

FOCUS



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KANSANS ATTEND NATIONAL EPSCoR CONFERENCE

Just weeks after Hurricane Katrina devastated the Gulf Coast, a group of Kansas travelers attended the 18th National EPSCoR Conference, Sept. 25-28, in Rio Grande, Puerto Rico.

The conference, held in a different EPSCoR jurisdiction each year, brings together NSF program officers, state program directors and staff, state legislators, and invited speakers to discuss issues such as research competitiveness, research infrastructure, technology transfer, and economic development.

The conference program, *Trajectory Toward Sustainable Scientific-Based Success in EPSCoR Jurisdictions*, featured several Kansans.

Dr. Ken Klabunde, University Distinguished Professor of Chemistry, Kansas State University, participated in the panel discussion on *Successful Formation of Nanotechnology Centers or Institutes in EPSCoR States*. His graduate student, Alexander Smetana, presented a poster on the *Synthesis of Silver Nanoparticles and Their Unusually High Bactericidal Activity*.

Tracy Taylor, President and CEO, Kansas Technology Enterprise Corporation, addressed the economic development officers' breakfast. He discussed the Kansas Economic Growth Act and explained how the 10-year biosciences roadmap will create quality jobs, reduce brain drain, and lead to innovative products, a healthier economy and a better quality of life in Kansas.

Kansas Legislators Sen. Nick Jordan (R-Shawnee) and Rep. Kenny Wilk (R-Lansing) were guests at the legislative breakfast hosted by the EPSCoR Foundation.

Other attendees from Kansas included: Keith Yehle, Director of Governmental Relations, and George Wilson, Associate Vice Provost for Research, both of The



KANSAS ATTENDEES GATHERED IN FRONT OF THE KANSAS NSF EPSCoR POSTER FOR A GROUP PHOTO. FROM LEFT TO RIGHT: KANSAS SENATOR NICK JORDAN, KEITH YEHLE, KU GOVERNMENTAL RELATIONS, KANSAS REPRESENTATIVE KENNY WILK, TRACY TAYLOR, PRESIDENT AND CEO OF KANSAS TECHNOLOGY ENTERPRISE CORPORATION, GEORGE WILSON, ASSOCIATE VICE PROVOST FOR RESEARCH AT KU, AND KEN KLABUNDE, KSU DISTINGUISHED PROFESSOR OF CHEMISTRY.

University of Kansas; Jim Guikema, Associate Vice Provost for Research, Kansas State University; Kristin Bowman-James, Project Director, Barbara Paschke,

Associate Director, and Doug Byers, Budget and Accounts Administrator, all of Kansas NSF EPSCoR.

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KANSAS RECEIVES \$3.7 MILLION THROUGH NSF EPSCoR CO-FUNDING

While a researcher in Kansas waits to hear whether her NSF proposal will be funded or declined, the responsible program officer at NSF in Washington may be discussing the proposal

and co-funding.

In FY 2005, 16 Kansas proposals at or near the funding cutoff level received a total of \$3.7 million through co-funding, a mechanism created by NSF in FY 1998 to accelerate the movement of EPSCoR researchers into the main stream of NSF funding. Proposals from researchers in EPSCoR states go through the same review process as proposals from non-EPSCoR states, but proposals from EPSCoR states may qualify for co-funding.

For a Kansas researcher, this may mean

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FROM THE DIRECTOR

Dear Colleagues:

It is difficult for me to believe that almost an entire year has passed since I became Director of the Kansas NSF EPSCoR. This year has been particularly busy and exciting. Two Requests for Proposals went out last spring, one for equipment and the second for education, and we received a number of meritorious proposals. As noted elsewhere in this newsletter, a substantial amount of funding, \$679,024 for education and \$1.045 million for multi-user equipment, was awarded. Furthermore, the Phase IV initiatives in Bioinformatics, Ecological Genomics, and Lipidomics are now well-established with every promise of sustainability beyond EPSCoR funding.

