

Cover page

Title: Multidimensional Correlative Tomographic Imaging Facility

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Abstract (150 word limit)

APS-U will enable nanofocusing of X-ray beam with orders of magnitude increase in flux which will open doors to many new scientific possibilities. However, this brings the challenge to strategically mitigate the sample disturbance by the extremely bright X-ray beam in studying a real sample system *in situ/operando*.^{1,2}

The Multidimensional Correlative Tomographic Imaging Facility (MCT) provides an ideal solution to this challenge while taking full advantage of APS-U collimated beam feature. Full-field tomographic techniques allows to image a large three-dimensional (3D) structure in short time with manageable and flexible dose control. Based on the 3D structure, regions of interest (ROI) of different sizes will be selected. The ROIs can then be characterized with multiple beam-scan probe techniques at different scales which localize radiation effects in a small volume. We anticipate MCT to become a world-leading facility for high-throughput, *in situ/operando* studies, especially for radiation sensitive “real world” samples e.g. batteries and corrosions.