

2025 Materials Science for QIS Review

Drs. Jiwei Lu, Grace Metcalfe, Ali Sayir and Michael Yakes | February 3-6, 2025 |
Arlington, VA -hybrid

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

Agenda Day 1 | February 3, 2025

Time	Topic	Speaker
8:15	Check-in	
8:45	Welcome remarks	E. CLEVELAND AND A. SAYIR
9:00	Unveiling and controlling quantum point defects in oxides	KAI-MEI FU (U WASHINGTON) JUAN CARLOS IDROBO (U WASHINGTON) ANDREI FARAON (CALTECH) JOSEPH FALSON (CALTECH) YUAN PING (U. WISCONSIN, MADISON)
10:30	BREAK	
11:00	Materials advancements for silicon qubits (MASQ)	SHASHANK MISRA (SANDIA NATIONAL LAB)
12:30	LUNCH	
14:00	Thermally robust and oxide-managed Josephson tunnel junctions	VALLA FATEMI (CORNELL)
14:45	Gate-defined Quantum Dot Qubits Based on Light Holes in Strained Ge Heterostructures: Material Property Correlations and Predictive Performance Metrics	DARYOOSH VASHAEE (NCSU)
15:30	BREAK	
16:00	Guest talks (15 minutes each)	
	Magnetic phase transition and caloric behavior in EuTiO_3 system	MENKA JAIN (U. CONN),
	TBD	RUSS RENZAS (U. NEVADA RENO)
	Small Defects, Big Deal: Using the Optical, Electrical, and Mechanical Properties of DX Centers	RAFAEL JARAMILLO (MIT)
	A transmon made from a thickness-controlled niobium nitride film	CHARLOTT BOETTCHER (STANFORD)
17:00	MEETING ADJOURN	

Agenda Day 2 February 4, 2025		
Time	Topic	Speaker
8:15	Check-in	
8:45	Welcome remarks	E. CLEVELAND AND A. SAYIR
9:00	Probing microscopic sources of disorder in Josephson junctions	DAVID SCHUSTER (STANFORD)
10:30	Poster session/Networking	
12:30	LUNCH	
14:00	Design and Control of Atomic Defects in Group II-Oxide Materials	EDO WAKS (UMD) DOUGLAS IRVING (NCSU) JAMES LEBEAU (MIT) DAVID AWSCHALOM (U. CHICAGO) GIULIA GALLI (U. CHICAGO) SUPRATIK GUHA (U. CHICAGO) JON-PAUL MARIA (PSU)
15:30	BREAK	
16:00	Alternating-Bias Assisted Annealing of Josephson Junctions	DAVID P. PAPPAS (RIGETTI)
17:00	MEETING ADJOURN	

Agenda Day 3 February 5, 2025		
Time	Topic	Speaker
8:15	Check-in	
8:45	Welcome remarks	E. CLEVELAND AND A. SAYIR
9:00	EpiQ: Epitaxial approaches for materials enhancements of superconducting qubits	DEBDEEP JENA (CORNELL)
10:30	BREAK/POSTERS/NETWORKING	
12:00	LUNCH	
13:30	Identifying the origin of lossy defects in Josephson junctions	ANGELA KOU (UIUC)
14:15	Material interfaces and defects in superconducting qubits: a first-principles closed loop approach	WILLIAM SHELTON (LSU)

15:00	BREAK	
15:30	Semiconductor and topological materials for quantum applications	STEPHANIE LAW (PSU)
16:30	MEETING ADJOURN	

Agenda Day 4 February 6, 2025		
Time	Topic	Speaker
8:15	Check-in	
8:45	Welcome remarks	E. CLEVELAND AND A. SAYIR
9:00	Multi-scale probes of correlation and causation in silicon	JOHN NICHOL (UNIV. ROCHESTER)
10:30	Closing remarks	E. CLEVELAND AND A. SAYIR
11:00	Sidebar meetings	
11:00	NIST (?)	
11:30	Misra/SNL	
12:00	LUNCH	
13:00	Sidebar meetings	
13:00	Fatemi/Cornell	
13:30	Schuster/Stanford	
14:00	Vashae/NCSU	
14:30	Jena/Cornell	
15:00	Shelton/LSU	
15:30	Nichol/Rochester	
16:00	Kou/UIUC	