

SER-CAT Data Collection Plans at Other Beamlines During APS Dark Period

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The APS Upgrade project (APS-U) is currently scheduled to begin in April 2023, with the upgraded APS coming online one year later. The massive upgrade will increase the brightness of the X-ray beams by up to 500 times and produce small and highly stable X-ray beams. During the APS-U dark period, SER-CAT will also upgrade its beamlines to make use of these small and intense beams, develop new powerful scientific tools for X-ray diffraction studies such as hands-free automated data collection and methods required for synchrotron serial crystallography.

To continuously support SER-CAT members' data collection needs and structural biological research with dedicated beamtime during the year long dark period, SER-CAT has been collaborating with two domestic (ALS and NSLSII) and one international (Diamond, UK) synchrotron facilities to provide “virtual beamlines” to our members with guaranteed pre-allocated beamtime.

Through scientific collaborations, SER-CAT has secured 600 hours of dedicated beamtime at the Berkeley Center for Structural Biology beamlines, Advanced Light Source, and 400 hours of dedicated beamtime at the New York Structural Biology Center beamline at the National Synchrotron Light Source II. In addition, as a member of APS MX consortium, SER-CAT has submitted the Block Allocation Groups (BAG) proposal to Diamond Light Source in the United Kingdom and has been awarded about 350 hours of beamtime in 4 different MX beamlines.

A SER-CAT remote operations group has been formed to train and schedule SER-CAT member user groups at these remote facilities. Duties include drafting the operation plans, managing member scheduling at the different facilities, coordinating with remote facility staff, and providing the logistical support on user registrations, sample preparation and crystal shipping, remote data collection & processing, data transfer & archiving.

An overview of the plan to support SER-CAT member data collection on remote “virtual beamline” during APS Upgrade dark period, including strategic planning, beamtime scheduling, logistics, and scientific support, will be described and discussed. Work supported by the SER-CAT Member Institutions, the University of Georgia Research Foundation, The National Institutes of Health (S10_RR25528 and S10_RR028976) and the Georgia Research Alliance.