

# Physikalisches Kolloquium

Thursday, 07.05.15, 17:15, HS 100  
 Reception with coffee & cookies 16:45

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## *Transient electronic structure in ultrafast surface reactions and phase transitions in solids*

### Abstract

Electronic excitations at surfaces and in solids can lead to rich variety of processes, which often include transfer of electronic energy into nuclear motion. Femtosecond laser excitation may induce chemical reactions at surfaces or even ultrafast phase transitions in solids. Both types of processes occur on ultrafast (femto- to picosecond) timescales and are accompanied by pronounced changes of the electronic structure. Here I discuss different experimental approaches to probe such transient electronic structure changes on ultrafast timescales by employing (i) time-resolved resonant inelastic x-ray scattering (RIXS) and (ii) time- and angle-resolved photoelectron spectroscopy (ARPES). Experiments performed at the X-ray free electron laser LCLS provide direct insight into the changes of the chemical bond of CO on Ru(001) and CO<sub>2</sub> formation, leading to a pronounced changes in the valence electronic structure. Furthermore, we use time-resolved ARPES for a systematic study of the photoinduced non-equilibrium phase transition in the tri-telluride charge-density wave system and probe directly the resulting transient evolution of the electronic structure and collective phonon dynamics of the system through their influence on the electronic band structure.

All of you interested in physics are cordially invited!

