

The U.S. DEPARTMENT OF ENERGY'S **ADVANCED PHOTON SOURCE** at Argonne National Laboratory

Ten Years of Spectroscopy at the APS Sector 3-ID Beamline

The excitement expressed by a group of scientists at the Advanced Photon Source (APS) on January 24, 1996, was the culmination of years of preparation and signaled an end to a nomadic existence at various synchrotron radiation centers around the world. "First beam" filled the station of APS sector 3-ID and within a few months, scientific experiments with sub-meV energy resolution were under way. A team led by Ercan Alp, Wolfgang Sturhahn, and Thomas Toellner, with great support from the engineering personnel and management of APS, created and perfected a novel x-ray spectroscopy, now known as nuclear resonant inelastic x-ray scattering (or nuclear resonant vibrational spectroscopy). Over the next decade, scientists working at X-ray Operations and Research sector 3-ID discovered the Nuclear Lighthouse Effect, invented nuclear resonant magnetometry, designed the highest resolution x-ray monochromators (which still hold the world record), and pioneered inelastic spectroscopy at mega-bar pressures and thousands of Kelvin. Over a dozen students have prepared doctoral dissertations based on their work at sector 3-ID. Today, the beamline is operated by the Inelastic X-ray and Nuclear Resonant Scattering Group lead by Wolfgang Sturhahn. It serves the biophysics, inorganic biochemistry, geophysics, materials science, and condensed matter physics communities. Ten years on, many of those original scientists, as well as new colleagues and users, raised forkfuls of cake and cups of coffee in celebration and remembrance for the past and future of sector 3-ID.

For more information on general-user research at sector 3-ID, please contact Wolfgang Sturhahn at sturhahn@aps.anl.gov.

- Disciplines supported: Materials science, physics, geoscience, biochemistry, optics development
- Research techniques available: Nuclear resonant inelastic x-ray scattering, momentum-resolved inelastic x-ray scattering, synchrotron Mössbauer spectroscopy
- Device: 2.7-cm undulators (x 2)



Sector 3-ID personnel and users, February 17, 2006.

CALL FOR PROPOSALS

At the APS, our door is open to experimenters from all scientific disciplines whose research requires the highest brilliance hard x-ray beams in the Western Hemisphere.

General-user proposals for beam time during Run 2006-3 are due by July 14, 2006. Information on access to beam time at the APS is at http://www.aps.anl.gov/user/beamtime/get_beam.html or contact Dr. Dennis Mills, DMM@aps.anl.gov, 630/252-5680.

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