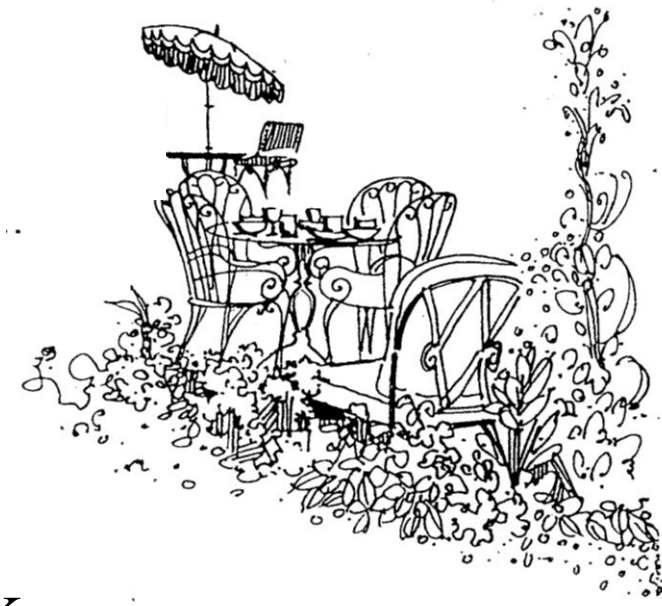
Chez Pierre

Presents ...

Monday, October 28, 2013
12:00pm
MIT Room 4-331



Charlie Kane

University of Pennsylvania

"Topological Order at the Surface of a Topological Insulator"

The surface of a topological insulator provides a route to realizing novel electronic states. Coupling to a magnetic material leads to a gapped time reversal symmetry breaking state that resembles half of an integer quantum Hall state. Coupling to a superconductor leads to a gauge symmetry breaking state that resembles a topological superconductor and hosts Majorana fermions. In the absence of interactions, the combination of time reversal and gauge symmetries protect the gapless metallic state of the surface. Strong interactions, however, lead to richer possibilities for symmetry protected topological states. In this talk we will describe a gapped phase of the topological insulator surface that respects all symmetries, but has an intrinsic topological order. This surface state resembles the Moore Read fractional quantum Hall state, but has an extra set of semionic quasiparticles that are necessary for the consistent action of time reversal and gauge symmetries.