



清华大学高等研究院

Institute for Advanced Study, Tsinghua University

物理学术报告 Physics Seminars (biweekly)

- Title:** Quantum spin liquids as soft-gap Mott insulators
- Speaker:** Yi Zhou
(*Department of Physics, Zhejiang University*)
- Time:** 4:00pm, Wednesday, Oct 8, 2014
(3:30~4:00pm, Tea, Coffee, and Cookie)
- Venue:** Conference Hall 322, Science Building, Tsinghua University

Abstract

In this talk, we begin with brief summary on experimental and theoretical status on realistic quantum spin liquid materials and then focus on quantum spin liquid states at the vicinity of metal-insulator transition. Based on chargeful electron-like quasiparticles, instead of charge neutral spinons, we propose a low energy effective theory for the quantum spin liquid states. We also show that the usual $U(1)$ QSLs with spinon Fermi surface is a representative member of this class of spin liquids. Based on our effective low energy theory, an alternative picture to the Brinkman-Rice picture of Mott metal-insulator transition is proposed. The charge, spin and thermal responses of spin liquids are discussed as well as collective modes under such a phenomenology, which are consistent with existing experiments and can be further verified by future experiments.

周毅，男，1998年7月本科毕业于清华大学物理系；2004年1月于清华大学高等研究院获得博士学位；于2009年7月加入浙江大学物理系，2013年1月聘为教授。目前的研究方向为量子多体问题和理论凝聚态物理。