J-WAFS | Abdul Latif Jameel World Water and Food Security Lab

J-WAFS Food & Water News

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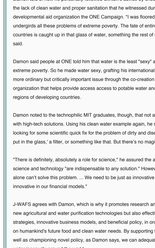
News Items

MIT 2016 Commencement speaker Matt Damon discusses the importance of working on global problems like water



Actor and humanitarian Matt Damon presented this year's MIT Commencement address. Damon's speech implored graduates to tackle the world's most important and challenging problems. Re-iterating the advice that former president Bill Clinton had given him, Damon urged the students to "turn towards the problems you see." "Engage with them," he added. "Walk right up to them and look them in the eye, then look yourself in the eye, and decide what you're going to do about them."

Damon told of how he personally followed Clinton's advice by choosing to do something about the lack of clean water and proper sanitation that he witnessed during a visit to Zambia with the developmental aid organization the ONE Campaign. "I was floored by the extent to which it undergirds all these problems of extreme poverty. The fate of entire communities, economies, countries is caught up in that glass of water, something the rest of us get to take for granted," he said.

Damon said people at ONE told him that water is the least "sexy" aspect of the effort to fight extreme poverty. So he made water sexy, grafting his international movie star glamour onto the more ordinary but critically important issue through the co-creation of Water.org, an aid organization that helps provide access access to potable water and sanitation in high-poverty regions of developing countries.

Damon noted to the technophilic MIT graduates, though, that not all problems can be addressed with high-tech solutions. Using his clean water example again, he said, "People are always looking for some scientific quick fix for the problem of dirty and disease-ridden water. A 'pill you put in the glass,' a filter, or something like that. But there's no magic bullet."

"There is definitely, absolutely a role for science," he assured the audience, noting that that science and technology "are indispensable to any solution." However, he emphasized, "science alone can't solve this problem. … We need to be just as innovative in public policy, just as innovative in our financial models."

J-WAFS agrees with Damon, which is why it promotes research and development not only of new agricultural and water purification technologies but also effective commercialization strategies, innovative business models, and beneficial policy, in order to have a positive impact on humankind's future food and clean water needs. By supporting technological innovation as well as championing novel policy, as Damon says, we can adequately prevent food and clean water insecurity around the world.

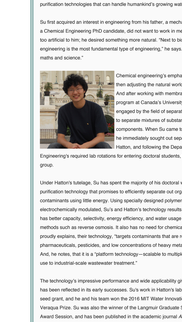
To view the video recording or read the transcript of Damon's commencement speech, click here.

J-WAFS PI Valerie Karplus named one of 2016's "Best 40 Under 40" Profs

Valerie Karplus recently made *Poets & Quants'* 2016 list of "The 40 Under 40 Most Outstanding MBA Professors." Karplus is bringing her expertise on air pollution, climate change, and China's energy system to cross-border, multi-disciplinary research teams working at the intersection of technology, innovation, the natural sciences, and engineering. As part of a diverse portfolio of research projects aimed at informing policy and advancing solutions to major societal challenges, her J-WAFS-funded project is a cross-disciplinary collaboration with Noelle Selin, the Esther and Harold E. Edgerton Career Development Associate Professor in MIT's Institute for Data, Systems and Society and in the Department of Earth, Atmospheric, and Planetary Sciences, that aims to quantify mercury contamination of rice in China through atmospheric emissions from coal-fired electricity generation. The project also looks at the impact of mercury-contained rice on food security in China.

For the full story, see the article by *Poets & Quants*.

Funding and Other Opportunities



The Rockefeller Foundation Cassava Innovation Challenge

Cassava is the main source of nutrition for approximately 50 percent of Africa's 1 billion people. This root crop has a very short shelf life, though. To address food spoilage, the Rockefeller Foundation, Gatsberg, and the International Institute of Tropical Agriculture (IITA) have launched The Rockefeller Foundation Cassava Innovation Challenge, a global competition that aims to increase the shelf life of cassava in Nigeria by rewarding novel solutions with technical assistance and up to $1 million in funding. The Cassava Challenge is open to both non-profit and for-profit organizations, including governmental and inter-governmental organizations. Applications will be accepted until July 8, 2016. For more information, visit RockefellerFoundation.org/CassavaChallenge.

