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