

# Research@MARYLAND

CONNECTING *the* UNIVERSITY of MARYLAND RESEARCH COMMUNITY

## ISR Milestone Brings Reflection and Plans for the Future

A multidisciplinary Maryland institute that focuses on complex engineered systems will mark its 25-year anniversary next month with a three-day forum where stakeholders will appraise its accomplishments, review its best practices and discuss new partnerships.

The Institute for Systems Research, or ISR, was one of six initial Engineering Research Centers, or ERCs, funded by the National Science Foundation in 1985. The NSF is bringing a team of academic and industrial experts to campus from Nov. 17 to 19 to examine ISR's impact on systems research, technology and education in areas such as air traffic management, network security, hybrid communication networks and bio-inspired engineering.

This external visit is a first review of an ERC that has "graduated" and completed its NSF funding; ISR completed NSF funding almost 15 years ago.

"They are one of our most successful graduated ERCs, having built upon and sustained an interdisciplinary culture on campus, in partnership with industry, on visionary engineered systems—even after our support ended," says Lynn Preston, the NSF official who has led the ERC program for the past 25 years.

Preston says her agency and others want to better understand ISR's success and also provide feedback to University of Maryland researchers for future direction. The review can help prepare current ERCs for self-sustaining operation, she adds.

Preston expects a report to be published in *The Chronicle of Higher Education* early next year.

Darryll Pines, dean of the A. James Clark School of Engineering, which houses the ISR, says its success is due in large part to its establishing significant partnerships with industry—one of the first units on campus to do so.

"Their strengths have really come from the diversity of the research, the experience of interacting with industry and the international collaborations that have occurred," Pines says. "That was the vision



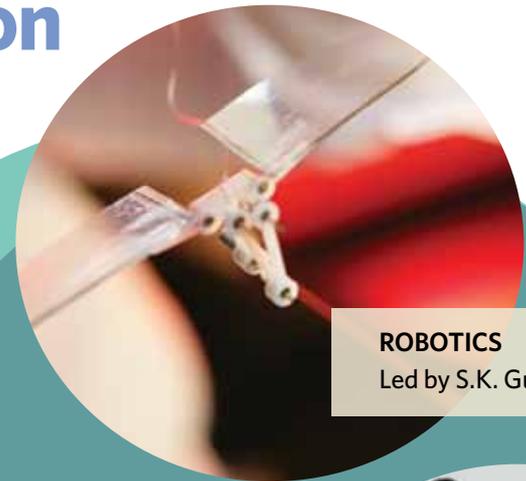
**GREEN COMMUNICATIONS**  
Led by Anthony Ephremides

of the institute's founding director, John Baras, and subsequent leadership has built upon that."

Reza Ghodssi, the current director, says new scientific and societal challenges will require the institute to expand its partnerships further, both on and off campus.

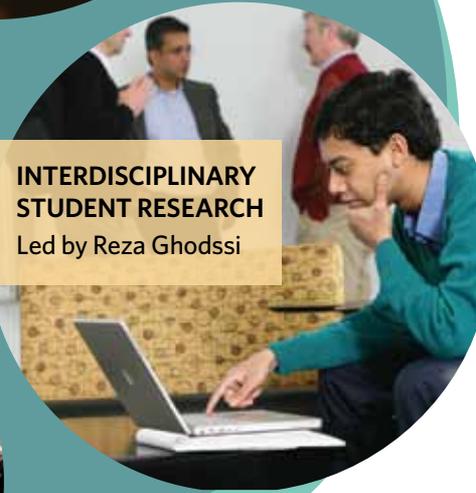
He says one of four key areas of growth is robotics, especially with small, autonomous aerial vehicles used by military and civilian agencies for surveillance or search and rescue operations. Another is "green communications," which includes decreasing energy consumption and increasing energy efficiency for telecommunications worldwide.

A third initiative involves microsystems; Maryland researchers are brainstorming



**ROBOTICS**  
Led by S.K. Gupta

### New ISR Initiatives



**INTERDISCIPLINARY STUDENT RESEARCH**  
Led by Reza Ghodssi



**MICROSYSTEMS**  
Led by Elisabeth Smela and Pamela Abshire

a mobile medical clinic the size of an iPhone, Ghodssi says, that can travel to remote areas, do diagnostics, then transmit the data to a distant hospital.

Finally, the institute plans to expand its collaborations with students and other centers on campus—Ghodssi sees forming even larger teams with faculty and students from almost every school or college.

"To address the really big issues in security, public health and competitiveness in manufacturing, it is essential that we broaden our research expertise," he says.



Reza Ghodssi

## THE FEDERAL CORNER

### UPDATE FROM THE OFFICE OF FEDERAL RELATIONS

#### Research legislation up for reauthorization

Congress continues working on the reauthorization of legislation that affects researchers nationwide. The America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education and Science (COMPETES) Act, signed into law in 2007, mandated investing in research and development that improves the competitiveness of the United States.

It was passed in response to a National Academies' report, "Rising Above the Gathering Storm," which warned that America's place as a global leader in science and technology was at risk. The House of Representatives has already passed a reauthorization bill that differs slightly from a Senate version. Final action on resolving differences between the two bills is expected this fall.

