Center for Quantum Materials Innovation and Education Excellence (CQ-MIEE)

Science and Technology of Emerging Materials Symposium 2025 (STEMS 2025)

November 15 – 16, 2025

Location: Engineering 2, room 102

Saturday, November 15, 2025

8:00 am – 8:30 am	Registration		
8:30 am – 9:00 am	Introduction and welcome		
9:00 am – 10:30 am	Session 1: Synthesis and Characterization of Quantum Materials - Chair: Dr. Madhab Neupane		
	9:00 am – 9:30 am	**(Invited)** Synthesis, Characterization and Application of Two-dimensional Materials	Eric M. Vogel, Georgia Institute of Technology
	9:30 am – 10:00 am	**(Invited)** Probing and Controlling Topological Semimetals with In Situ Tunable Strain	Jiun-Haw Chu, University of Washington
	10:00 am – 10:15 am	Electronic structure of a rare Earth based nodal line semimetal candidate LnSbTe	Nathan Valadez, University of Central Florida
	10:15 am – 10:30 am	Investigation of Chiral Phonons in Breathing Kagome Lattice Quantum Material Nb3TeCl7	Dylan Jeff, University of Central Florida
10:30 am – 11:00 am	Coffee break		

11:00 am – 12:30 pm	Session 2: Calculation, Modelling and Characterization of Quantum Materials - Chair: Dr. Rong ying Jin		
	11:00 am – 11:30 am	**(Invited)** AI-Driven First-Principles Modeling of Moiré Superlattices	Ting Cao, University of Washington
	11:30 am – 11:45 am	Spin and orbital textures in van der Waals quantum matter	Paulo Eduardo de Faria Junior, University of Central Florida
	11:45 am – 12:00 pm	Electrical and nonlinear optical properties in monolayer 2D kagome material Nb_3TeCl_7	Israel Herrera, University of Central Florida
	12:00 pm – 12:15 pm	Epitaxial Growth and Structural Characterization of Topological Insulator Thin Films by Molecular Beam Epitaxy	Nia Suitt, University of Central Florida
	12:15 pm – 12:30 pm	Lattice dynamics of quantum material PdPS3 investigated via polarized Raman spectroscopy	Nelson Alvarez, University of Central Florida
12:30 pm – 2:00 pm	Networking lunch & Working lunch with EAB (lunch provided)		
2:00 pm – 3:30 pm	Session 3: Emerging Materials for Energy and Electronics - Chair: Dr. Titel Jurca		
	2:00 pm – 2:30 pm	**(Invited)** Conductive ruthenium oxide films with surface-orientation control as experimental models for oxygen evolution reaction studies	Dhananjay Kumar, North Carolina A&T
	2:30 pm – 3:00 pm	**(Invited)** Nanocarbon Metal Composites with Increased Electrical Conductivity and Transmittance to Light	L. Salamanca-Riba, University of Maryland
	3:00 pm – 3:15 pm	Electrocatalytic Ammonia Synthesis from Nitrate on Nickel Phosphide Nanocrystals	Melody Fernandez, University of Central Florida

	3:15 pm – 3:30 pm	Bow Tie Antenna Coupled with a Lead-Graphene Josephson Junction for Potential Millimeter-Wave Detection	Emily Frederick, University of Central Florida
3:30 m – 4:00 pm	Coffee break and poster setup		
4:00 pm – 5:00 pm	Session 4: Industry panel – Chair: Dr. Parag Banerjee		
	Panelist	Company	
	Izabela Barros	Lockheed Martin	
	Somil Rathi	Kepler Scientific	
	Jonathon Watson	Horiba Instruments Inc.	
	Hansol Lee	3M	
5:00 pm – 8:00 pm	Poster session and reception – Chair: Dr. Lorraine Leon		
	Note: reception starts at 6:30 (dinner provided)		

Sunday, November 16, 2025

8:30 am – 10:00 am	Session 5: Growth and electronic/optical properties of quantum materials - Chair: Dr. Andrea Blanco Redondo		
	8:30 am – 9:00 am	**(Invited)** Hidden anomalies in topological semimetal PtBi2	Rongying Jin, University of South Carolina
	9:00 am – 9:15 am	Epitaxial Growth and Structural Characterization of Quantum Materials by Molecular Beam Epitaxy	FNU Himanshu, University of Central Florida
	9:15 am – 9:30 am	Electronic structure of charge density wave materials	Iftakhar Bin Elius, University of Central Florida
	9:30 am – 9:45 am	Modifying Magnetic Order in Kagome Using Strain	Edward Perez, University of Central Florida
	9:45 am – 10:00 am	Spin-photon Defect Centers in Silicon for Scalable Quantum Technologies	Md Sakibul Islam, University of Central Florida

10:00 am – 10:30 am	Coffee Break		
10:30 am – 12:00 pm	Session 6: New Phenomena, Surfaces and Reactions in Emerging Materials - Chair: Dr. Parag Banerjee		
	10:30 am – 11:00 am	**(Invited)** What we cannot measure, we cannot understand: Bridging the gap with electron microscopy	Juan Carlos Idrobo, University of Washington
	11:00 am – 11:30 am	**(Invited)** Time-domain optical control of molecular and material dynamics	Tom Hopper, University of Central Florida
	11:30 am – 11:45 am	Designer Catalyst Surfaces on Black Phosphorus	Hailey Akins, University of Washington
	11:45 am – 12:00 pm	Atom Economical Synthesis of Zinc Acetylacetonate Complexes	Justin Moore, University of Central Florida
12:00 pm – 1:00 pm	Networking lunch (lunch provided)		
1:00 pm – 2:30 pm	Session 7: Emerging Materials for biological applications - Chair: Dr. Robert Steward		
	1:00 pm – 1:30 pm	**(Invited)** Biopolymer-van der Waals heterogeneous structures	Shuai Zhang, Pacific Northwest National Laboratory
	1:30 pm – 1:45 pm	Label-free optical recording of bioelectric potentials with 2D excitonic devices.	Viktoryia Shautsova, University of Central Florida
	1:45 pm – 2:00 pm	How molybdenum disulfide (MoS2) modulates actin assembly kinetics and NIH-3T3 fibroblast cell morphology and spreading	Bryan Demosthene, University of Central Florida
	2:00 pm – 2:15 pm	Production of MoS2 Monolayers via Peptide-Driven Liquid Phase Exfoliation	Micah Wilkerson, University of Central Florida

	2:15 pm – 2:30 pm	Engineering Two-Dimensional MoS_2 Flakes to Probe Cellular Force Dynamics in Mechanobiology	Tamar Yishay, University of Central Florida
2:30 pm – 2:45 pm	Coffee break		
2:45 pm – 3:45 pm	Session 8: PREM Experience and opportunities		
	<u>Panelist</u> Terrick McNealy-James Israel Herrera Dylan Jeff Ayelen Mora Nathan Valadez		
3:45 pm – 4:00 pm	Closing Remarks		

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