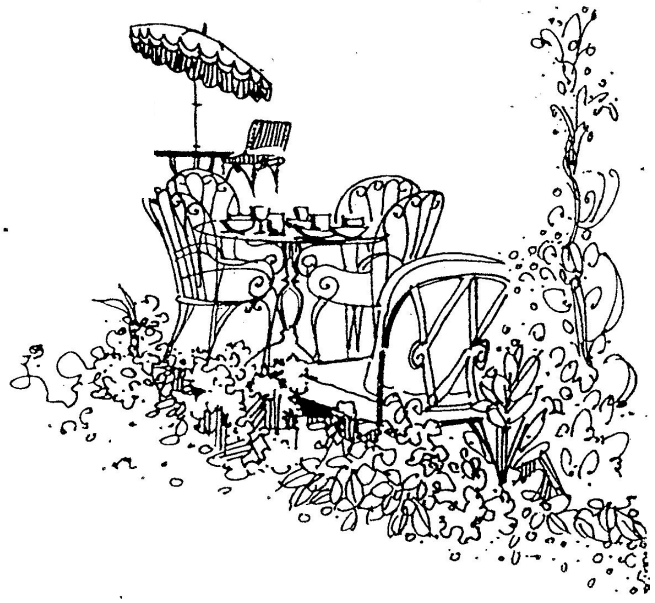
Chez Pierre

Presents ...

Thursday, February 24, 2011
11:00am
MIT Room 4-331



SPECIAL CHEZ PIERRE SEMINAR

Cheng Cen
University of Pittsburgh

"Oxide Nanoelectronics on Demand"

Complex oxides and their heterostructures have exhibited a great collection of novel functionalities and are considered one of the most promising candidates for next generation technological materials. At the interface formed between LaA_lO_3 and SrTiO3, by scanning a biased conducting atomic force microscope (AFM) tip along a programmed trajectory at room temperature, we can reversibly control in nanoscale the metal-insulator transition. With this technique, a variety of rewritable nanoscale devices and structures have been studied. These nanostructures, which are mainly assembled from basic elements including conductive wires and dots with characteristic dimensions just a few nanometers, show great performance as field effect transistors, nanodiodes and photodetectors. At low temperatures, a variety of electronic, spintronic and superconducting properties are observed, with enormous potential for exploitation in quantum devices.