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 criticality with two length scales**

Speaker: 郭文安 教授 (北京师范大学)

Time: **4:00pm, Wednesday, May 18, 2016**
(3:30~4:00pm, Tea, Coffee, and Cookie)

Venue: **Conference Hall 322, Science Building, Tsinghua University**

Abstract

The theory of “deconfined” quantum critical points describes phase transitionsat temperature $T=0$ outside the standard paradigm, predicting continuoustransformations between certain ordered states where conventional theoryrequires discontinuities. Numerous computer simulations have offered no proofof such transitions, however, instead finding scaling violations which wereneither predicted by the new theory nor conform withstandard scenarios. In this talk, I will show that this enigma can be resolved by introducing a critical scaling form with two divergent length scales. I will also present simulation results of a quantum magnetwith antiferromagnetic and dimerized ground states which confirm the form, provinga continuous transition with deconfined excitations and also explaininganomalous scaling at $T>0$. Our findings revise prevailing paradigms forquantum criticality.