Perhaps the biggest challenge of this year was in crafting the proposal for Phase V of the Kansas NSF EPSCoR for years 2006-2009. The Kansas Economic Growth Act was a key factor in the decision to focus on the biosciences for this next initiative. Last spring Kansas NSF EPSCoR issued a call for multidisciplinary, multi-institutional proposals that could result in garnering major federal funding for the creation of sustainable research centers. It was envisioned that the selected initiatives would be in areas that would benefit the State's economy. Ultimately, two proposals were selected for inclusion in the renewal. The first initiative, *Forecasting Ecological Change in the Central Plains*, will use the Kansas grasslands as the model ecosystem to assess the ecological and societal impacts of global change. The second initiative, *Bio-Materials by Design*, addresses a critical need to develop bio-based advanced materials to replace petroleum-based materials.

As in the past, the efforts for the renewal involved many people, including researchers and administrators, as well as staff members at all three universities. We



KRISTIN BOWMAN-JAMES,
PROJECT DIRECTOR

are also especially appreciative of Kansas Technology Enterprise Corporation and its University Programs Committee for supporting our efforts. Now we just await word about continued funding.



NEW HOME TO THE KANSAS NSF EPSCoR PROGRAM, FOLEY HALL ON KU'S WEST CAMPUS IS JUST MINUTES FROM KU'S NEW MULTIDISCIPLINARY RESEARCH BUILDING SCHEDULED TO OPEN IN DECEMBER 2005.

EPSCoR MOVES TO FOLEY HALL

An "Out of Service" sign appeared on the Strong Hall elevator just days before the scheduled move of the Kansas NSF EPSCoR Office to Foley Hall on the West Campus of the University of Kansas. So, inconvenience aside, on October 6, a crew of six hauled desks, file cabinets, display cases, poster tubes, and more than 100 boxes down a flight of stairs and out the door to vans parked on the sidewalk.

"I really felt sorry for the movers," said Doug Byers, Budget and Accounts Administrator. "They had to move a lot of heavy stuff down stairs and around corners, yet

they got the job done in less than six hours."

Staff required almost a week to unpack.

The new mailing address appears below; the telephone, fax, and e-mail remain the same.

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KANSAS RECEIVES \$3.7 MILLION THROUGH NSF EPSCoR CO-FUNDING

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that a proposal at or near the funding cutoff will receive an award rather than a decline. The amount of co-funding to an EPSCoR jurisdiction depends on several factors, including the quality of the proposals submitted and the funds budgeted for co-funding.

"If the program officer recommends an award and NSF EPSCoR agrees to co-fund it, dollars from both directorates are used to fund the award," explains Barbara Paschke,

Associate Director of Kansas NSF EPSCoR. "Because co-funding decisions are confidential, researchers do not know that they've received a co-funded award. Co-funding operates quietly behind the scenes and provides significant benefits to Kansas researchers whose proposals might otherwise be declined for lack of funds."

Additional information about co-funding is available at:

<http://www.nsf.gov/ehf/epscor/cofunding.jsp>

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YANIK TAPPED FOR NSF PRESIDENTIAL AWARD



EMPORIA STATE UNIVERSITY PROFESSOR OF MATHEMATICS ELIZABETH YANIK, ENJOYS A RARE MOMENT WITH PRESIDENT GEORGE W. BUSH IN THE OVAL OFFICE FOLLOWING THE PRESENTATION OF THE PRESIDENTIAL AWARD FOR EXCELLENCE IN SCIENCE, MATHEMATICS, AND ENGINEERING MENTORING. YANIK WAS ONE OF NINE INDIVIDUALS RECOGNIZED BY THE NATIONAL SCIENCE FOUNDATION.

It took Emporia State University (ESU) math professor Elizabeth (Betsy) Yanik just about as long to get to the White House as the time involved in the current president's last election campaign. Fourteen months marked the time span from the submission of Dr. Yanik's nomination materials for the NSF Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring to the moment when she was one of nine individual awardees standing in the Oval Office with the President!

