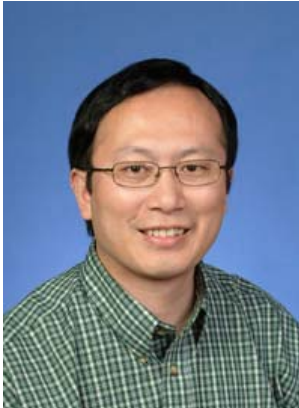




Dr. Long Que Receives NSF CAREER Award



Dr. Long Que

The National Science Foundation awarded Dr. Long Que with a grant of \$400,000 for his project entitled "CAREER: Biomelecular Nanophotonic Fabry-Perot Interferometry (BioNanoFPI)". This award, through the Faculty Early Career Development (CAREER) Program is one of the most prestigious awards given in support of junior faculty.

Dr. Que is an Assistant Professor of Electrical Engineering with Louisiana Tech University and the Institute for Micromanufacturing and the 4th recipient of a NSF CAREER Award at Louisiana Tech University.

The recommendation was made by the Electronics, Photonics & Device Technologies (EPDT) program of Division of Electrical, Communications and Cyber Systems.

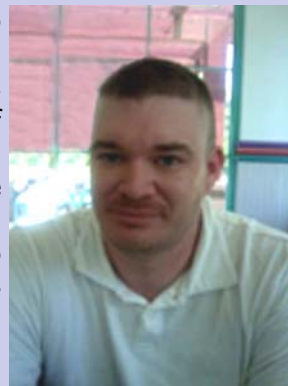
This proposed project aims to design a Biomolecular Nanophotonic Fabry-Perot Interferometer (BioNanoFPI) platform that will allow scalable parallel detection of multiple bio-agents with concentrations in the femtomole range and ease-of-operation using a broadband white light source instead of a laser. The development of a polymer-based micromachined FPI (μ FPI) with integrated nanostructures will enable a BioNanoFPI platform that allows for the creation of two-dimensional, highly-multiplexed, inexpensive arrays to conduct large-scale parallel screening of chemical and biomedical libraries.

The Faculty Early Career Development (CAREER) Program is a Foundation-wide activity that offers the National Science Foundation's most prestigious awards in support of the early career-development activities of those teacher-scholars who most effectively integrate research and education within the context of the mission of their organization. Such activities should build a firm foundation for a lifetime of integrated contributions to research and education.

IfM Ph.D. Student Receives LASPACE Fellowship

Ph.D. student Steven Baker has been awarded a fellowship through the Louisiana Space Consortium. This fellowship, sponsored by NASA and the Louisiana Board of Regents, provides the student with a stipend of \$25,000 per year, for a period of up to five years. Steven was competitively awarded this fellowship based on merit and the students potential to influence the space and aerospace industries. Steven, who is supervised by Dr. Pedro Derosa, will develop and apply computational models to understand the effect of nano-inserts in Titanium Carbide materials of relevance to NASA.

This fellowship is one of four awarded to Louisiana Tech University in Spring 2009 (*with three highlighted in the last newsletter*); and the largest simultaneous LASPACE Fellowship award in the history of LA Tech, with all students affiliated with research at IfM. This is further validation that La Tech students are accomplishing great things at the IfM and should be always encouraged to seek high levels of achievement.



Steven Baker

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Special points of interest:

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

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Comments are welcomed!



Transducers 2009 Highlights

Transducers '09 ~ The 15th International Conference on Solid-State Sensors, Actuators and Microsystems

The Transducers conference is one of two premier international microsystem conferences in the world, which is held bi-annually. The dates of the conference were June 21-25, 2009 hosted at the Sheraton Denver Hotel, in Denver, Colorado.

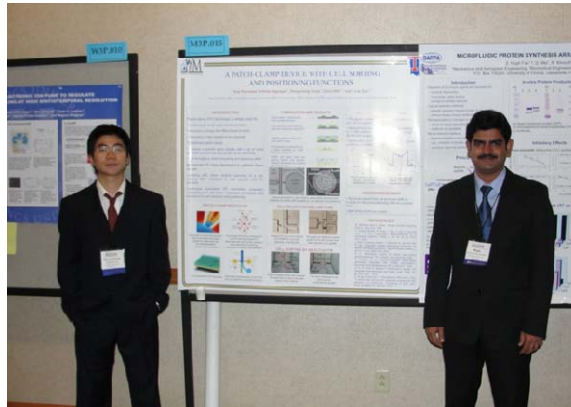
Several representatives from Louisiana Tech University and the Institute for Micromanufacturing (IfM) participated in Transducers 2009. LA Tech was in the top 10 universities at Transducers'09 in terms of the most number of papers accepted for presentation: 20:Michigan, Berkeley; 16:Stanford; 11:Georgia Tech; 7:Caltech; 6:**LaTech**, Urbana-Champaign, University of Colorado, MIT, UCLA; 5:Pennsylvania State University, University of Florida, University of California-Irvine, University of Louisville; 4:Northwestern University, Carnegie Mellon, Sandia National Laboratories; 3:University of Wisconsin; 2:Purdue University.

Acceptance rate for oral presentation is ~16% this year from the total of 1306 abstracts submitted worldwide and La Tech ranked in this category as well.

