

Massachusetts Institute of Technology  
Department of Physics

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Condensed Matter Theory Seminar

“Let there be topological superconductors ”

**Professor, Eun-Ah Kim - Cornell University**

**Abstract:** Superconductivity research has traditionally been discovery driven. Of course  $T_c$  is a non-universal quantity that cannot be predicted, hence off-limits to theorists. Nevertheless, it must be possible to reach intelligent predictions for superconductors that are interesting for reasons other than high  $T_c$  per se. In this talk I will present our recent results proposing two different platforms for topological superconductivity: p-doped transition metal dichalcogenides (TMD's) and quantum spin-ice/metal heterostructure. For the p-doped TMD's the strategy is to break the spin-degeneracy in momentum space. For the quantum spin-ice/metal the strategy is to let the emergent gauge field of quantum spin-ice mediate pairing in the metallic layer. I will close the talk with experimental implications and prospects for realizing the proposed topological superconductors. In particular, quantum spin liquid/ metal heterostructure strategy may be a fruitful direction for new quantum spin liquid materials.

**12:00pm**  
**Wednesday, November 30, 2016**  
**Low Room (6C-333)**

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Host: Senthil Todadri