



INSTITUTE FOR MICROMANUFACTURING

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Message from the Associate Director of Operations

The laboratory section of the Institute for Micromanufacturing (IfM) consists of a comprehensive set of resources for the realization of leading edge micro- and nano-systems. These resources are used by a broad range of users, including faculty, students, and external partners and collaborators.

It may be stated that a successful laboratory operation is ideally one in which all users have the supplies, equipment and know-how to carry out their research activities. It is the responsibility of the IfM operations staff to oversee the day-to-day operation and management of the laboratory section of the Institute, including equipment installation and maintenance, training of faculty and students on proper operation of equipment, scheduling of equipment use, laboratory security and safety.

The IfM laboratory opera-

tions staff in addition to being available to instruct users in proper use of equipment, provide assistance in developing and applying processing techniques, particularly to those users with little or no experience with micro- and nanotechnology related processes.

Consistent with a steadily growing laboratory user community, safety is also a major priority. The IfM has a regular safety training session conducted by the IfM operations safety officer which is required for all new laboratory users.

As the Associate Director of Operations, I can be reached and will be happy to provide more detailed information about the Institute's laboratory resources that are available to interested users.

Philip Coane
Associate Director



Mr. Philip Coane
Associate Director
Senior Research Engineer

Phone: (318) 257-5100
Fax: (318) 257-5104

E-mail: pcoane@coes.latech.edu

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“Louisiana Nanotechnology Day” June 4, 2004

Louisiana Governor Kathleen Blanco issued a proclamation, declaring June 4, 2004, as the “Louisiana Nanotechnology Day.” The proclamation recognized the Institute for Micromanufacturing as a top nanotechnology center in Louisiana, possessing strong foundations in nanotechnology, and advancing this field in Louisiana and the world. On June 4, the Institute also participated in the event “Nanotechnology: a Celebration of Tiny Technologies for Today and Tomorrow;” hosted by the LSU Center for Advanced Microstructures and Devices,

the Pennington Biomedical Research Center, and the Baton Rouge Technology Council. This event included presentations and displays on the prospects of nanotechnology in Louisiana, ranging from revolutionary medical devices and treatments to the manufacturing of a wide range of materials with highly desirable properties for a multitude of applications. The Institute was represented by Dr. Tatsiana Shutava and Mr. Malcom Prouty, who have contributed to some of the Institute's nanotechnology efforts directed by Dr. Yuri Lvov.



Malcolm Prouty
Ph.D. Student

Dr. Tatsiana Shutava
Postdoctoral Scholar

Special points of interest:

- Nanotechnology
- Biotechnology
- Environmental Technology
- Information Technology

Newsletter Editor

Mrs. Jeanette Futrell
jfutrell@latech.edu
Comments are welcomed!



“Capitol Day”



**Kody Varahramyan, Steven Soper, Charles O'Connor
Governor Blanco, Nicolas Bazan, Michael Khonsari**

Foundation and the Board of Regents.

Faculty and student researchers, as well as some industry representatives, used displays, videos, computer simulation, hands-on demonstrations, and even an actual human brain to acquaint a steady stream of lawmakers and Capitol visitors with their cutting-edge research.

“The implications and potential of the Consortium’s research are far reaching,” said Louisiana EPSCoR Director Michael Khonsari. “The Consortium’s goal is to establish a world-class infrastructure that will promote Louisiana’s considerable research capabilities and stimulate our economic competitiveness through the development of micro- and nano-scale systems for chemical, biomedical and other commercial applications.” To date, Consortium researchers have earned four patents, with another 13 pending.

members of the Louisiana Board of Regents and Governor Kathleen Blanco. “I applaud you for the exciting work you are doing,” Governor Blanco told Consortium representatives at the reception. “Your research directly supports the economic development objectives of Vision 2020. The wonderful discoveries you’ve made, the technologies you’ve developed and the transfer of that technology to new business ventures have tremendous economic potential for our state. And I look forward to even more exciting discoveries in the future.”

“You have forged productive, long-term partnerships that will continue to pay dividends well into the future. The patents you have received and the technological know-how you put into practice day in and day out are having a meaningful impact on Louisiana. The devices and technology you’re developing are helping to bring Louisiana to the forefront of technological progress in a variety of disciplines. Congratulations on all your success,” said Commissioner of Higher Education Joseph Savoie, also on hand for the event and reception.