Yanik, who has a reputation for developing workshops and summer programs in mathematics and science for young women in middle school through high school, was nominated by Professor Clyde Martin, a Horn Distinguished Professor at Texas Tech. Dr. Martin, an ESU alumnus, has collaborated with Dr. Yanik on several joint grant proposals. He worked with her colleagues at ESU to secure the letters of recommendation from professors and students, and then submitted the nomination materials to the National Science Foundation in the spring of 2004.

In May, 2005, Dr. Yanik received a call from NSF suggesting that she consider clearing her calendar to make a trip to Washington. However, the award confirmation only came days before the trip, and Dr.

Yanik was sworn to secrecy. The award ceremony was a two day event, with the presentation of the award in the Eisenhower Office Building, followed by a reception in the Indian Treaty Room. Awardees were then escorted next door to the White House to meet with President Bush in the Oval Office.

Dr. Yanik is proud of the NSF recognition and acknowledges Marvin Harrell, co-director of her extensive math and science mentoring programs at Emporia State, as vital in the success of the programs and her nomination.

For more than a decade, Dr. Yanik has co-organized *Expanding Your Horizons*, a one-day program for over 200 sixth through eighth grade girls, who spend a Saturday meeting and visiting with 50 women professionals from across Kansas. (For several years, Kansas NSF EPSCoR has assisted in funding this vital program.) In addition, every February, ESU brings about 60 high school juniors to campus for the Sonia Kovalevsky Mathematics Day. The students' high school teachers attend the one-day seminar as well. For the last seven summers, she has co-directed MASTER IT, a week-long camp in June for eighth and ninth grade girls interested in math and science. (Kansas NSF EPSCoR also has assisted in funding this effort.)

As part of the presidential award, Dr.

NATIONAL EPSCoR CONFERENCE



BARBARA PASCHKE, KANSAS NSF EPSCoR ASSOCIATE DIRECTOR, THE HONORABLE KENNY WILK, MEMBER OF THE KANSAS HOUSE OF REPRESENTATIVES, AND HIS WIFE, DARLENE WILK, DISCUSSED THE EPSCoR PROGRAM AT ONE OF THE CONFERENCE'S OUTDOOR ACTIVITIES.



KRISTIN BOWMAN-JAMES, KANSAS NSF EPSCoR PROJECT DIRECTOR, AND DR. BRETT DEPAOLA, KANSAS DOE EPSCoR PROJECT DIRECTOR ENJOYED THE EXTENSIVE HALL OF POSTER DISPLAYS BY PARTICIPATING STATES, AND STOPPED TO ADMIRE THE KANSAS POSTER.

Yanik will receive \$10,000 from NSF to support MASTER IT for one summer. She is thrilled to have this financial support this summer.

At the national level, Dr. Yanik has directed Women Count Conferences (2001, 2003, 2005) for directors of mathematical outreach programs. She is currently the national director of the Women and Mathematics Network, president of Women and Mathematics Education, and the Kansas Governor on the Mathematical Association of America's Board of Governors.

Dr. Yanik has been on the faculty at ESU for 15 years in the Department of Mathematics, Computer Science, and Economics.



KAREN SANDBERG, NSF EPSCoR PROGRAM OFFICER FOR THE KANSAS RESEARCH INFRASTRUCTURE IMPROVEMENT AWARD AND KRISTIN BOWMAN-JAMES, KANSAS NSF EPSCoR PROJECT DIRECTOR, ENJOYED PUERTO RICO.



KANSAS ATTENDEES AT THE NATIONAL EPSCoR CONFERENCE INCLUDED: KEN KLABUNDE, KSU DISTINGUISHED PROFESSOR OF CHEMISTRY; KRISTIN BOWMAN-JAMES, KANSAS NSF EPSCoR PROJECT DIRECTOR; ALEXANDER SMETANA, KSU GRADUATE STUDENT; JIM GUIKEMA, KSU ASSOCIATE VICE PROVOST FOR RESEARCH; AND DOUG BYERS, KANSAS NSF EPSCoR BUDGET AND ACCOUNTS ADMINISTRATOR.



