



Harvard - MIT
Center for Ultracold Atoms

Tuesday | April 25 |
3:30 pm Pfizer Lecture Hall
(Mallinckrodt 023)

CUA SEMINAR

Prof. Eugene Polzik
Niels Bohr Institute, University of Copenhagen

Macroscopic objects in the quantum regime

Studies of extreme cases within quantum mechanics have always been particularly attractive. How macroscopic can be an object and still demonstrate unique quantum features, such as entanglement? What are the real limits of measurement precision in quantum mechanics? I will review our experiments where macroscopic objects are driven deep into the quantum regime. Generation of an entangled Einstein-Podolsky-Rosen state between distant mechanical and atomic oscillators, the concept of an oscillator with an effective negative mass and progress towards application of those ideas to gravitational wave detection will be reported. Another challenge within quantum physics of macroscopic objects is generation of Fock states corresponding to single quantum excitations of an oscillator. Progress along those lines with Fock states of motion and of a macroscopic atomic ensemble will be presented. Finally, I will briefly review our work towards an atomic quantum simulator.

*** * NOTE TIME CHANGE * ***

No 10 Minute Talk

3:30 pm: Prof. Polzik
4:30 pm: Refreshments