

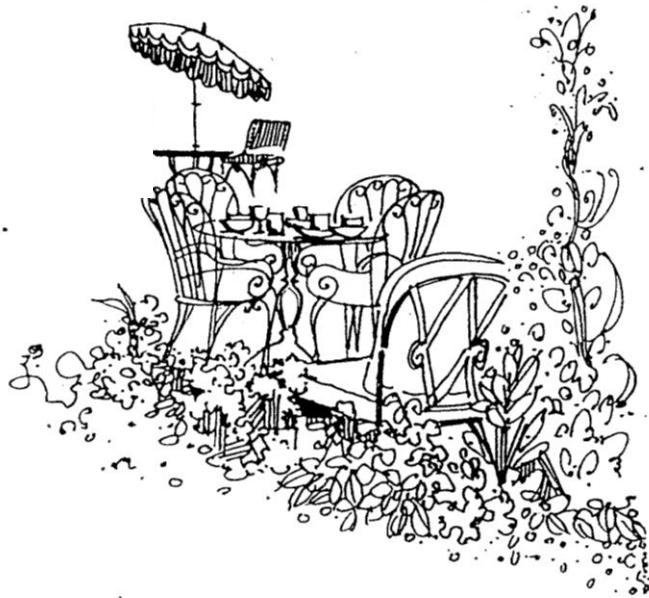
Chez Pierre

Presents ...

Thursday, February 21, 2013

10:00am

MIT Room 4-331



SPECIAL CHEZ PIERRE SEMINAR

Kin Fai Mak
Cornell University

“Electrons in two dimensions: graphene and beyond”

The unique electronic properties of graphene, a single atomic layer of graphite, have attracted tremendous interests. While the discovery of the material is highly important in its own right, it has stimulated the advances in other novel two-dimensional materials and phenomena. In this talk, I will firstly present results of our measurement of graphene’s universal optical conductivity, arising from its chiral electronic structure. I will then discuss how such optical properties are completely modified upon explicitly breaking the sublattice (or chiral) symmetry of the honeycomb lattice, from which a new electronic degree of freedom called “valley” emerges. Based on complementary optical and photoconductivity measurements, we show that molybdenum disulfide, in its monolayer form, is a prototypical direct band gap semiconductor with broken chiral symmetry. Finally, I will demonstrate the optical injection of long-lived valley polarization in this system and briefly discuss its implications on valley and spin based devices.