

## **Microfocusing Undulator Beamlines for Macromolecular Crystallography**

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### **Abstract**

We propose to develop microfocusing capabilities for macromolecular crystallography (MX) at the Advanced Photon Source (APS) at Argonne National Laboratory: a new dedicated microfocus beamline at the SBC-CAT and upgraded of one of the GM/CA beamlines. Macromolecular X-ray crystallography is the most powerful method for the determination of 3D structure of macromolecules including large biological molecules, proteins, nucleic acids, complexes and multi-component assemblies. Since its inception in the 1950s, it has provided critical observations in biology, and it continues to contribute greatly to the understanding of many biological and cellular processes. However, many of the most important problems in biology yield only small, weakly scattering crystals. Fortunately they tend to be better ordered. Microbeams will improve data quality, and will reduce radiation damage. These new and upgraded beamlines will allow the structural biology community in the USA to better address the most challenging problems in macromolecular crystallography.