



Seminar

Quenched Disorder and Vestigial Nematicity in the Pseudo-gap Regime of Cuprates

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Time: 4:00pm, Dec. 16, 2014 (Tuesday)

时间: 2014年12月16日 (周二) 下午4:00

Venue: Conference Room 607, Science Building 5

地点: 理科五号楼607会议室

Abstract

The pseudo-gap regime of high- T_c cuprates phase diagram exhibits a variety of mysterious behaviors. In the last few years, evidence from NMR/NQR, STM, and X-ray scattering experiments has shown a general tendency of short-range incommensurate charge-density-wave (CDW) order “intertwined” with superconductivity (SC). Additionally, transport, STM, and neutron-scattering have indicated the existence of long-range point-group symmetry breaking with an electron-nematic character, associated with CDW fluctuations. In this talk I will first present theoretical analysis of an effective field theory model of classical incommensurate CDW in the presence of weak quenched disorder. While long-range CDW order is precluded in such systems, any discrete symmetry breaking (nematic phase in this case) can generally survive up to a non-zero critical disorder strength. Implications of such “vestigial order” in the context of cuprates experiments will be discussed. The results of a generalized model including SC will be introduced as the second part of the talk.

About the Speaker

Laimei Nie received her Bachelor degree in physics from Tsinghua University in 2011, with a focus on theoretical condensed matter in Prof. Zheng-Yu Weng’s group. From 2011 to present she is a PhD student in Prof. Steven Kivelson’s group at Stanford University. Her main research interests include intertwined orders in cuprates and other unconventional superconductors, renormalization group approach to non-Fermi liquid behaviors, and applications of DMRG method to strongly correlated systems.