

Einladung zum Physikalischen Kolloquium

**Montag, 20.12.2010,
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Femtosecond photoionization of doped helium nanodroplets

Superfluid helium nanodroplets doped with atoms, molecules and clusters are intriguing systems at the border between gas-phase and condensed matter physics. Using femtosecond spectroscopy, various dynamical molecular processes under the influence of the helium environment can be followed in real time. As examples, we study the decoherence and relaxation of vibrational wave packet motion of diatomic alkali molecules that are weakly coupled to helium droplets. Vibrational spectra of homo- and heteronuclear alkali triatomic molecules are discussed in comparison with high-level quantum chemistry calculations. Quantum interference spectroscopy allows for measuring the formation dynamics and spectroscopy of alkali-helium exciplex molecules. At high laser pulse energies, rare-gas doped helium droplets ionize and form a nanoplasma that features peculiar dynamical properties.

