

MISSISSIPPI EPSCoR Experimental Program to Stimulate Competitive Research



KSU-IC's Glasscock delivers keynote

Kent Glasscock is the president of the Kansas State University Institute for Commercialization, or KSU-IC. The institute helps monetize intellectual property developed at Kansas State University, Wichita State University and MRIGlobal in the international marketplace. He was the keynote speaker during Mississippi's annual EPSCoR State Meeting.



He spoke on how the world's future depends on a deep understanding of how a global food system operates because feeding a growing world requires more than just increasing production. Protecting our food supply is as important as producing it. Today up to 40% is lost somewhere along the food chain so now is the time for our research scientist and students to make a global impact.

Glasscock is responsible for developing strategies to create sustainable technology-based business and wealth creation in rural and underserved urban America. This is achieved

MSU's Kundu earns NSF CAREER award



Dr. Santanu Kundu, assistant professor of chemical engineering in the Bagley College of Engineering at MSU received a 2014 Faculty Early CAREER Award from the National Science Foundation. The award is titled "CAREER: Large-Strain Deformation of Polymeric Gels: Non-linearity, Instability, and Fracture."

He is also an EPSCoR seed grant recipient and conducts research in the Bi-

oSim focus group of the MS EPSCoR project.

The project aims to achieve fundamental understanding of the deformation behavior of polymeric gels, and will also be relevant to any soft materials. Polymer gels are used in many applications ranging from bioimplants to tissue scaffolds to oil recovery to drug delivery. Accordingly, this CAREER project will impact the materials/polymer science, chemical engineering, and biomedical disciplines.

The educational and outreach component focuses on three segments: (a) incorporation and further development of course modules on polymer science and soft polymeric materials, (b) involvement of undergraduate students in results-driven research activities, and (c) inspiring middle and high school students to pursue education in STEM majors through laboratory demonstrations and participation in small research projects.

Student poster winners named at State mtg.

Congratulations to all of the undergraduate and graduate students who participated in the 2014 Mississippi EPSCoR State Meeting poster competition. Awards were made for the top three awards in both undergraduate and graduate research categories. New this year was a "Best in Conference" award to both an undergraduate and graduate student. Cash awards were made to the winning recipients: First Place-\$300;

Second Place-\$200; Third Place-\$100; Best in Conference-\$100.

Graduate recipients were: First Place: Katelyn Dreux, University of Mississippi (UM); EPSCoR Mentor, Dr. Greg Tschumper; Second Place: Samantha Reilly, UM; EPSCoR Mentor: Dr. Randy Wadkins; Third Place and Best in Confer-

ence, Joseph Reddy of Mississippi State University (MSU); EPSCoR Mentor, Dr. Andy Perkins.

Undergraduate recipients were: First Place: Jonathan Landrum, Mississippi College, EPSCoR Mentor: Dr. David Magers; Second Place, Ashton Nicholson, UM, EPSCoR Mentor, Dr. Nathan Ham-

mer; Third Place, Laura Cline, UM, EPSCoR Mentor, Dr. Greg Tschumper; Best in Conference, Aishat Aloba (UM), EPSCoR Mentor, Dr. Dawn Wilkins.



UMs John Kelly (l) explains his research to Dr. Amal Dass

EPSCoR

CSI teacher workshop scheduled

Middle school science teachers will soon be experiencing CSI: Mississippi during the 2014 professional development summer teacher workshop. The workshop will be held June 16-27, 2014, at Delta State University in Cleveland, MS.

Katie Echols, EPSCoR education and outreach coordinator, said the Creative Science Through Inquiry (CSI) workshop will introduce teachers to the use of forensic science as a method of teaching fundamental science skills and concepts. The workshop is focused around the MS science curriculum and will incorporate biology, chemistry, physical science, physics, mathematics, technology, writing, and more. Participants will experience inquiry-based and laboratory instruction and will receive research-based curriculum materials developed through the MS-EPSCoR program, a stipend, and CEUs.

Additional information can be found on the Mississippi EPSCoR homepage: <http://www.msescor.org/events/>

EPSCoR teacher compiles robotics team

Previous EPSCoR CSI summer workshop participant, Anna Parker, a Physics faculty member at Starkville Academy, took on a new challenge this past school year — establishing and leading a competitive robotics team

from her school. She was successful...

Competing for the first time in the Mississippi Best Robotics competition, her team placed 8th out of 26 teams. The competition was held at



Starkville High School in conjunction with MSU's Bagley College of Engineering. As students guided their robots, they were encouraged by bands, cheerleaders and the sound of sports jams being played through

the sound system.

Mississippi BEST is designed to inspire and interest students in engineering, science, and technology through participation in an exciting sports-like technology contest.

Six weeks before the competition, teams traveled to MSU's Raspet Flight Research Laboratory to collect the materials they would use to build their robots. They worked during class, after school and on weekends to complete their work.