KEITH YEHLE, KU GOVERNMENTAL RELATIONS, ATTENDED THE MEETING TO STAY ABREAST OF CHANGES IN THE EPSCoR PROGRAM AND TO REPORT BACK TO THE UNIVERSITY ADMINISTRATION.



DR. MANUEL GOMEZ, PROJECT DIRECTOR, PUERTO RICO EPSCoR, DISCUSSED VARIOUS ASPECTS OF PUERTO RICO'S INITIATIVES WITH TRACY TAYLOR, PRESIDENT AND CEO OF KANSAS TECHNOLOGY ENTERPRISE CORPORATION, FOLLOWING TAYLOR'S PRESENTATION AT THE ECONOMIC DEVELOPMENT INITIATIVES SESSION. KANSAS REPRESENTATIVE KENNY WILK LOOKS ON.

MULTI-USER EQUIPMENT AWARDS

Five new scientific instruments costing \$1.045 million will soon be used by Kansas scientists to conduct research in the biosciences, the current focus of state R&D investment.

The purchases result from a Spring 2005 multi-user equipment competition sponsored by Kansas NSF EPSCoR. The instruments will help scientists become more competitive for federal grants by improving the quality and capacity of their laboratories and encouraging collaborations among researchers.

Undergraduate and graduate students at the universities will reap the benefits through

experience with state-of-the art equipment and the application of new methods in today's science and technology workplace.

Faculty receiving equipment awards and their projects:



DAVID EICHHORN, WSU – CHEMISTRY, PURCHASE OF A SINGLE CRYSTAL X-RAY DIFFRACTOMETER

Wichita State University will purchase a new CCD-based X-ray diffractometer to enhance research aimed at

understanding enzyme mechanisms and processes, combating disease, and improving utilization of energy resources.

Researchers will be able to obtain a picture of the solid-state structure of molecules synthesized in their labs. This information is important for analysis and interpretation of other types of data and vital for comparison of model complexes to the enzymatic sites that they study. The X-ray diffractometer will be used in teaching a graduate course in X-ray crystallography and used as part of the advanced undergraduate inorganic chemistry lab.

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EDUCATION INITIATIVES

Seven Education Initiative Grants designed to enhance science, technology, engineering and mathematics (STEM) education in Kansas are now underway thanks to awards totaling \$679,024 from Kansas NSF EPSCoR.

The awards to faculty at the University of Kansas (KU), Kansas State University (KSU) and Wichita State University (WSU) began on June 1, 2005. The initiatives target students from kindergarten through graduate school, forge partnerships with public schools, and serve underrepresented students in STEM fields, including Native Americans.

Several of the initiatives will develop pilot programs or produce preliminary data for larger proposals to the National Science Foundation to improve STEM educational opportunities for students and encourage students to pursue STEM careers.

Award recipients and their projects:

ALICE BEAN, KU – PHYSICS AND ASTRONOMY, CRAZY QUARKS: AN INTERACTIVE MULTIMEDIA EDUCATION PROJECT

The Crazy Quarks Project seeks to increase science literacy by entertaining children with the world of quarks. Objectives are to: 1) create a developmentally-appropriate process that introduces quarks and the people who work with them into the common language of kids; 2) conduct research to better understand how young people are introduced to and grasp the scientific world of the unseen and abstract; 3) demystify subatomic physics and change the perception that science is difficult and inaccessible; 4) develop a 30-minute children's series for a national television audience (longer term goal); 5) develop materials for ongoing presentations including a website and facilitated live interactive shows; and 6) facilitate professional development of the collaborators.



