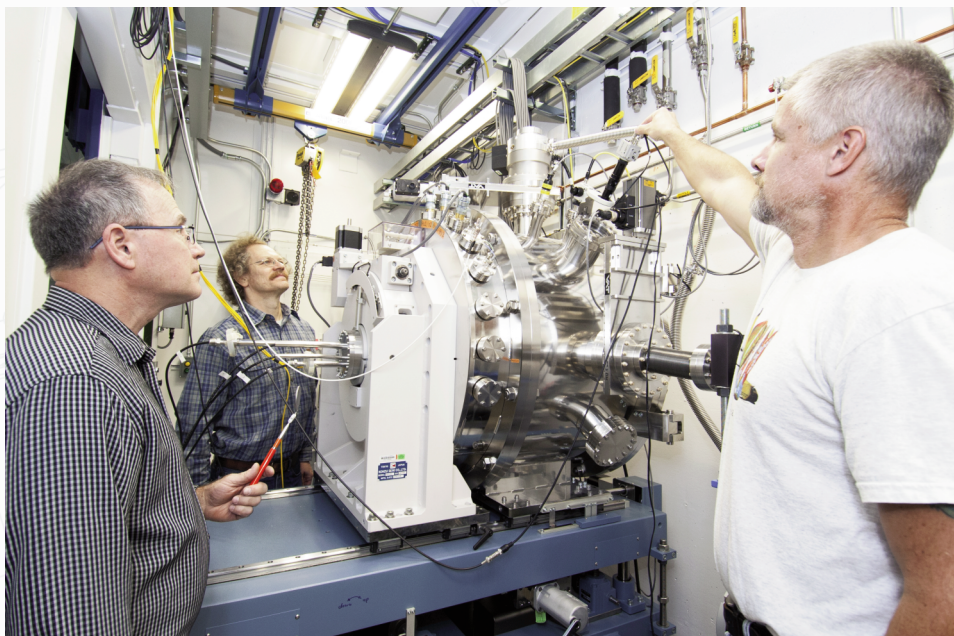


THE ADVANCED PHOTON SOURCE

A BURST OF FIRSTS FOR RIXS BEAMLINE 27-ID AT THE APS

New experimental capabilities and new technologies took a bow during the Advanced Photon Source (APS) user-beam run ending in August 2014, as the resonant inelastic x-ray scattering (RIXS) beamline on Sector 27 of the U.S. Department of Energy's APS came to life.

Sector 27, which is under the Inelastic X-ray Scattering & Nuclear Resonant Scattering (IXN) Group led by Thomas Gog in the Argonne X-ray Science Division (XSD) at the APS, has been newly constructed as the RIXS-only beamline for the APS user community. Previously, the RIXS community had been using both the Sector 30 and Sector 9 beamlines. Now, Sector 27 will consolidate all RIXS efforts at the APS on one dedicated, optimized, state-of-the-art insertion device beamline, offering enhanced energy resolution and x-ray intensities, combined with advanced beam focusing and a comprehensive suite of sample environments for meaningful *in situ* experimentation. The new beamline will support the study of complex materials of high technological and fundamental importance, including 5d-transition-metal-oxides, iridates, osmates, rheniates, and others where a treasure trove of novel phenomena are expected, such as topological band or Mott insulators, quantum spin liquids, field-induced topological order, and topological superconductors.



In the beamline 27-ID-A research station: (l. to r.) Timothy Roberts, Thomas Gog, and Richard Krakora check out the primary high-heat-load monochromator. Roberts and Krakora are Scientific Associates with the IXN Group and are part of the technical team installing and commissioning RIXS beamline 27-ID.

The APS Sector 30 insertion device beamline had been dual purpose, serving both the resonant and non-resonant inelastic x-ray scattering communities; Sector 30 will now be a dedicated, high-energy resolution inelastic x-ray scattering beamline featuring the HERIX diffractometer and two new, 1.72-cm-period undulators, the shortest-period undulators designed and built at the APS. These undulators are capable of producing 23.7-keV x-rays in the first harmonic and almost double the

incident flux for the photon-hungry HERIX instrument.

At 27-ID, measurement of the beam properties showed excellent performance in critical x-ray beam qualities of flux, size, divergence, and throughput. These results led to the decision to dismantle RIXS instrumentation on 30-ID and 9-ID at this time and move it to 27-ID, according to Gog.

The new beamline has a new front-end for increased power, and a novel hard x-ray beam position monitoring system developed by APS staff.

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This project was supported by the U.S. Department of Energy (DOE) Office of Science. The APS is a user facility operated for the DOE Office of Science by Argonne National Laboratory under Contract No. DE-AC02-06CH11357.

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 2015-2 are due by Friday, March 6, 2015.

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

The Advanced Photon Source is a U.S. DOE Office of Science User Facility operated for the DOE Office of Science by Argonne National Laboratory under Contract No. DE-AC02-06CH11357



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