Condensed Matter / Quantum Information Seminar

THURSDAY, SEPTEMBER 23, 2004

4:00 PM

BROIDA ROOM 3302

MICROWAVE KINETIC INDUCTANCE DETECTORS

Dr. Ben Mazin
Caltech

This talk will detail investigation of a promising low temperature photon detector called Microwave Kinetic Inductance Detectors (MKIDs). MKIDs make use of the change in the surface impedance of a superconductor as incoming photons break up Cooper pairs. This is accomplished by making the strip of superconductor part of a microwave resonant circuit, and monitoring the phase of a signal transmitted through (or past) the resonator. The primary advantage of this technology is that by using resonant circuits with high quality factors, passive frequency domain multiplexing will allow up to thousands of resonators to be read out through a single coaxial cable and a single HEMT amplifier. During the course of our investigation we discovered a previously unknown noise source, identified it as substrate noise, and reduced it through careful engineering. MKIDs currently achieve sensitivities adequate for ground-based submillimeter and optical astronomy.