

New Grants Show UMD's Continuing Research Strength

The University of Maryland has recently netted an array of research grants from funders including federal agencies, the intelligence community, corporations and foundations that will help researchers push the frontiers of science.

Among them are five Multidisciplinary University Research Initiative (MURI) and two Minerva grants from the Department of Defense, a \$3.75 million grant from the National Science Foundation to encourage entrepreneurship among researchers, and awards supporting work in astronomy and nanotechnology.

"These awards show that the university continues its run of research excellence across a wide range of fields," says **Patrick O'Shea**, Maryland's vice president for research and chief research officer. "I'm proud of these researchers, and I know that their work will yield crucial new findings."

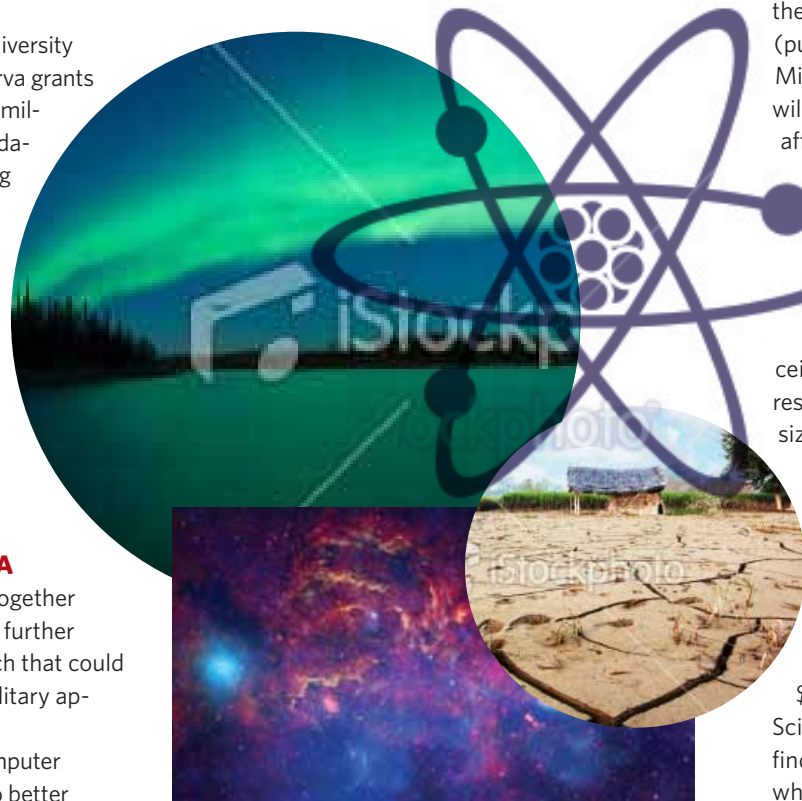
DOD GRANTS: MURI AND MINERVA

The university's new MURI grants bring together researchers from different institutions to further basic technological and scientific research that could eventually lead to developments with military applications:

- **Thomas Antonsen** (electrical and computer engineering; physics) will lead a project to better understand the ionosphere and explore new ways to modify it. The award, which will range from \$4.5 million to \$7.5 million, includes collaborators from Texas Tech University and the University of California at Los Angeles. "It's exciting," says Antonsen. "This will be a big challenge."
- **Ichiro Takeuchi** (materials science and engineering) will co-lead an \$8.6 million project to use computer modeling to come up with replacements for Indium, a scarce and costly element used in a range of critical technologies including touch screens. "This is a new way to do materials science," says Takeuchi. The five-year project is led by Duke University.
- **P. S. Krishnaprasad** (electrical and computer engineering) and **Christopher Jarzynski** (chemistry and biochemistry) are part of a five-year, \$6.5 million



Ichiro Takeuchi



Maryland researchers have been awarded grants to study the ionosphere, using atoms to generate energy, how climate change may affect international conflicts, and new strategies to improve space telescope.

project led by the University of California, Davis that will develop nanoscale synthetic "machines" that could eventually help fight disease by delivering drug molecules to specific locations, or by detecting disease long before more overt symptoms appear.

- **Ian Spielman** (physics) and **Steven Rolston** (physics) will do research into strategies to use atoms rather than electrons to generate energy. Instead of relying on electrons to generate electric current, they looking at other properties of atoms, such as spin, to generate magnetic current.
- **Chris Monroe** (physics) will use quantum physics to come up with strategies for building the next generation of superfast computers. His group has already developed a very early prototype.

ADDITIONAL AWARDS

Two Maryland studies are being funded through the highly competitive Minerva Research Initiative that focuses on the social sciences. **Elisabeth Gilmore** (public policy) received \$1.9 million Minerva grant to develop models that will predict how climate change could affect regional and civil conflict. And



Elisabeth Gilmore

Michele Gelfand (psychology) was awarded \$813,000 to examine how the human brain reacts to violations of social norms across cultures.



Michele Gelfand

In addition, Maryland received \$1 million from the W.M. Keck Foundation for research to improve the sensitivity and decrease the size and cost of ground and space telescopes. The interdisciplinary team will be led by **Sylvain Veilleux** (astronomy) and includes **John Mather**, 2006 Nobel Laureate in Physics.

Earlier this year, the university, along with George Washington University and Virginia Tech, won a \$3.75 million grant from the National Science Foundation to bolster entrepreneurship by finding and training student and faculty researchers who have potentially marketable ideas. Known as Innovation Corps (I-Corps), the program aims to help translate basic research into products and companies. Together, the three schools will find and train 100 teams a year.



