

Massachusetts Institute of Technology
Department of Physics

Condensed Matter Theory Seminar

" Resolving a conundrum in P-doped Ba-122 : a quantum-critical superconductor?"

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Abstract: An important focus of the study of high temperature superconductivity has been the role of antiferromagnetic quantum criticality and its relation to superconductivity. The results of a number of intriguing experiments on a particular member of the iron-pnictide family (P-doped Ba-122) have been presented as evidence of a spin-density wave quantum critical point hidden under the superconducting dome. In this talk, I'll show that, in fact, quantum critical fluctuations associated with antiferromagnetism alone are unable to account for many of the striking features observed around optimal doping. These include a striking enhancement in the London penetration depth and a mysterious disappearance of spectral weight across the superconducting transition. I'll propose a possible explanation for some of these features, which involves viewing the phase in the vicinity of optimal doping as a granular superconductor with frustrated Josephson couplings.

12:00noon
Tuesday, November 18, 2014
***Low Seminar Room (6C-333)**

Host: Timothy Hsieh