

Condensed Matter Seminar

Dr. Jong Han

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Title: Simulating Steady-State Strongly Correlated Nonlinear Transport

Abstract: In steady-state nonequilibrium, it will be shown that there exists a time-independent quantum theory via the imaginary-time formalism, which can be implemented for general quantum dot models. By introducing Matsubara voltage, the operators governing nonequilibrium statistics and the real-time dynamics can be formulated in a single framework. By numerically implementing this new idea via quantum Monte Carlo technique, demonstration will show that we finally have an essentially exact numerical method for calculating strongly correlated nonlinear transport in nanoscale devices such as the Kondo anomaly in quantum dot systems. If time permits, discussion will also cover preliminary results on the interplay of electron-phonon and Coulomb interactions in molecular electron transport.

Thursday November 1, 2007

4:10 to 6PM - Rm 416 PHY/GEO