Leszczynski hailed as distinguished lecturer in China



Dr. Jerzy Leszczynski, a President's Distinguished Fellow and Director of the Interdisciplinary Nanotoxicity Center at Jackson State University (JSU) was received with a grand reception as a distinguished lecturer at Lanzhou University in Lanzhou, China, April 5-16 2014. In 2008, as a tribute to the centenary celebration of Lanzhou University (LZU), the University established "Centennial Expert's Forum". According to the LZU guidelines the Forum brings to LZU "top level figures in the relative fields including No-

bel Laureates, academicians from National Academies, and international renowned scholars to give lectures and establish interactive activities with students and faculty members."

Leszczynski gave talks on *Computational Approach- the Third Pillar of Science* and *Searching for the Feasible Routes of Transformation for Simple Molecules Vital for Prebiotic Chemistry*, and *Nanomaterials: Vital Characteristics Revealed by Computational Studies*. His lectures were attended by more than 600 students and faculty members. Lanzhou University

is one of the key universities under Ministry of Education, China and is one of the top 10 universities in contributions to academic publications in international journals frequently cited by ongoing research from around the world.

A strong collaboration with Lanzhou University will serve to strengthen the more than 150 domestic and international collaborations spearheaded by Leszczynski during his tenure at JSU and further positions JSU as a forerunner in the emerging area of nanotechnology.



EPSCoR seed grant pays off for MSU's Hoffman



Dr. Federico Hoffman, an assistant professor at Mississippi State University (MSU) in the Department of Biochemistry, Molecular Biology, Entomology, and Plant Pathology is reaping the bene-

fits of an 2011 EPSCoR seed grant he received. The first paper deriving from the EPSCoR seed grant research has been accepted into Molecular Biology and Evolution (Impact Factor 10.353), and it has been selected for a "press tip." First author, Neal

Platt, is a PhD student in Hoffman's lab and will graduate in May. Here is the link to the publication: <http://mbe.oxfordjournals.org/content/early/2014/03/31/molbev.msu112.abstract>

The National Science Foundation (NSF) has also funded a grant that is a continuation of the 2011 seed grant titled: *Collaborative Research: SG: piRNA Dynamics in the Absence of Active TEs*.

EPSCoR

Hammer collaborates with French scientists

Dr. Nathan Hammer, an associate professor at the University of Mississippi (UM) recently traveled to France to meet with collaborators at two universities - Université Paris 13 Nord in Villetaneuse, and the Centre Laser de L'Université Paris-Sud in Orsay.

Researchers in France are developing new spectroscopic techniques that are employed to study intermolecular interactions with biological building blocks. The purpose of Hammer's trip was to learn about these techniques and see their equipment designs and operating experiments in person so that he could incorporate these ideas into research at the UM. A return trip by one of the researchers is a possibility in the next year but is still being discussed as are collaborations

where they study the same molecules at UM that they are studying in France.

Hammer (middle) with Nicolas Nieuwjaer (l), assistant professor, and Charles Desfrancois (r), senior researcher and Director of Laboratoire de Physique des Lasers and Vice President of the Scientific Council of the Université Paris 13 Nord in Villetaneuse.



Hammer, (standing right), meets with Dr. Gilles Grégoire, senior researcher, at the Centre Laser de L'Université Paris-Sud in Orsay.

Women in STEM seminars held

The year's Women in STEM seminar series was designed to showcase the work of female researchers in science, technology, engineering, and mathematics (STEM) to women at community colleges across the state. Speakers are recruited to give a one hour seminar at a community college campus. Topics such as work-life balance, career opportunities, lessons learned, and educational requirements are discussed in the context of the personal experiences of the speaker while opportunities for involvement in STEM are discussed with the community college students. "We

are showing female students that STEM careers are both available and attainable for women," said Katie Echols, EPSCoR Education and Outreach coordinator.

Recently in March a seminar was held at Northwest Mississippi Community College and the speaker was Dr. Sarah Liljegren, Assistant Professor, Biological Sciences at UM.

In April, a seminar was held at Tougaloo College with Dr. Barbara Alexander, Associate Professor in the Department of Physiology and Biophysics from the University of Mississippi Medical Center.

Ole Miss to host summer REU

The annual University of Mississippi (UM) Physical Chemistry Research Program will host its summer Research Experience for Undergraduates (REU) program again this summer. Ten students from around the United States who have completed their freshman year of college and who have not yet graduated will participate in Physical Chemistry Research Program activities and work on a research project under the di-

rection of a faculty advisor alongside EPSCoR-supported undergraduate and graduate students.

REU student participants will receive a \$5,000 stipend, a housing and meal plan for 10 weeks, and travel assistance. Information about the Ole Miss Physical chemistry Research Program, now in its 6th year, can be found at <http://reu.chem.olemiss.edu>.