Key elements of the bills include funding increases for the National Science Foundation, the National Institutes of Health and the Department of Energy; programs to support innovation in manufacturing; the strengthening of educational opportunities in science, technology, engineering and mathematics (STEM); and more support for NASA and the National Oceanic and Atmospheric Administration.

The legislation also calls for developing an innovation infrastructure and establishing an Office of Innovation and Entrepreneurship to foster innovation and devise national and regional strategies for innovation and competitiveness.



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](mailto:rgrad@umd.edu).

## New Cybersecurity Center Launches

Citing the university's research expertise and close interactions with nearby federal agencies, university and government officials in October announced the creation of the Maryland Cybersecurity Center, also known as MC<sup>2</sup>.

MC<sup>2</sup> will serve the state and nation in providing research and development, as well as education in cybersecurity. Plans call for a holistic approach that focuses not only on technology, but also on policy, business, economics and behavioral aspects of cybersecurity. The center will offer a comprehensive educational component for Maryland students and the federal and industry work force.

Patrick O'Shea, professor and chair of electrical and computer engineering, and Larry Davis, professor and chair of computer science, will lead the new initiative. A Dec. 9 opening event is planned. For more information, visit [www.cyber.umd.edu](http://www.cyber.umd.edu).



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



**Maria Cameron** is an assistant professor of mathematics. Her research encompasses stochastic processes and numerical methods that can be used in seismic modeling and molecular dynamics.



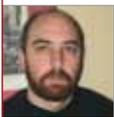
**Edward Eisenstein** is an associate professor of bioengineering. His research looks at gene-metabolite relationships in medicinal plants, the molecular basis for plant disease resistance and plant metabolic engineering.



**Mary A. Garza** is an assistant professor of public and community health. Her research includes the interplay of psychosocial, behavioral and neighborhood-level factors associated with health behavior.



**David Maimon** is an assistant professor of criminology and criminal justice. His research looks at the consequences of community social disorganization on behavioral and psychological outcomes, including underage drinking, suicide and crime.



**Ernesto Calvo** is an associate professor of government and politics. His most recent published work concerns democratic governance in developing countries, with a focus on Latin America.

## Fighting Fungi with Fungi

In an ecological twist of the adage "If you can't beat 'em, join 'em," a university researcher will soon search South America's jungles for fungi to circumvent a fungus-borne disease that has wreaked havoc on the continent's rubber-producing industry.

**Priscila Chaverri**, an assistant professor of plant science and landscape architecture, will travel to the Amazon Basin in the next couple of years looking for a natural biocontrol to stop the spread of South American leaf blight, or SALB, which has destroyed much of the Hevea trees in the region.

While most of today's rubber is produced synthetically, the latex taken from Hevea trees is the only rubber that can be used for condoms, medical gloves and other sensitive equipment. It is also important that a biocontrol be found to prevent the disease from spreading to other rubber-producing regions in Africa and Asia.

Chaverri will use her expertise in systematics to try and identify a natural deterrent.



Priscila Chaverri

"Nature has a way, over time, of producing its own remedies," she says.

The research is funded by a \$650,000 grant from the National Science Foundation, and joins Chaverri and her two graduate students with a researcher from the Smithsonian Institution and two plant pathologists from a private organization in France.

## FACULTY AWARDS & HONORS



**AVRAM BAR-COHEN**, a distinguished university professor who chaired the Department of Mechanical Engineering for nine years, has taken a leave of absence to serve as a program manager for the Defense Advanced Research Projects Agency, or DARPA. In this new capacity, Bar-Cohen will support DARPA programs on thermal energy science and systems. Upon completion of his two-year appointment, he plans to return to campus.



**OLIVIA CARTER-POKRAS**, an associate professor of epidemiology and biostatistics, received the 2010 Hispanic Heritage Month Award, presented annually by Gov. Martin O'Malley to those who have dedicated their time and work to improve the lives of Hispanics in the state. Carter-Pokras was recognized for her research in eliminating health disparities.



**JAMES DRAKE**, a professor of physics, was awarded the 2010 James Clerk Maxwell Prize for Plasma Physics by the American Physical Society. It is the highest honor bestowed to plasma physicists by the society and recognizes Drake's work on plasma turbulence and the mechanisms controlling fast magnetic reconnection and its associated particle acceleration.

## UPCOMING EVENTS & CONFERENCES

### DIVISION OF RESEARCH SEMINAR SERIES

#### New Faculty Research Orientation

Wednesday, Oct. 20, 2 to 4 p.m.  
Maryland Room, Marie Mount Hall  
RSVP to [vpr@umd.edu](mailto:vpr@umd.edu) by Oct. 15

#### Strategic Priorities and Initiatives for NIH Extramural Funding

Featured speaker is **Sally Rockey**, deputy director of extramural funding for the National Institutes of Health

Monday, Oct. 25, 11 a.m. to noon  
Benjamin Banneker Room, Stamp Student Union  
RSVP to [vpr@umd.edu](mailto:vpr@umd.edu) by Oct. 20



#### Future of Information Forum

Friday, Nov. 5, 10 a.m. to 2 p.m.  
Special Events Room (6137) McKeldin Library  
Lunch provided  
RSVP to [vpr@umd.edu](mailto:vpr@umd.edu) by Oct. 29

For more information contact [geronimo@umd.edu](mailto:geronimo@umd.edu)



### RESEARCH@MARYLAND

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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](mailto:geronimo@umd.edu).

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