Dr. Long Que, professor of Electrical Engineering and his students Mr. Zhongcheng Gong (Ph. D. student), Mr. Siva Penmetsa (Master student); along with Dr. Chester Wilson, professor of Electrical Engineering and Ph. D. students Joshua Brown and Chad Whitney; and Dr. Ville Kaajakari, professor of Electrical Engineering and Ph. D. student Ding Hand attended the conference.

Dr. Que's group presented papers based on three ongoing pro-

jects in his Micro-NanoSystems Lab at the Institute for Micromanufacturing (IfM) of Louisiana Tech University.



Mr. Gong (left) and Mr. Siva (right) standing with one of their posters.

Two posters presented by Mr. Penmetsa and Mr. Gong are entitled "A patch-clamp device with cell sorting and positioning function" (collaboration with Professor David Mills) and "Encapsulation of microparticles and biomolecules based on nanoassembly techniques with microfluidic droplet devices" (collaboration with Professor Yuri Lvov), respectively.



Ph.D. student, Zhongcheng Gong presented the oral presentation at the conference.

One oral talk entitled "Signal sensitivity and intensity enhancement for a polymer-based Fabry-Perot interferometer with embedded nanostructures in its cavity" was given by Mr. Gong.

Mr. Hand and Dr. Kaajakari presented a poster on the shoe power generation. Mr. Hand's poster was one of the busiest in the "Power MEMS" session, and for good reason. The presented prototype was the only power harvesting device that generates over 1 mW of power.

In addition to the poster, Mr. Hand showed a movie of the prototype generating power and displayed the actual working prototype.

Representing Dr. Wilson's group, Ph. D. student, Mr. Joshua Brown, was selected to give an oral presentation entitled "Microreactors for Synthetic Diesel Production to Optimize Nanostructured Cobalt Catalyst", co-authored by John McDonald, which was extremely well received. It was the only effort in nanotechnology at the conference to manufacture synthetic diesel.

Chad Whitney presented a poster entitled "An Accelerator Based Neutron Gun Micro-Fabricated in Metal/Ceramic Packaging." The poster was also extremely busy, as he presented the first MEMS neutron gun. This small inexpensive neutron source is of use to the intelligence community for covert fissionable weapons detection.

Dr. Ville Kaajakari
Dr. Long Que
Dr. Chester Wilson



IfM Faculty and Staff Announcements

Bella Von Widowmaker (aka Morgan), AKC registered German Shepherd belonging to Debbie Wood has been selected as a finalist in the 2009 AKC Human Fund Awards for Canine Excellence (ACE), as an Exemplary Companion Dog. Winners will be announced in August. If Morgan is chosen she will be presented with a sterling silver medallion and cash award at the internationally televised AKC/Eukauba National Championship in Long Beach, CA in December 2009. Along with the letter announcing Morgan as a finalist, she and



Debbie received a Certificate of Recognition.

Morgan in cap and gown ceremony following completion of Obedience I & II Training.

“Final Results of A Well Engineered Project”

After nine months of engineering statistics, and with the last element in place Daniel Paun announced himself to the world. The final results were made known Wednesday, June 10th at 11:58 a.m., weighing in at 6.8 lbs with a length of 19.6 ins. Daniel was welcomed home by his brother, Alex, the proven success of a former project collaborated on by the Paun’s. Proud engineer, mathematician, and parents are Dr.’s Andrei and Mihaela Paun.



Daniel Marcus Paun

Memorial Service Held

On May 15, 2009, a memorial service was held commemorating the life of Scott Williams and a plaque hung in his honor and memory.

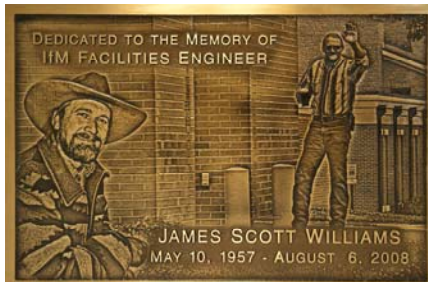


Photo by Estevan Garcia

A permanent reminder of who he was and what he meant to the Institute for Micromanufacturing (IfM) is now memorialized in bronze on its wall. Many friends, family, and other acquaintances came to be a part of this occasion. Speakers were Mrs. Marie Williams, Budget Administrator, Athletics, Louisiana Tech University, Dr. Mike McShane, Associate Professor, BME, Texas A&M, Dr. Dinesh Kommireddy, Senior Engineer, Medical Surgical Systems, BD Medical, New Jersey.

Also planned speaker, Dr. Mike Vasile, retired, Albuquerque, New Mexico (unable to attend due to cancelled flights at the last moment), along with many others unable to attend sent their personal remarks, with some being read aloud by Host of Ceremonies, Dr. Stan Napper, Dean, College of Engineering and Science, Louisiana Tech University.



Out back of IfM, planted in memory of Scott by Mrs. Marie Williams, is a Nuttall Oak Tree that will grow to shade the loading dock, where Scott took his breaks

and visited with all that stopped by during those breaks. The plaque shows him there with his coffee cup waving in acknowledgment to the passers by, in everlasting tribute.

SEM Photo Paclitaxel Crystalization

On way to achieving nanoformulation of this cancer drug.



Research being performed in IfM Lab by: Dr. Yuri Lvov, Mr. Zhiguo Zheng, and Mr. Xingcai Zhang.



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and Less Expensive Consumer Products,
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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.



*Institute for Micromanufacturing
Louisiana Tech University
Ruston, LA*