Chez Pierre

Presents ...

Thursday, December 1, 2011
2:00pm
MIT Room 4-331

SPECIAL CHEZ PIERRE SEMINAR

Yoichi Ando
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"Probing the Exotic Surface States in Topological Insulators and Superconductors"

A topological state of matter is characterized by a nontrivial topological structure of the quantum-mechanical wavefunctions in the Hilbert space. Due to the so-called bulk-edge correspondence, a gapless surface state always accompanies a topologically nontrivial bulk state. In topological insulators, a nontrivial Z2 topology of the bulk state leads to the emergence of Dirac fermions on the surface. Similarly, topological superconductors are accompanied by surface Andreev bound states that consist of Majorana fermions. In my group at Osaka, we have been trying to experimentally address those exotic surface states in topological states of matter, and this talk concerns the following two topics:

1) Surface Dirac fermions in the topological insulator Bi2Te2Se and related materials probed by Shubnikov-de Haas oscillations

2) Surface Majorana fermions in the CuxBi2Se3 superconductor probed by point-contact spectroscopy