

THE
MIT
I&E
LANDSCAPE

2015–2016



INTRODUCTION

The innovation and entrepreneurship (I&E) landscape at MIT spans an extensive range of programs, organizations, and student groups dedicated to fostering innovation on campus and beyond. The landscape is diverse, offering a vast array of activities to support the MIT community's aspirations of advancing ideas from conception to impact.

The inaugural 2015-2016 MIT I&E Landscape publication highlights the many events and activities which took place throughout the year. From teaching students the ins and outs of entrepreneurship; helping young engineers develop leadership skills; to empowering researchers to bring technologies to market; and connecting the best minds in the healthcare ecosystem to solve the industry's biggest challenges; the collective footprint of the MIT community is felt throughout the Institute and around the globe.

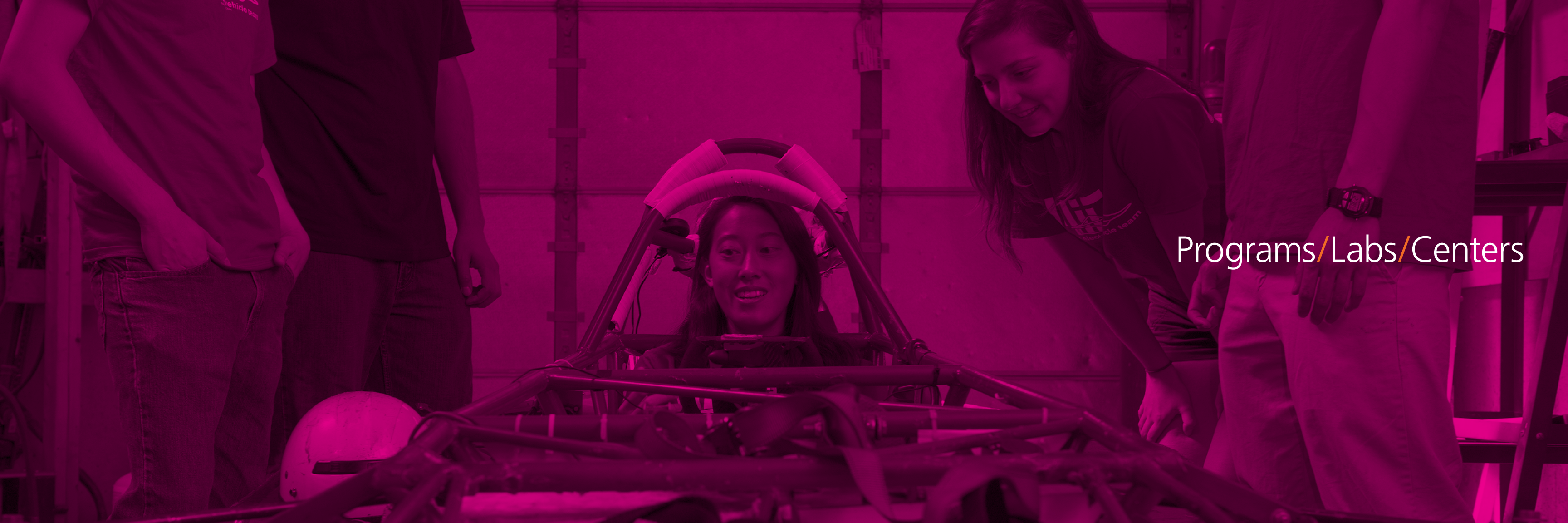
The MIT Innovation Initiative works with all five schools at MIT to support the I&E landscape as a connector, convener, and partner, so that we can jointly strengthen the educational pathway and networks for our innovation communities to realize their ideas.

As you flip through these pages, we hope you'll join us in celebrating the accomplishments of the vibrant I&E community at MIT, and we hope you enjoy reading about the exceptional students they support.



To learn more about the MIT Innovation Initiative, visit innovation.mit.edu.





Programs/Labs/Centers

ABDUL LATIF JAMEEL WORLD WATER AND FOOD SECURITY LAB

Population growth, climate change, urbanization, and development are bringing unprecedented challenges to meeting the world's diverse needs for water and food. The Abdul Latif Jameel World Water and Food Security Lab (J-WAFS) was established in 2014 as an Institute-wide effort to bring MIT's unique strengths to bear on these problems.

J-WAFS coordinates and promotes water and food research at MIT, emphasizing the deployment of effective technologies, programs, and policies that will have a measurable and international impact as humankind adapts to a rapidly expanding and evolving population on a changing planet.