KLAUS HOFFMANN, WSU – AEROSPACE ENGINEERING, DEVELOPMENT OF NUMERICAL TOOLS FOR BLOOD FLOW SIMULATIONS WITH FLEXIBLE BOUNDARIES

A multidisciplinary team will develop a computational code for blood flow simulation with flexible boundaries. The simulation will model several aspects of fluid (blood) and domain (arteries) to represent the physics of

the problem, including development of flexible boundaries and specification of boundary conditions, unsteady pulsating flow, non-Newtonian viscous effects, and applications for complex geometries. The multi-disciplinary educational program to support the simulation research will become the basis of an NSF IGERT proposal involving aerospace engineering, mechanical engineering, mathematics, chemistry, and biology.

KELLY LIU, KSU – GEOLOGY, A GEOPHYSICAL TEST SITE ON THE KSU CAMPUS

This project complements a NSF DUE award to establish a geophysical test site on the campus of Kansas State University, thereby maximizing use of existing geophysical instruments to enhance active learning and hands-on experience of hundreds of undergraduate students. Funds will be used to: process data to be collected by the pre-construction survey of the site; build a database of geophysical data collected from the site; design questionnaires for evaluation and assessment of student learning outcomes; establish a website for the geophysical site; and attract potential users.

CATHERINE LOUDON, KU – ECOLOGY AND EVOLUTIONARY BIOLOGY, VISUALIZING THE INVISIBLE USING SCIENTIFIC VIDEOGRAPHY IN BIOLOGY EDUCATION

This project will improve and expand collaborative educational opportunities for students at both the University of Kansas and Haskell Indian Nations University (HINU). It will provide HINU undergraduates with an introduction to research in a biological field using technology and techniques new to HINU, provide a forum in which KU graduate students can present their research, allow faculty at each school to develop laboratory exercises for effective teaching in undergraduate science laboratories, and provide up-to-date training and equipment for faculty members. The project will purchase videographic equipment, produce exercises that will help undergraduates comprehend biological organisms, and furnish technical expertise, analytical methods, and mathematical models which can form a base for future endeavors in biology, environmental science or health fields.

KIRSTEN NICOLAYSEN, KSU – GEOLOGY, AN INTERACTIVE COMPUTER TUTORIAL TO INVESTIGATE THE LINK BETWEEN MINERAL PREFERRED ORIENTATION AND SEISMIC ANISOTROPY

This project will develop a computer tutorial to enhance student understanding of the

link between large-scale tectonic processes and the record of these processes in micro-scale textures. The tutorial will focus on the link between mineralogy and geophysics by highlighting the link between seismic anisotropy and lattice-preferred orientation of olivine in the upper mantle. An interactive case study will be developed for students to explore mineral identification, lattice-preferred orientation, and compositions of mantle analogs with increasingly complex visual presentations related to propagation of seismic energy. Students will also participate in geoscience curriculum design and project evaluation.

MARK SCHNEEGURT, WSU – BIOLOGICAL SCIENCES, MOLECULAR BIOLOGY AND MICROBIOLOGY TRUNK PROGRAM

This project will provide teachers and students with molecular biology equipment and supplies needed to perform inquiry-based exercises that address life sciences content standards. A team of WSU scientists and educators will work with media developers and classroom teachers to generate three modules, each with complete lesson plans, classroom activities, and teacher support. The planned modules will demonstrate the chemical nature of DNA, show that phenotypic characteristics are determined by genotype, and show that DNA is the basis for speciation. The project focuses on public high schools in Wichita, a city rich in underserved targeted populations that are underrepresented in the sciences and engineering, and will reach students in Western Kansas via the state's Kan-Ed network.

CAROL SHANKLIN, KSU – GRADUATE SCHOOL, LEVERAGING AN EXISTING SUMMER RESEARCH PROGRAM INTO AN AGEP SUBMISSION

This project will expand Kansas State University's Summer Undergraduate Research Opportunities Program (SUROP), which offers first-hand experience in science, technology, engineering and mathematics (STEM) research to undergraduates from under-represented groups. Funds will support activities leading to the submission of a proposal to the NSF Alliances for Graduate Education and the Professoriate (AGEP) program; expand assessment of SUROP; and support a graduate recruiting fair.

