

**The Exploration of Inner Space:
Diagnostics, Imaging and Manipulation
of Atoms, Molecules and Cells**

Thursday September 3rd, 2009 6:30pm
San Jose State University
Engineering 303

Michael Isaacson
Narinder Singh Kapany Professor
Department of Electrical Engineering
Jack Baskin School of Engineering
University of California at Santa Cruz
msi@soe.ucsc.edu

Over the centuries, there have been a variety of tools invented to extend one's "vision" from telescopes to probe outer space to microscopes to probe inner space. In the past two decades there has been a veritable explosion of different tools being used to explore inner space. In part, this explosion has been fueled by the increased capability of semiconductor technology, not only for designing and controlling large-scale tools, but also by the technology used to make the chips themselves. This explosion has been driven also by the ability to be able to construct new materials from the bottom up in a variety of different ways. These technologies have led to a new paradigm for discovery in that the interrogator necessarily no longer needs to be orders of magnitude larger than the object itself under "interrogation", but rather can be the same order of magnitude in size.

I will explore the modes of vision we used for interrogation of the micro/nano world and examine how micro-miniaturization leads to new diagnostic and manipulation tools. Discussion will include examples at the interfaces of biotic-abiotic systems, potential computational devices and other nanotechnology based systems which have potential in energy conversion.