



Recent IfM Grants

IfM faculty receive in excess of \$1.5 Million in recent grants

Dr. Tabbetha Dobbins,

- Engineering Dopant Local Atomic Structures in Complex Metal Hydrides, Louisiana Board of Regents, \$91,111
- (Co-PI's: Yuri Lvov, Daniela Mainardi, Roland Tittsworth) Understanding the Local Atomic-Level Effect of Dopants in Complex Metal Hydrides Using Synchrotron X-Ray Absorption Spectroscopy (XAS) and Density Functional Theory Simulations, Department of Energy, \$300,000.

Dr. Daniela Mainardi

- Modified-Methanol Dehydrogenase Enzymatic Catalysts for Fuel Cell

Devices", National Science Foundation, \$400,000

Dr. Debasish Kuila

- Synthesis and Characterization of Nano-Catalysts for Hydrogen Production, Louisiana Board of Regents, \$125,198
- (Co-PI's: Dr. Alfred Gunasekaran, Dr. James Spaulding) Enhancement of Educational infrastructure for Nanotechnology, Louisiana Board of Regents, \$124,665

Dr. Chester Wilson

- Micro-Nanotechnologies for Neutron Detectors & Sources, Louisiana Board of Regents, \$142,373

Dr. Yuri Lvov

- Nanotechnology for Pulp and Paper Industry: Layer-by-Layer Polyelectrolyte Coating, Louisiana Board of Regents, \$178,480

Dr. Cheng Luo

- An Innovative Intermediate Layer Lithography Approach for Patterning Conducting Polymers, National Science Foundation, \$82,300

Dr. Andrei Paun

- A New Way of Looking at Cells: Through the P Systems, National Science Foundation, \$150,000

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IfM Co-Sponsors IEEE Conference on Microtechnology in Medicine & Biology

The Institute for Micromanufacturing in conjunction with the Center for Entrepreneurship and Instructional Technology at Louisiana Tech University (LaTech) have participated in the sponsorship of the 3rd Annual International IEEE-EMBS Special Topic Conference on Microtechnologies in Medicine & Biology, held May 12-14, 2005 in Oahu, Hawaii.

Dr. Michael McShane, represented IfM and LaTech at the conference as Program Chair for the Technical Program. Also attending and

representing LaTech was Ph.D. Biomedical Engineering graduate student, Guodong Zhang. Presentations by Dr. McShane included *Lithography Combined with Multilayer Nanoassembly: Versatile*



Dr. McShane at Opening Reception

Approach to Fabricate Nanocomposite Micropatterns for Bio-interfaces, co-authored by Javeed Shaikh Mohammed and Mark DeCoster, and *Intrinsic Optical Signal*

Imaging of a Ratiometric Fluorescence Oxygen Nanosensor, co-authored by Guodong Zhang, Pankaj S. Shitole, Rahul A. Pujari, Vinod S. Charnani, and Charles J. Robinson.

The IEEE-EMBS purpose was to foster interaction between biologists and medical researchers; chemists and physicists; and biomedical, fluid mechanical and microfabrication engineers, and to promote a fundamental exchange of ideas, considered vital to the development of new research tools and technologies in the BioMEMS field.

Special points of interest:

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

Newsletter Editor

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 Comments are welcomed!



Poster Symposium on Novel Concepts in Nanotechnology

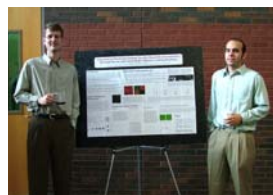
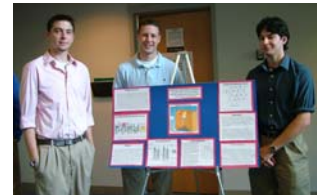
On May 20, 2005, students from Dr. Chad O'Neal's *Nanotechnology Principles* course presented posters in the First Annual *Poster Symposium on Novel Concepts in Nanotechnology*. This course is one of the core courses for the Micro/Nanosystems graduate programs at Louisiana Tech University. There were also eighteen upper-level undergraduate students participating. The student posters described novel research ideas in the area of

nanotechnology for which they had developed and written fifteen page NSF style proposals. This was their final course project, which they had worked on for a large portion of the spring quarter. The goal of this project was for the students to gain some experience doing a literature search, analyzing published research, and then creating a novel research idea and developing it into a feasible research proposal. The students were free to

expand on existing research ideas or develop something completely unique, provided it had never been done before. The proposals followed the NSF guidelines for proposals and emphasized the work plan, preliminary work, feasibility, intellectual merit, and broader impacts. The posters created were graphical presentations of their plans and were presented by the research teams comprised of two to three students each. Seventeen groups presented their posters to an audi-

ence of students, faculty, and IfM staff. Three faculty members were asked to evaluate these posters and the research concepts as part of the evaluation process. The Symposium was a great success, with many new research ideas generated that will result in innovative projects.

