The J. Bennett Johnston, Sr.,
CENTER FOR ADVANCED MICROSTRUCTURES AND DEVICES

Serving the South!

CAMD is a synchrotron-radiation (SR) source owned and operated by the Louisiana State University; it is the only state funded SR facility in the US. It was built with $25-million in Federal (DOE) funding awarded to LSU in 1988 and user light was first available in September, 1992. Beginning in 1989, CAMD staff members and users have sought and obtained funding from state and Federal agencies (NSF, NIH and DOD) to build 16 beamlines that cover the spectrum from the far infrared to well into the hard X-ray region. Approximately 200 of CAMD's more than 300 users come from universities, industries and other laboratories within Louisiana. Additional users, although primarily regional from the southeastern US, come from many US states and territories as well as other countries. CAMD is an open user facility and users who propose projects suitable regarding the scope and mission of CAMD are assigned beamtime on a competitive basis. The synergistic benefits of having researchers from across the country and the world work at LSU, sharing expertise, and jointly building infrastructure such as beamlines and endstations, that provides benefits to all involved.

Technical Specifications: *The SR source is a second-generation 1.3 GeV electron-storage ring; beamlines utilize radiation produced by the eight 3-meter -radius bend magnets (Chasman-Green lattice) or from the 7-Tesla superconducting wavelength shifter. Currently, an NSF-funded superconducting 7.5-Tesla, 11-pole wiggler is under construction for a planned early 2012 installation. This wiggler will accommodate 3 additional high-energy X-ray beamlines.*

Beamlines Available to Users:

- **High-resolution Fourier-transform-infrared microscope**
- **Three operational vacuum-ultraviolet and soft X-ray beamlines capable of angle-resolved photoelectron spectroscopy and EXAFS and XANES of low-atomic-number elements (spectral range from 5 eV through 1000 eV). A fourth vacuum ultraviolet beamline is installed and near operational status.**
- **Four bend-magnet DCM beamlines dedicated to micro-probe work, EXAFS and XANES, small-angle scattering and X-ray diffraction. (spectral range 1.5 – 10 keV).**
- **The superconducting wavelength-shifter serves 4 beamlines for monochromatic or broadband microtomography (2 micrometer spatial resolution), protein crystallography including MAD analysis, and the development of radiation therapies to specifically target malignant cells. A high-energy (>30 keV) EXAFS and XANES, and XRD will be available soon.**
- **Four X-ray lithography beamlines are dedicated for the fabrication of micromechanical devices using X -rays from the bend magnets and for higher-aspect-ratio mechanical structures using the higher-energy X-ray radiation from the wavelength shifter. CAMD also has the infrastructure (clean rooms, plating lab, metrology and processing capabilities) to support the microfabrication work.**

Partnerships with other universities and institutions

Partnerships between LSU and other universities have made possible the number and variety of beamlines available to users. These institutions include Louisiana Tech University, Bonn University and the Universities of California at Riverside, Louisiana at Lafayette, Nebraska at Lincoln, Tennessee and Texas. Additional partnerships with the Gulf Coast Protein Crystallography Consortium (LSU and eight medical schools and universities in Texas and Oklahoma) and the Mary Bird Perkins Cancer Center in Baton Rouge have provided key research tools for biological and biomedical studies in thehard X-ray spectral range.

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