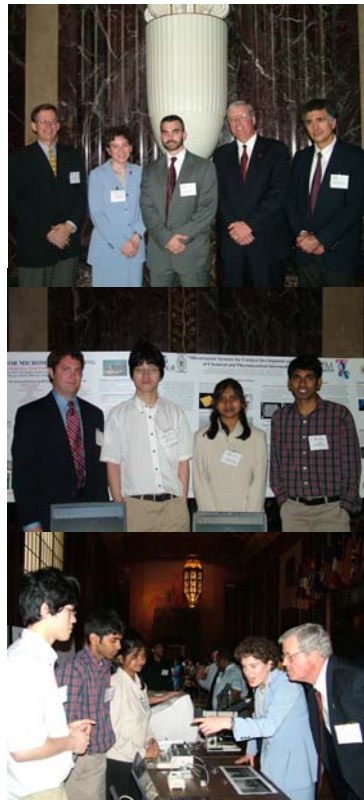
Volume 1, May 2004 of the Louisiana EPSCoR Newsletter

Researchers and students representing Louisiana’s nine-university Consortium for Micro-Nano Technologies for Advanced Physical, Chemical and Biological Sensors provided state lawmakers with an exciting glimpse into Louisiana’s technological and economic future.

“Capitol Day,” hosted on April 20 in the Capitol Rotunda by the Board of Regents’ Experimental Program To Stimulate Competitive Research (Louisiana EPSCoR), featured displays and hands-on exhibits illustrative of the Consortium’s wide-ranging research into the virtually limitless possibilities of micro- and nano-technology, the science of manufacturing microscopic devices with applications in fields as diverse as medicine, manufacturing and national defense. The Consortium is funded jointly by the National Science

Also featured at the event was the work of Louisiana university researchers associated with the newly-formed Center for Biological Modular Microsystems, who have used “smart” nano- and micro-scopic polymers, such as plastics, to fabricate microsystems capable of detecting the presence of disease as well as harmful environmental factors.

The Capitol Rotunda event was followed in the evening by a reception at the Governor’s Mansion, attended by state lawmakers, event participants, campus representatives,



Institute for Micromanufacturing Faculty and Students meeting with Louisiana legislators at Capitol Day.





New Faculty

The IfM welcomes two new faculty this summer.

Dr. Chad O'Neal, Assistant Professor of Mechanical Engineering. He received his Ph.D. from the University of Arkansas-Fayetteville in 2004, specializing in the microsystems area. He also received his BS and MS degrees in Mechanical Engineering from the University of Arkansas, Fayetteville. Dr. O'Neal's technical expertise includes the area of design and development of MEMS, and IC fabrication and packaging.



Dr. Chad O'Neal



Dr. Chester Wilson

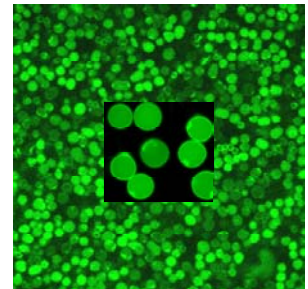
Dr. Chester Wilson, Assistant Professor of Electrical Engineering. He received his Ph.D. in Electrical Engineering from the University of Wisconsin-Madison in 2002, specializing in the microsystems area. He received his MS degree in Applied Physics from the University of Washington-Seattle, and his BS degree in Electrical Engineering from Seattle University. Dr. Wilson's technical expertise includes the area of solid state devices and MEMS. Prior to joining Louisiana Tech University, he was a Research Fellow/Adjunct Faculty at the University of Michigan-Ann Arbor.

Distinguished Lecture Series

Dr. Shuguang Zhang, Associate Director of the Center for Biomedical Engineering from the Massachusetts Institute of Technology, a key player in the biomaterials and regenerative medicine fields spoke at the Institute for Micromanufacturing, on Friday May 14, 2004. Dr. Zhang's appearance culminated a

series of lectures with noted researchers who specialize in different areas of bionanotechnology. These lectures have been sponsored by the Institute for Micromanufacturing and the School of Biological Science, as part of their Governor's Bionanotechnology Initiative efforts.

The other distinguished speakers who spoke in this lecture series during the 2003-04 academic year were Dr. Michael Pishko of Pennsylvania State University, and Dr. Albena Ivanisevic of Purdue University.



