



## ICQM Weekly Seminar

### Visualization of Novel Electronic Structures in Topological Insulators



**Yulin Chen**

**Oxford University (Physics department),**

**Time: 4:00pm, July 11, 2012 (Wednesday)**

**时间: 2012年7月11日 (周三) 下午4:00**

**Venue: Room 607, Conference Room A, Science Building 5**

**地点: 理科五号楼607会议室**

#### Abstract

Three-dimensional (3D) topological insulators (TIs) represent a new state of quantum matter with a bulk gap generated by the spin-orbit interaction and an odd number of relativistic Dirac fermions on the surface. The unusual surface states of TIs can be the host for many striking quantum phenomena, such as an image magnetic monopole induced by an electric charge and Majorana fermions induced by the proximity effect from a superconductor.

By investigating these materials with angle-resolved photoemission spectroscopy (ARPES), we were able to directly visualize their non-trivial electronic structures. We will also show that the manipulation of these unusual topological surface states can further lead to other novel topological states, such as the quantized anomalous Hall state. Finally, we will briefly discuss the application potentials of these unusual materials, in electronics, spintronics and energy-related applications.



#### About the Speaker

Yulin Chen got his Bachelor's degree in 2000 at university of Science & Technology of China, and got the Ph.D degree in 2008 at Stanford University.. Now he is Fellow and Tutor in Physics, University Lecturer in Condensed Matter Physics in Oxford University. His research interest lies in experimental condensed matter physics; and specifically, in understanding the behavior of electrons in unconventional materials, such as topological quantum matters and strongly correlated systems.