By spearheading the efforts of faculty, labs, and centers at MIT to work towards solutions for water and food security that are energy-efficient and environmentally benign, J-WAFS promotes the development and commercialization of the next generation of

technologies that can be broadly applied to food safety, urban water supply, agriculture and irrigation, and watershed protection.

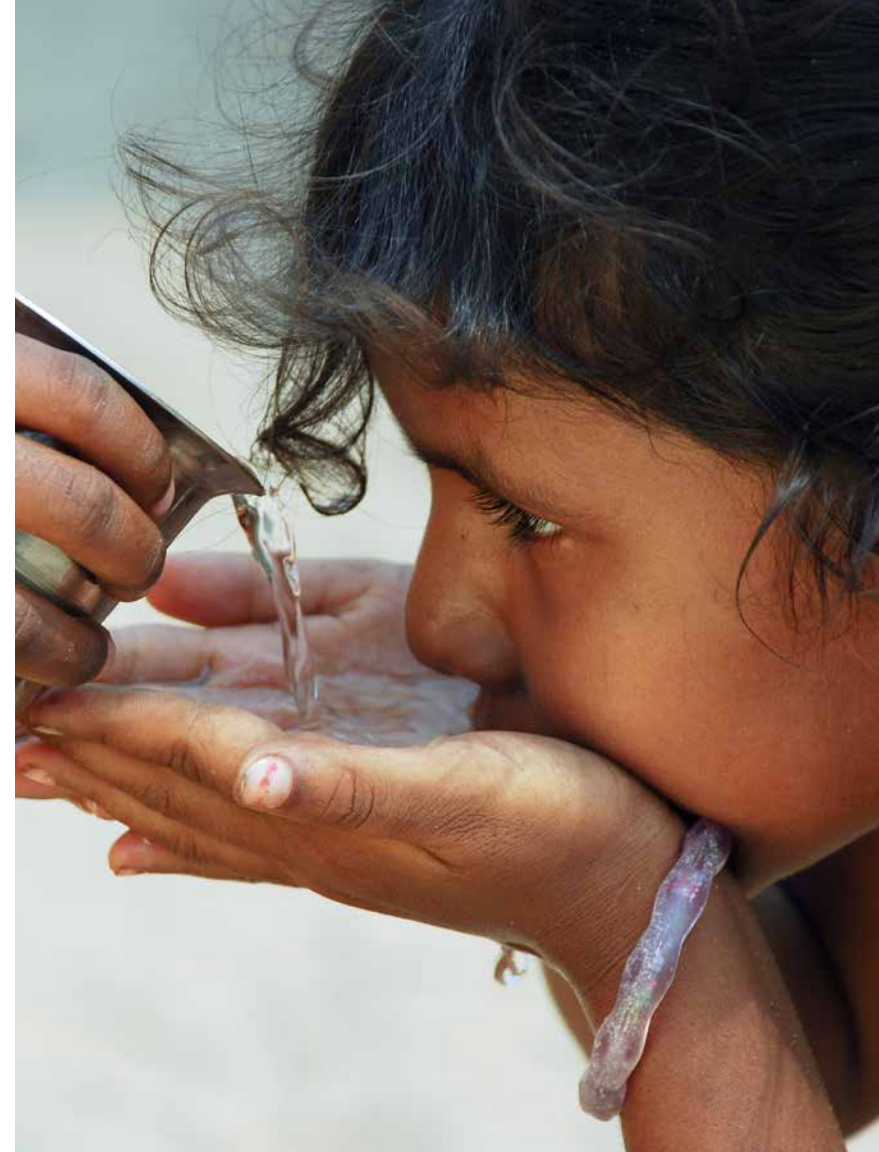
By collaborating with domestic and international partners, J-WAFS brings MIT's expertise to bear on issues that arise in specific regional contexts, spanning diverse societies, environments, and economies.

By supporting graduate student-driven water and food research and business communities on campus—through fellowships, conference sponsorships, and other mentoring and assistance—J-WAFS is strengthening an energized community around water and food-related research at MIT while developing the next generation's capacity to address these issues.

The J-WAFS Solutions program has the specific mission of moving water and food technologies from labs at MIT into the commercial world, where they will improve

the productivity, accessibility, and sustainability of the world's water and food systems. Managed by the Deshpande Center for Technological Innovation, the program provides grants and support to help faculty and students commercialize breakthrough technologies and inventions by transforming promising ideas at MIT into innovative products and cutting-edge spinout companies.

