J-WAFS is pleased to announce three new recipients of J-WAFS Solutions grants as well as the award of a second year of funding to two current projects. The J-WAFS Solutions program, funded through a research partnership with Community Jameel, the social enterprise arm of Abdul Latif Jameel Enterprises, and administered in partnership with the MIT Deshpande Center for Technological Innovation, awards grants of up to $150k per year for commercialization support.

This year’s projects include innovative technologies to improve food safety and water quality and make irrigation and pesticide application more efficient. J-WAFS’ financial support, as well as the mentorship from industry partners that the Solutions program facilitates, helps to move these water and food technologies from labs at MIT into the commercial world, improving the productivity, accessibility, and sustainability of water and food systems.

New 2017 J-WAFS Solutions projects:
- **In-situ Particle Characterization in Emulsions for Field-scale Quality Assurance in the Dairy Industry**
  - PI: Sanjay Sarma, Vice President for Open Learning and Fred Fort Flowers (1941) and Daniel Fort Flowers (1941) Professor of Mechanical Engineering

- **Reducing Runoff and Environmental Impact of Agricultural Sprays**
  - PI: Kripa Varanasi, Associate Professor of Mechanical Engineering

- **Developing Intelligent Selective Electrodialysis for 21st century Agriculture**
  - PI: John H. Lienhard V, Abdul Latif Jameel Professor of Water and Food, and Director, Abdul Latif Jameel World Water and Food Security Lab

Renewal grants:
- **Development of Low-Cost Water Filter Using Sapwood Xylem**
  - PI: Rohit Karnik, Associate Professor of Mechanical Engineering; Amy Smith, Senior Lecturer, Department of Mechanical Engineering and Co-director, D-Lab

- **Detection of Pathogens Using Dynamically Reconfigurable Liquid Colloid Particles**
  - PI: Timothy Swager, John D. MacArthur Professor of Chemistry; Alexander M. Klibanov, Novartis Professor, Chemistry and Bioengineering

The J-WAFS Solutions program aims to help MIT faculty and students commercialize breakthrough technologies and inventions by transforming promising ideas at MIT into innovative products and cutting-edge spin-off companies. Details about the J-WAFS technologies awarded grants this year are available via this MIT News article and at the J-WAFS website.
Reminder: J-WAFS Grant for Water and Food Projects in India

J-WAFS is still accepting submissions to the J-WAFS Grant for Water and Food Projects in India, a new funding opportunity for current members of the MIT community interested in addressing a water or food challenge in India. This grant is intended to further work being pursued by individuals as part of their MIT research, innovation and entrepreneurship initiatives, coursework, or other relevant new activity. Up to three grants, totaling $15,000, will be awarded.

Submission deadline is 5:00 PM EST on September 18th, 2017. Interested applicants should refer to the J-WAFS Water and Food Projects in India call for proposals for instructions and application requirements.

J-WAFS Highlight

Mission-driven MIT start-up seeds both resilient water systems and economies in rural Mexico

There is a village in the Yucatan peninsula called La Mancalona. This community of 450 residents is in a tropical jungle region of rural Mexico where beekeeping and subsistence farming are the main means of employment. It is remote, and until 2013, community members lacked access to clean drinking water; instead, they relied on expensive bottled water or bottled soda, a cheaper alternative.

2013 was the year that the village joined up with an MIT research team to pilot a new technology. Leading the MIT team was Steven Dubowsky, professor emeritus of mechanical engineering at MIT, Amy Bilton, then a postdoc in MIT’s Department of Aeronautics and Astronautics, and MIT mechanical engineering research associate Huda Elasaad. The technology? Photovoltaic powered reverse osmosis: modular, scalable, rooftop solar-powered water filtration.

The collaboration between Dubowsky and Elasaad began at the MIT Center for Clean Water and Clean Energy, a partnership between MIT and King Fahd University of Petroleum and Minerals (KFUPM) in Saudi Arabia. They shared a passion for meeting the need for affordable clean water with effective technology and a desire to elevate communities economically and socially with their work. This vision has since grown from a successful field trial in La Mancalona to the launch of a Somerville-based startup with an economic justice mission: PV Pure.

