

**MRS/Kavli Future of Materials Workshop:
Solid-State Materials and Quantum Information
Presented by MRS Bulletin**

Friday, April 26, 2019, 8:00 am-5:00 pm
Sheraton Grand Phoenix Hotel, Second Level Paradise Valley
Phoenix, Arizona

Chairs: Chris Richardson (University of Maryland-College Park), Javad Shabani (New York University), and Shashank Misra (Sandia National Laboratories)

Program

7:30-8:30a Registration & Breakfast

8:30-9:00a Introductions and Goals for Workshop
Kavli Foundation Representative
MRS Representative
Chairs

9:00-10:00a Opening Remarks: Perspective and defining problem space
Charlie Tahan, University of Maryland-College Park

10:00-10:30a Coffee break and informal discussion

10:30-12:00a Discussion Topic: Quantifying the problems with today's qubits
Moderator: Chris Richardson, University of Maryland-College Park

Superconducting qubit spectroscopy
Will Oliver, Massachusetts Institute of Technology

Surface adsorbent noise sources
Vince Lordi, Lawrence Livermore National Laboratory

Fabrication challenges in single atom spin qubits
Jeff McCallum, The University of Melbourne

The need and search for topological protection
Jay Sau, University of Maryland

12:00-1:30p Lunch and informal discussion [Open podium session]

- 1:30a-2:45p** Discussion Topic: Qubit metrics and workarounds
Moderator: Shashank Misra, Sandia National Laboratories
- Defect qubits
Gregory Fuchs, Cornell University
- Semiconductor and hybrid qubits
Jason Petta, Princeton University
- Superconductor qubits
Dave Pappas, National Institute of Standards and Technology
- Epitaxial Growth
Peter Krogstrup, Delft
- Chiral Majorana qubits
Kang Wang, University of California, Los Angeles
- 2:45-3:15p** Coffee break and informal discussion
- 3:15-4:30p** Discussion Topic: Materials pathways and qubit applications for the future
Moderator: Javad Shabani, New York University
- MBE growth
Chris Palmstrom, University of California, Los Angeles
- Quantum sensing
Lee Bassett, University of Pennsylvania
- Ge qubits
Tzu-Ming Lu, Sandia National Laboratories
- Spins in quantum materials
Nitin Samarth, Penn State
- Topological phenomena and quantum coherence in electronic nanodevices
Stevan Nadj-Perge, Caltech
- Oxide qubits and materials
Jeremy Levy, University of Pittsburgh
- 4:30-5:00p** Review and concluding remarks by chairs