Learn more at jwafs.mit.edu.



Profile Charles Swofford



Charles (Charley) Swofford obtained his PhD in chemical engineering from the University of Massachusetts Amherst and currently works in the Sinskey Lab at MIT as a postdoctoral associate. His research interests lie in the interface between engineering and biology, focusing on developing synthetic biology tools for industrial and clinical applications.

Charley works on the J-WAFS Solutions-supported project—A Multiplex, Nanosensor Platform for the Real Time Monitoring of Food and Water-Borne Contaminants—led by Professors Anthony Sinskey and Michael Strano. The interdisciplinary team is creating a single integrated platform that can address food and water contaminants in a low cost, widely deployable nanosensor array.

In collaboration with the chemical engineering group, Charley is working to develop DNA aptamers that can recognize various analytes in food and water, including allergens, heavy metals, and pathogens. These aptamers can be attached to optical carbon nanotube sensors developed in the Strano lab that emit light in the near-infrared upon successful binding of an analyte. The final platform will help both manufacturers and end users identify over 300 distinct contaminants.

Catalyst is a new program designed to accelerate and heighten the impact of translational research. Catalyst was incubated in the Madrid-MIT M+Visión Consortium, which focuses on biomedical technology innovation. In partnership with the MIT Innovation Initiative, Catalyst will extend the model to additional fields and departments across the Institute.

Participation in Catalyst offers to young professionals, the opportunity to lead innovation projects; to students and trainees, hands-on research experience; to industry and sector specialists, chances to participate in innovative R&D and improve their own innovation activities; and to mid-career and senior leaders, high-impact teaching and mentorship opportunities—all while advancing new technologies with the potential to benefit people. Catalyst teams have included over 150 people in 88 research groups who

have produced 20 projects with potential for healthcare impact.

Many of the 18 Catalyst teams in the last year, all with projects launched from scratch between 2012 and 2015, have shown promising signs of translational success, including four licenses, two startups, and \$9 million raised from public and private translationally-oriented funding sources. Teams were recognized by the Spanish Foundation for Science and Technology, *Technology Review Spain*, Impacto Salud, and MassChallenge. This rate of progress is in part due to Catalyst's novel innovation method called IDEA3.

One such project that gained wide attention in 2015 is called neuroQWERTY. The team is developing a software-based technology to quantify motor impairment—detecting imperceptible delays in keyboard interaction that could signal neurodegeneration. Their

belief is that the technology could someday help to detect diseases like Parkinson's in patients years before clinical symptoms become apparent. Team neuroQWERTY has been recognized in the Singapore Challenge, won a significant grant from the Michael J. Fox Foundation, and was covered in international media publications.

Learn more at mvisionconsortium.org.



Profile **Álvaro Sánchez-Ferro**



Dr. Álvaro Sánchez-Ferro joined the Catalyst program in 2013. He earned his MD from the Autònoma de Madrid University in 2004, and specialized in neurology at the 12 de Octubre Hospital of Madrid in 2009. He became interested in neurodegeneration while studying the genetic evaluation of Parkinson's disease under Dr. Thomas Gasser's supervision at Hertie Institut (Tübingen, Germany).

Although Dr. Sánchez-Ferro enjoyed patient care, he was drawn to MIT and the Catalyst program as "an opportunity to try to have impact on health care and have things change." Along with collaborators, he is trying to identify opportunities and thinks "we have found some gaps where technology could really help. We are completing evaluation of the basic tool and we have run a couple of studies. We've published results and we are about to publish again."

Dr. Sánchez-Ferro credits the Catalyst program for helping him grow as a scientist and entrepreneur, saying it enabled him to "start something from scratch and grow it...but also how to be realistic and imagine what will happen in the future...to envision the future."

DESHPANDE CENTER FOR TECHNOLOGICAL INNOVATION

Innovation is a two-part process, and it's rarely linear.

First come the transformative scientific discoveries. They are inspired by failed experiments, fortuitous conversations, enlightened insights—or some other combination of knowledge and chance. By supporting these nascent ideas, the Deshpande Center for Technological Innovation places MIT researchers on the path to realize the impact of their research.

In the second stage of the innovation process, transformative ideas are translated into processes or products with direct, large-scale impact for the world. Deshpande Center grantees are introduced to and engaged with a powerful network of people and resources who assist them in refining their understanding of potential markets, developing commercialization strategies, and drawing up startup company business plans.

