Laser Seminar
Monday, March 12, 2018

Time	16.45
Location	ETH Zurich, Hönggerberg, HPF G6
Speaker	**Prof. Stephan Thürmer** Department of Chemistry, University of Kyoto, Japan
Title	Exploring non-radiative relaxation processes in X-ray irradiated liquid water and aqueous solutions
Abstract	Irradiation of liquid water and aqueous solutions with X-rays leads to a multitude of non-radiative relaxation (autoionization) processes on a sub-10 fs timescale. How energy dissipates, which species form and what we can learn about the hydrogen-bonding network and hydration structure from the autoionization signature is at the focus of current research. The aqueous environment enables various local and non-local relaxation channels, which are a sensitive probe of electronic-structure interactions, hydration configuration, ion pairing, charge and energy transfers in solution. Lately, several unique non-local relaxation channels have been identified in solution using soft X-ray liquid microjet photoelectron spectroscopy. These include intermolecular Coulombic decay (ICD), where the energy released in the (local) electron-hole recombination is used to ionize a neighboring species, and electron transfer mediated decay (ETMD), where even the electron for recombination originates from a neighboring species and up to three participating entities are involved. Both processes are sensitive to distance, coordination structure and the presence of counter-ions. It has been shown that electronic relaxation in aqueous solution can be strongly coupled with ultrafast nuclear dynamics along the hydrogen-bonding coordinate, providing additional structure information, including hydrogen-bond strengths. These studies are still at an early stage and the possibilities are actively explored. In my presentation, I will address different aspects of autoionization spectroscopy on aqueous solutions, and discuss the current state as well as future directions of the research on these mechanisms.
Host	Hans Jakob Wörner, Laboratory of Physical Chemistry, D-CHAB
More Info	http://www.fastlab.ethz.ch/laser-seminar.html

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