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# (I) Toward tabletop, quantum-limited mechanical sensing and new optomechanical control

*Tuesday 8 June 2021 12:30 (20 minutes)*

Mechanical systems represent a fundamental building block in many areas of science and technology, from atomic-scale force sensing to quantum information transduction to kilometer-scale detection of infinitesimal spacetime distortions. All such applications benefit from improved readout sensitivity, and many seek new types of mechanical actuation. In this talk I will discuss our efforts to realize a tabletop, room-temperature optomechanical system capable of sensing the broadband (100Hz - 1MHz) quantum noise in the radiation force from incident laser light; this would represent a milestone toward optomechanically tuned squeezed light sources and mechanical sensitivities beyond the standard quantum limit. Time permitting, I will also discuss our progress toward creating a qualitatively different kind of optomechanical system in which light, even an average of a single photon in the apparatus, strongly tunes the spatial extent and effective mass of a mechanical mode.

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