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## High-Resolution Scanning X-Ray Microscopy at PtyNAMi

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The group 'X-Ray Nanoscience and X-Ray Optics' at DESY and Universität Hamburg works on the development of refractive X-ray optics with optimum performance as well as scanning X-ray microscopy techniques in the hard X-ray regime. These are powerful scientific tools for structure determination that is applied in various scientific fields, such as biology, chemistry (catalysis), physics, materials science and nanotechnology.

The Ptychographic Nano-Analytical Microscope (PtyNAMi) installed in the nanohutch of beamline P06 at PETRA III has been developed during the last two BMBF funding periods in collaboration with the Technische Universität Dresden. It is designed to create focused X-ray beams with sizes of 50 nm (FWHM) and even smaller, which allows one to image objects with high spatial resolution yielding local elemental, chemical and structural information of a specimen. Scanning coherent X-ray microscopy (ptychography) can be combined with tomographic methods potentially yielding structural information in 3D with a spatial resolution of 10 nm and even below. The new microscope is mechanically optimized in view of its stability and residual sample vibrations are controlled using optical interferometers, reducing imaging artifacts related to long-term drifts and higher-frequency vibrations of a sample. In this contribution, we present recent results of high-resolution X-ray imaging experiments obtained with PtyNAMi combining fluorescence and coherent diffraction contrast.

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