

THE ADVANCED PHOTON SOURCE

A NEW BEAMLINE FOR 0.5- TO 2.5-KEV X-RAYS

Investigations of the complex electronic excitation spectrum that results from the emergence of low-energy collective modes will be the focus of a new beamline to be constructed by the Intermediate Energy X-ray Collaborative Development Team (IEX-CDT) at Sector 29 of the Advanced Photon Source (APS).

A Memorandum of Understanding formalizing the relationship between Argonne National Laboratory, the APS, and the member institutions of the IEX-CDT was signed on August 27, 2009, at a ceremony held at the APS. The IEX-CDT member group includes the University of Illinois at Chicago (UIC), the University of Illinois at Urbana-Champaign (UIUC), and the University of Michigan (UM). The IEX beamline will provide state-of-the-art facilities for soft x-ray scattering and high-energy photoemission spectroscopy. The beamline was developed by IEX-CDT members UIC Distinguished Professor Juan Carlos Campuzano; UIUC Professor Peter Abbamonte; UM Professor James Allen; and George Srajer, Associate Division Director in the Argonne X-ray Science Division (XSD). Campuzano is also an Argonne Distinguished Fellow.

“One of the grand challenges of the 21st Century is to understand the physics of materials that exhibit competing interactions,” Campuzano said. “We refer specifically to materials in which the energy scales of valence bonding, Coulomb repulsion and the kinetic energy of mobile electrons are similar in size, and the resulting ground state is a compromise among these effects.”

“The IEX beamline will reveal the physics of electronic behavior in fascinating, complex materials that have significant technological potential,” said J. Murray Gibson, Argonne Associate Laboratory Director for Photon Sciences. “Thanks to scientific direction from the IEX-CDT members, an innovative beamline design, and partnership with the Department of Energy and the National Science Foundation, we are able to offer this unique new tool to the synchrotron x-ray community.”

The beamline x-ray source will be a special APPLE-type polarizing undulator that will provide the most brilliant source of circularly polarized x-rays in the range of 0.5-2.5 keV. The undulator for IEX may also be quasiperiodic and capable of producing linear polarization.

The IEX beamline has been formally assigned floor space at the APS and funding has been approved by the National Science Foundation and the Department of Energy's



Cutting the ceremonial cake. L. to r.: Murray Gibson, Juan Carlos Campuzano, Peter Abbamonte, and Argonne Director Eric Isaacs



Guebre X. Tessema (left), NSF Program Manager for Instrumentation for Materials Research-Major Instrumentation Projects, and National Facilities converses with J.C. Campuzano prior to the ceremony.

Office of Basic Energy Sciences. Construction is set to begin in January 2010. The target for beamline completion is 2012.

The beamline will be constructed under the auspices of the IEX-CDT and operated by the X-ray Operations and Research section of XSD. At the APS, CDTs are one class of partner user. Partner users are individuals or groups whose work involves a greater degree of collaboration with the APS than is generally expected of general users. CDTs are external partner groups that drive the development of a beamline that will be ultimately operated by the APS.

CALL FOR APS GENERAL-USER PROPOSALS

The Advanced Photon Source is open to experimenters who can benefit from the brightest hard x-ray beams in the Western Hemisphere.

General-user proposals for beam time during Run 2010-1 are due by Friday, March 5, 2010.

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 is a U.S. Department of Energy laboratory managed by UChicago Argonne, LLC

The Advanced Photon Source is funded by the U.S. Department of Energy, Office of Science, Office of Basic Energy Sciences