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## **New Opportunities for Time-Resolved Photoelectron Spectroscopy at the European XFEL**

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A new SASE3 beamline branch at European XFEL in Schenefeld is currently being installed. It will be available to a large user community for time-resolved pump-probe photoelectron spectroscopy (TR-XPES) of solids and surfaces.

SASE3 provides ultra-short (10-100 fs), extremely intense (1 - 2 mJ) pulses of coherent soft X-ray light (0.27 - 3.0 keV photon energy), which is ideally suited for comprehensively investigating matter on the atomic length scale with femtosecond temporal resolution: Spin- and time-resolved ARPES will allow tracking the dynamics of electronic structures on the fundamental time scale of electronic motion. Time-resolved XPS and XPD will allow monitoring the temporal evolution of chemical processes and structural dynamics, respectively, in real time.

The X-ray beam can be varied in size at the sample position between 20 and 100  $\mu\text{m}$ , matching the typical focal size of electron spectrometers. Two dedicated experimental stations have been developed, a spin-resolving photoelectron momentum microscope (University of Mainz) and a time-of-flight spectrometer (University of Hamburg). The new branch, however, was designed flexible as a “multi-purpose” branch, allowing users to bring their own transportable experimental stations and operate them with the FEL beam. The branch is expected to become operational at end of 2019.

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