Ultimately, the project will help increase participation of students of color in STEM graduate programs at KSU and other participating institutions.

MULTI-USER EQUIPMENT AWARDS

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MICHAEL KANOST, KSU – BIOCHEMISTRY, UPGRADE OF 400 AND 500 MHZ NMR SYSTEMS

Kansas State University will upgrade its 400 and 500 MHz NMR spectrometers that are currently used by more than 40 separate research groups. The upgrades, which will be anchored to an interdisciplinary multi-user facility, will improve collaboration and research in areas such as insect biology, functionalized polyoxometalates, supramolecular synthesis, characterization of human blood coagulation factor, neurodegeneration in Parkinson's disease, improving the utility of starch, and environmental safety. Three courses and two summer programs will utilize the upgraded equipment.

JEFFREY OLAFSEN, KU – PHYSICS AND ASTRONOMY, PORTABLE MAGNETIC RESONANCE IMAGING RESOURCE FOR BASIC RESEARCH IN BIOMECHANICAL AND LIVING SYSTEMS

Magnetic Resonance Imaging (MRI) is a powerful tool for non-invasive experiments that capture three-dimensional images of internal structures without the risks of ionizing radiation existing with other modalities such as computer tomography or radiography. The University of Kansas will acquire a flexible, portable, state-of-the-art MRI system that can be utilized in current experiments for multidisciplinary research on small volume systems. Graduate and advanced undergraduate students will benefit from training on the equipment. Imaging human

and animal tissue systems to define the structure of the materials and enhance the basic understanding of how the biological material behaves under physiological loading will be the primary uses of the equipment. The campus location will make it possible to easily move the tissue between complex high-loading equipment and the MRI imaging equipment, thereby eliminating the need to make a two-hour round-trip to the Medical Center in Kansas City to test tissue that degrades with time.

RUTH WELTI, KSU – BIOLOGY, ACQUISITION OF A MASS SPECTROMETER FOR LIPIDOMICS

The Kansas Lipidomics Research Center (KLRC) Analytical Laboratory at Kansas State University, which currently serves scientists from more than 35 research laboratories,

PART OF THE NATIONAL SCIENCE FOUNDATION'S STRATEGY IS TO INVEST IN TOOLS, INCLUDING MULTI-USER EQUIPMENT THAT ENABLES DISCOVERY, INNOVATION, AND LEARNING.

will acquire an ESI-quadrupole/time of flight tandem mass spectrometer (Q-TOF). The instrument facilitates the identification of unknown lipids by providing accurate mass measurements that can be correlated with chemical formulas. Coupled with an electro-

spray ionization tandem mass spectrometer (ESI-MS/MS) funded by the National Science Foundation, the Q-TOF will: increase the analytical capacity of the KLRC lab and facilitate determination of the functions of genes, proteins, and lipids in metabolic and signaling pathways. Twelve junior faculty, 44 postdoctoral trainees, 76 graduate students, and 59 undergraduate students will directly benefit in the research program. Longer term, the knowledge acquired with this equipment will lead to practical applications in industry, medicine, and agriculture.



KANDATEGE WIMALASENA, WSU – CHEMISTRY, PURCHASE OF A RAPID SCAN SPECTROPHOTOMETER WITH STOPPED FLOW CAPABILITIES

Wichita State University will acquire a Rapid Scanning Spectrophotometer with stopped flow, and ultraviolet, visible, near IR spectral and circular dichroism measurement capabilities. The equipment will expose graduate and undergraduate students to a wide array of modern time resolved spectral techniques, allow students to learn the cutting-edge, experimental techniques that are commonly used in the studies of biochemical and chemical reaction mechanisms and dynamics studies at millisecond time scales, and improve the ability to obtain quality spectral data for various purposes.

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