



Synchrotron Radiation Center

University of Wisconsin – Madison

Call for Proposals

January 14, 2009

The Synchrotron Radiation Center (SRC) is calling for proposals on experiments with synchrotron radiation in the 5-4000 eV photon energy range and in the infrared. A variety of beam lines are available that are optimized for angle-resolved photoemission, magnetic circular dichroism (MCD), core level spectroscopy, infrared microscopy, etc.

For a general overview of the research possibilities, see the SRC web page at http://www.src.wisc.edu/users/research_overview.htm.

Available undulator beamlines are the U3-PGM operating from 8 - 245 eV, the U1-NIM operating from 5.9 - 40 eV, the U2-Wadsworth beamline operating from 8 - 40 eV, and the U2-VLS-PGM operating from 80 - 2000 eV.

Details of the performance of all SRC beamlines can be found at <http://www.src.wisc.edu/facility/complist.htm>

The deadline for the next beam time requests is February 1, 2009. This is for beam time starting after August 3, 2009. The duration of the request may be 1 year or 2 years. Submittal forms are available in several formats on the SRC web page at: <http://www.src.wisc.edu/users/proposalforms.htm> and from the Administrative Office (email name: srcadmin send to @src.wisc.edu). Printed submissions should be mailed to the address below by February 1, 2009.

Beam Time Request
Synchrotron Radiation Center
University of Wisconsin-Madison
3731 Schneider Drive
Stoughton, WI 53589

Several end stations can be requested in the Beam time Request Form under item C:

1. The two available angle-resolved photoelectron spectroscopy systems equipped with **Scienta analyzers** are for high momentum- and high energy-resolution studies of solids at temperatures ranging from 18K-370K. The SES-R4000, equipped with a sample introduction and transfer system, is mainly used for experiments that require in situ sample cleaving. The SES-200U system, primarily used for metal single crystal and epitaxial thin film studies, was recently upgraded with a new detector/controller system and a sample preparation chamber. The system is designed for samples to be cleaned by thermal flashing or ion sputtering. The prep-chamber has a LEED system and a water-cooled evaporator shroud for three sources. The sample manipulator is computer controlled in the xyz direction as well as in the rotational axis along the z-direction. The data acquisition software allows experimenters to automatically map Fermi surfaces over a large region and take constant resolution scans as a function of photon energy. Spectra can also be accumulated in the constant initial state (CIS) mode or constant final state (CFS) mode. A digital 12 bit video system for online LEED

analysis to monitor film growth and sample quality, and a differentially pumped ion-gun were recently added to enhance the overall functionality of the SES-200U system. Keeping in mind that the Scienta systems will be highly over-subscribed, a prospective researcher should provide a detailed justification in their proposal to help the reviewers in their recommendations. For questions regarding the orientation of the angular dispersion plane with respect to the sample manipulation axis and the polarization plane of the synchrotron light as well as the relative location of associated auxiliary equipment such as sample transfer, cooling, and availability of various preparation chambers, please get in touch with Hartmut Höchst at email: hhochst (send to @wisc.edu) before submitting the request.

2. The **Cylindrical Mirror Analyzer (CMA)** chamber is a general purpose photoemission chamber based on a double-pass CMA. It includes capabilities for ion etching, sample heating and cooling, gas dosing, and rapid sample introduction. In addition, a number of ports are available for evaporation sources, RGA measurements and other user instrumentation compatible with the existing configuration. User evaporation sources may be installed in the sample prep area of the chamber. For more information, please contact Mark Bissen at email: mbissen (send to @src.wisc.edu).
3. The **Magnetic Circular Dichroism (MCD)** chamber is available for MCD and magnetic linear dichroism (MLD) measurements of thin film magnetic materials. It is equipped with a 0.12 T electromagnet operated under computer control. Samples are typically prepared elsewhere, capped, and transferred into the system. For more information, please contact Mark Bissen at email: mbissen (send to @src.wisc.edu).
4. The **X-ray Absorption (XAB) Chamber** is currently designed for total electron yield (TEY) measurements of solids in UHV. Special features include a load lock sample transfer system designed for rapid introduction of multiple samples. It can also be equipped for partial electron yield (PEY) and total fluorescence yield (TFY) measurements. For more information, please contact Mark Bissen at email: mbissen (send to @src.wisc.edu).
5. An **infrared microscope** with programmable mapping stage coupled to a Fourier transform infrared (FTIR) spectrometer is available (2-micron resolution, 650-8000 wave numbers spectral range). It can be reserved in daily or weekly increments, and the time requirements should be noted on the proposal. In addition, a far IR experimental system is available for use in the range 200-2000 wave numbers. Designed for the UHV study of surface adsorbates, it includes capabilities for sample temperature control and surface preparation and characterization. For detailed information on the capabilities of the IR systems please contact Bob Julian at email: rjulian (send to @src.wisc.edu).
6. The **X-PEEM Spectromicroscopy** with SPHINX (Spectromicroscope for the Photoelectron Imaging of Nanostructures with X-rays) is available for the microchemical analysis of cells, tissues, minerals or materials science specimens, with tens of nanometer spatial-chemical resolution. Contact P. Gilbert at email: pupa (send to @src.wisc.edu) to arrange experiments.

The Program Advisory Committee (PAC), an outside committee consisting of five independent experts in various fields of science, will rate the beam time proposals. A rating in the upper third will be critical for obtaining beam time at highly oversubscribed equipment, such as the U3-PGM, U1-NIM, and the Scienta analyzers. Users may want to consider the U2-Wadsworth beamline as an alternative. In addition, the PGM beamline is used in a time-share mode, with the principal User guaranteed beam time from noon until midnight. A second User may be scheduled from midnight until 8 am. Proposals for exclusive use of the PGM (i.e. no secondary user) will be accepted, but will **require a compelling scientific case** as judged by the PAC.

The criteria given to the PAC for rating the proposal are scientific creativity, potential impact of the proposed research, relevance to the scientific discipline, and productivity of the research team. Characteristics of well-received proposals are a clear introduction that explains the goals and their importance for science/technology to a general audience, a well-defined research plan (possibly including test experiments), and new ideas (not just the same measurement on a new set of samples).