

Chez Pierre

Presents ...

Tuesday, May 1, 2018

12:00pm Noon

MIT Room 4-331

Special Chez Pierre Seminar



Sergey Frolov – University of Pittsburgh

“Status of the Search for Majorana Fermions in Semiconductor Nanowires”

Tunneling spectroscopy measurements on one-dimensional superconducting hybrid materials have revealed signatures of Majorana fermions which are the edge states of a bulk topological superconducting phase. We couple strong spin-orbit semiconductor InSb nanowires to conventional superconductors (NbTiN, Al) to obtain additional signatures of Majorana fermions and to explore the topological phase transition. A potent alternative explanation for many of the recent experimental Majorana reports is that a non-topological Andreev state localizes near the end of a nanowire. We compare Andreev and Majorana modes and investigate ways to clearly distinguish the two phenomena. We are also exploring how Andreev states can be chained together along the nanowire to realize the one-dimensional Kitaev model, a discrete way of generating Majorana modes.