HQOC

HARVARD Quantum Optics Center

ITAMP

Institute for Theoretical Atomic Molecular and Optical Physics

Joint Quantum Sciences Seminar

Wednesday | Mar. 6 | 4:00 pm
Jefferson 250

Keith Schwab

Professor of Applied Physics,
California Institute of Technology

"Experiments with Mechanical Systems at Quantum Limits: Current Status, Limitations, Ways Forward"

It is now possible to both cool micron-scale mechanical structures to thermal states with occupancy near the ground state and to perform back-action evading measurements with sensitivity near the zero-point level. However, we have found that glassy dielectrics and resulting noise processes block further cooling to a high purity ground state and leads to parametric instabilities. I will describe this work and our plans to avoid these noise sources. I will also describe our experiments with a gram-scale oscillators formed by a superfluid He-4 acoustic resonator coupled to very low dissipation microwave resonators, and prospects to achieve extremely low-dissipation, measurements at the standard quantum limit, and extremely sensitive detection of inertial forces.

Student Presentation by Philip Zupancic, Graduate Student, Greiner Lab
"Local Amplitude and Phase Control – Dynamic Beamshaping via MicromirrorDevices"

Student Presentation will begin at 4:00 PM
Guest Presentation will begin at 4:30 PM
Refreshments will be provided