



Start-Up Companies from IfM Research

In recent years an increasing number of start-up companies have been established based on the research and technologies developed at the Institute for Micromanufacturing.

These companies are Aura Nanotechnology, Artificial Cell Technologies, Inc., Nano Pulp and Paper Company, Microcoil, Inc., and Nuclear Microsystems.

Aura Nanotechnology is the featured start-up company highlighted in this issue of the newsletter, and similar articles will highlight some of the other companies in upcoming issues.

Inside this issue:

Bobby Jindal Visits 2

IfM Technology License 2

Sigma Xi Grant 3

NSF Fellowship 3

LaSpace Fellowship 3

Vision & Mission 4

Special points of interest:

- Nanotechnology
- Biotechnology
- Biomedical Nanotechnology
- Environmental Technology
- Information Technology

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Comments are welcomed!

Aura Nanotechnology

Aura Nanotechnology is a limited liability company that was established in the summer of 2003 and is developing sensors for biomedical and agricultural applications. Aura recently completed a licensing agreement with Louisiana Tech University Research Foundation for use of intellectual property that was developed at the Institute for Micromanufacturing through research headed by Dr. Michael McShane. It is envisioned that these early stage technologies will lead to products addressing needs for real-time monitoring. For example, low-cost, rapid-response sensors for monitoring dialysis to improve efficiency and minimize duration; and "smart tattoo" sen-

sors for calcium monitoring in dairy cows and diabetic blood sugar monitoring in humans.



Dr. Patrick Grant (shown above), serving as the president and chief executive officer, has been submitting small business innovative research (SBIR) proposals to federal agencies, such as NIH and the USDA. The company received a Louisiana SBIR Phase Zero grant in September of 2005 for preparation of a USDA Phase I proposal to develop a cal-

cium sensitive Smart Tattoo for the prevention of milk fever in dairy cattle.

As part of the NSF Partners for Innovation grant that Louisiana Tech University received, a group of students from the Innovative Research Ventures (IVR) class have been assigned to perform a market analysis of a disposable urea biosensor for dialysis that Aura Nanotechnology is developing. In addition, the NSF grant has provided support for an undergraduate student to perform preliminary research and development of the urea biosensor.





Vice President Guice showing Representative Jindal a miniaturized system for homeland security applications.



Representative Jindal getting briefed by Dr. Wilson of IfM.



IfM undergraduate and graduate students discussing their research projects with Representative Jindal.

US Representative Bobby Jindal Visits IfM

US Representative Bobby Jindal visited the Institute for Micro-manufacturing on February 20, 2006. Accompanied by Vice President Guice, Dean Napper, and Institute Director Varahramyan, Mr. Jindal was given a tour of the Institute facilities and was briefed about the research and development work of national interest being carried out at the Institute. Mr.



(L-R) Vice President Guice, Dean Napper, Representative Jindal, Director Varahramyan

Jindal also met with a group of faculty, staff, and students, who

highlighted some of their research efforts, including the area of homeland security. Mr. Jindal felt that the Institute resources and research were of great value to Louisiana and the nation and offered words of appreciation and encouragement.

IfM Technology License

The next standard for camera lenses in mobile phones is expected to originate from a technology derived from research conducted at the Institute for Micromanufacturing, and recently licensed by the Holochip Corporation. As a result, Louisiana Tech University has a new licensing agreement with Palo Alto, CA-based company Holochip to begin com-

mercializing the new micro lenses developed within Tech's Institute for Micromanufacturing. This shows the research conducted at IfM has practical and commercial applications.

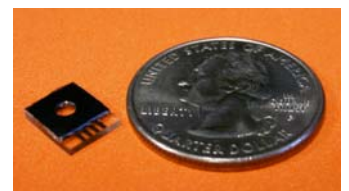
The new micro lens (shown in the figure) were developed through unique micro-fabrication techniques to create smaller lenses that have greater zoom capabilities at better resolutions than

currently available. This technology has been developed by a team of researchers consisting of Mr. Ji Fang (Senior Research Engineer), Dr. Kody Varahramyan (IfM Director), and graduate students.

The key is that the new lens can zoom in and out without moving parts. This is done by adjusting the curvature of the lens, which is only about 2 millimeters in diameter. It can conceivably be in all

cell phones. The technology could also be used for everything from security cameras to DNA plate readers.

Holochip is also in the process of providing funding support for new research at the Institute for Micromanufacturing.





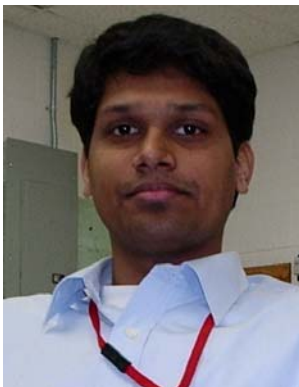
IfM Student Awarded Sigma Xi GIAR

Shashi Kanth Sriram, has been awarded Sigma Xi Grants-In-Aid of Research (GIAR) funding to support his research project entitled "Encapsulation of Mesenchymal Stem Cells (MSC's) through Layer-by-Layer (LbL) Nanoassembly".

Sigma Xi is the internationally recognized honor society for scientists and engineers. Since 1922, this society has funded more than 25,000 graduate and

undergraduate students to facilitate research among young investigators, and to position them to compete for larger research grants.

An average of 2,000 applicants submit proposals annually for this competitive grant pro-



Shashi Kanth M. Sriram

gram. Grant proposals are funded solely based on their scientific merit. As an independent endorsement of research potential, GIAR has a value that goes beyond financial considerations.

Shashi is conducting his research under the supervision of Dr. David Mills. He has

one publication, seven presentations at national and international meetings to his credit, and was also nominated to the 2006 Who's Who Among Students in American Universities & Colleges® by Louisiana Tech University.

IfM Student Awarded NSF Research Fellowship



Scott Pellegrin

Scott Pellegrin, a PhD student under the supervision of Dr. Chester Wilson, was awarded the NSF Graduate Research Fellowship. This highly competitive fellowship rewards exceptional students that are

deemed likely to succeed in new research. The fellowship is for three years, at \$30,000 per year, plus coverage of tuition and other educational expenses. Scott is developing a new category of small radiation detectors, for

use in detecting concealed nuclear weapons. The university is patenting one configuration, which is undergoing field testing by several companies interested in licensing the technology.

IfM Student Awarded LaSpace Fellowship

Chad Whitney, a PhD in Engineering student at the IfM, was this year's recipient of the Louisiana Space Initiatives Graduate fellowship award. The LaSpace Fellowship provides \$20,000 per year for four years to

promising PhD students involved in research of interest to NASA. Chad works under the supervision of Dr. Chester Wilson and Dr. Pedro Derosa. He is designing, testing, and modeling neutron detectors. These de-

tectors, which are the smallest in the world, are being evaluated by NASA for use as a dosimeter for extended space travel.



Chad Whitney



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Vision and Mission

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

The mission of the IfM is:

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

- ❖ To transfer new technology and provide technical training to industry and government
- ❖ 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, Biomedical Nanotechnology, Environmental Technology, and Information Technology constitute the five 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.



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