

UMD Will Help Guide Climate Implementation

The University of Maryland, already positioned at the junction of cutting-edge environmental science and global climate change policy, is one of the co-hosts of the international Climate Action 2016 summit on May 4-6.

The event aims to begin implementation of a pioneering agreement to cut carbon emissions forged at the United Nations' Paris climate conference in December.

The event will zero in on several topics that can be immediately addressed following the agreement, says School of Public Policy (SPP) Dean **Robert Orr**. These include implementation of the agreement at city and subnational levels, climate-smart land use and climate-based resilience and adaptation.



Robert Orr, SPP dean, confers with U.N. Secretary-General Ban Ki-moon in 2014.

Maryland will lead another main point of discussion—development of research-based analysis and tools to support decision making, says Orr, who also serves as a U.N. under secretary-general and helped achieve success at the Paris conference.

"Our location and our strength in a number of important research areas mean UMD is poised to take a central role in a global research network aimed at finding climate solutions," Orr says. "We're mobilizing the entire university behind this in a cross-disciplinary manner, because we know that working together we can make a unique contribution."

Maryland researchers' efforts to answer hard climate science and sustainability questions are broad-ranging. Among them, the **Department of Geographical Sciences** has done groundbreaking work monitoring global forest loss using satellite imagery; the **Joint Global Change Research Center** is developing critical capabilities in climate modeling and remote sensing; the **University of Maryland Energy Research Center** is devising climate-friendly power sources and a next generation of batteries; **Department of Biology** researchers are

focusing on the conservation and ecology of plant and animal ecosystems worldwide; and **CICS-MD – the Cooperative Institute for Climate & Satellites-Maryland**, hosted by **Earth System Science Interdisciplinary Center (ESSIC)**, is part of a national consortium that specifically contributes to advancing NOAA's mission and goals to understand and predict changes in climate, weather, oceans, and coasts.

Ensuring that UMD's rich output of climate and sustainability research has far-reaching impacts will be a priority of the School of Public Policy's newly announced **Center for Global Sustainability**. The center will help UMD researchers develop proposals in concert with partners worldwide, leveraging the university's expertise to help nations set and meet greenhouse gas emissions goals.

"As a major research institution, our duty is to work on solutions for important global issues like climate, not just in a strictly academic sense, but to ensure the innovations that come from our research programs are put into practice for the good of all people," says UMD Vice President and Chief Research Officer **Patrick O'Shea**.

The Climate Action 2016 forum will be held May 4 at the Stamp Student Union to give the academic community and civic and business leaders a chance to participate in discussions on the research and analytical processes needed to deal with climate change. The invitation-only summit in the nation's capital on May 5 and 6 will be attended by U.N. Secretary-General Ban Ki-moon and other top global officials.

To learn how to participate in the Climate Action 2016 forum at UMD, visit go.umd.edu/forum. View a request for proposals at go.umd.edu/forumRFP.

Tier 1 Seed Grants Get Research Rolling

The Division of Research recently announced winners of 2016 Tier 1 grants—awards of up to \$50,000 to help faculty show proof of concept and pursue sponsored research, or to support scholarship leading to a significant publication.

David H. Chae, an assistant professor of epidemiology and biostatistics, is investigating psychosocial stresses, including discrimination, on African-American HIV-positive gay men and how they shape health outcomes. He'll also investigate the utility of biomarkers for inflammation and cellular aging in the context of HIV.



Debabrata Biswas, an assistant professor of animal and avian sciences, will study genetic engineering of the probiotic organism *Lactobacillus casei* to produce more antimicrobial and anti-inflammatory conjugated linoleic acids. He will examine whether this raises the concentration of beneficial microbes in the gut and improves host health, aiming to eventually use the strain against dangerous antibiotic-resistant bacteria.

Nancy Gallagher, senior research scholar and interim director of the Center for International and Security Studies at Maryland, will create the world's first comprehensive, searchable, crowd-sourced database of satellites and space debris by designing a web portal and software using observations from scientists, amateur astronomers and commercial satellite operators.

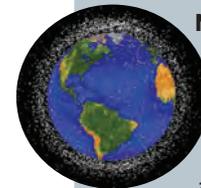


IMAGE: NASA

Sean Downey, assistant professor of anthropology, plans to conduct a two-year study of swidden—or slash-and-burn—agriculture in Maya villages in Belize. Among other methods, he'll use unmanned aircraft to analyze how landscape-scale patterns emerge without top-down planning, and whether traditional swidden systems are examples of emergent sustainability.

Mary A. Garza and Lesliam Quirós-Alcalá, assistant professors in the School of Public Health, will study the health needs of Latino employees at UMD, as well as assess their health behaviors, attitudes and concerns in order to identify barriers and facilitators of chronic disease prevention and inform health promotion programs.

Tier 1 application deadlines are June 1 and Dec. 1. The Research Development Office suggests that faculty schedule a meeting there prior to submission. For information, visit <http://research.umd.edu/development/faculty-incentive>.

3-D Printing: Campus Embraces Futuristic Fabrication

For faculty, staff and students across the Maryland campus, what some are calling "the future of manufacturing" is right now.

