Massachusetts Institute of Technology
Department of Physics

Condensed Matter Theory Seminar

"Kagome spin liquid, Symmetry protected topological phase and Deconfined criticality"

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Abstract: The kagome Heisenberg model is one of the most paradigmatic and highly debated models that realizes a spin liquid phase. In this talk, I will present our numerical (DMRG simulation) and theoretical study, supporting the kagome spin liquid is a U(1) Dirac spin liquid. Numerically, I will discuss the spin gap of the kagome spin liquid, and more importantly the "excitation spectrum" (from DMRG) showing sharp Dirac cones that perfectly matches the U(1) Dirac spin liquid. Theoretically, we reveal an interesting connection between the kagome spin liquid, chiral spin liquid, symmetry protected topological (SPT) phase and deconfined criticality. Specifically, we reformulate the kagome spin model ``exactly'' into a lattice gauge model. In such unbiased framework, we show that the previous discovered chiral spin liquid is indeed a gauged U(1) SPT phase, the kagome spin liquid is a gauged deconfined critical point (between a U(1) SPT and a superfluid).

12:00pm
Tuesday, November 8, 2016
Duboc Room (4-331)

Host: Michael Pretko