

THE ADVANCED PHOTON SOURCE

QUICK-SCANNING XAFS AT APS BEAMLINE 9-BM

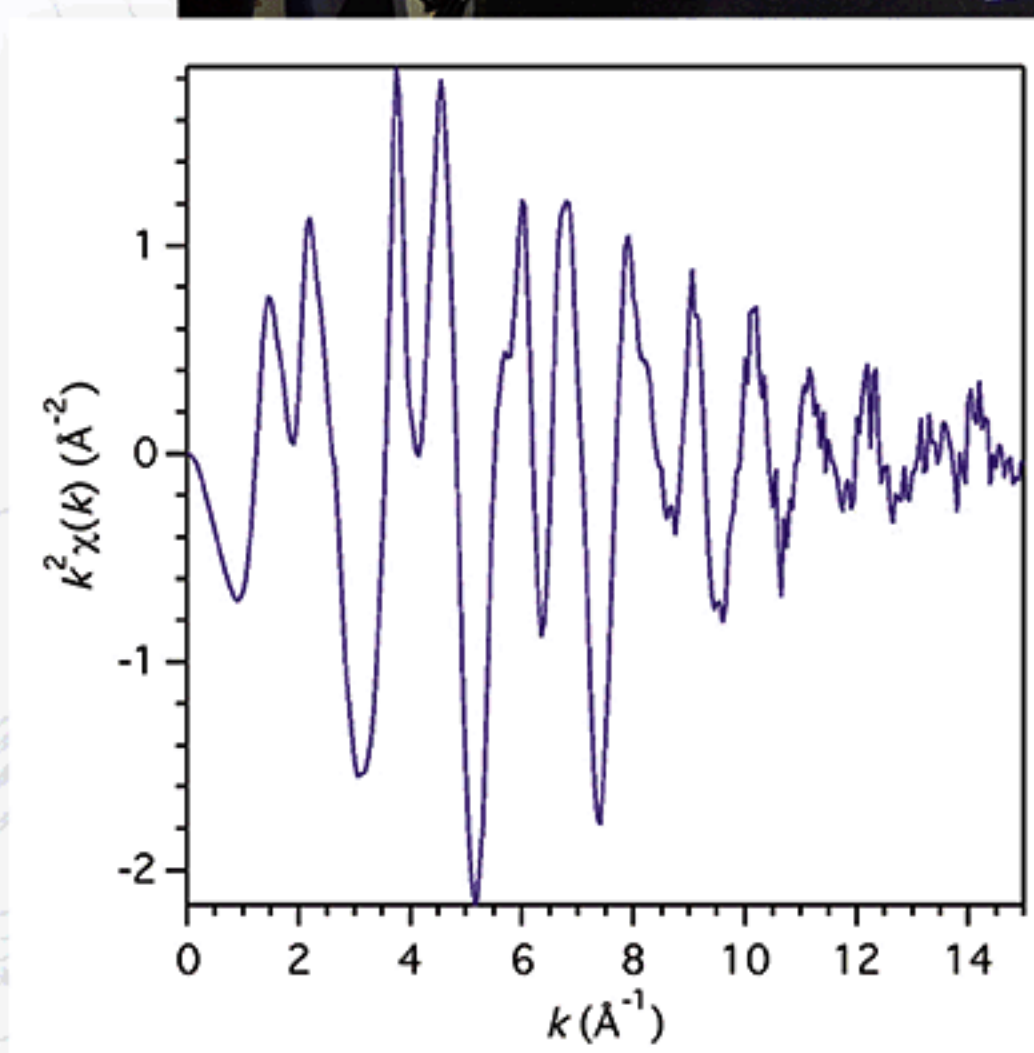
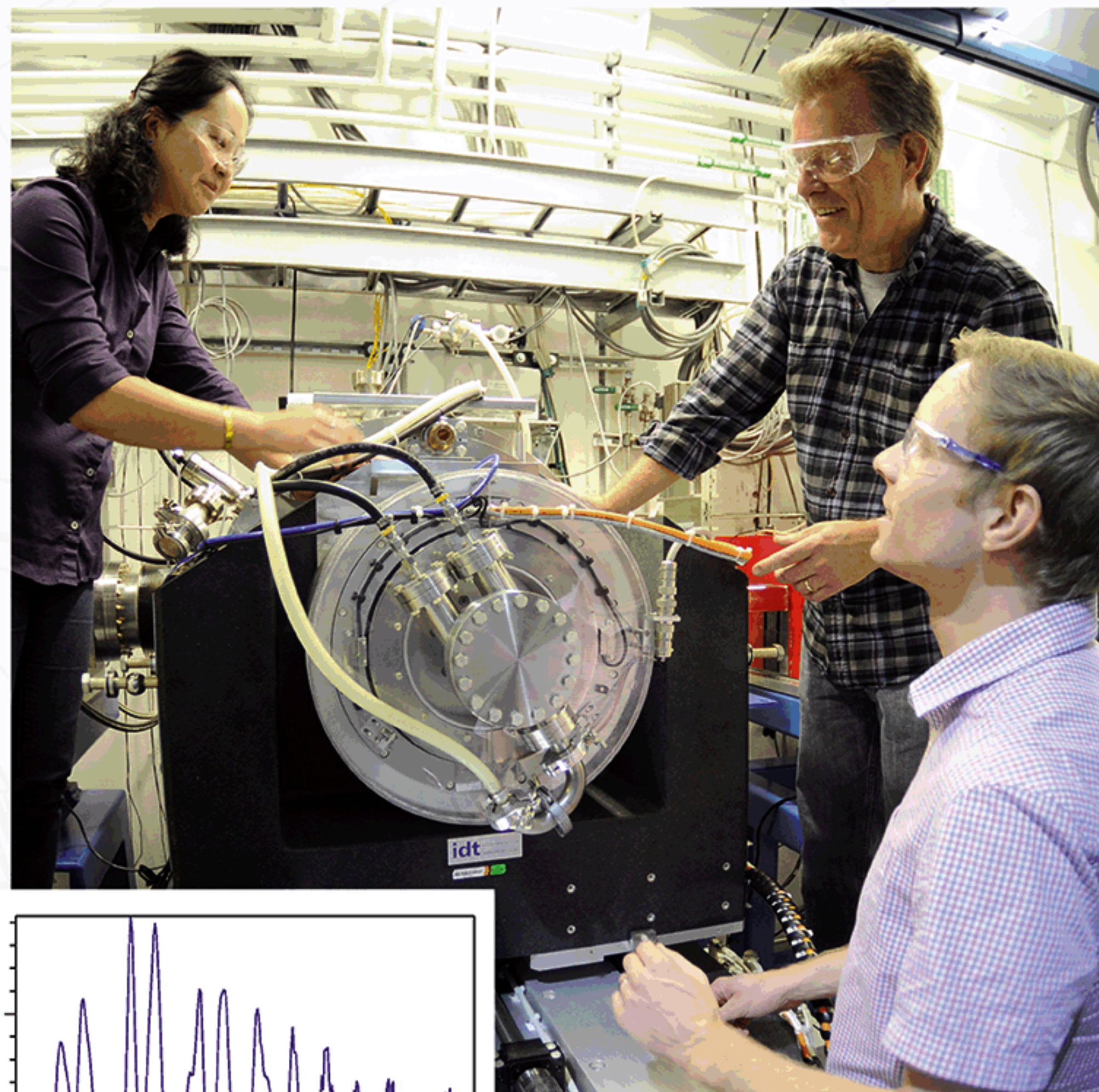
A new quick-scanning double crystal monochromator (DCM), which allows collection of a full extended x-ray absorption fine structure (EXAFS) spectrum in as little as five seconds, has been added to X-ray Science Division (XSD) beamline 9-BM-B at the U.S. Department of Energy's Advanced Photon Source (APS) at Argonne National Laboratory. This ability is now available to APS users for the study of chemical reactions and material transformations on short time scales, while maintaining the important capability of reaching the low-energy phosphorous and sulfur K-edges.

