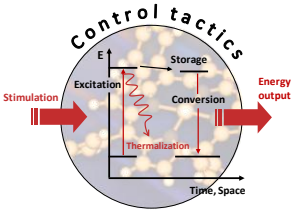

Theory for photo-excited states in correlated materials

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With modern time-resolved pump-probe spectroscopies one can track the dynamics of electrons and lattice in correlated systems with femtosecond time resolution, and possibly control complex material properties in an ultrafast manner. In this talk, I will discuss recent advances for the theoretical description of ultrafast processes in correlated materials. I will mainly focus on the generalization of dynamical mean-field theory for nonequilibrium, which is suitable to describe electron dynamics in high-dimensional bulk systems, hetero-structures, and surfaces. In a second part of the talk, I will focus on the dynamics of photo-excited carriers in an antiferromagnetic Mott insulator, which is related to questions as diverse as the ultrafast melting of antiferromagnetic order, light-induced changes of the exchange interaction, and the strongly non-linear transport of photo-excited carriers in a Mott insulating hetero-structure. The latter might be important to understand the functionality photovoltaic devices which are based on Mott-insulating hetero structures.