



## Reaching Out in the Name of Science

*The following is the first in a series of three focusing on the education and outreach programs of LA EPSCoR's National Science Foundation EPSCoR-funded CyberTools project.*

University researchers are more than researchers. They are mentors — advisers, teachers, role models and friends — introducing students to the world of science; encouraging them to consider it as a career, sharing their experience and insight with other scientists.

They are messengers, making the public aware of scientific research and why it's important and being done.

And while “education and outreach” has long been an integral part of their scientific careers, it has taken on new importance in recent years. Consider that:

- There are not enough people in the nation's STEM (science, technology, engineering and math) pipeline.
- According to a new report from the College Board, [www.collegeboard.com](http://www.collegeboard.com), the U.S. has fallen from first to 12th in the share of adults 25 to 34 with postsecondary degrees.
- Since 1999, the share of U.S. engineering doctorates earned by temporary and permanent visa holders rose from 51 percent to 68 percent in 2007.

In terms of Louisiana, the State is trying to diversify its economy; bring more industry to the State by fostering cutting-edge research that companies could take from the research stage to commercialization and also help them expand their own industries. An important step is to ensure a strong science and technology (S&T) base and student pipelines to sustain growth.

The following are highlights of some of the education and outreach programs related to the EPSCoR project, either through direct funding or researcher participation, held over the last three years.

### Summer Programs

A LA Tech **Nanoscience and Education Summer Outreach Program** concentrates on the disciplines of molecular science and nanotechnology, a combination of biology and engineering at the nanoscale. It links engineers, scientists



High School interns at the Career Academy Summer Internship program in a website design meeting at the University of Louisiana-Lafayette.

and graduate students at the university's Institute for Micromanufacturing (IfM) and the Colleges of Applied and Natural Science and Engineering and Science with students and teachers from rural and urban school systems in northern Louisiana.

Teachers learn about engineering and science through interactions with university researchers and by conducting bionanotechnology research using state-of-the-art equipment under the mentorship of university faculty and students. An EPSCoR researcher served as a mentor for a high school teacher attending the program.

A **summer collaborative program** of LA Tech University's IfM, Tulane's Center for Computational Science and its Biochemistry department, the University of New Orleans' Chemistry department and Xavier University is open to undergraduates. The six-week program places teams of students at one of the universities according to their academic

background and preference.

The **Beowulf High School Summer Boot Camp**, hosted by the LSU Center for Computation and Technology, offers participants the opportunity to work hands-on with the Center's researchers, including Professor Thomas Sterling, a former NASA scientist who invented the Beowulf supercomputing cluster. They learn how to use supercomputers for research, develop and run basic applications and experiment with computer science techniques for video games. Hands-on activities include building a computer and learning how to program a mini-supercomputer.

A **Research Experience for Undergraduates (REU)** held for three consecutive years at Tulane's Center for Computational Science, provided a research experience in computation science to undergraduate students from Xavier, Dillard University, UNO, LA

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Tech, Brown University and Tulane. The third REU, held in conjunction with UNO and Xavier, featured faculty mentors from Xavier, UNO and Tulane representing disciplines ranging from chemistry, biomedical engineering, psychology, physics, and neuroscience to ecology, epidemiology and mathematics.

Three **Summer Interdisciplinary Research in Computational Sciences for Undergraduates (REU) program** were funded by the National Science Foundation Office of Infrastructure. Beginning 2010, the funding provides for eight undergraduates to participate in a variety of computational science research projects along with the faculty and staff at LSU's Center for Computation and Technology (CCT) for a period of nine weeks. The objective: to teach them how to use the most current cyberinfrastructure tools and participate in individually designed training sessions targeted to their specific degree.

Due to the large amount of quality applications received for the 2010 program, the CCT partnered with the LA Board of Regents EPSCoR office to support additional students. As a result 16 students were admitted to the 2010 REU program, including four female and one Hispanic student.

**Summer Internships** Undergraduate and graduate students have participated in summer internships at such places as Microsoft, Argonne National Laboratory, Poland's Poznan Supercomputer Center, Cardiff University, University of Southern California, Washington University, University of Maryland, Sandia National Laboratory, and Schlumberger, France.

In other examples, seven graduate students were enrolled in summer intern-

ships at Lawrence Berkeley National Laboratory, the National Center for Atmospheric Research, the International Summer School on Grid Computing in Nice, France, and the Tulane Health Sciences Center.

The unique Joint Faculty Appointments Program, funded by the Louisiana Board of Regents and NSF EPSCoR, supports faculty hired in a joint position between two universities. The two JFAP faculty members holding joint positions between LA Tech and Grambling State University have included summer internships at LA Tech for a small number of students from either institution to work with JFAP faculty for a period of up to eight weeks.

In 2010, the JFAP program received extra funding from the LA Board of Regents EPSCoR office that enabled 16 students, including six African-American females and seven African-American males, to participate in summer internships.

**Computational Science Workshop for Louisiana Educators**, held at LSU Center for Computation and Technology and led by leading computational science educators from universities around the country, introduced high school teachers to computational science tools and techniques. Each left with at least one lesson plan and homework assignment for their students that included new computational science concepts and activities.

Twelve of the 25 participants were females of which four were African American and one an American Indian, and two were African American males.

A five-week intensive **Career Academy Summer Internship** was held at the University of Louisiana at Lafayette in collaboration with the Carencro High School Academy of Information Technology, which is part of the National

## About CyberTools

The NSF EPSCoR program awarded the Board of Regents' LA EPSCoR program a \$9 million Research Infrastructure Improvement (RII) Grant in 2007. With matching funds of \$3 million from the Board of Regents Support Fund and \$3.2 million from the nine participating institutions, the total of the three-year grant is over \$15.2 million.

The focus of the LA EPSCoR CyberTools grant is on cyberinfrastructure — the technology and network systems that have infiltrated every aspect of today's modern world — specifically on the development of CyberTools to help investigators effectively utilize cyberinfrastructure at a level that would not otherwise be possible.

The participating institutions are: Louisiana State University\*, LSU Health Sciences Center-New Orleans, Louisiana Tech University\*, Southern University-Baton Rouge\*, Tulane University\*, Tulane Health Sciences Center, University of Louisiana-Lafayette\*, University of New Orleans\* and Xavier University. (\*Members of LONI, the Louisiana Optical Network Institute)

Academy Foundation. The internships of the 10 participating students were integrated into the CyberTools project. They studied science and cyberinfrastructure while documenting the experience both in video and via a website for dissemination and attended classes exposing them to capabilities such as Louisiana Optical Network Initiative (LONI).