3-D printing, which uses additive fabrication to make objects from software designs, is available at locations in the A. James Clark School of Engineering's Terrapin Works, McKeldin Library and elsewhere. Most users looking to make a model, prototype or art project upload designs to desktop printers at the Makerbot Innovation Center (below, right), which opened last year. Prints are 10 cents per gram, with payment through Terrapin Express.

"With 3-D printing, you can democratize design, creativity and engineering at the same time," says **Darryll J. Pines**, Nariman Farvardin professor of aerospace engineering and dean of the Clark School. "Students today are thinking, could they be the next Google? The next Facebook? It's good to have that dream, and we want them to dream more. We are just giving them the tools to make them successful."

Terrapin Works has a range of more advanced printers for those who need them, says **Jim Zahniser**, executive director of engineering information technology. Among them are devices for printing metal pieces using a laser fired into a bed of powdered metal, and another that allows fabrications as small as 150 nanometers, used for virtual "organs-on-chips" in drug research. UMD bioengineering researchers, meanwhile, are printing living organic tissue that could one day save lives in human subjects.

"This has the capability to make things you couldn't make any other way," Zahniser says. "The technology is constantly evolving, and as more people use it, the costs will come down."



For information, visit terrapinworks.umd.edu.



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SPOTLIGHT

I-Corps Expanding the Reach of Innovation

A program that brings entrepreneurs and scientists together to propel federally funded research to market has been such a resounding success that it's being expanded to encompass more agencies.

UMD is the lead institution for the Mid-Atlantic node of the Innovation Corps (DC I-Corps) program, originally targeting National Science Foundation research, and now expanded to the National Institutes of Health. Other agencies are also preparing to come on board.

Dean Chang, associate vice president for innovation and engineering and lead principal investigator for the regional node, says I-Corps is a rigorous, proven model for research commercialization. President Barack Obama in August announced the program would be scaled up with eight new and expanded federal agency partnerships.

"I didn't think when we first started that I'd hear President Obama singing the praises of I-Corps," Chang says. "This is a national priority—a

transformational way to bring research innovations out of the lab and into society."

The DC I-Corps node, one of seven around the country, was founded in 2013 with a \$3.75 million NSF grant. It functions like an entrepreneurial boot camp. The evidence-based methodology kicks research teams out of their labs to conduct hundreds of interviews with potential end users, decision makers and payers to track and develop deep insight into business models and markets.

"They get out of the building and really begin to clearly understand with boots on the ground, what are the biggest customer pain points," he says. "They learn what adjustments, or 'pivots,' are needed to take advantage of opportunities they discover."

To attend an upcoming "Intro to I-Corps" workshop, visit innovation.umd.edu/learn/i-corps.



Dean Chang

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 Tara Burke, Director, Research Development Resources, at tburke13@umd.edu.

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FACULTY AWARDS & HONORS



Two University of Maryland faculty members were elected to the National Academy of Engineering, among the highest recognitions in the field. **ANTONIO J. BUSALACCHI**, professor of atmospheric and ocean science and director of the Earth System Science Interdisciplinary Center (ESSIC), was recognized for his international leadership in climate prediction and projection research, and for his work understanding tropical oceans in coupled climate systems via remote sensing. The academy also recognized **JAMES E. HUBBARD JR.**, Samuel P. Langley Distinguished Professor of aerospace engineering, for advances in the modeling, design, analysis and application of adaptive structures.



Endowed Associate Professor of Global Philanthropy and Nonprofit Leadership **ANGELA BIES** was named co-editor of *Nonprofit and Voluntary Sector Quarterly*. The publication is widely recognized as the top scholarly research journal in the field of nonprofit, philanthropic and civil society studies.

NEW FACULTY

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

Calvert W. Jones, assistant professor of government and politics, researches new approaches to citizen-building in the Middle East, with an emphasis on goals, mechanisms and outcomes in state-led social engineering efforts.

Taharee A. Jackson, assistant professor in minority and urban education, explores the development of critical consciousness in educators, policies for equity and diversity, and teacher-activists who advocate for social justice.

Jennifer D. Roberts, an assistant professor of kinesiology, researches the relationship between the built environment and physical activity and its impact on obesity and other public health outcomes.

Musa Subasi, assistant professor of accounting and information assurance, researches economic consequences of investor conferences and institutional and individual trading activity around various corporate events.

UPCOMING EVENTS & CONFERENCES

RESEARCH SEMINARS

Meet the Secretary

Anthony Foxx, Secretary of Transportation

April 14, 9:30 a.m.
Stamp Student Union
RSVP: go.umd.edu/foxx

Anthony Foxx, head of a federal agency with more than 55,000 employees and a budget exceeding \$70 billion, will discuss the future of transportation.



ARPA-E Research Overview

Eric Rohfling, Deputy Director for Technology, Advanced Research Projects Agency-Energy (ARPA-E)

March 28, 11 a.m.
Pepco Room, Jeong H. Kim Engineering Building
RSVP: go.umd.edu/Rohfling