Louisiana EPSCoR
EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEARCH VOL.5 NO.2 FEBRUARY 2008

LONI Institute Takes Louisiana to Next Step

The stars in Louisiana's continuing ascent in the world of technology are coming into alignment.

Within just three years, the State has created what is arguably the nation's most advanced regional computing facility.

Louisiana's $25 million investment in its *Louisiana: Vision 2020* Master Plan's information technology program and $50 million in the Louisiana Optical Network Initiative (LONI) have connected research campuses and supercomputer sites with optical networks.

Individual institutions have been strengthened and a strong foundation for statewide research collaborations created.

The next objective: Integrating and amplifying that strength into a world-class scientific and economic development powerhouse that is far stronger than its individual parts.

"The innovative and collaborative use of the technology by leading researchers in computational sciences is what will significantly further advance the State.

"It is for that reason that the six universities with a LONI site have organized the LONI Institute, a bold new inter-university research collaborative," says Dr. Les Guice, Chair, LONI Management Council and LA EPSCoR Committee.

The LONI institutions are Louisiana State University and A&M College, Louisiana Tech University, Southern University and A&M College, Tulane University, University of Louisiana at Lafayette, and University of New Orleans.

Dr. Guice adds that the Institute has no walls but is instead a research collaboration creating a multidisciplinary environment across the State.

Supported by a five-year, $7 million grant from the Board of Regents Post-Katrina Support Fund Initiative and some $8 million from the six partnering institutions, the LONI Institute will conduct research primarily in biology, materials science and computational sciences.

Pointing out that supercomputing has revolutionized science by freeing scientists to concentrate more on their experiments than on the mathematics of computation necessary to prove their theories, Dr. Ed Seidel, the Institute's Project Director, cites the human genome project, which he says owes its success as much to advances in computer sciences as it does to experimentation.

"It also illustrates the larger emerging trend: Without computational models, data mining, visualizations, and other knowledge discovery tools, large-scale simulation and data sets cannot be analyzed and understood in a reasonable time," says Dr.

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LONI Ties into NSF TeraGrid

The Louisiana Optical Network Initiative (LONI), on February 1, began integrating its centerpiece supercomputer, Queen Bee, into the TeraGrid, a nationwide, National Science Foundation-funded research infrastructure that incorporates high-performance computing resources across the nation.

"The fact that LONI is one of only 11 nationwide NSF-selected TeraGrid partners puts Louisiana in high standing among nationwide high-performance computing environments," says Dr. Ed Seidel, LONI's Chief Scientist and Director, LSU Center for Computation and Technology.

LONI will contribute one-half of the computational cycles of its super computer to support the national research community. In exchange, NSF is providing $2.2 million in funding for additional support of the machine and the new set of users, as well as additional network connections

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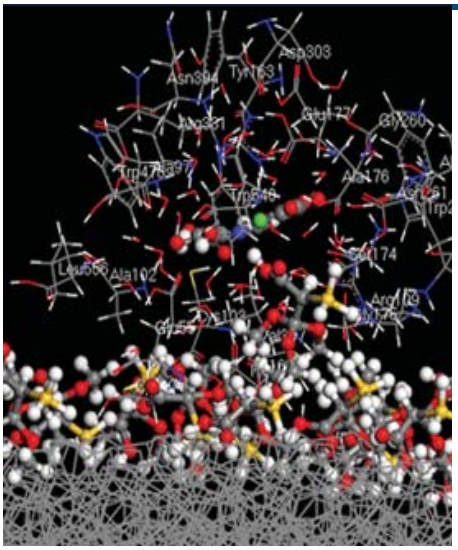
In a tour that included viewing Tulane University's supercomputer, "Ducky," which enabled the university to participate in LONI, are, from left, Lt. Governor Mitch Landrieu; Tulane Senior Vice President for External Affairs Yvette Jones, Dr. Ed Seidel, LONI Chief Scientist; Dr. E. Joseph Savoie, Louisiana Commissioner of Higher Education; and Tulane Executive Diretor of State/Local Affairs Flozell Daniels. (A Tulane University Publications Photo)



A computer simulation of an enzyme by Dr. Daniela Mainardi, Louisiana Tech Assistant Professor of Chemical Engineering. Understanding how this enzyme works in nature will provide clues to designing efficient chemical catalysts to mitigate the harmful effects of methane in the atmosphere, leading to a reduction in global warming.

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Seidel. "Computing will advance biology in the 21st century, just as mathematics advanced physics in the 20th century."

"The LONI Institute's greatest impact will be through the recruitment of new faculty, staff and graduate student research positions at the six universities as well as the initiation of projects in cooperation with industry to advance economic development," notes Dr. Michael Khonsari, LA EPSCoR Project Director and Board of Regents Associate Commissioner for Sponsored Programs Research and Development.

"LONI embodies the multi-institutional collaborative research endeavors for which Louisiana EPSCoR, since its inception, has been a catalyst," he adds. "Through its application to research and education, LONI will increase the State's competitiveness for federal and private funding, create a better-educated workforce, and accelerate its ability to reach its goal of a knowledge-based economy."

The LONI Institute's goals and objectives are to:

- build a highly skilled, information technology-oriented workforce;
- increase the competitiveness of the research institutions for federal funding, and recruitment and retention of the best students, staff and faculty;
- transform education, with computer sciences infused into the curriculum at many educational levels, in many disciplines;
- drive Louisiana's economic development and have university/industry cooperative research programs and centers of excellence flourishing within five years;
- grow and be self-sustaining within five years, attracting faculty beyond the initial focus areas of biology and materials.

In late 2004, the weekly online publication GRIDtoday described Louisiana's ascent in the world of information technology via LONI and the nationwide optical research network, National LambdaRail, as follows: *And so it was that Louisiana went from being excluded to envied, technological underdog to top dog.*

Actually, it was just the beginning.

"Computational science—the use of advanced computing capabilities to understand and solve complex problems—has become critical to scientific leadership, economic competitiveness, and national security…computational science is one of the most important technical fields of the 21st century because it is essential to advances throughout society."

"Computational Science: Ensuring America's Competitiveness," Presidential Information Technology Advisory Committee, 2005

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from LONI to the rest of the TeraGrid.

"The formal connection for LONI scientists to the TeraGrid opens access to leadership-class resources that are essential for scientific discovery in today's most complex problems," says Dr. Les Guice, LONI Management Council Chair and Louisiana Tech University Vice President for Research and Development.

NSF selected LONI to become a TeraGrid partner as a new resource provider in September 2007 and, on October 1, Louisiana officially became a partner.

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