

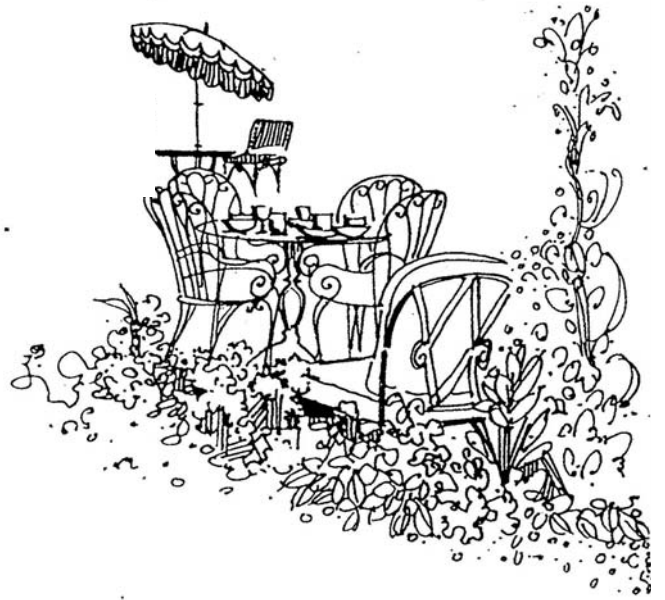
# *Chez Pierre*

Presents ...

**Monday, September 28, 2009**

**12:00pm**

**MIT Room 4-331**



**David Hsieh**

*Massachusetts Institute of Technology*

## ***“Experimental Signatures of a Topological Insulator”***

The topological insulator is a new time-reversal-invariant topologically ordered phase of matter, which exhibits exotic quantum-Hall-like behavior even in the absence of a magnetic field. These materials are characterized by a spin-orbit coupling induced bulk energy gap and an odd number of spin-polarized Dirac cones localized on their surfaces. In this talk, I will introduce the experimental method to measure this type of time-reversal-invariant topological order using a combination of spin- and angle-resolved photoemission spectroscopy. I will present results that led to the first experimental identification of topological insulators in BiSb random alloys. I will then present more recent results on a second generation of topological insulators based on stoichiometric binary compounds, and discuss methods of engineering their Dirac surface states for device application.