Quantum criticality with two length scales

郭文安 教授

北 京 师 范 大 学

2017年04月26日(周三) 下午15:00-16:30

波谱楼1016报告厅

个人简介:

1990年本科毕业于兰州大学理论物理专业，1993年，在兰州大学获量子光学专业硕士学位，1996年，在北京师范大学，获统计物理专业博士学位。 曾经在荷兰Delft理工大学从事博士后研究。1999年起，任北京师范大学物理学系副教授，2004年起，任北京师范大学物理学系教授。

Abstract:

The theory of "deconfined" quantum critical points describes phase transitions at temperature $T=0$ outside the standard paradigm, predicting continuous transformations between certain ordered states where conventional theory requires discontinuities. Numerous computer simulations have offered no proof of such transitions, however, instead finding scaling violations which were neither predicted by the new theory nor conform with standard 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 magnet with antiferromagnetic and dimerized ground states which confirm the form, proving a continuous transition with deconfined excitations and also explaining anomalous scaling at $T>0$. Our findings revise prevailing paradigms for quantum criticality.

Reference: Hui Shao, Wenan Guo, Anders W. Sandvik, Science 352, 213 (2016)

主办单位:武汉物数所理论与交叉研究部