

### Plenary Talk

PV X Thu 8:30 Audimax

#### **Atomic and Molecular Reactions in Slow-Motion: Time-Resolved Experiments with XUV and IR Laser Pulses**

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Advances in IR laser-technology and in the generation of intense XUV and X-ray radiation open new avenues for experiments on the dynamics of atoms and molecules in ultra-short light pulses. At present, laser pulses with durations of only a few femtoseconds (5-20 fs) down to the attosecond regime can be produced. The combination of these new sources with many-particle imaging spectrometers (so-called re-

action microscopes) for the coincident detection of ions and electrons enable detailed studies at light intensities of  $10^{14}$  W/cm<sup>2</sup> or more and thus reveal insight into the coupling of light with matter. How does an atom absorb two or more photons from an intense laser pulse, and how is the energy released after the interaction? This and other fundamental processes are subject of ongoing research. Pump-probe experiments with molecules allow the observation of rotational, vibrational and electronic excitations with unprecedented resolution and in real time, and time-resolved experiments with molecules using intense fs XUV Laser pulses are very first steps towards the visualization of fundamental molecular reactions. The general physical and technical concepts will be discussed and recent results will be presented.