CFEL SCIENCE

SEMINAR

7th February 2012 - 14:15

FLASH HALL (28c) - Seminar Room

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Theory for strongly correlated systems out of equilibrium group, MPSD, CFEL

Theory for strongly correlated systems out of equilibrium

In correlated materials, exotic quantum states can emerge from the interplay of electrons, spins and lattice at energy scales far below the bare Coulomb repulsion and the Fermi energy. Numerical approaches such as continuous-time quantum Monte Carlo and dynamical mean-field theory have been developed to solve the relevant microscopic models in a wide parameter range. In some cases, they even allow us to make ab-initio predictions for the properties of correlated materials. Recent experimental developments call for a generalization of these methods to nonequilibrium: For example, ultrashort light pulses can be used to drive correlated systems into nonequilibrium phases through the selective excitation of certain phonon modes. In my talk, I report on the effort to develop numerical tools to study the time-evolution of correlated systems within dynamical mean-field theory. I will discuss two applications: photo-doping into a Mott insulator, and the damping of Bloch oscillations in the Hubbard model.

Host: MPSD, CFEL