PV Pure’s water purification system provides villages that do not have access to affordable clean water the methods to gather, purify, and sell water through the power of renewable energy. Solar panels charge batteries that pump water from existing sources (both brackish well water and collected rain water), power internal UV sterilization bulbs, and push water through a set of semiporous water filtration membranes. Their systems range in production from 250 to 26,000 liters of purified water per day. When the average person in Mexico consumes approximately 2-5 liters of drinking water per day per person, this contribution is significant.

The system is operated via smart controls that tune its functionality for changes in climate, weather, and water chemistry. It is also maintenance optimized. These elements ensure resiliency for the technology, consistency for its clean water outputs, affordability, and ease of use. Individuals of any skill level and technical background can be trained in the system’s use and maintenance, an essential quality for a technology designed for remote areas.

Before participating in the technology pilot, La Mancalona was like many other rural communities around the globe without access to clean water. Residents lacked access to accessible and affordable water filtration technologies. They relied on expensive bottled water, often spending up to 25% of their income. So, when Dubowsky, Elasaad, and their team began work there, they knew they had a lot to learn.

Their organizational partner, Fondo Para La Paz, provided essential support as they facilitated a user
adoption process with high standards for cultural sensitivity. "We tried very hard to integrate the community into every stage of implementation in the Yucatan. It was so important for us to make sure that the community there embraced and valued the technology, because we knew that its future was actually in their hands," said Elasaad. This entailed extensive training in operation and maintenance as well as broader education in clean water use. As Elasaad puts it, "safe water doesn't stop at the system."

In addition to enabling small communities to be water independent, PV Pure’s technology creates a secondary economy. Trained residents run and maintain their systems, selling water to others at a price that everyone can afford. In La Mancalona, local device operators sold their outputs at 5 pesos per 20-liter bottle, just one-fifth of what the equivalent bottle of water would cost. After covering labor and maintenance, they still earned a profit – $3,600/year that was re-invested in their community.

The two-year pilot at La Mancalona proved the effectiveness of the solar powered reverse osmosis technology as well as the community-centered economic philosophy behind it. The technology proved to be so valuable that at the end of the pilot Dubowsky and Elasaad received a list of over 80 villages in the surrounding area of the Yucatan that were in need of it. It was then that the team realized that they couldn’t meet the need for their work through the non-profit model that they had been following. They looked to business for a road map to bring their technology into the hands of those who need it and still achieve the social good that underscores their efforts.

In 2015 they incorporated as PV Pure, and moved their fledgling startup to Greentown Labs, an incubator for clean tech in Somerville, Massachusetts. Since then the PV Pure founders have focused on building their team while conducting additional field trials, developing on-the-ground partnerships, and formulating strategic manufacturing and deployment strategies. At present, they are focusing on Mexico, the Caribbean, and the southwestern United States, due to abundant solar availability and need for clean water. In a few months, they will bring water to 18,000 people in the Sonoran desert through a collaboration with the Yaqui indigenous community and facilitated by the sponsorship of the energy company IEnova. While they see a global potential for their product, in some ways, the team already feels like they’ve made it. As Elasaad puts it, "we’ve all decided that whether we help one village or a million it’s all worth it.”

And they may be poised to reach a million. When a technology effectively meets an important need, its users are often the most convincing marketers. The water entrepreneurs of La Mancalona are now selling water to tourists who come to their region to visit the Mayan ruins. The transaction that occurs is so much more than just financial: they’re educating foreigners about new water utility possibilities that can emerge through the union of technology and community engagement.

PV Pure’s management team:

Huda Elasaad
Co-Founder
Chief Scientist

Steven Dubowsky
Co-Founder
Chief Engineer

Mark Sears
C.E.O.

