



清华大学高等研究院

Institute for Advanced Study, Tsinghua University

学术报告

- Title:** Kagome spin liquid, symmetry protected topological phase and deconfined criticality
- Speaker:** Yin-Chen He
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- Time:** 3:30pm, Thursday, 2016-08-11
- Venue:** Conference Hall 322, Science Building, Tsinghua University

Abstract

In my talk I will introduce the spin liquid phases that occur in kagome antiferromagnets, and show that their physical origin is closely related with the symmetry protected topological phase (SPT) and deconfined criticality. I will first present our numerical (DMRG) study on the kagome XXZ spin model that exhibits two distinct spin liquid phases, namely the chiral spin liquid and the kagome spin liquid (the groundstate of the nearest neighbor kagome Heisenberg model). Both phases extend from the extreme easy-axis limit, through SU(2) symmetric point, to the pure easy-plane limit. Motivated by these numerical results, I will then focus on the easy-axis kagome spin system, and reformulate it as a lattice gauge model. Such formulation enables us to achieve a controlled theoretical description for the spin liquid phases. We then show that the chiral spin liquid is indeed a gauged U(1) SPT phase. On the other hand, we also propose that the kagome spin liquid is a critical spin liquid phase, which can be considered as a gauged deconfined critical point (between a SPT and a superfluid phase).

Refs:

- [1] Yin-Chen He, Subhro Bhattacharjee, R. Moessner, Frank Pollmann, Phys. Rev. Lett. 115, 116803 (2015)
- [2] Yin-Chen He, Subhro Bhattacharjee, Frank Pollmann, R. Moessner, Phys. Rev. Lett. 115, 267209 (2015)