

**Massachusetts Institute of Technology**  
**Department of Physics**

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**Condensed Matter Theory Seminar**

“Predicting topological semimetals and spin liquid candidates from the electron filling and space groups symmetry”

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**Abstract:** In recent years, Weyl/Dirac semimetals and quantum spin liquids have received much attention for their intriguing, exotic physical properties. In this talk we will discuss a guiding principle for predicting their experimental candidates. We will start with extending Oshikawa-Hastings (Lieb-Schultz-Mattis) theorem to spin-orbit coupled systems and, with that result, we will discuss materials that may realize quantum spin liquids. The generalized theorem also has a nontrivial consequence on the electronic band structure of noninteracting systems and is useful to predict topological (crystalline) insulators and nodal semimetals.

**12:00noon**  
**Tuesday, October 13, 2015**  
**Duboc Seminar Room (4-331)**

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Host: Michael Pretko