



## Colloquium Good Chemistry for Three Grad Students

Three chemistry graduate students from a field of 60 won the top awards for their poster presentations at a recent colloquium sponsored by Louisiana's Center for BioModular Multi-Scale Systems (CBM<sup>2</sup>).

A highlight of the all-day program was a luncheon address by Baton Rouge Mayor-President Melvin L. "Kip" Holden, who discussed the role of research in community development. Featured speakers also included CBM<sup>2</sup> scientists from Louisiana State University and A&M College (LSU), Tulane University, and Xavier University.

CBM<sup>2</sup> is the centerpiece of a 2004-07 National Science Foundation EPSCoR grant for \$9 million that was matched with \$3 million from the Board of Regents Support Fund, and \$1.5 million from the participating institutions.

The Center, located on LSU's South campus, brings together an interdisciplinary, multi-institutional research team possessing expertise in microsystems engineering, materials, chemistry, and biological systems with state-of-the-art equipment and facilities. The objective is to further develop the understanding and tools needed for genetic research.

Hamed Shadpour, won the poster presentation's first prize of \$3,000, André A. Adams, the \$2,000 second prize, and Jasmine Millican, the third prize of \$1,000. All three are candidates for a Ph.D. in chemistry from LSU.

Honorable mention winners, fourth through ninth, respectively, were Naga Korivi, Johnpeter Ngunjiri, Sreedhar Thirumala, Guanyan Fu, and Maoshi Guan, all of whom are LSU graduate students, and Fareed Dawan, a graduate student at Southern University and A&M College.

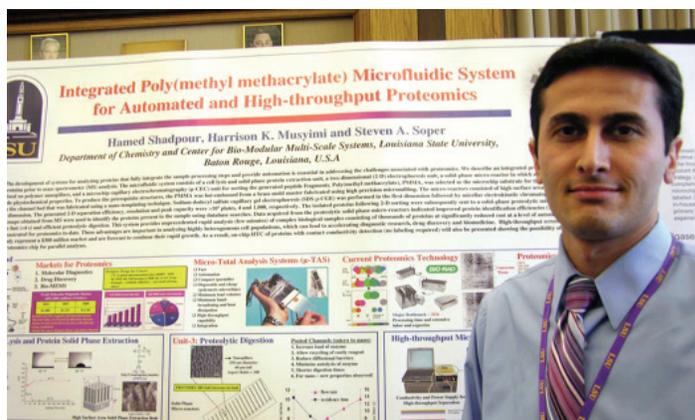
Mr. Shadpour, who received full fellowships for his undergraduate and master's degrees, was awarded his bachelor's degree in chemistry with honors and master's degree in chemical engineering, also with honors, from Iran's Gilan University and Amirkabir University of Technology, respectively. A CBM<sup>2</sup> research assistant, he was the recipient of a 2006 Rohm and Haas Award for Excellence in Research, and designated an Honorable Ph.D. Candidate by the American Chemical Society.

A native of Shreveport, LA, Mr. Adams, whose Ph.D. focus is bioanalytical chemistry, earned his B.S. degree in chemistry from Grambling State University where he was awarded the Richard Rayford Outstanding Chemistry Major Award in 1997 and 1999.

He is a CBM<sup>2</sup> research assistant and the recipient of a 1999 Department of Energy Research Undergraduate Laboratory Fellowship. His research experience includes the Ernest Orlando Lawrence Berkeley National Laboratory's Center for Environmental Biotechnology and the Dow Chemical Company.

Ms. Millican was awarded her B.S. in chemistry from Southern University and an M.S. in organic chemistry from LSU. She was one of three graduate students in the LSU chemistry department to

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LSU graduate student Hamed Shadpour and his prize-winning poster at a recent research colloquium of the Center for BioModular Multi-Scale Systems (CBM<sup>2</sup>).

### About those Top Three Winning Posters

Selecting a poster topic that focuses on just one important component of a research project in which they have invested untold hours, even years, is no small task for students. Highlights of the research that the CBM<sup>2</sup> colloquium's three top presenters zeroed in on are as follows:

**An integrated microchip** for automated proteomics, the complex large-scale screening of all proteins present in a cell, was the focus of Hamed Shadpour's poster. In this project, researchers have developed a microchip capable of separating approximately 1,000 proteins in a given sample in less than 30 minutes as opposed to several days using conventional methods.

