



SATELLITE WORKSHOP - Photon Science

Molecular dynamics at FLASH

Thursday, 29 January 2026

FLASH provides unique opportunities for the molecular science community by offering ultrashort X-ray pulses that span a broad energy range from the extreme ultraviolet to soft X-rays up to 900 eV. This radiation serves as a powerful probe for valence and core-level spectroscopy, enabling element- and site-specific investigations of molecules. In addition, the pulses serve to excite molecular dynamics via deep valence or core levels. When combined with synchronized optical lasers and THz sources, FLASH allows scientists to gain deep insights into the evolution of electronic structures during molecular processes.

Currently, established research communities at FLASH are exploring areas such as photo- and astrochemistry of gas-phase molecules, explore its limits at the few fs scale, perform fundamental studies in surface catalysis, and study molecules in liquid environments. Looking ahead, promising extensions into ground state chemistry, interfacial chemistry and biomolecular dynamics in ion traps are on the horizon, particularly considering the significant investments in the highly stable and coherent seeded FLASH1 source.

The goal of this workshop is to connect FLASH scientists with researchers from the broader molecular user community, promote various ultrafast molecular techniques available at FLASH, and foster the exploration of new scientific approaches.

Organisers: M. Gühr, D. Mayer, R-P Wang, F. Lever

Contact: markus.guehr@desy.de

PROGRAMME

Chair: Dennis Mayer

14:00-14:15	<i>Instrument presentation by DESY staff</i>	
14:15-14:40	XUV-initiated molecular dynamics captured with transient absorption spectroscopy	Christian Ott
14:40-15:05	tba	Ingo Fischer
15:05-15:30	Unraveling Molecular Structure and Dynamics with Coulomb Explosion	Rebecca Boll
15:30-15:50	<i>Coffee break</i>	

Chair: Ru-Pan Wang

15:50-16:15	Atmospheric aerosol research with X-rays: from synchrotron to FELs.	Nonne Priesle
16:15-16:40	tba	Heshmat Noei
16:40-17:05	Steady-State and Time-Resolved Studies of Charge Transfer Reactions in Solution Phase	Erik Nibbering
17:05-17:25	<i>Coffee break</i>	

Chair: Fabiano Lever

17:25-17:50	High charge states of polycyclic aromatic hydrocarbons (PAHs)	Melanie Schnell
17:50-18:15	Exploring Biomolecular Structure and Dynamics in the Gas Phase	Sadia Bari
18:15-18:40	Investigating bond making and breaking in biomolecular systems using FLASH	Gert von Helden
18:40	<i>End of workshop</i>	