The participating student teams are shown in the pictures below.





LaSPACE LURA Awards

Corporal Tammy Vanlangendonck-Sewell and Sergeant Jason Vise are students advised by IfM faculty, who recently received assistantship awards from the Louisiana Space Consortium Undergraduate Research Assistantship (LURA) program. This award provides student support for outstanding LURA assistants to engage in faculty mentored NASA related aerospace, space sciences, or aeronautics research on a LaSPACE consortium campus. LURA awards are \$5000 for one 12 month academic period. Proposals are submitted by qualified faculty and the sponsoring Faculty/student team will propose the research projects, along with one or two LaSPACE undergraduate research assistants.



Corporal Vanlangendonck-Sewell

Corporal Vanlangendonck-Sewell is a 6 year Marine Corps veteran, where she served as a missile ordinance technician/security officer and an aircraft navigation electronics technician. She will be working with Dr. Chester Wilson's group. She will help in the development of a mobile miniaturized high energy

particle gun, and a variety of nanoparticle radiation signature detectors. A Louisiana native, Tammy is planning to pursue a Masters degree at Louisiana Tech after completing her undergraduate degree in Electrical Engineering. Her future plans are to start an aerospace research career at NASA or in an Air Force research lab, in space-based defense systems.



Sergeant Vise

Sergeant Jason Vise is a US Army veteran from Operation Iraqi Enduring Freedom, where he served as a field supply coordinator/vehicle technician. He will be working with Dr. Scott Gold's group. Jason is heading up the component development of a miniaturized high performance liquid

chromatography system. He plans to pursue a Masters degree at Louisiana Tech after completing his undergraduate degree in Mechanical Engineering. His future career plans are to become a Research Professor.

Student and Staff Recognitions

Each quarter the IfM hosts an All IfM Meeting, prior to which faculty and staff nominate deserving M.S. and Ph.D. students, as well as a staff person for recognition of his/her achievements. This tradition began in the Spring Quarter of 2002. The criteria established for student nominations take into consideration scholarly activities (e.g. journal publications), demonstrated initiative, and productivity in research efforts.

This past Spring Quarter those recognized were: Ph.D. student Rohit Srivastava, M.S. student Zhiguo Zheng and IfM staff member Dee Tatum.

Mr. Srivastava was presented with a certificate for Excellence in Scholarly work

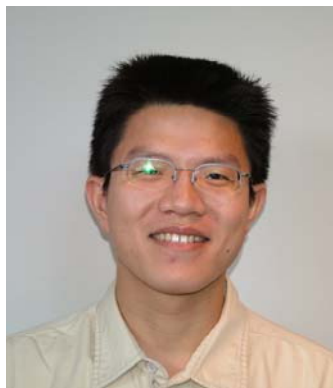


Rohit Srivastava

and Research and a monetary award. Mr. Srivastava was nominated by his advisor, Dr. Micheal McShane, Associate Professor of Biomedical Engineering and IfM.

Mr. Zheng was presented with a certificate for Excellence in Scholarly Work and Research and a monetary award.

Mr. Zheng was nominated by his advisor, Dr. Yuri Lvov, TC Pipes Endowed Chair Professor of Micro and Nanosystems.



Zhiguo Zheng

Mr. Dee Tatum, Specialized Technician was presented with a certificate for Distinctive Professional Performance and Conduct, and a

monetary award. Mr. Tatum is a member of the facilities team and responsible for the hot embossing, thin film deposition, electronic design & fabrication, and electronics troubleshooting.



Dee Tatum

Note: Future "All IfM Meetings" will be held semi-annually, in the Fall and Spring Quarters.



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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 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, 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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 Louisiana Tech University
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