



Dedicated APS Powder Diffraction Beamline Funded by DOE-BES

A new high-resolution powder diffractometer beamline will be funded by the U.S. Department of Energy's Office of Basic Energy Sciences for construction at APS sector 11-BM. The beamline proposal and subsequent funding arise from the department's general call for new instrumentation at x-ray and neutron facilities. This state-of-the-art, dedicated powder instrument will be a part of APS facility beamlines that provide a majority of beam time (80%) for general users. The project is a collaborative effort among APS scientists Peter Lee, Mark Beno, and Robert von Dreele; and ANL Materials Science Division scientists John Mitchell and James Jorgensen.

Powder diffraction is a powerful tool for understanding the crystal structure of important new materials. Definitive knowledge of the crystal structure of a material (inorganic, organic, or biological) is the gateway to understanding its physical properties, its chemical reactivity, and/or its biological functionality. The increasingly complex chemistry and physics of modern materials demands that this structural information be obtained in a routine fashion and with state-of-the-art precision.

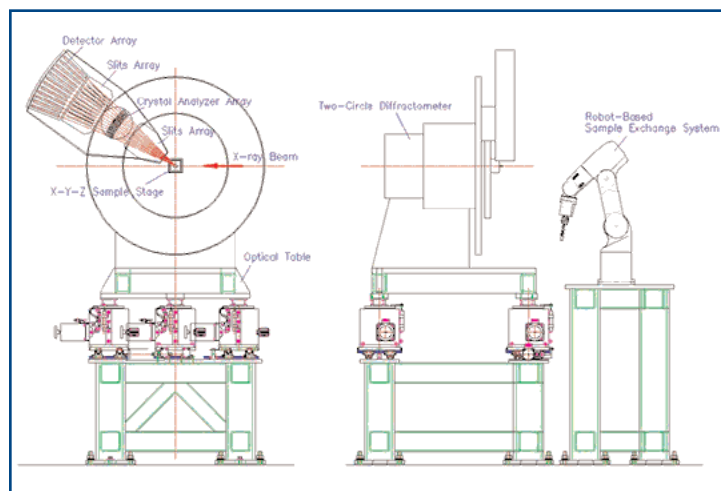
The new instrumentation funds will allow the APS to build a high-resolution x-ray powder diffractometer that will bring state-of-the-art capability to the powder diffraction user community. The result of this construction project will be a user-friendly, high-resolution, high-throughput instrument positioned to initiate leading structural science of importance to fields ranging from condensed matter physics and materials chemistry to the pharmaceutical and biological sciences.

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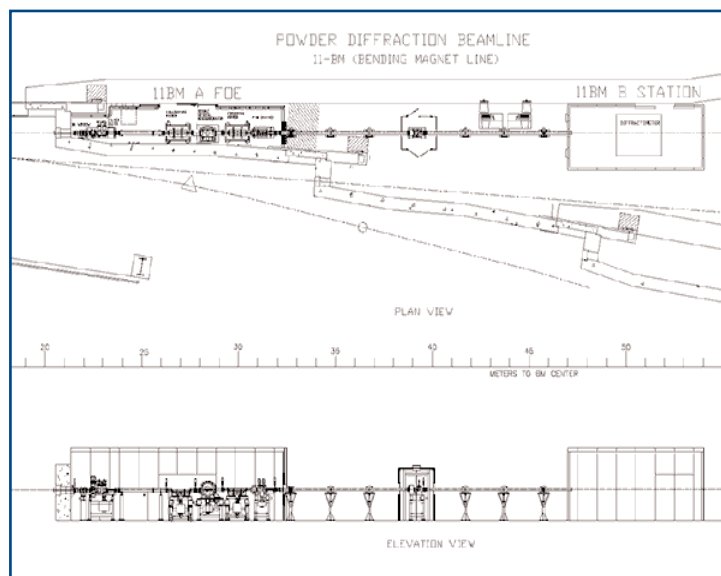
Want to learn more about powder diffraction?

See the Stanford Synchrotron Radiation Laboratory's informative overview of powder diffraction at <http://smb.slac.stanford.edu/powder/>

A tutorial on the subject is at <http://www.chemistry.ohio-state.edu/~woodward/overview.pdf> (Adobe Acrobat required).



Schematic of the powder diffractometer setup.



Schematic top and side views of the new dedicated powder diffraction beamline to be constructed at APS sector 11-BM.