Louisiana EPSCoR
EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEARCH VOL.8 NO.1 OCTOBER 2010

NSF Cyber Connectivity Award to Enhance Collaborations at Xavier

With the successful implementation of the Louisiana Optical Network Initiative (LONI), research universities in Louisiana and Mississippi have reaped the benefits of the high-bandwidth optical network for their cutting-edge research and cross-disciplinary collaborations.

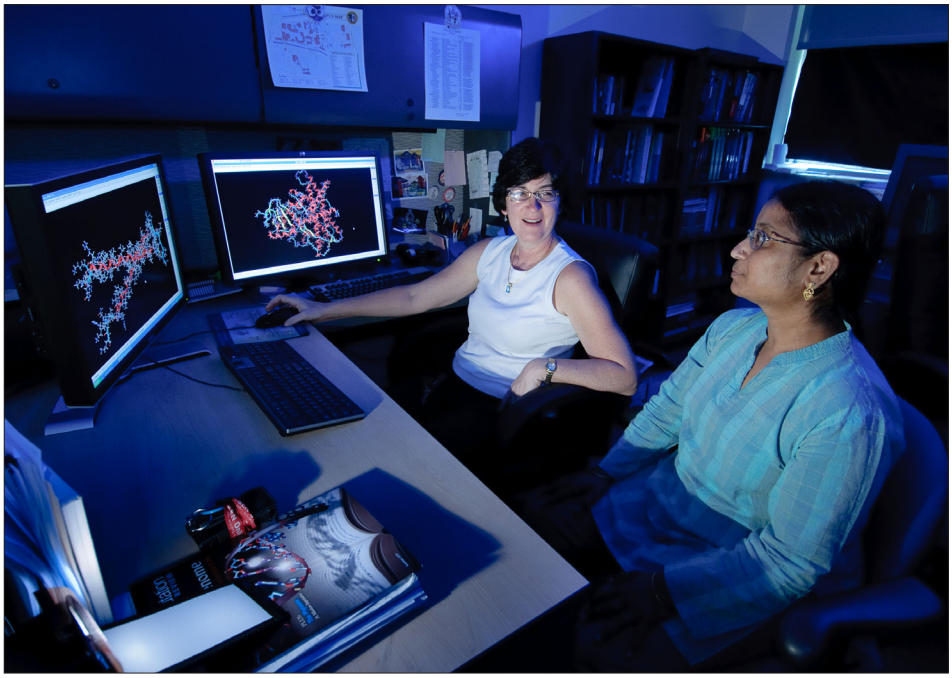
Building upon this success, the network will now be expanded to include Xavier University.

Louisiana EPSCoR was recently awarded a $1.17 million two-year Research Infrastructure Improvement grant by the National Science Foundation to extend LONI's high-bandwidth optical network into Xavier University.

Xavier is a private, historically-black university located in New Orleans which is nationally recognized for its science, technology, engineering, and mathematics (STEM) curriculum.

Through this initiative, Xavier will become the first Louisiana institution whose research activities are anchored in a primarily undergraduate curriculum that is linked into LONI at a bandwidth that takes full advantages of the optical network's capabilities.

The LONI network links supercomputer resources across the state and centers around one of the Top 25 supercomputers in the world. This 50 Teraflop core supercomputer, known as *Queen Bee,* is capable of performing 50 trillion floating point calculations per second.



Dr. Cheryl L. Stevens, Associate Dean for Scholarship in the College of Arts and Sciences and Chemistry Chair, and Post-doctoral Research Associate, Dr. Jayalakshmi Sridhar discuss the molecular models of two enzymes (Cytochrome P450 2A6 (right) and Her2 transmembrane helices dimer (left)). Both of these enzymes are important targets for the development of novel therapeutics in the treatment of cancer. Photo by Irving Johnson III, Xavier University.

LONI also links Louisiana institutions to the National Lambda Rail, allowing researchers to collaborate with scientists on major initiatives at 280 leading research institutions and Federal agencies.

The grant will significantly benefit Xavier's research and education environment through:

- Curricular enhancement and undergraduate research experiences, increasing the likelihood these students will go on to graduate school.
- Create a pipeline for traditionally underrepresented undergraduates who are well-trained and qualified for life-long careers in computational fields.

- Aid in workforce development efforts to produce leaders toward meeting current and future demands for science and engineering professionals.
- Remove bandwidth limitations, allowing Xavier researchers to fully participate in innovative research projects with cyberinfrastructure applications.
- Enhance computationally-oriented research so researchers can become more competitive in obtaining grants and patents.

The enhanced cyber-infrastructure environment will support collaborative materials science research projects that are already underway at Xavier, including:

- Studies of molecular magnetism to aid in the design of higher-performance magnets to enhance the capabilities of, for example, high density information recording media.
- Research on novel materials for energy conversion and spintronics applications.
- Molecular dynamics simulations of the interaction energies between surfactant molecules and the crystal planes of nanoparticles.
- Research aimed at eliminating pinholes during the fabrication of thin-film batteries.
- The investigation of polymorphism in pharmaceutically active organic crystals.
- Numerical modeling efforts aimed at reducing the time required to engineer nanofluidic devices used to identify molecular signatures and thereby aid a variety of applications in biological discovery.

"Xavier University of Louisiana is extremely pleased to be joining the Louisiana Optical Network Initiative (LONI). Through LONI, Xavier's faculty will be able to establish more active research relationships with some of the State's leading computational and experimental faculty, thereby making Xavier more competitive for federal funding.

It also will significantly strengthen current research partnerships including collaborations with several Louisiana institutions through the Louisiana EPSCoR LaSIGMA project, and with New York University's Materials Research Science and Engineering Center (MRSEC) through our joint grant, i.e., NSF Partnerships for Research and Education in Materials (PREM) program.

In addition, connection to LONI will be critical for Xavier's continued success in being number one in the nation in providing educational opportunities and research training to underrepresented minority students in science, technology, engineering, and mathematics disciplines."

- Dr. Gene D'Amour

Senior Vice President of Resource Development at Xavier University

Louisiana EPSCoR
P.O. Box 3677
Baton Rouge, LA 70821-3677
#4475