

Massachusetts Institute of Technology
Department of Physics

Condensed Matter Theory Seminar

"Quantum criticality in metals - results from quantum Monte-Carlo simulations"

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Abstract: In many systems of strongly correlated electrons, it is believed that quantum critical points (continuous phase transitions that occur at zero temperature) play a crucial role in determining the physics over certain regions of phase space.

Although quantum critical phenomena in insulators are relatively well understood, the analogous problems in metals pose a substantial theoretical challenge and are still, to a large degree, an open problem.

Fortunately, certain classes of metallic quantum critical points can be simulated efficiently using numerically exact, quantum Monte Carlo methods, without suffering from the notorious "sign problem" which often hinders numerical simulation of fermionic systems.

I will describe recent results from large-scale Monte Carlo simulations on two such quantum critical points, namely the nematic quantum critical point, and the antiferromagnetic quantum critical point.

12:00pm
Wednesday, October 12, 2016
Duboc Room (4-331)