

Chez Pierre

Presents ...

Thursday, February 4, 2016

10:00AM

MIT Room 4-331

Special Chez Pierre Seminar

Michael Zaletel

University of California-Santa Barbara

” Symmetry constraints in quantum materials:
making the most of seeing nothing“

A fundamental property of any material is the electron filling, i.e., the number of electrons per unit cell. Within band theory, materials at odd filling must be metals, while those at even filling can be insulators. In the presence of interactions, flux-threading arguments can generalize this constraint, ruling out un-fractionalized insulators at certain fillings, with important implications for the interpretation of experiment.

In this talk I will show that “filling constraints” can be made both more general - and far more constraining - than has long been thought. These constraints have interesting applications to the hunt for topological semi-metals and spin-orbit coupled spin-liquids. I will conclude by showing how related symmetry constraints have led to a new understanding of the half-filled Landau level.