The new DCM was engineered by Instrument Design Technologies, and includes a frictionless air-bearing rotary stage with a direct drive motor that enables quick scanning of the DCM crystal angle and, thereby, x-ray beam energy. The frictionless motion allows for excellent beam stability to be maintained while rapidly changing energy over hundreds of electron volts.

The crystals are directly water cooled for excellent temperature and energy stability. Furthermore, high-resolution encoders track the DCM crystal angle, providing excellent reproducibility of the beam energy. Both Si (111) and (220) crystals are available, and the beamline provides access to energies from 2.1 to 25 keV.

In combination with the existing 9-BM gas handling systems and low-energy capabilities, the quick-scanning DCM makes 9-BM an ideal location for *in situ* catalysis and environmental research. Contact: Dale L. Brewe, brewe@aps.anl.gov; Steve M. Heald, heald@aps.anl.gov; George Sterbinsky, sterbinsky@anl.gov; Tianpin Wu, twu@anl.gov

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Tianpin Wu (left, XSD-SPC), Dale Brewe (right, XSD-SPC), and George Sterbinsky (foreground, XSD-SPC) with the quick-scanning XAFS instrument at APS beamline station 9-BM-B.

Inset: An EXAFS spectrum collected in 5.5 sec from a ZnO pellet using quick-scanning XAFS at APS beamline 9-BM.

CALL FOR APS GENERAL-USER PROPOSALS




The Advanced Photon Source is open to experimenters who can benefit from the facility's high-brightness hard x-ray beams.

General-user proposals for beam time during Run 2017-2 are due by Friday, March 3, 2017.

Information on access to beam time at the APS is at http://www.aps.anl.gov/Users/apply_for_beamtime.html or contact Dr. Dennis Mills, DMM@aps.anl.gov, 630/252-5680.

Argonne National Laboratory is a U.S. Department of Energy (DOE) laboratory managed by UChicago Argonne, LLC

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