MIT News, Opportunities, & Water and Food Events

New MIT Course on Water Innovations for Developing Countries

This fall, Susan Murcott of MIT's D-Lab will be joined by MIT alumna and water entrepreneur Kate Cincotta to teach a new class, Water, Sanitation, Hygiene and Environmental Innovations for the Common Good. Featuring weekly hands-on lab activities – such as how to drill a water well, how to test water quality, how to build a slow sand filter, and more – the course will cover both theory and real-world practice related to water/environment innovations in developing countries and underserved communities worldwide. The class is open to MIT graduate (11.474) and undergraduate (EC.715) students.
Katherine Taylor, 28, Named MIT Technology Review's "35 Innovators Under 35"

Katherine Taylor MS '15, who is CEO and co-founder of the MIT spinout Kethworks, has been named one of "35 Innovators Under 35" by MIT Technology Review. The simple water pump that she developed during her mechanical engineering master's program at MIT could transform the lives of millions of farmers in India.

Kethworks builds reliable, solar-powered irrigation systems that enable their customers to farm year-round, a challenge in India where diesel or kerosene pumps are prohibitively expensive.

Vote for Water and Food Innovation Finalists through MIT Solve

MIT Solve’s 2017 Solve Global Challenge finalists have been announced and are available for a vote. Teams from MIT and across the world responded to the topics of Brain Health, Sustainable Urban Communities, Women and Technology, and Youth, Skills, and the Workforce of the Future. Water and food innovations are well represented in the finalist pool, including the MIT team Pipeguard.

Read more... Deadline September 16th, 2017.

Outdoor Screening of Poverty, Inc. at MIT

MIT’s Legatum Center and Lab for Chocolate Science are hosting an outdoor screening of the documentary film Poverty, Inc. The film examines the international development industry with perspectives from 200 people in 20 countries across the globe. From U.S. agricultural subsidies to solar panels, TOMs Shoes to international adoptions, the film challenges viewers to ask the question: Could I be part of the problem?

When: September 7th, 7:00 PM
Where: MIT Stata Center outdoor amphitheater
32 Vassar Street, Cambridge

MIT Water Club BBQ Open House

Meet this year's Water Club leadership and learn more about the activities for the coming year as well as how to get involved.

When: September 13th, 4 PM
Where: Kresge BBQ Pits (near MIT Student Centre)

More info

MIT Water Innovation Prize Kickoff Dinner

Save the date for the kickoff dinner for this year's MIT Water Innovation Prize. Learn more about water innovation, pitch your own idea, or network with others to find teammates for a future water innovation team. The dinner will include invited speakers who will discuss the world’s water challenges and new innovations to address them.
MIT Water Summit

Save the date for the 2017 MIT Water Summit. The theme of this two-day summit is the water and food nexus. Panels and keynote speakers from academia, government, industry, and other sectors will be present.

When: November 6 - 7th
Where: MIT Wong Auditorium

More info

Greentown Labs Energybar

Join Greentown Labs for a panel discussion focused on the water sector. The panel will highlight challenges water-based startups encounter and how to overcome them, as well as why startup and corporate partnerships in water is a valuable pursuit. More information is available here.

When: September 7th, 5:30 - 8:30 PM
Where: Greentown Labs, 28 Dane Street, Somerville, MA 02143

Northeast Graduate Student Water Symposium 2017

Attend the Northeast Graduate Student Water Symposium (NEGSWS) on September 8 - 10, 2017. The symposium includes student-led sessions and discussions on regional approaches to research needs, funding, and teaching needs on water-related subjects.

When: September 8 - 10th, times vary
Where: University of Massachusetts, Amherst

More info and registration

NEWIN Massachusetts Water Week

Join the New England Water Innovation Network (NEWIN) for a week of events focused on water innovations and highlights from their network partners. Networking sessions, company tours, incubator open-houses, water facility tours, dinners and meetings comprise the range of opportunities for engagement that are available.

The week culminates in the NEWIN Symposium on Water Innovation: Innovating a New Future for Wastewater Management at Worcester Polytechnic Institute in Worcester, MA. MIT staff and students can receive a discount by registering as a NEWIN affiliate. Contact Marcus Gay for more information about the discount at marcus@novustechnicalservices.com.

