

2024 Materials for QIS Review

Drs. Jiwei Lu, Grace Metcalfe, Ali Sayir and Michael Yakes | February 5-8, 2024 |
Arlington, VA

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

Agenda Day 1 | February 5, 2024

Time	Topic	Speaker
8:30	Check-in	
9:00	Welcome remarks	A. SAYIR and AFOSR team
9:15	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)
10:15	BREAK	
10:45	Design and Control of Atomic Defects in Group II-Oxide Materials (CONT)	
12:15	LUNCH	
13:30	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)
15:00	BREAK	
15:30	Unveiling and controlling quantum point defects in oxides (CONT)	
16:30	MEETING ADJOURN	

Agenda Day 2 February 6, 2024		
Time	Topic	Speaker
8:15	Check-in	
8:45	Welcome remarks	E. CLEVELAND AND A. SAYIR
9:00	Materials advancements for silicon qubits (MASQ)	SHASHANK MISRA (SANDIA NATIONAL LAB)
10:30	BREAK Sidebar 1: Misra/SNL	
11:15	Thermally robust and oxide-managed Josephson tunnel junctions	VALLA FATEMI (CORNELL)
12:00	LUNCH	
13:30	Material interfaces and defects in superconducting qubits: a first-principles closed loop approach	WILLIAM SHELTON (LSU)
14:15	BREAK Sidebar 2: Fatemi/Cornell	
15:00	Gate-defined Quantum Dot Qubits Based on Light Holes in Strained Ge Heterostructures: Material Property Correlations and Predictive Performance Metrics	DARYOOSH VASHAEE (NCSU)
15:45	"Round table discussion" <ul style="list-style-type: none"> - Intro to "What is Material Science" - What area of research/expertise is missing in MQC? 	
16:30	MEETING ADJOURN	

Agenda Day 3 February 7, 2024		
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	
11:00	Probing microscopic sources of disorder in Josephson junctions	DAVID SCHUSTER (STANFORD)
12:30	LUNCH	

14:00	"Round table discussion" (with 15 min break in the middle) <ul style="list-style-type: none"> - Discussion on negative outcomes/unpublished results on Material ideas. - TLS/TLF: what they are or are not, commonalities vs. differences? - What are missing in the current materials characterization/diagnostics toolbox? - Any other topics of shared interest?
15:30	MEETING ADJOURN
15:30	Sidebar 3: Vashae/NCSU
16:00	Sidebar 4: Jena/Cornell
16:30	No host networking (Location: Bronson Bierhall)

Agenda Day 4 February 8, 2024		
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	BREAK Sidebar 5: Shelton/LSU	
11:15	Identifying the origin of lossy defects in Josephson junctions	ANGELA KOU (UIUC)
12:00	Closing remarks	E. CLEVELAND AND A. SAYIR
13:30	Sidebar 6: Nichol/Rochester	
14:00	Sidebar 7: Kou/UIUC	
14:30	Sidebar 8: Schuster/Stanford	