Topical Breakouts of Cross-cutting Interest

March 13, 8:30 – 10:00 AM

Current Infrastructure Capabilities and Resources for the QIS Community (Virginia A)

8:30-8:48	Quantum Materials Characterization Capabilities at BES X-ray and Neutron User Facilities (Stephen Streiffer, ANL)
8:48-9:06	BES Nanoscale Science Research Center Capabilities for QIS (Charles Black, BNL)
9:06-9:24	ASCR's Quantum Computing Testbed Laboratories (I. Siddiqi, LBNL; P. Maunz, SNL)
9:24-9:42	Quantum Computers and HPC (Travis Humble, ORNL)
9:42-10:00	SRF Technology and Cold Electronics for QIS (Anna Grassellino, FNAL)

Analog Simulations and Quantum Simulation Experiments (Virginia B)

8:30-8:50	K. Birgitta Whaley (UC Berkeley), "Using Near-Term Quantum Computers to Gain Insight to Complex Problems in Chemical Science: Analog and Digital Challenges"
8:50-9:10	Monika Schleier-Smith (Stanford), "Quantum Simulation Experiments Connecting the Cosmos to Qubits"
9:10-9:30	Vlad Manucharyan (UMd), "Superconducting Circuit Simulator for Quantum Impurity Problems of Condensed Matter and High Energy Physics"
9:30-9:50	Pavel Lougovski (ORNL), "Digital, Analog, and Hybrid Quantum Simulations: Challenges and Opportunities"
9:50-10:00	Questions and General Discussion

Quantum Sensors and Detectors (Virginia C)

8:30-8:50	Michael Lilly (SNL), "Quantum Sensed Nuclear Magnetic Resonance Discovery Platform"
8:50-9:10	Shimon Kolkowitz (UW-Madison), "Quantum Probes of the Materials Origins of Decoherence"
9:10-9:30	Kent Irwin (SLAC), "Quantum Sensors in the QuantISED Program - I"
9:30-9:50	Reina Maruyama (Yale), "Quantum Sensors in the QuantISED program - II"
9:50-10:00	Questions and General Discussion

Quantum Computing for Application-specific Research (Wilson A)

8:30-8:50	Todd Martínez (SLAC), "Using and Simulating Quantum Computers for Quantum Chemistry"
8:50-9:10	Marcela Carena (FNAL), "Field Theory and Fundamental Physics using Quantum Computers"
9:10-9:30	Ojas Parekh (SNL), "Quantum Optimization"
9:30-9:50	Bert de Jong (LBNL), "Advancing Physical Sciences with Quantum Computers"
9:50-10:00	Questions and General Discussion

Quantum Transduction and Entanglement Distribution 1 (Wilson B)

8:30-8:50	Michael Wasielewski (Northwestern), “Systems for Transducing Entanglement between Photons and Electron Spins”
8:50-9:10	Xuedan Ma (ANL), “Generating Photon Qubits and Quantum Transduction: a Materials Perspective”
9:10-9:30	Maria Spiropulu (Caltech), “Quantum Communication Channels for Fundamental Physics and Quantum Networks”
9:30-9:50	Matt Eichenfield (SNL), “Microwave-to-optical Quantum Transduction for Quantum Networking Applications”
9:50-10:00	Questions and General Discussion

Quantum Transduction and Entanglement Distribution 2 (Wilson C)

8:30-8:50	Tian Zhong (U. Chicago), “Generation and Remote Distribution of Quantum Entanglement in Solids”
8:50-9:10	Kai-Mei Fu (U. Washington), “Building Hybrid Qubit Systems for Quantum Networks: Trapped Ions and Semiconductor Spins”
9:10-9:30	Eden Figueroa (BNL/Stony Brook), "Developing a Quantum Repeater Network on Long Island”
9:30-9:50	Emilio Nanni (SLAC), “Transduction for New Regimes in Quantum Sensing and an Integrated Platform for Quantum Photonic Networks”
9:50-10:00	Questions and General Discussion