

Upgrade of the Advanced Crystallographic Program at ChemMatCARS

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Synchrotron radiation user facilities are critical resources, which enable state-of-the-art research and student training in physics, chemistry, and material science. ChemMatCARS, an NSF-funded (NSF/CHE-1346572) national user facility for frontier research, is dedicated to chemistry and materials science using synchrotron x-rays at the Advanced Photon Source (APS), Argonne National Laboratory and operated by the University of Chicago. ChemMatCARS provides world-class facilities for (1) advanced chemical crystallography, (2) liquid surface scattering, and (3) small angle X-ray scattering.

ChemMatCARS maintains dedicated advanced crystallographic programs for small molecule which include photo-crystallography, high-resolution charge density studies, high pressure (<10 GPa) chemical crystallography using a diamond anvil cell (DAC), ultra-low temperature crystallography using open flow Helium at ~10 K, and element-specific resonant diffraction and diffraction anomalous fine structure (DAFS) (tunable energy from 5 to 70 keV). ChemMatCARS advanced crystallographic programs current equipped with a Bruker D8 diffractometer along with an APEXII CCD detector which has lower dynamic range, smaller active area, and low quantum efficient above 30 KeV. In order to extend current programs for the high energy diffraction measurements as the user community request, ChemMatCARS has purchased a hybrid pixel array detector (Pilatus 3X 1M CdTe) for high energy X-ray diffraction science. This poster focuses on the introduction of the new setup for 15IDD hutch for advanced crystallographic programs for small molecules and the highlights of the scope of the science carried out at the ChemMatCARS.