

Massachusetts Institute of Technology  
Department of Physics

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**CONDENSED MATTER THEORY SEMINAR**

**“The Search for Topologically Degenerate Majorana Modes in Semiconductor/Superconductor Interfaces”**

**Jay Sau**  
*Harvard University*

**Abstract:** Majorana fermions are fermion-like excitations that were originally proposed in particle physics by Ettore Majorana and are characterized as being their own anti-particle. In condensed matter systems Majorana fermions occur as fractionalized excitations with topologically protected degeneracy associated with such excitations. In this talk, I will discuss a recent set of proposals for realizing Majorana modes in a large class of spin-orbit coupled, time-reversal symmetry broken superconducting systems. The simplicity of this class of systems has resulted in several experimental attempts, which have successfully observed preliminary evidence for the Majorana modes in the form of zero-bias conductance peaks and doubled Shapiro steps. Following this I will then discuss future possibilities in terms of modifications to the experiments to help confirm the presence of Majorana modes.

**3:30 PM**  
**Wednesday, May 15, 2013**  
**Room 4-331 (Duboc Room)**