X-ray Microscopy and Imaging at the Advanced Photon Source

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X-ray microscopy and imaging is widely used in a variety of synchrotron applications to investigate structures from nanometer to millimeter scales in materials science and biology. This talk will provide an overview of current research activities in the X-ray Microscopy and Imaging Group at the Advanced Photon Source, including both full-field and scanning probe applications. Applications cover a wide range of scientific areas such as: functional materials research at nanometer scale in thin-films and self-organized and self-assembled structures; biological and biomedical research on trace-element distributions in subcellular organelles, single cells, and tissues; environmental research on natural and externally introduced nutrients and toxicities in soil and marine systems; materials microstructure studies on internal strain, grain boundaries, deformation and sintering; and small animal and soft tissue research on vascular networks and pulmonary ventilation. In addition, significant R&D efforts are directed to advance to state-of-the-art x-ray microscopy and imaging facilities such as phase-contrast and coherent diffraction imaging capabilities, as well as nano-focusing optics developments.

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