Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Laboratorium für Physikalische Chemie (LPC))

Einladung zu einem Kolloquium

Datum/Zeit:	**Dienstag, 18.03.2025, 16.45 Uhr**
Referent:	**Dr. Sebastian Hartweg** Universität Freiburg, Molekül- und Nanophysik, Physikalisches Institut, Freiburg, Deutschland
Titel:	*Weakly-bound molecular systems probed by double imaging photoelectron photoion coincidence spectroscopy*
Ort:	**HCI J3**

Many sample systems of chemical or biological relevance occur naturally in the solution phase, imposing challenges to the application of photoelectron spectroscopy and other techniques typically used on gas phase samples to obtain deep physical insights. Experiments on small non-covalently bound clusters can in principle be used to bridge this gap between the gas phase and condensed phases. This approach, however, requires tools to obtain cluster size resolved photoelectron and photoion data.
I will present examples of the application of double imaging photoelectron photoion coincidence spectroscopy to the study of weakly-bound molecular systems, including the study of dissociative ionization processes of hydrogen-bonded nucleobase pairs[1] and the UV-induced autoionization of solvated electron pairs via electron-transfer mediated decay in sodium ammonia clusters[2]. Finally, I will discuss dissociation reactions occurring after XUV-induced double ionization of molecules[3] and molecular clusters, highlighting challenges and how the use of electron-ion coincidence detection can overcome them.

1 Hartweg, S., M. Hochlaf, G.A. Garcia, and L. Nahon, Photoionization dynamics and proton transfer within the adenine-thymine nucleobase pair, J. Phys. Chem. Lett., 202310.1021/acs.jpclett.3c00564

2 Hartweg, S., J. Barnes, B.L. Yoder, G.A. Garcia, L. Nahon, E. Miliordos, and R. Signorell, Solvated dielectrons from optical excitation: An effective source of low-energy electrons, Science, 2023. **380**(6650), doi:10.1126/science.adh0184

3 Ngai, A., S. Hartweg, J.D. Asmussen, et al., H_2-roaming dynamics in the formation of h_3^+ following two-photon double ionization of ethanol and aminoethanol, Scientific Reports, 2025. **15**(1), 10.1038/s41598-024-84531-9

Gäste sind willkommen