Joint CQSE and CASTS Seminar

Weekly Seminar
Sep. 19, 2014 (Friday)

TIME Sep. 19, 14:30 ~ 15:30
TITLE Quantum Correlation
SPEAKER Prof. Chyh-Hong Chern
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PLACE Rm716, CCMS & New Physics Building, NTU

Abstract

Pseudogap formation is an ubiquitous phenomena in strongly-correlated superconductors, for example cuprates, heavy-fermion superconductors, and iron pnictides. As the system is cooled, an energy gap opens in the excitation spectrum before entering the superconducting phase. The origin of formation and the relevancy to the superconductivity remains unclear, which is the most challenging problem in condensed matter physics. Here, using the cuprate as a model, we demonstrate that the formation of pseudogap is due to a massive gauge interaction between electrons, where the mass of the gauge boson, determining the interaction length scale, is the consequence of the remnant antiferromagnetic fluctuation inherited from the parent compounds. Extracting from experimental data, we predict that there is a quantum phase transition belonging to the 2D XY universality class at the critical doping where pseudogap transition vanishes.