



PHYSIKALISCHES KOLLOQUIUM

Referent:

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Thema:

Controlling correlated materials with ultra-short electric field transients

Zeit und Ort:

Dienstag, 04.04.2017, 16:40 Uhr
Recknagel-Bau, Hörsaal REC/C213, Haecelstr. 3

Leiter:

Prof. Dr. Matthias Vojta

Kurzfassung:

Femtosecond laser technology has opened the possibility to probe and control the dynamics of condensed matter phases with intertwined spin, charge, and lattice degrees of freedom on microscopic timescales. In many cases, even a qualitative understanding of the underlying physical processes is missing. In this talk, I discuss recent theoretical developments based on the nonequilibrium generalization of dynamical mean-field theory (DMFT). A light-induced manipulation of the interactions in a solid can be understood in the framework of a Floquet-Hamiltonian, which describes the evolution of a periodically-driven quantum system over one period. Along these lines, I will focus on the possibility to use time-dependent laser fields to manipulate superconductivity or magnetic and orbital exchange interactions in solids. I will discuss both the transient dynamics under pulsed fields, with the possibility of switching between different states in a controlled and ultra-fast manner, and driven steady states which emerge when the energy absorption from the external field is balanced by dissipation.

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