

Recent developments and future of the GM/CA@APS X-ray crystallography user facility at the Advanced Photon Source

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The General Medical Sciences and Cancer Institutes' structural biology facility at the Advanced Photon Source (GM/CA @ APS) operates a national user facility for crystallographic structure determination of biological macromolecules by X-ray diffraction, including two undulator beamlines - beamline 23IDB, and beamline 23IDD - with an emphasis on advancing challenging, high-impact projects. This poster gives an overview of recent developments, as well as long-term aims relevant to the planned APS upgrade. Updates at beamline 23IDB include (a) a Dectris Eiger detector was recently incorporated, and (b) the development of the second-order nonlinear optical imaging of chiral crystals (SONICC) system progresses with improved optics. Updates at beamline 23IDD include (a) a new high-capacity sample automounter has tripled the puck capacity to 18, which is particularly helpful for remote operations, and (b) plans for compound reflective lens (CRL) optics for X-ray focusing down to ~ 1 μm at beamline 23IDD are in the works, which will dovetail nicely with the planned upgrade of the APS ring. New software enhancements will also be discussed. Finally, proof-of-concept experiments in X-ray FEL-like, serial crystallography experiments have been performed for fixed and injector-based sample delivery systems, as well as for *in situ* crystallization screening experiments.

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