Woodward & Curran Foundation Invites Applications for Clean Water Initiatives

The Woodward & Curran Foundation, the charitable arm of integrated engineering, science, and operations company Woodward & Curran, is accepting applications from nonprofit organizations for projects focused on protecting and promoting clean water sources. Track 2 Impact Grants: Three-year grants of up to $100,000 for innovative projects applying or advancing technology to address water issues relating to climate change. Letters of intent are due July 1, 2016. For further information, see the call for proposal.

The George Barley Water Prize

The George Barley Water Prize, presented by the Everglades Foundation, will award an unprecedented $10 million to the researcher or researchers capable of developing a cost-effective process for recovering phosphorus while yielding clean water from natural water bodies on a globally-applicable scale. Pre-applications are currently being accepted. For more info and to apply, visit BarleyPrize.com.

BIG Pitch Collegiate Innovation Competition

BIG Pitch Collegiate Innovation Competition, presented by the Ocean Exchange foundation, will award a $10,000 cash prize to undergraduate and graduate innovations that improve economies, health, and the environment, fitting under the theme of sustainability. The deadline for final registration is September 30, 2016. For more info and to apply, visit OceanExchange.org.

BORDA Global Fellowship Program

BORDA is offering one-year full-time fellowships, starting in September 2016, in India, Nepal, and Bangladesh. The Fellowship intends to bring the best talent globally to India's sanitation and wastewater management sector, while providing an opportunity for young professionals and students from across the world to work in, experience and learn from India's vast social and environmental challenges. BORDA will pay basic living costs and round-trip travel fare. Applications are due July 22, 2016. More information and the application form can be found on their website.

J-WAFS Highlight

A ChemEng PhD's pursuit of new technology to keep water clean

Water—clean and non-salinated—is life's most precious resource. Yet agricultural, industrial, and household wastes from human activity are increasingly polluting the world's limited reserves of freshwater. In order to protect this life-sustaining resource, contaminated water must be treated before returning to the environment. Water remediation is currently a costly, energy-intensive process, though. Xiao Su has spent his time as a doctoral researcher trying to develop purification technologies that can handle humankind's growing water treatment needs.

Su first acquired an interest in engineering from his father, a mechanical engineer. But Su, a Chemical Engineering PhD candidate, did not want to work in mechanics, explaining that it's too artificial to him; he desired something more natural. "Next to bioengineering, I think chemical engineering is the most fundamental type of engineering," he says. "I like its combination of maths and science."

Chemical engineering's emphasis on understanding and then adjusting the natural world to what attracts Su's interest. And after working with membranes in his undergraduate program at Canada's University of Waterloo, Su became engaged by the field of separation science—using processes to separate mixtures of substances into their individual components. When Su came to MIT for his doctoral studies, he immediately sought out separation expert Professor Alan Hatton, and following the Department of Chemical Engineering's required lab rotations for entering doctoral students, Su joined Hatton's research group.

Under Hatton's tutelage, Su has spent the majority of his doctoral work developing a water purification technology that promises to efficiently separate out organic compounds and other contaminants using little energy. Using specially designed polymers that can be electrochemically modulated, Su's and Hatton's technology results in a separation process that has better capacity, selectivity, energy efficiency, and water usage performance than current methods such as reverse osmosis. It also has no need for chemical additives. In addition, Su proudly explains, their technology, "targets contaminants that are really hard to remove, such as pharmaceuticals, pesticides, and low concentrations of heavy metals, in a selective fashion." And, he notes, that it is a "platform technology—scalable to multiple levels, anywhere from home use to industrial-scale wastewater treatment."

The technology's impressive performance and wide applicability give it great promise, and that has been reflected in its early successes. Su's work in Hatton's lab is funded through a J-WAFS seed grant, and he and his team won the 2016 MIT Water Innovation Prize and the associated Veraqua Prize. Su was also the winner of the Langmuir Graduate Student Oral Presentation Award Session, and has been published in the academic journal *Advanced Functional Materials*.

In addition to the academic success, the technology has garnered interest from the private sector. Companies ranging from a large beverage producer to a multi-national pharmaceutical manufacturer have contacted the research team about utilizing their technology for industrial use, which has spurred an effort within the team to spin out their technology into the commercial market. And Su couldn't be happier about it.

Set to receive his PhD in September and listed as the "lead entrepreneur" for commercializing the technology, Su is poised to lead the start-up venture as a founder and adviser. And he sees the move as a logical next step in his engineering career. The commercialization "validates that the technology we did in lab works in real life," he says. "I think that's the goal of engineering." And, of course, the goal of water purification.

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