MIT **DESHPANDE CENTER**
FOR TECHNOLOGICAL INNOVATION

Launched in 2002, the Deshpande Center has supported more than 140 original research projects. These projects have led to the formation of 30 startup companies, which collectively have attracted more than \$500 million in private investment.

The center manages three grant programs, two of which are run jointly. The Masdar Institute and MIT Innovation Program is a partnership with the Masdar Institute (MI) and supports projects being run jointly by MIT and MI faculty. The second is run in collaboration with the Abdul Latif Jameel World Water and Food Security Lab (J-WAFS). These projects are required to align with J-WAFS' strategic research focus around water and food supply.

To help raise awareness of funded research projects and assist them on their path to commercialization, the center hosts a range of events each year. The centerpiece

event IdeaStream gathers leading minds in innovation and is aimed at connecting MIT researchers with the entrepreneurial community. The annual symposium includes presentations and posters highlighting grantees at different stages, from new grantee to spin-off. Roughly 200 entrepreneurs, industry executives, venture capitalists, and MIT researchers attend the conference, which has the generous support of corporate sponsors.

The center regularly meets with delegates from numerous national and international universities and organizations to discuss the Deshpande Center's and MIT's approach to innovation and technology commercialization. The Deshpande Center is seen as an internationally renowned model for stimulating technological innovation.

Learn more at deshpande.mit.edu.



Profile Karl Gantner



Karl Gantner '16 pursued an MBA and a master's degree in aeronautics and astronautics. He works as the program manager on the Nanosatellite Optical Downlink Experiment (NODE) project managing schedule, budget, and commercialization strategy. NODE is a high-data-rate communications laser built to meet the expanding downlink needs of nanosatellite operators.

Last spring, the NODE team had arranged a demonstration mission on a commercial nanosatellite, but lacked funding to build the necessary hardware. Also looking to commercialize the technology, Karl and the NODE team found a perfect fit with the support and funding from the Deshpande Center.

GORDON-MIT ENGINEERING LEADERSHIP PROGRAM

The **Bernard M. Gordon-MIT Engineering Leadership Program** (GEL), launched in 2008, aims to develop the next generation of engineers—leaders who are empowered not only with technical know-how but with the confidence to create the innovations of tomorrow. GEL cultivates an understanding of the creative and inspirational components of the leadership equation as a complement to a student's technical education.

The Gordon Engineering Leadership Program endeavors to be a national model for training tomorrow's engineering leaders. The aim is to promote idea-to-impact teaching and learning. This approach doesn't simply expand students' technical knowledge—it contributes to their ability to provide real-world solutions that scale rapidly and achieve broad positive impact.

The program provides a series of immersive exercises and classes in which juniors and seniors develop leadership skills that help

them to become highly effective leaders of engineering teams. GEL builds on the Undergraduate Practice Opportunities Program (UPOP), but students can also enter by having demonstrated equivalent experience in an engineering project in an academic or industrial setting.

The first year of the program (GEL1) introduces students to engineering leadership experiences and development, and sees approximately 150 students participate. For an exclusive group of 30-35 students, the second year of GEL (GEL2) is an intensely personalized leadership development program that includes the highly experiential Engineering Leadership Laboratory where students develop their skills immersively, complementing the program's other courses.

GEL provides students with the knowledge and hands-on practice needed to lead successful careers in the engineering industry. Engineers from industry participate in the

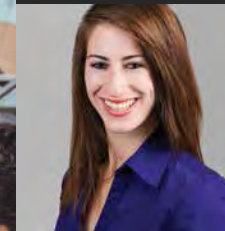
leadership labs, and GEL's alumni have gone on to accept positions at a wide-range of companies.

In response to an increased interest in helping to support MIT's graduate population, GEL is working towards creating a fully developed leadership development program for graduate students in the Schools of Engineering, Science, and Architecture, and the School of Humanities, Arts and Social Sciences. Dr. David Niño has been hired to oversee this initiative and currently teaches GEL's first graduate course, 6.928 (Leading Creative Teams).

Learn more at gelp.mit.edu.



Profile Julia CrowleyFarenga



Julia CrowleyFarenga is an aeronautics and astronautics major and second year student in the GEL program. Julia entered GEL because she felt it was the best way for her to strengthen the skills she will need to address engineering problems and have an impact on the world.

