

**X-ray Interfacial Science Collaborative Development Team (XIS-CDT)**

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Executive Summary

Interfacial science by its very nature brings together a diverse community with interests in catalysis, biomenbranes, oxide film growth, semiconductors, geochemistry, surface physics, corrosion, nanoscience, tribology, and electrochemistry. One of many grand challenges in this interdisciplinary field is to understand and control the assembly of atoms and molecules at well-defined surfaces in complex environments. Increasingly sophisticated X-ray methods that exploit the inherent spatial-temporal-spectral properties of undulator radiation are being developed to meet these challenges. We propose to build a dedicated X-ray Interfacial Science (XIS) facility at a sector of the Advanced Photon Source that will fully exploit the unique capabilities of the APS to advance our understanding of this area, expand and grow the scientific and technical advances being made in this area, and create a “home-base” of synergistic support to meet the increasingly complex demands of an ever-growing community. The proposed facility would have two canted undulators producing four separate x-ray beams: one with variable-energy and three with selectable fixed energies. The XIS facility would provide state-of-the-art X-ray scattering, spectroscopy, and microscopy tools