



25th January 2011 - 02:15 pm
FLASH HALL (28c) - Seminar Room

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Ultrafast Dynamics of Laser-Excited Solids

The interaction of ultrashort laser pulses with matter is of significant interest both to fundamental physics and industrial applications. Transient states of matter as well as nonequilibrium scattering dynamics can be studied in real time. From the theoretical point of view the temporal separation of the induced processes as excitation, energy dissipation and possible phase transitions is of great importance.

In this talk I present an overview on our theoretical investigations of the ultrafast dynamics induced in solids during and after laser irradiation. We focus in particular on nonequilibrium effects on ultrashort timescales and necessary modifications of the description of materials reaction as compared to a near-equilibrium situation, which can usually be assumed on longer timescales. Examples are the strength of electron-phonon coupling, the description of dielectric breakdown and the timescales and dynamics of phase transitions. We also discuss peculiarities occurring during short-wavelength excitation as compared to visible light.

