

# Physics Colloquium

## Monday April 24<sup>th</sup>, 2006

### 4:15 PM 428 Pupin Hall

#### Professor Aharon Kapitulnik, Stanford University

### “Tests for Yukawa-Type Forces at sub-mm distance”

Recent theories of physics beyond the standard model have predicted deviations from Newtonian gravity at short distances. In order to test these theories, we have built an apparatus that can measure attonewton-scale forces between small masses separated by distances on the order of 25 microns. A micromachined silicon cantilever was used as the force sensor, and its displacement was measured with a fiber interferometer. We have used our measurements to set bounds on the magnitude  $\alpha$  and length scale  $\lambda$  of Yukawa-type deviations from Newtonian gravity; our results presented here yield the best experimental limit in the range of  $\lambda$  between 5 and 50 microns. We also discuss new experiments that are underway in which substantial improvements are expected.



*Host: Prof. Altshuler*