

A Stimulus for Research

NIST grants boost UM stimulus funds to \$52 million

The university has recently been awarded two major grants totaling \$25.8 million from the National Institute of Standards and Technology, or NIST, bringing Maryland's total of stimulus funding to \$52 million.

The NIST grants—\$15 million to support a UM-based fellowship program and \$10.3 million to build an advanced quantum physics laboratory—are the latest funds received from the American Recovery and Reinvestment Act of 2009, or ARRA, passed by Congress last year to jump-start the economy and spur the development of new technologies.

"These federal recovery act grants are advancing basic understanding in areas ranging from early childhood development to quantum physics, and are laying the foundation for new treatments, new products and new technologies," says **Mel Bernstein**, Maryland's vice president for research.

In addition, Bernstein says, the stimulus funds are helping build the careers of young scientists and engineers, and are supporting a broad range of innovative research at Maryland across multiple disciplines.

ARRA funding to the university also comes from the National Science Foundation, the Department of Energy and the National Institutes of Health, including NIH-funded research on stemming the transmission of H1N1 influenza, designing new technologies for improving electronic health records and addressing next-generation DNA sequencing technologies. (See sidebar).

The NIST-funded fellowship program will bring some 50 fellows per year over three years to work at NIST laboratories in Gaithersburg, Md., and Charleston, S.C., where they can use the latest technologies to study weights and measurement.

The program will be administered by the university's Institute for Research in Electronics and Applied Physics, under its director and the program's principal investigator, Professor **Daniel Lathrop**.

"This grant will continue to strengthen ties between NIST and the University of Maryland throughout the entire scope of science and technology," Lathrop says.

The NIST-funded Laboratory for Advanced Quantum Science will be part of the university's Physical Sciences Complex slated to begin construction this year. The 21,000-square-foot lab will provide Maryland scientists and other investigators with facilities specially designed for the needs of research at the frontiers of quantum science.

Research will focus on advancing our basic understanding of the universe, as well as developing technologies for cryptography, advanced computing and the design and use of sensors of many kinds.

The Division of Research provided support for both of the NIST proposals throughout the application process.



An artist's rendering of the Physical Sciences Complex, where Maryland's Laboratory for Advanced Quantum Science—funded by recovery act money—will be built underground.

Over the past year, the division has hosted seminars and briefings and maintained a Web site offering detailed information for university researchers applying for stimulus funding.

"This significant ARRA funding is a unique opportunity for University of Maryland researchers, and it's an important role of the Division of Research to provide assistance that helps faculty secure these grants," says **Ken Gertz**, associate vice president for research development.

Ultimately, Gertz expects the stimulus funds to have a long-lasting effect on the research enterprise at Maryland. "It's really contributing to more than just jobs," he says. "The ARRA funding allows researchers to take on big issues like health care, clean energy and national security that have both a financial and societal impact."

Selected Funded Projects As of March 1, the American Recovery and Reinvestment Act of 2009 has funded 96 projects for a total of \$51,800,893. They include:



Title: Translational Research—From Mechanisms of Influenza Transmission to Prevention
Amount: \$478,536
Funding Agency: National Institute of Allergy and Infectious Diseases
Principal Investigator: Donald Milton, Maryland Institute for Applied Environmental Health



Title: Toward a GZK Neutrino Detector at the South Pole
Amount: \$499,900
Funding Agency: National Science Foundation
Principal Investigator: Kara Hoffman, physics

Title: Proximate and Ultimate Causes of Sensory System Evolution
Amount: \$787,402
Funding Agency: National Science Foundation
Principal Investigator: Karen Carleton, biology

Title: Computational Gene Modeling and Genome Sequence Assembly
Amount: \$250,000
Funding Agency: National Library of Medicine
Principal Investigator: Steven Salzberg, Center for Bioinformatics and Computational Biology

Title: Computational Interactive Exploration of Temporal Patterns in Electronic Health Records
Amount: \$337,534
Funding Agency: National Cancer Institute
Principal Investigator: Ben Shneiderman, Institute for Advanced Computer Studies



Title: Acquisition of a 3-Tesla Functional Magnetic Resonance Imaging (fMRI) Machine
Amount: \$1,936,855
Funding Agency: National Science Foundation
Principal Investigator: Nathan Fox, human development



UPDATE FROM THE OFFICE OF FEDERAL RELATIONS

2011 Federal Budget Focuses on Energy Research

President Obama's fiscal year 2011 budget sets aside \$28.4 billion for energy research, a 6.8 percent increase for the Department of Energy, or DoE, emphasizing job creation, development of a clean energy economy and improved energy efficiency to limit greenhouse gas emissions.

This furthers the president's objective of supporting scientific innovation to develop clean and secure energy technologies, maintain national security and reduce environmental risks. It also bodes well for the UM research community, as specific items in the proposed FY11 budget align with ongoing university research projects.

For example, the DoE's Office of Science is expected to receive \$5.1 billion, including \$1.8 billion for basic energy sciences to discover novel ways to produce, store and

use energy. Energy storage is a key area of research at Maryland, with Maryland's Energy Frontier Research Center using nanostructures to develop groundbreaking energy storage devices.

The budget also requests \$4.7 billion in clean energy technology programs, with approximately \$2.4 billion earmarked for energy efficiency and renewable energy programs. More than \$40 billion in loan guarantees are requested for innovative clean energy programs, with \$108 million allocated to support research in wind, solar and geothermal energies. Also included is approximately \$300 million for the Advanced Research Project Agency-Energy, the DoE initiative that focuses on high-risk, high-payoff concepts in energy research.

