WK8: Tipping X-ray - Comprehensive Nanoscale Characterization with Multimodal X-ray Imaging

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A deeper understanding of energy conversion and transport in real-world materials and devices requires multimodal imaging capabilities to visualize rich, localized physical and chemical processes. These processes can be delicate and need to be measured in situ to capture the evolution of nanoscale objects, ranging from correlated electronic phases in quantum materials to defects at electrochemical interfaces. To meet this challenge, major instrumentation initiatives that integrate scanning near-field optical microscopy and scanning tunneling microscopy with x-ray beamlines (SX-STM) are under rapid development at the Advanced Photon Source. These new instruments open up opportunities to investigate localized nanoscopic phenomena with unprecedented comprehensive information including chemical sensitivity, local structure distortion, and electronic heterogeneities. The world’s first user program in SX-STM will soon become available at the new XTIP beamline. This workshop will gather world-leading researchers in the field of nanoscale characterization to identify new scientific opportunities, cultivate user community, and form international collaborations.