When: September 11th - 18th, dates and times vary
Where: Locations vary

More info and registration

NEWIN Water Pitch Night: Water IT, Sensors, Data Analytics and Security

NEWIN is hosting Water Pitch Night in Boston on September 14th. Speakers from MassTech Collaborative and OpRTC will discuss their sensor, security, and analytics technologies.

When: September 14th, 5:00 - 8:00 PM
Where: 50 Milk Street, Boston, MA

More info and registration

Funding and Other Opportunities

New Product Initiative Engineer Position at Gradiant

MIT startup Gradiant is seeking a product initiative engineer. This technology-driven water service
company focused on purifying contaminated water from oil and gas extraction and other industrial processes. Their systems commercially convert highly contaminated waste streams to drinking-quality water. Visit their website for more information about the position.

Job and Fall Internship Opportunities with Ceres

Ceres, a sustainability nonprofit organization working with influential investors and companies to build leadership and drive solutions, has open positions for employment and internships in Boston. The organization tackles the world’s biggest sustainability challenges, including climate change, water scarcity and pollution, and human rights abuses. Visit their website for more information about the positions.

PhD Student Position at Arizona State University

Two PhD student position are available in the Garcia Lab at the School of Sustainable Engineering and the Built Environment (SSEBE) at Arizona State University (ASU) beginning in spring ’18. Research topics include: hydrological variability and change, sustainable water management, coupled (socio-hydrological or socio-ecological-technical) systems analysis, and resilient infrastructure systems. Visit their website for more information.

ITRI-Rosenveld Postdoctoral Fellowship in Water-Energy Technologies

The Energy Technologies Area at Lawrence Berkeley National Laboratory invites applications for a distinguished postdoctoral fellowship opportunity in water-energies technologies. Applicants for the two-year appointment should apply directly to the CERC-WET website and identify a topic; an ETA mentor is required. Application materials are due by November 1, 2017.

USDA Announces $400,000 to Support Agricultural Science Entrepreneurs

The U.S. Department of Agriculture's (USDA) National Institute of Food and Agriculture (NIFA) is awarding $400,000 through a new competition to help university researchers in agricultural science bring their discoveries to the marketplace. The competition, Innovations in Food and Agricultural Science and Technology (I-FAST), is a joint initiative of NIFA and the National Science Foundation (NSF). Pre-applications are due September 8th, 2017. Visit the website for more information.

Apply for the MATTO New Ventures Showcase

The Massachusetts Association of Technology Transfer Offices (MATTO) and the Massachusetts Technology Transfer Center (MTTC) are showcasing start-ups in food and nutrition, ocean and marine sciences, big data, clean tech, as well as other fields in a forum on October 13th, 2017. Visit the MATTO website for a presenter application form. Registration is $80 for MATTO members and $100 for non-members.

Pilot Program: Tipping Points Request for Applications

The Foundation for Food and Agriculture Research seeks applications for developing and testing computational and mathematical methods – with existing approaches – that deepen our understanding of the complex relationship between the food system, health, and the environment. The goal of this Request for Applications (RFA) is to support projects that encourage food system-level transformations that promote positive community-wide health outcomes and economic opportunities. Funded projects will examine multiple food-system interventions and environmental factors to address how components of a system function within the context of their environment. The collective behaviors that arise from individual elements of the food system working together to alleviate food insecurity and increase health outcomes will also be considered. A letter of intent and matching funds are required for this RFA; the deadline is September 13th, 2017. More information and submission guidelines

Call for Community Input: Science Breakthroughs in Food and Agriculture

Throughout the next six months, the National Academies of Sciences, Engineering, and Medicine’s Science Breakthroughs 2030 will explore new scientific approaches and ideas in food and agriculture. Individuals can share ideas, insights, and tools via the project’s website. After collecting input the study committee will produce a report describing ambitious and achievable scientific pathways to address problems and opportunities in the food and agriculture system. More information and idea submission