The program presented Julia with real leadership challenges, working with peers to practice leadership and teamwork in a variety of structured exercises, and gave her the feedback needed to develop her abilities as a team leader. During Julia's first year of GEL, she was elected as president of the MIT Rocket Team. While serving in this new leadership role, she found herself using the knowledge and skills she was learning in GEL and applying them in real time.

Julia's experiences in GEL taught her how to become a more effective leader and played a major role in her team's success as they went on to win the 2015 Intercollegiate Rocket Engineering Competition.

This year as a GEL2 student, Julia was promoted to the selective role of team coach. As team coach, she provides feedback and coaching to a multidisciplinary team of first year students. "I am amazed and inspired as I watch their leadership skills and self confidence develop," she says.

After Julia graduates from MIT, she plans to attend graduate school and continue her studies in rocket propulsion. She is confident that participating in GEL has prepared her for whatever future challenges she might face as a teammate and as a team leader. "This program has had an incredible impact on me," she says.

IMPACT PROGRAM

IMPACT provides career development for post-doctoral and advanced pre-doctoral trainees through a six-month mentorship program to focus their work for heightened real-world value. It was prototyped in 2015 at MIT through the Innovation Initiative, and has since won a grant from the National Institutes of Health to sustain it for five years.

The expanded program now includes trainees from research institutions across the region—currently including Brandeis University, Harvard University, Beth Israel Deaconess Medical Center, Boston University, Massachusetts General Hospital (MGH), Tufts University, Mass Eye and Ear, and UMass Medical, as well as MIT.

The program is designed to help trainees, known as IMPACT Fellows, to sharpen their career focus, explore alternative career paths, and develop their skills at articulating their work for diverse audiences. Meeting weekly, fellows work in groups and in one-to-one

sessions with mentors. Upon completion of the program, trainees will have obtained first-hand experiences exploring important personal and professional challenges that otherwise may take years to encounter, and greater confidence to make strategic decisions about their future.

IMPACT trainees come from a wide range of research programs in chemistry, biological engineering, mechanical engineering, chemical engineering, brain research, materials science, and other areas. The first cohort included 12 trainees and 23 in the first half of 2016. Another cohort of 24 will be recruited for a fall term.

Faculty mentors in IMPACT represent a similar diversity of institutions and expertise. They include MIT, Beth Israel, Harvard Medical School, MGH, BioVentures Investors, Brigham and Women's Hospital, Syros Pharmaceuticals, Concert Pharmaceuticals, PDS, and others. The 28 mentors have expertise

ranging from basic science to engineering, product development, and technology commercialization.

IMPACT is part of the Institute for Medical Engineering and Science and the MIT Innovation Initiative.

Learn more at impactprogram.mit.edu.



Profile **Reeja Jayan**



Dr. Reeja Jayan is an assistant professor of mechanical engineering at Carnegie Mellon University. She was previously a postdoctoral associate in chemical engineering at MIT working under Professor Karen Gleason. Dr. Jayan leads a multidisciplinary lab engaged in the molecular scale design and synthesis of organic (polymers), inorganic (ceramics), and organic-inorganic hybrid thin film materials for applications in energy generation, energy storage, and biosensing.

Her work has resulted in 18 peer-reviewed journal publications and filing of four patent applications. She is a member of the MIT Innovation Initiative and is a co-founder of the MIT Think Tank, an organization geared towards interdisciplinary problem solving.

While an IMPACT Fellow, Dr. Jayan was interviewing for faculty positions and experiencing the challenge of the process. IMPACT helped her to “rewire” her approach to communicating her work to diverse audiences, and to think more strategically about her career options and negotiations. In addition, IMPACT helped Dr. Jayan explore new directions in technology research, motivated by a medical problem in which she has particular interest.

LEGATUM CENTER FOR DEVELOPMENT AND ENTREPRENEURSHIP AT MIT

The **Legatum Center** aims to accelerate broad-based prosperity across the developing world through innovation-driven entrepreneurship. The center realizes this mission by building pathways for the MIT community to develop the specialized knowledge, capabilities, mindset, and networks they need to accelerate progress.

The center administers a competitive fellowship program for MIT students that have demonstrated a commitment to building and scaling impact in the developing world through their entrepreneurial venture.

In addition, the Legatum Center offers seed grants for students looking to explore and experience opportunity out in the field. The center also convenes an annual conference and hosts community lectures and workshops throughout the year to promote and shape the discourse on bottom-up development and system change through innovation-driven entrepreneurship.