Williams takes over CompBio



Dr. Byron Williams, an Assistant Professor of Computer

Science and Engineering at MSU, has been named as the new lead for the Computational Biology focus area, effective February, 2014. He has been an active EPSCoR participant since joining the faculty at MSU in 2011, and has made significant contributions to the CompBio research mission during that time. Williams replaces Dr. Timothy McLean (USM),

who graciously stepped in as CompBio lead after Dr. Raphael Isokpehi (JSU) took a new position at Bethune-Cookman in August, 2013. Isokpehi had been CompBio lead since the Track 1 RII project inception in September, 2009. "The entire MS EPSCoR community are grateful for his leadership. Successes will continue with the faculty as Williams leads this research group," said EPSCoR science coordinator, Dr. Keith Walters.

Wolfe completes Masters at MSU, enters Ph.D. program at UMMC

Victoria Wolf defended her thesis "A Multi-Compartment Model of the Normal Menstrual Cycle: Integrating Hormonal, Ovarian, and Endometrial Elements" on April 1st as partial fulfillment for her Master of Science degree in Biomedical Engineering at Mississippi State University (MSU).



She completed this research with Drs. Robert Hester and William Pruett at the University of Mississippi Medical Center (UMMC). Wolf has been accepted into the Ph.D. program in the Department of Physiology at UMMC.

Wolf is supported by EPSCoR and began working with Hester in January, 2013.



UM students enjoy ACS ceremony

University of Mississippi (UM) students, faculty and American Chemical Society (ACS) members enjoyed a fun evening at the ACS sponsored annual award ceremony and banquet. More than 50 students were recognized for outstanding achievements in coursework and research.

The following EPSCoR-sponsored students received awards at the 2014 ACS Banquet:



Analytical Chemistry - April Steen; Inorganic - Cara Thorne; ACS Graduate Research Awards: Eric Dornshuld, Chanaka Kumara.



Top Graduating Chemistry Majors (GPA > 3.75) were also recognized at the banquet as were

EPSCoR Project Personnel:

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Tang receives Drapeau award



Anthony Tang, a sophomore biochemistry major at the University of Southern Mississippi

(USM), was selected for a Donald Drapeau award for the second place of best poster submission at the 2014 USM Undergraduate Research Symposium.



Dr. Keisha Walters, Outstanding Senior Chemistry Graduate

Students, and Outstanding Senior Chemistry Graduate Cara Thorne.

Working in Dr. Song Guo's lab, Tang studied the degradation of zinc phthalocyanine (ZnPC) in various organic solvents.

Vasquez remains at MSU



Dr. Erick Vasquez completed his Ph.D. in Chemical Engineering at

Mississippi State University in August, 2013. He remained at MSU as a post-doctoral researcher, advised by Dr. Keisha Walters, and continues to be a key contributor to the BioSim research program. He continues his efforts with Walters and is also working with EPSCoR newcomer Dr. Santanu Kundu (MSU), investigating properties of pulmonary mucus. Vasquez had

He will continue with his research and take it further by exploring the mechanism behind the degradation he was observing.

several other offers from other institutions and business and industry, but chose to stay at MSU given the research he is conducting. Vasquez credits much of his success to the EPSCoR funding he has received throughout his time at MSU.

Vasquez's dissertation was entitled "Surface Modification and Transport Properties of Nano- and Micro-particles."



Travel grant: Wadkins to return to VAST

As a result of a 2011 EPSCoR Travel Grant, Dr. Randy Wadkins from the University of Mississippi (UM) will be returning to the University of Science and Technology-Hanoi (USTH) to teach an undergraduate course, Dec. 16-22, 2014.

In 2011, Wadkins spent one week at the University of Science and Technology at Hanoi (USTH), Vietnam. The specific aims of this trip were threefold: (1) continue ongoing discussions about a scientific collaboration to isolate, characterize, and model hydrolase inhibitors from Vietnamese flora; (2) plan for Wadkins' teaching a course on molecular modeling to students at USTH via support from the US Vietnamese Education

Foundation; 3) recruit undergraduate and graduate students from Vietnam to attend the UM.

Wadkins was part of a delegation of UM that held a joint meeting with the Vietnamese Academy of Science and Technology (VAST) on December 1-3, 2011 in Halong Bay, Vietnam. This was the latest effort by UM to actively engage VAST in scientific collaboration, with particular emphasis on exploration of medicinal plants found in Vietnam and nearby regions of southeast Asia. Wadkins' interest is in finding tanshinones from Vietnamese *Salvia*

plants that can act as inhibitors of members of the a/b hydrolase family of enzymes, particular-

ly carboxylesterases. Such inhibitors have application in a range of very diverse biochemical problems, including treatments for Alzheimer's Disease, amelioration of unwanted side effects in cancer chemotherapy, and overcoming pesticide resistance in insects. Preliminary data from Wadkins' collaborator at St. Jude suggested that tanshinones might be effective inhibitors of these hydrolases. Tanshinones are enriched in *Salvia* plants, especially Danshen root and approximately 90 species of *Salvia* are distributed throughout Vietnam.



Dr. Pham Quoc Long (l) and Dr. Randy Wadkins at Vietnamese Academy of Science and Technology.