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: **Superconductivity in the doped t-J and Hubbard models on the square lattice**

Speaker: **Hongchen Jiang 姜红臣**
(SLAC and Stanford University)

Time: **4:00pm, Tuesday, June 19, 2018**

(3:30~4:00pm, Tea and Coffee)

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

Abstract

The Hubbard model, and the closely related t-J model, play central roles in the theory of highly correlated electronic systems. Enormous effort has been devoted to studying the properties of these models at intermediate couplings. A general consensus is still lacking for this class of problem. Here, we report a large-scale density-matrix renormalization group study of the lightly doped t-J and Hubbard models on 4-leg cylinders to directly address this problem. By keeping an unusually large number of states and long system sizes, we are able to accurately document the interplay between superconductivity, spin and charge-density-wave orders. The long-distance behavior is consistent with that of a Luther-Emery liquid with a spin-gap, power-law charge-density-wave and superconducting correlations. This is the widest such systems for which power-law superconducting correlations have been established.