterostructures	R. KUKREJA UC DAVIS
14:30	BREAK	
15:00	Measuring Atomic Scale Charge and Magnetization via 4D-STEM	P. HUANG UIUC
15:30	Terahertz Electron Paramagnetic Resonance Ellipsometry: A new tool to characterize defect spins in materials with extreme properties	M. SCHUBERT UNIV. NEBRASKA-LINCOLN
16:00	MEETING ADJOURN	

Agenda Day 2 Tuesday, June 14, 2022		
Time	Topic	Speaker
8:30	Check in / Login	
9:00	A New Materials Platform for Room-Temperature Control of Quantum Coherence	M. B. RASCHKE UNIV. COLORADO
9:30	Discovering New Atomically Laminated Transition Metal Borides with Diverse Properties	D. CAKIR UNIV. NORTH DAKOTA
10:00		
10:30	BREAK	
11:00	UNDO-Phase: UNcertainty-DOMinated Phase Transitions in Magnetic Materials: Investigating 2-D Lattices	P. ACAR VIRGINIA TECH
11:30	Time-Reversal Symmetry Breaking And Spin Polarization In 2D Material	O. L. A. MONTI UNIV. ARIZONA
12:00	LUNCH	
13:00	Functional Nanostructured Strongly Correlated Solids	I. SCHULLER UCSD
13:30	Extreme Nonlinearity in Transition Metal Oxides	A. Demkov and J. Ekerdt UT AUSTIN
14:00	BREAK	
14:30	Poster Session I (see the list attached at the end)	
17:00	MEETING ADJOURN	

Agenda Day 3 Wednesday, June 15, 2022		
Time	Topic	Speaker
8:30	Check in / Login	
9:00	Irrational Crystalline Interfaces And Implications on Slip-Emission under Phase-Transformations	H. SEHITOGLU UIUC
9:30	Semiconducting AlN: A New Pathway to High Voltage, Power and Temperature Ultra-Wide Bandgap Power Electronic Components	W. DOOLITTLE GIT
10:00	Growth and Characterization of Gallium-Oxide Epitaxial Films for High Performance Contact Structures	R.V. CHINTALAPALLE AND L.M. PORTER UTEP & CMU
10:30	BREAK	
11:00	All-Optical Transformations Performed Using Diffractive Materials	A. OZCAN UCLA
11:30	Quantification of Atom Probe Tomography Data	W. WINDL AND E. MARQUIS OSU / UNIV. MICHIGAN
12:00	LUNCH	
13:00	Effects of Disorder on the Ferroquadrupole State in TmVO ₄	I. FISHER STANFORD
13:30	Electron-Phonon Renormalization Tuned Pyroelectricity in Nanomembranes	J. SHI RPI
14:00	BREAK	
14:30	LiHoxY _{1-x} F ₄ : Dipole-Coupled Ising Magnets	D. SILEVITCH CAL TECH
15:00	The Electronic Structure of a Correlated Interface	C. AHN YALE UNIV.
15:30	Molecular Quantum Crystals: Tunable Optical Anisotropy of 2D Molecular Crystals on TMDs	J. W. PARK U. CHICAGO
16:00	MEETING ADJOURN	
17:30	No Host Networking	

Agenda Day 4 Thursday, June 16, 2022		
Time	Topic	Speaker
8:30	Check in / Login	
9:00	Optical Response of Two-Dimensional Dirac Materials With a Flat Band	Y-C LAI ASU
9:30	Complex Charge Density-Waves and Superconductivity in Kagome Metals	R. FERNANDES UNIV MINNESOTA
10:00	Dislocations as Nature's Quantum Wires	M. GHAZISAEIDI OSU
10:30	BREAK	
11:00	The $\nu = 0$ Quantum Hall State of a Topological Insulator	S. STEMMER UCSB
11:30	Towards Microwave Impedance Microscopy at Millikelvin Temperatures	MONICA ALLEN UCSD
12:00	LUNCH	
13:00	Light-Matter Interactions and Many-Electron Excitations in Quantum Materials	L. YANG WUSTL
13:30	Electron-phonon Coupling and Temperature Effects on Wide Band Gap Material Ga_2O_3 : Exploring Consequences for Operating Performance and Breakdown_	E. ERTEKIN UIUC
14:00	BREAK	
14:30	Poster Session II (see the list attached at the end)	
17:00	MEETING ADJOURN	

Agenda Day 5 June 17, 2022 One-on-one with PO		
8:30	Check in / Login	
	Dr. Ali Sayir	Dr. Jiwei Lu
9:00		
9:30		
10:00		
10:30		
11:00		
11:30		
12:00		
13:00	MEETING ADJOURN	