Sylvain Veilleux

Maryland also has expanded its record of partnering with industry, garnering two grants from Agilent Technologies. **Oded Rabin** was awarded \$50,000 to study the use of nanoparticles to improve methods to sense minute amounts of chemicals, and **Shuvra Bhattacharyya** received a \$31,000 grant to do work on novel software and hardware designs to improve signal processing systems.

"Despite a very difficult and complex funding environment, our researchers continue to be recognized for their outstanding work and innovative ideas," says **Ken Gertz**, associate vice president for research development.

Mpower Grants Encourage Joint Work Between College Park, Baltimore Researchers

A new round of 2013 seed grants via MPowering the State, each worth up to \$75,000, are designed to leverage external funding and forge collaborative research between UMD and UMB.



Norma Andrews

- **Norma Andrews** (UMD) and **Ricardo Feldman** (UMB) will use stem cells to look for new treatments for Gaucher disease, a disorder that leads to severe osteoporosis.
- **Jaydev Desai** (UMD), **Cornelia Fermuller** (UMD) and **Kelly Westlake** (UMB) are developing a portable robotic glove to improve hand function in stroke patients.



Jaydev Desai

- **Patrick Kanold** (UMD) and **Bruce Krueger** (UMB) are examining how errors in brain development during early pregnancy may contribute to autism.

- **Robin Puett** of (UMD), along with **Braxton Mitchell** (UMB) will study how air pollution affects diabetes among Amish people in Lancaster County, Pa.

- **Benjamin Shapiro** (UMD) and **Stuart Martin** (UMB) will use a new method to study how cancer cells attach themselves to new locations in the body.

- **Bhanu Telugu** (UMD) and **Loren Thompson** (UMB) are examining the feasibility of using pregnant guinea pigs as a model for human preeclampsia.



Xiaoping Zhu

- **Xiaoping Zhu** (UMD) and **Marcela Pasetti** (UMB) will study new strategies for vaccinating children against whooping cough.



CONNECTING
the UNIVERSITY
of MARYLAND
RESEARCH
COMMUNITY

Research@ MARYLAND

INSIDE:

New Grants Show UMD's
Research Strength

MPower Grants Foster
Collaboration

Info Studies Prof. Studies
Social Media Revolution

SPOTLIGHT

Information Studies Professor Focuses on the Social Media Revolution

When Edward Snowden made his blockbuster revelations about the National Security Administration's widespread surveillance earlier this year, many people were shocked. Jennifer Golbeck Ph.D. '05 wasn't one of them. She focuses much of her research on how modern communications can reveal our beliefs, personalities and behavior—even those we want to keep secret. An associate professor in the College of Information Studies, she has focused much of her research on understanding how social media, including texting, tweeting and posting on social media sites, are changing how we live.



Jennifer Golbeck

Golbeck has a \$4 million grant from the Department of Defense to study how social media can help the military decide which sources of information are trustworthy. She is also working with the Office of the Director of National Intelligence to analyze Twitter traffic to predict when volatile regions and countries will erupt into protest or civil war.

She notes that widespread monitoring is not new. For years, large companies have used massive amounts of information about consumers to learn about more about their needs and desires. But with people generating ever-larger amounts of digital information, these algorithms are becoming even more sophisticated. "People don't really understand the power of what you can infer from these algorithms," she says.



ILLUSTRATION BY MKHMARKETING (CC BY 2.0)

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
email them to Anne Geronimo, Division
of Research, at geronimo@umd.edu.
Produced by University Publications
for the Division of Research
Patrick O'Shea, vice president for research
and chief research officer
Executive editor: Anne Geronimo
Managing editor: Karen Shih
Art director: Jennifer Paul

Office of the Vice President for Research
2133 Lee Building
University of Maryland
College Park, MD 20742-5121
www.umresearch.umd.edu

RESEARCH@MARYLAND
CONNECTING the UNIVERSITY of MARYLAND
RESEARCH COMMUNITY



FACULTY AWARDS & HONORS



WESLEY MUSSER, a professor in the Department of Agricultural and Resource Economics, was named a fellow by the Northeastern Agricultural and Resource Economics Association. His research focuses on farm management and finance in the context of risk management.



WILLIAM E. BENTLEY, Department of Bioengineering professor and chair, has been elected to fellowship in the American Chemical Society (ACS). He is a founding principal investigator of the university's FDA-sponsored Center of Excellence in Regulatory Science and Innovation and a member of the Maryland Biochip Collaborative.



Economics Professor **WALLACE OATES** received the Daniel Elazar Distinguished Federalism Scholar Award from the American Political Science Association. It recognizes distinguished scholarly contributions to the study of federalism and intergovernmental relations.

UMD-Smithsonian Seed Grants Encourage New Collaborations

A tradition of partnerships between the University of Maryland and the Smithsonian Institution continues with the awarding of six grants, each worth up to \$50,000, to further research in a broad range of areas:

- **Daniel Gruner**, entomology, and Smithsonian researcher Robert Fleischer are studying how invasive predators, especially rats, have had an impact on bird species on islands.
- **Charles Delwiche**, cell biology and molecular genetics, and the Smithsonian's Valerie Paul are researching the diversity of blue-green algae, especially in the Gulf of Mexico and the Caribbean Sea.
- **Carol Keefer**, animal and avian sciences, and Adrienne Crosier of the Smithsonian are examining how to better freeze the sperm of cheetahs and other cat species in order to protect the endangered animals.
- **Ricardo L. Punzalan**, information studies, and the Smithsonian's Robert Leopold are studying how to most effectively digitize ethnographic collections.
- **Susan De La Paz**, education, along with Smithsonian researcher Melissa Wadman, has created a project to help middle school students explore the museum's digital resources.