



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 Spins as quantum simulators

Speaker: Thierry Giamarchi (*University of Geneva*)

Time: 4:00pm, Wednesday, March 30, 2016
(3:30~4:00pm, Tea, Coffee, and Cookie)

Venue: Conference Hall 322, Science Building, Tsinghua University

Abstract

Quantum magnets in insulating structures have proven to be remarkable systems when subjected to a strong magnetic field.

In addition to their own intrinsic interest they can be mapped on model systems of itinerant quantum particles. This has allowed to use them as quantum simulators for studying the properties of interacting hard core bosons. In particular I will focus on two recent ladder compounds for which a combination of numerical studies and analytical ones has allowed to obtain fully the dynamical correlation functions.

I will review the recent results in that respect, in particular some of the experiments and the corresponding theories for phenomena such as Bose-Einstein condensation and Tomonaga-Luttinger liquids as observed by neutrons, NMR and also ESR.

I will discuss the recent successes in this domain as well as several of the open problems and perspectives offered by such compounds such as the possibility to study dimensional crossover, disorder effects etc.