In-person Poster Session I : Tuesday, June 14, 2022 (14:30 to 17:00)	
Title	Presenter
Millimeter Wave Interactions with High Temperature Materials	Z. COHICK AFRL
Magneto-Optical Composite Materials With Tunable And Zero Net Magnetization	A. CHABANOV USTA
In Situ Nanoscale Visualization Of Peritectic Reactions	A. J. SHAHANI UNIV. MICHIGAN
Quantifying The Defect Character Of Grain Boundaries With Traction-Based Descriptors	H. B. CHEW UIUC
Formation and Characterization of 2D Mo ₂ C Crystals via Biased CVD	GÖKNUR CAMBAZ BÜKE TOBB UNIV. ECON & TECH
Vapor Phase-Assisted Sintering Of Transparent Yb ³⁺ :Lu ₂ O ₃ Laser Ceramics--	J. EUN AND R. F. SPEYER GA TECH
Imaging and Manipulation of the Electronic Landscape of Material Surfaces via Atomic-Resolution Force Microscopy under Ambient Conditions	M. Z. BAYKARA AND A. MARTINI UC MERCED
Evolution of Anisotropy and Order of Band-to-band Transitions, Excitons, Phonons, Static and High Frequency Dielectric Constants including Strain Dependencies in Alpha and Beta Phase (Al _x Ga _{1-x}) ₂ O ₃	M. SCHUBERT UNIV. NEBRASKA-LINCOLN
Optically Active Single-defect Spin-qubits in Wide Bandgap ZnSe	E. WAKS U. MARYLAND
Effect of Extreme Electric Fields on Thermal Transport in Wide-gap Semiconductors	B. LIAO UCSB
Growth and Characterization of Superconductivity in Group IV Semiconductor Thin Films	J. SHABANI NYU
Effect of Ca and Zr Modification and Texturing on Electrocaloric Response for Barium Titanate Systems at the Critical Points	EBRU ALKOY AND BURCH MISIRLIOGLU GEBZE TECH AND SABANCI U.
Unraveling phonons at the atomic scale	J. LEBEAU MIT
Co-doping Perovskite Dielectrics for Reliability under Extreme Voltages	E. DICKEY CMU
	A ALLANORE MIT

Virtual Poster Session II: Thursday June 16, 2022 (14:30 to 17:00)	
Title	Presenter
Strongly Correlated Electrons for Topological Quantum Phases	Q. SI RICE UNIV.
Defect Equilibration Studies in Binary Metal-Oxides	S. RAMANATHAN PURDUE UNIV.
Intertwined Topological and Magnetic Orders in Atomically Thin Chern Insulator MnBi ₂ Te ₄	X. XU U. WASHINGTON

Electromagnetically Induced Modification of Metal Optical Properties	MATTHEW BERG KANSAS STATE UNIV.
Ultrathin Topological Bismuth Crystals Grown Inside Van Der Waals Materials	J. SANCHEZ-YAMAGISHI UC IRVINE
Multiferroic Heterostructures Towards High Frequency Acousto-Magnetic Electronics	M. R. PAGE AFRL
Tuning Magnetism and Superconductivity via Extreme Strain in Free-Standing Heusler Membranes	J. K. KAWASAKI UNIV. WISCONSIN, MADISON
High Temperature and Pressure Multicomponent Alloy Design	S. YANG SOUTHERN UNIV. AND A&M COLLEGE
Experimental Discovery of Kramers Nodal Lines and Weyl Points in SmAlSi	E. MOROSAN & M. YI RICE UNIV.
Semiconducting AlN: A New Pathway to High Voltage, Power and Temperature Ultra-Wide Bandgap Power Electronic Components	W. DOOLITTLE GIT
Quadrupolar Photogalvanic Spectroscopy as a Probe of Complex Matter	R. AGARWAL U. PENN
Quantum Magnetotransport in Two-Dimensional Quartic Materials-	H SEVINÇLI IZMIR INST. OF TECH.
Window Development Tools for Hypersonic Application	R. HAY AFRL
Low Emissivity Window	B. SLOVICK SRI
Exploring Light-Matter Interaction in Gallium Oxide Micro- And Nanostructures	B. MENDEZ UNIV Complutense Madrid
Fundamental Study of p-Type Doping in MOCVD-Grown Ga ₂ O ₃	M. RAZEGHI NORTHWESTERN
Spectrally Selective Filters for Infrared Radiation with both Broadband and Narrowband Features	KURSAT SENDUR SABANCI UNIV.
Ion Channels in Geopolymers: Artificial Synapses with Unique Electro-mechanical Properties	C. LAMUTA UNIVERSITY OF IOWA
Creep and Functional Fatigue Behavior of NiTiHf High Temperature Shape Memory Alloys for High Temperature Applications	B. KOÇKAR HACETTEPE UNIVERSITY
Investigation of Electron Transport in β -(Al, Ga) ₂ O ₃ Thin Films	E. AHMADI UNIV. MICHIGAN
Understanding The Signatures Of Emergent Magnetism In Topological Insulator/Ferrite Bilayers	Y. SUZUKI STANFORD
Kane-Mele-Hubbard Physics In Semiconductor Moiré Materials	K. F. MAK CORNELL
Exploring Quantum Spin Liquids with Near-Field Terahertz Magnetic Spectroscopy	J. HARTER UCSB
Exploring Correlated Topological States with Charge Density Waves	K. BURCH & L. SCHOOP BC & PRINCETON