

WEEKLY CALENDAR

March 14, 2011

Departmental Colloquium

Thursday, 3:40 PM, March 17, 2011
109 Nicholson Hall

"Topological Insulators: From Basic Science to Materials Design"

Zhong Fang

Institute of Physics, Chinese Academy of Science, China

Host: Jiandi Zhang and Ward Plummer

• Refreshments served at 3:15 PM in 232 (Library) Nicholson Hall •

Topological insulator is a new state of quantum matter. It is different with trivial insulator in the sense that its bulk is insulating, while its surface supports metallic Dirac type surface states. Exotic quantum phenomena, such as Majorana Fermions, magneto-electric effect, and quantum anomalous Hall effect, have been expected from topological insulators, while their experimental realizations remain challenging, due to the lack of suitable samples or requirement of extreme conditions. Within recent couple of years, more and more topological insulators were discovered, yet lots of new compounds still wait to be explored. In this talk, I will start from our earlier studies on Bi_2Se_3 family compounds, and then move to recent study for the topological aspect and quantum magnetoresistance of Ag_2Te . The possible realization of quantized Anomalous Hall effect and Majorana fermions will be also discussed from the view point of materials design.

Publications:

1. "Consistent probabilities in Wheeler-DeWitt quantum cosmology", David A. Craig and **Parampreet Singh**, Physical Review D 82, 123526 (2010).
2. "Oscillatory pairing of fermions in spin-split traps", Kuei Sun, Julia S. Meyer, **Daniel E. Sheehy** and Smitha Vishveshwara, Physical Review A 83, 033608 (2011).

Reminder:

Daylight Saving Time begins at midnight Saturday, March 12, 2011. Set your clock ahead 1 hour.