

NanoXAS - an innovative Tool combining Scanning Probe and X-Ray Microscopy

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In materials science there are two different techniques dominating the field: X-ray microscopy and scanning probe microscopy (SPM). While x-ray microscopy provides chemical sensitivity, but is currently limited to about 15nm resolution, SPM provides sub-nm resolution but with no or only little chemical information. Combining the two techniques, i.e. the spatial resolution of SPM with the chemical sensitivity of X-ray microscopy, would thus be very advantageous.

We show a new technical approach for combining XAS with SPM: A conventional scanning transmission x-ray microscope (STXM) setup, using a fresnel zone plate (FZP) to focus the x-ray beam to a spot size < 50 nm in diameter and thus increasing the emitted photoelectron density, is one part of the instrument. On the other side of the sample, a coaxially insulated cantilever tip is placed in the center of the focused beam in order to locally collect the emitted photoelectrons. The instrument, named NanoXAS, is currently being commissioned and first results are presented.