Department of Physics Colloquium

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Quantum Electromechanics

What is the largest object whose motion requires a quantum, rather than classical description? This question lies at the very foundation of quantum mechanics. At the same time, investigating this question experimentally is a highly practical endeavor of isolating an object from its environment and taming uncontrolled sources of noise. Establishing quantum control over large objects impacts a host of potential quantum technologies, such as quantum sensing, communication, and computation. In this talk, I will describe our recent success in controlling the quantum state of macroscopic mechanical oscillators and our progress in using this result to develop quantum information processing devices that exploit the unique properties of mechanical systems. In particular, we are developing a device that uses a mechanical oscillator to transfer information noiselessly between electrical and optical domains. In the quantum regime, this device would enable a communication network with information security guaranteed by physical laws of nature.

WISCONSIN

Friday, December 4, 2015

3:30 pm | 2241 Chamberlin Hall

Coffee & Cookies at 3:15pm

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