

# Physikalisches Kolloquium

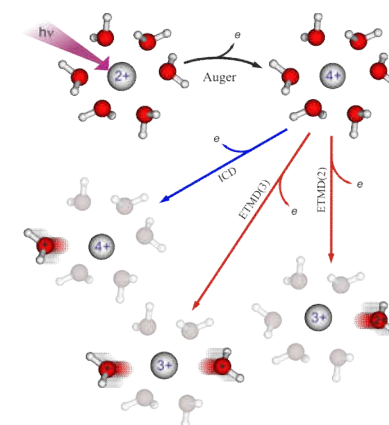
Thursday, 8<sup>th</sup> June 2016, 17:15, HS 100  
 Reception with coffee & cookies 16:45

Dr. Kirill Gokhberg, Institute of Physical Chemistry, Uni Heidelberg:

## *X-ray induced electronic decay cascades in medium: from rare-gas to microsolvated clusters*

### Abstract

Interaction of highly energetic X-ray photons with matter is a centerpiece of experimental techniques aimed at elucidating its structure and electronic properties. However, absorption of ionizing X-ray radiation initiates ultrafast electronic decay cascades which lead to the widespread damage of the irradiated system, introduce errors into determined molecular structures and cause the loss of function in biomolecules. In my talk I will present the results of ab initio modelling of such cascades in rare-gas and micro-solvated clusters. Specifically, the non-local electronic decay processes - interatomic Coulombic decay (ICD) and electron transfer mediated decay (ETMD) - will be introduced. These processes constitute a major part of de-excitation cascades triggered by X-ray absorption in a medium; they represent important mechanisms, whereby energy and charge are redistributed throughout the medium in just a few tens of femtoseconds after photoabsorption. As a particularly interesting example, I discuss the absorption of X-rays by micro-solvated metal ions which results in a complicated chain of local and non-local electronic relaxation steps and provides a glimpse of how radiation damage is incurred in the important class of metal containing biomolecules.



All of you interested in physics are cordially invited!