

Joint Quantum Seminar

Wednesday, March 6, 2:00 pm

Please note time change

Jefferson 250

Prof. Irfan Siddiqi

University of California, Berkeley

“Weak Quantum Measurements: From Art to Architecture”

Canonical microwave frequency cavity quantum electrodynamical systems can be constructed from superconducting circuits, which thus enable a powerful laboratory for exploring foundational questions in quantum mechanics. When combined with near-quantum-limited photon detection, it is possible to enter the weak measurement regime where the continuous voltage output from the cavity can be used to construct individual quantum trajectories which statistically represent the most likely dynamical evolution of the artificial atom contained therein. Such techniques can be combined with fast feedback to change the measurement observable within the coherence time of the system, allowing one to probe quantities typically inaccessible to classical devices. As an example, I will discuss canonical measurements of the phase of a quantum signal which exceed the sensitivity afforded by heterodyne detection, and whose associated trajectories allow us to verify the acquisition of nearly-purely phase data.

Guest Presentation will begin at 2:00 PM

Refreshments will be provided

