

## SYSR 4 Hauptvortrag

Zeit: Samstag 10:00–10:30

Raum: TU HE101

**Hauptvortrag**

SYSR 4.1 Sa 10:00 TU HE101

**Photoelectron spectroscopy of solids with soft and hard x-rays: Towards enhanced bulk sensitivity** — ●RALPH CLAESSEN — Experimentalphysik II, Universität Augsburg, D-86135 Augsburg, Germany

Photoelectron spectroscopy (PES) is a powerful tool for electronic structure determination in solids, allowing direct access to densities of states, band structures, and Fermi surfaces. However, a serious drawback of the method is its extreme surface sensitivity of only a few atomic layers, which results from the rather low photoelectron mean free path when using vacuum ultraviolet radiation, as is usually the case. This problem can be overcome by using high-energy x-ray photons at third generation synchrotron radiation sources, leading to much higher probing depths. I will present examples of soft x-ray PES (SX-PES,  $h\nu \approx 700..1000$  eV) on selected transition metal oxides with large unit cells, where strong surface effects would prevent the use of conventional PES for a reliable determination of their *bulk* electronic structure. It will also be shown that SX-PES spectra still contain substantial k-space information. The bulk sensitivity can be further enhanced by using hard x-rays (HX-PES,  $h\nu \approx 6..10$  keV), where probing depths of more than  $100\text{\AA}$  can be achieved. This not only helps to overcome the surface barrier, but also opens an opportunity for PES on *buried* interfaces and nanostructures. I will discuss first pilot experiments in this direction and plans for a possible HX-PES beamline at the new x-ray source PETRA-III at Hasylab.