

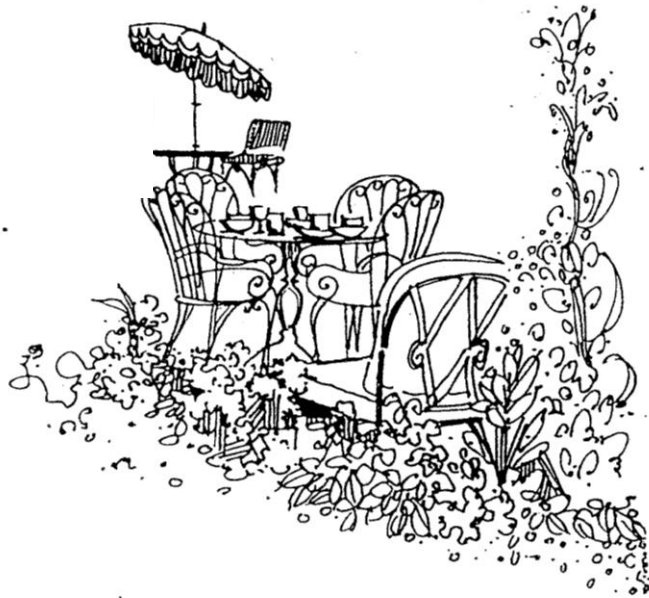
Chez Pierre

Presents ...

Thursday, February 10, 2011

11:00am

MIT Room 4-331



SPECIAL CHEZ PIERRE SEMINAR

Jing Xia

California Institute of Technology

"Topological phases and their competition with symmetry-breaking orders"

Topological order is a new kind of collective order beyond Landau's symmetry-breaking classification. Interesting in its own right, certain topologically ordered materials including the "chiral p-wave" superconductors and "non-Abelian" fractional quantum Hall (FQH) states may be used to realize fault-tolerant "topological" quantum computers. Both optical and electrical techniques have been used to identify topological phases and to study their competition with more conventional broken symmetry orders. As the first example, I will describe ultra-sensitive magneto-optic Kerr measurements on ruthenate superconductor Sr_2RuO_4 with a recently developed "loop-less" fiber-optic Sagnac interferometer, identifying Sr_2RuO_4 to be a "chiral p-wave" topological superconductor. As a second example, I will discuss in 2D electrons at filling factor $5/2$ the intriguing competition between the "non-Abelian" topological FQH state, an electronic liquid crystal phase and a newly discovered "reentrant isotropic compressible" state. I will also provide evidence for a novel rotational-symmetry-breaking FQH state as a consequence of this competition.