Look to the Federal Corner for more information regarding higher education and the federal government. If you have a specific matter you would like to see discussed in this column, please contact Rae Grad, director of federal relations, at rgrad@umd.edu.

UM Startup Showcases Audio Camera

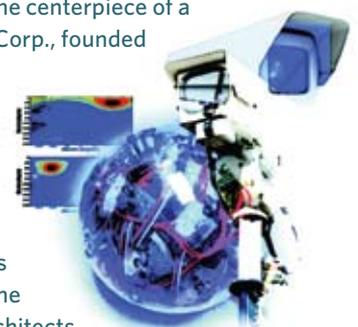
A camera able to "see" noise is the centerpiece of a new startup venture, VisiSonics Corp., founded by Maryland researchers who have partnered with a local entrepreneur.

The novel technology, which creates real-time audio images out of sound arriving from all directions, has numerous applications—from pinpointing the direction of gunfire to helping architects to design better concert halls.

"VisiSonics products will offer a new generation of enabling solutions addressing security, architectural acoustics, virtual conferencing and telepresence, analytic tools and innovations in entertainment and gaming," says **Ramani Duraiswami**, an associate professor of computer science who led the development of the camera.

His partners in VisiSonics include research assistant **Adam O'Donovan**, senior research scientist **Nail Gumerov** and software entrepreneur **Bill Strum**.

Licensed from UM by the Office of Technology Commercialization, the camera can be seen at Maryland Day, April 24, in the Division of Research information booth.



We introduce you to new faculty and research scientists in the Maryland research community.



Amir Riaz is an assistant professor of mechanical engineering specializing in thermo-fluid and energy science. His research includes multiphase fluid mechanics as they relate to carbon dioxide sequestration and oil and gas reservoir management.



Thomas Carlson is an assistant professor of psychology and director of the Maryland Vision Science Lab. He researches how objects are represented in the human brain and how people dynamically track objects through space and time.



Miriam Phillips is an assistant professor of dance specializing in flamenco. Her research focuses on the ethnology and anthropology of dance forms originating in India, Spain and West Africa.



Nathan Hall is an assistant professor of human development. His research involves studying emotions in college students and designing motivational interventions to foster students' academic development.



Gniesha Dinwiddie is an assistant professor of African American studies. Her research includes life course perspectives on physical and mental health as well as inequality in educational attainment.

Technology for Kids Has a Social Impact

Two Maryland researchers at the forefront of designing computer interfaces for children were recently honored by the Association for Computing Machinery, or ACM, the world's largest educational and scientific computing society.

Ben Bederson and **Allison Druin** received the 2010 Social Impact Award from the ACM's Special Interest Group in Computer Human Interaction. The award recognizes individuals who promote the application of human-computer interaction research for pressing social needs.

The duo—who are also husband and wife—were lauded for their work in developing the International Children's Digital Library, a multilingual free digital library of children's books that consists of more than 4,000 books in over 50 languages and boasts more than 3 million users worldwide.

Bederson, an associate

professor of computer science, was also recognized for his research on the usability and technical challenges associated with electronic voting systems. And Druin, a professor of information studies and director of the university's Human Computer Interaction Lab, received individual mention of her pioneering work in the development of technology for children, and the inclusion of children as partners in the design process.

"The university could not be more proud of Ben and Allison. Their research with young people interacting with emerging technologies continues to bring worldwide recognition to our institution," says **Nariman Farvardin**, senior vice president for academic affairs and provost.



Ben Bederson and Allison Druin

FACULTY AWARDS & HONORS



John Anderson

Three Maryland researchers were recently inducted into the National Academy of Engineering, or NAE, an honor granted to senior professionals in business, academia and government who are among the world's most accomplished engineers.

John Anderson, **Ali Mosleh** and **Ben Shneiderman** join more than 2,000 peer-elected NAE members—including 16 other Maryland faculty—who are chosen for their leadership and expertise on numerous academy projects in engineering and technology that can improve the quality of life.

"We are fortunate to have faculty members of such talent and dedication to our campus to nurture the next generation of engineers," says university President **Dan Mote**, who is an NAE member and the organization's current treasurer.

Anderson, a professor emeritus of aerospace engineering and curator at the Smithsonian National Air and Space Museum, was inducted for his contributions to aerospace engineering and history textbooks and for his research in hypersonic gas dynamics.

Mosleh, the Jeong H. Kim Professor of Mechanical Engineering, was inducted for his contributions to the development of Bayesian methods and computational tools in probabilistic risk assessment and reliability engineering.

Shneiderman, a professor of computer science with an appointment in the Institute for Systems Research, was inducted for research, software development and scholarly texts concerning human-computer interaction and information visualization.



Ali Mosleh



Ben Shneiderman

New Research Site Designed

The Division of Research has redesigned its Web site (www.umresearch.umd.edu) to assist faculty researchers in accessing the latest information on funding opportunities, compliance regulations, research incentive programs, entrepreneurship and more.

The new site highlights key areas of research at UM that include energy, climate adaptation, food safety and public health. It also features short vignettes of Maryland faculty who were photographed as part of the division's "Faces of Research" initiative last year.

"We want our faculty to have the most up-to-date information and tools they need to further their research," says **Anne Geronimo**, the director of research development who worked with the university's Office of Web and New Media Strategies in redesigning the site.



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The Division of Research publishes **RESEARCH@MARYLAND** several times per semester. Its goal is to better inform and connect the research community at the University of Maryland. Your comments and suggestions are welcome. Please e-mail them to Anne Geronimo, Division of Research, at geronimo@umd.edu.

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