

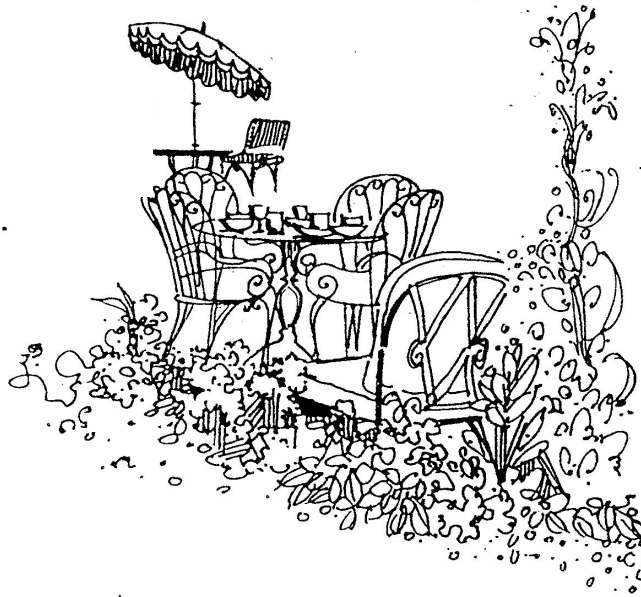
Chez Pierre

Presents ...

Monday, October 26, 2015

12:00pm

MIT Room 4-331



Chez Pierre Seminar

Arun Paramekanti

University of Toronto

”Band topology meets correlations - from oxides to cold atoms“

Band topology plays an important role in such unusual phases as topological insulators and semimetals. This talk will discuss the interplay of band topology and correlation effects in different systems. We will argue based on model Hamiltonians and ab initio calculations that double perovskites with strong spin-orbit coupling and high T_c ferromagnetism could host Chern bands and regimes of $C=2$ quantum anomalous Hall insulator (QAHI) phases in [111] thin film geometries. We will then consider models of phase transition from $C=2$ QAHI to ordinary insulator which involve quadratic band touching, and show that interactions drive an emergent nematic phase at such topological critical points. Finally, we will consider interaction effects in the Haldane model of the QAHI, showing that this realizes a symmetry-enriched chiral spin liquid with gapped semions, and discuss the Chern-Simons-Higgs theory of transitions out of this liquid.