Subject: MSD Colloquium, Thurs, 2/22, 11am, 212, A-157
From: Suzanne Kokosz <kokosz@anl.gov>
Date: Tue, 06 Feb 2007 08:03:19 -0600
To: Materials Science Division <msd@anl.gov>

SPEAKER: Prof. Daniel C. Mattis
University of Utah
Salt Lake City, Utah

TITLE: THE MANY-BODY PROBLEM IN

HIGH-Tc SUPERCONDUCTIVITY

DATE: Thursday, February 22, 2007

TIME: 11:00 a.m.

PLACE: Building 212, Room A157

HOST: Sam Bader

Refreshments will be available at 10:45 a.m.

Abstract:

In which it will be shown that the Hubbard model is inimical to High-Tc superconductivity, whereas a 3-band model supports it. It will be shown that a 3-band model in the strong-coupling limit yields a Hamiltonian for superconductivity that is entirely proportional to a coupling constant t^2/V, i.e. a universal theory. The universality is spoiled when nearest-neighbor and more distant Coulomb interactions among the electrons are taken into account. Still, superconductivity persists as long as the dielectric constant is sufficiently high. This theory is meant to explain superconductivity in the copper-oxide based perovskites but also applies to the semiconductor nano-architecture that we are presently studying.