Engineered shells by bionanotechnology approaches developed at the IfM for artificial cells, drug delivery, sensing, and other applications.

Recent Ph.D. Graduate and New Start-Up Company

Excerpts from June 4, 2004 edition of the NewsStar story by Jordan Blum "Bayou State Celebrates Nanotech"

Excerpts from June 16, 2004 edition of Tech News stories by Darlene Tucker and Kate Archer "State unites in pursuit of tech connections"

Patrick Grant earned his doctorate in Biomedical Engineering on May 22, 2004 and is wasting no time in starting a local Ruston business, Aura Nanotechnology, which he says is the first of its kind started out of Louisiana Tech University. Along with Tech administrators and faculty, Grant recognized the future of nanotechnology, and Tech has become among the nation's forerunners in the field. Nanotechnology is the creation and utilization of materials and devices through the manipulation of matter at the atomic and molecular levels. It involves operating at the scale of a nanometer, which is one-billionth of a meter and far too small for the human eye to detect.

Aura's first product is

a custom-coated 96-well microplate, which Grant described as a small Petri dish with 96 compartments for study. The nanotechnology comes into play with the custom coating that could promote cell cohesion or cell growth, among many other possibilities.

Michael McShane, assistant professor of biomedical engineering at Tech's Institute for Micromanufacturing, is the current owner of Aura, with Grant serving as chief executive officer before becoming co-owner when the financial details are worked out.

He is working on projects such as "smart tattoos" to monitor glucose levels in diabetics by shining a specialized light on the arm "tattoo." This research could also be applied to monitor the health of soldiers in the field,

which is just one reason why the government and U.S. Army sponsor many nanotechnology projects.



Aura
Nano-

technology, launched just a few months ago by Patrick Grant of Ruston, LA was featured with big-name companies like Abbott, Baxter and Johnson & Johnson at Bio 2004 in California. "I'm here in collaboration with Louisiana Tech," Grant said. "I just finished my Ph.D., and we took the research I was doing in the lab with my adviser, Dr. Mike McShane, and decided it had commercial applications." Armed with brochures and business cards just off the press, the 26-year-old CEO was ready to introduce Aura Nanotechnology to the bio

world. Through networking, Grant quickly found people interested in his company's niche: specialized cell culture coatings. For more information refer to:

<http://www.auranotech.com/>



Patrick Grant, Ph.D.
BioMedical Engineering
Louisiana Tech University



Louisiana Tech University

Institute for Micromanufacturing
 P. O. Box 10137
 911 Hergot Avenue
 Ruston, LA 71272
 Phone: 318-257-5100
 Fax: 318-257-5104
 Email: ifm-marketing@latech.edu

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 and Less Expensive Consumer Products,
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latech.edu/tech/engr/ifm/

Vision and Mission

The vision of the IfM is to be a world-class resource for the realization of commercially-viable micro- and nanosystems, contributing to the economic infrastructure of Louisiana and the nation and benefiting humanity as a whole.

The mission of the IfM is:

- h To research and develop novel micro and nanosystems for biomedical, biological, environmental, chemical, information technology, and other applications
- h To generate and harness commercially viable intellectual property
- h To partner with industry, government, and academia in economic development

- h To transfer new technology and provide technical training to industry and government
- h To develop curricula and educate students in micro/nano scale technologies and systems

The IfM offers a wide range of microtechnology capabilities for the realization of micro electro mechanical systems (MEMS), as well as a complementary array of nanotechnology capabilities for MEMS and other applications. **Nanotechnology, Biotechnology, Environmental Technology, and Information Technology** constitute the four major research and development thrust areas and centers of excellence of the IfM.

Examples of projects include:

BioMEMS efforts aimed at the development of select commercially viable micro and nanosystems for biomedical and biological applications; EnviroMEMS efforts aimed at the development of select commercially viable micro and nanosystems for environmental and chemical applications; Nanotechnology efforts directed at the development of select commercially viable nanotechnologies for BioMEMS, EnviroMEMS, and other applications; Information technology efforts are directly supportive of the State of Louisiana IT Initiative and current efforts include projects for the realization of enabling micro/nanotechnologies for information sensing, storage and processing.



*Institute for Micromanufacturing
 Louisiana Tech University
 Ruston, LA*