"The system provides unprecedented rapid analysis of complex biological samples consisting of thousands of proteins in anywhere from five to 30 minutes at a significantly reduced cost and at a level of automation that has not yet been demonstrated for proteomics," says Mr. Shadpour.

"These advantages, which can lead to accelerating diagnostic research, drug discovery and biomedicine, are important. As the speed goes up and cost comes down, more frequent real-time monitoring of disease biomarkers will facilitate better disease treatment." He adds that high throughput screening products already represent a \$300 million market and protein diagnostics, a \$1 billion-plus global market.

**Aside from prevention**, the single most important factor in reducing the impact of cancer occurrences is providing new tools capable of earlier detection. Developing viable instrumentation to accomplish this goal is the research objective highlighted in André Adams' poster.

The research project, which falls under both the proteomics and micromanufacturing regimes, is currently being applied to diagnostic breast cancer research. The intent is to demonstrate that biological micro electro mechanical systems (BioMEMS) are capable of rapidly processing whole blood to efficiently isolate

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receive a 2004 Proctor and Gamble Research Award. In the summer of 2006, she was selected to attend the Argonne National Laboratory's Neutron and X-ray School. She is a member of the American Chemical Society and served as the LSU Chemistry Graduate Student Council Vice President from 2004-2005.

The 12 judges, who represented a variety of disciplines, selected the top winners based on the following criteria: evidence of interdisciplinary work, impact of the research, the quality of the poster session presentation to the judges, and originality of the work.

Whether or not they placed in the CBM<sup>2</sup> colloquium contest, all 60 students who entered their posters undertook an exercise about which chapters, even books, have been written. What is involved and why is it so important?

"Posters are a means for students majoring in the sciences to communicate their research to their peers and professors at scientific meetings. And while that alone makes them very important, there is a lot more to it than that," explains Louisiana EPSCoR Director Michael Khonsari.

"Scientists can't live in a vacuum. We must communicate how important research is to the nation, its communities and citizens; explain how it impacts each and every one of us on personal and economic development levels."

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and count cancerous target cells from the complex whole blood matrix.

"Once the cancer cells are recognized and isolated within the microstructured network of inexpensive, easily replicated polymer-based (plastic) microdevices, cancer cells can be enumerated to determine both the onset of micrometastatic breast cancer and the disease state (metastasis) of more advanced cancers based on the cancer cell frequency," explains Mr. Adams.

"The number of cancer cells in the peripheral blood is closely associated with the patient mortality rate. By finding the cancer during the micrometastatic phase the associated prognosis can be significantly improved."

**The primary research** goals of the solid state chemistry research group highlighted by Jasmine Millican are to synthesize, characterize, and study the structure, dimensionality, and physical properties of new materials. Discovery and exploration are a big

## LONI Computing Power Increased

The Louisiana Optical Network Initiative (LONI), a fiber optics network connecting supercomputers at the state's major research universities, has increased the computing power with standards-based technology from Dell, making LONI's 85 teraflop grid one of the nation's largest.

The new computers, along with additional system and hardware upgrades, will provide a significant increase in computational resources for academic research, including the ability to perform hurricane tracking and storm surge modeling at much higher speeds and with greater accuracy than currently possible.

Six clusters comprised of Dell PowerEdge™ 1950 servers will be installed at the six LONI member campuses: Louisiana State University and A&M College, Louisiana Tech University, Southern University and A&M College, Tulane University, University of Louisiana - Lafayette, and the University of New Orleans.

Each 132-node cluster will feature five teraflops of storage. In addition, LONI will soon install a network that features a 50 teraflop Intel Linux Cluster to be housed at the state's Information Systems Building.

part of this basic science research, which creates, characterizes and predicts the behavior of materials.

"The fascinating structural features and physical properties of intermetallic lanthanide compounds, for example, are of great interest, yet very little is understood about the correlation between the structure, dimensionality, and physical properties of these compounds," says Ms. Millican.

"Development of these novel intermetallic compounds is an interdisciplinary effort that lies at the interface of chemistry and physics. Because a better understanding of the structure and properties of these materials can be obtained through collaborative efforts, work in this area allows one to interact and collaborate with experts in both fields.

"Some of the technical skills I have acquired include characterization of solids by powder and single crystal X-ray diffraction, microscopy techniques, and measurements of the electrical and magnetic properties of materials," she adds.



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