SYSR 6 Hauptvortrag

Zeit: Samstag 11:30–12:00 Raum: TU HE101

Hauptvortrag SYSR 6.1 Sa 11:30 TU HE101

Magnetism and Dynamics Probed via Nuclear Excitation: Applications and Perspectives — •Ralf Röhlsberger — HASYLAB@DESY, Notkestr. 85, 22607 Hamburg

The outstanding brilliance of 3rd-generation synchrotron radiation sources has rendered several x-ray scattering techniques sensitive to smallest amounts of material. This applies in particular for nuclear resonant x-ray scattering. It is the virtue of this technique to be capable of probing magnetic as well as vibrational properties, basically in the same experimental setup.

Magnetic properties are studied via elastic resonant scattering: Ultrathin layers of the resonant isotope are employed to directly probe magnetic spin structures on an atomic scale. This allows one to image the internal magnetic structure of nanoscale systems with very high depth resolution. Recent studies have been applied to exchange-coupled thin films like exchange-spring magnets, exchange-bias systems and coupled metal/oxide heterostructures.

Using inelastic resonant scattering, the vibrational density of states can be determined with energy resolutions in the sub-meV range. In thin films and nanostructured systems, the microscopic origin of excitations that are strongly influenced by the reduced dimensionality can be explored. Finally, the talk illuminates new possiblilities at future sources like PETRA III and the XFEL.