PtychoProbe

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The goal of the PtychoProbe (Ptychography + Nanoprobe) beamline is to realize the highest possible spatial resolution X-ray microscopy both for structural and chemical information. The unprecedented brightness of the APS MBA lattice will be exploited to produce a nm-beam of focused hard X-rays to achieve the highest possible sensitivity to trace elements, and ptychography will be used to further improve the spatial resolution for structural components to its ultimate limit. The proposed beamline will enable high-resolution two- and three-dimensional imaging of thick objects and bridge the resolution gap between contemporary X-ray and electron microscopy. Pushing X-ray microscopy into the nanoscale is crucial for understanding complex hierarchical systems on length scales from atomic up to meso and macroscales, and time scales down to the microsecond level, and is applicable to scientific questions ranging from biology to earth and environmental materials science, to electrochemistry, catalysis and corrosion, and beyond.