



## Seminar

# Manipulating Majorana Zero Modes in Quantum Nanowires

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**Time:** 10:30 am, Jan.16, 2014(Thursday)

**时间:** 2014年1月16日 (周四) 上午 10:30

**Venue:** Conference Room A (607), No. 5 Science Building

**地点:** 理科五号楼607会议室

### Abstract

The search for non-Abelian Majorana zero modes has become an exciting pursuit in condensed matter systems, driven by both the pursuit of exotic fundamental physics and the applications to a building block for fault-tolerant topological quantum computer. In this talk I will discuss the manipulation of Majorana zero bound modes in quantum nanowires. The talk is organized in three parts. The first part will review the fundamentals of the topological superconductor, followed by an introduction to the recent experimental progresses in the 1D systems. Then, motivated by the experimental studies, I will present our recent results in the Majorana quantum nanowires with broken inversion symmetry. Finally, I will turn to the time-reversal invariant (DIII class) topological superconductors and introduce the symmetry protected non-Abelian statistics for Majorana doublets realized in such 1D topological superconductors.

### About the Speaker

Xiong-jun Liu got his Bachelor Degree of Science from Nankai University in 2002, Master Degree from CAS in 2005 and Doctor of Philosophy from Texas A&M University in 2011. Since 2012 to present, he has been the IAS, Department of Physics, and MIT Joint Postdoctoral Fellow. His research interests are:

- Condensed Matter Theory, focused on topological superconductor, topological insulator, semiconductor spintronics and many-body physics.
- Cold Atoms, focused on the simulation of exotic topological states, spin-orbit coupling effects, and strong correlation effects.