

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Competition between spin density wave order and superconductivity in the underdoped cuprates EUN GOOK MOON, SUBIR SACHDEV, Harvard University — We describe the interplay between d -wave superconductivity and spin density wave (SDW) order in a theory of the hole-doped cuprates at hole densities below optimal doping. We describe quantum and thermal fluctuations in the orientation of the local SDW order, which lead to d -wave superconductivity. We also describe the back-action of the superconductivity on the SDW order, showing that SDW order is more stable in the metal. Finally, we propose a finite temperature crossover phase diagram for the cuprates. In the metallic state, these are controlled by a ‘hidden’ quantum critical point near optimal doping involving the onset of SDW order in a metal. However, the onset of superconductivity results in a decrease in stability of the SDW order, and consequently the actual SDW quantum critical point appears at a significantly lower doping.

Eun Gook Moon
Harvard

Date submitted: 20 Nov 2009

Electronic form version 1.4