In fall 2015, the Legatum Center welcomed a diverse cohort of 19 students who represent many academic stages and programs across the Institute. Students are implementing their ventures in regions across the developing world (Nigeria, Kenya, Egypt, Sudan, Uganda, Tanzania, Ghana, Cote d'Ivoire, South Africa, Mexico, China, India, Bangladesh, and Thailand) and represent many different sectors (IT and telecommunications, education, food and beverage, professional services, energy and utilities, agriculture, transportation, and health care and pharmaceutical).

As part of the Legatum Fellowship, students were awarded more than \$650,000 in tuition and stipend support and \$42,000 in travel seed grants. The center delivered customized programming, including primary market research and product development workshops in collaboration with the Martin Trust Center for MIT Entrepreneurship; a structured mentorship program matching all fellows with mentors from the MIT network

based on student needs; peer-led sessions hosted by MIT alumni; and several social and cohort-building activities.

In FY 2016, fellows and the growing alumni community continue to gain recognition for the great work they are doing. Bilikiss Adebisi-Abiola, a 2010-2011 fellow, was featured in *The Nerve Africa's* 20 Africans That Should Inspire Your 2016 as a successful entrepreneur whose company, Wecyclers, won the Seif Awards for social entrepreneurship. Wecyclers also won the Case Foundation's \$55,000 prize money at the Pitch For Lagos event in July 2015. Adetayo Bamiduro, a 2014-2015 fellow and founder of MAX, a logistics venture offering hyper local delivery services for consumers and businesses in Lagos, Nigeria, won second place at the TechCrunch Disrupt Conference in London in December 2015.

Learn more at legatum.mit.edu.



Profile Aukrit Unalahekhaka



Having grown up in a rice and corn-producing region in Thailand, Aukrit Unalahekhaka came to MIT to pursue a master's degree in the System Design & Management (SDM) program, jointly offered by the School of Engineering and the Sloan School of Management, with the goal of launching a high-impact venture around a technology platform that improves livelihoods for smallholder farmers in Pakistan, Thailand, and China.

In September 2015, Aukrit joined the Legatum Center's 2015-2016 fellowship cohort to accelerate the launch of Ricult, a web-based service through which farmers access credit markets to purchase high-quality inputs, sell their crops directly to buyers, and receive farm gate price data. He exemplifies MIT's motto, "mens et manus," by using skills and knowledge acquired through his SDM studies, his experience in management consulting with international firms, and his understanding of the challenges smallholder farmers face to develop an innovative and scalable solution. As an entrepreneurial leader, Aukrit is a role model for high-impact entrepreneurs across the developing world and also a community leader for MIT students by inviting industry experts to speak at student club events about opportunities for innovation-driven business in the developing world.

LEMELSON-MIT PROGRAM

The Lemelson-MIT Program celebrates outstanding inventors and inspires young people to pursue creative lives and careers through invention.

YOUNG INVENTORS BEGIN INVENTEAM EXPERIENCE

In October 2015, 14 teams of high school students received up to \$10,000 each in grant funding from the Lemelson-MIT Program as part of its 2015–2016 InvenTeam initiative. InvenTeams showcased their inventions at MIT during EurekaFest 2016.

FIRST MASS-PRODUCED ECO-FRIENDLY BATTERY

Jay Whitacre, PhD, a materials scientist and professor at Carnegie Mellon University's College of Engineering, received the 2015 \$500,000 Lemelson-MIT Prize. He was honored at EmTech MIT on November 2, 2015.

A MICRONEEDLE PILL, CONNECTED CAR DEVICE & MORE

Teams comprised of undergraduates from Western Michigan University and Pennsyl-

vania State University, along with graduate students from MIT and North Carolina State University, were awarded the 2015 Lemelson-MIT Student Prize on May 19, 2015. The 2016 Lemelson-MIT Student Prize winners were announced on April 12, 2016.

EUREKA FEST 2015

Lemelson-MIT Student Prize winners were honored for their inventive work alongside 15 InvenTeams from across the country that showcased their invention prototypes to the public on June 19, 2015 at the MIT Stata Center. Eureka Fest 2016 was held on June 17 and 18.

LEMELSON-MIT INVENTEAM STUDENTS AT WHITE HOUSE SCIENCE FAIR

Student inventors from SOAR High School in California and Wallenpaupack Area High School in Pennsylvania showcased their projects to President Obama at the fifth annual White House Science Fair on March 23, 2015.



Lemelson-MIT InvenTeam students have been selected to attend the White House Science Fair every year since its inception in 2010.

JUNIOR VARSITY INVENTEAM INITIATIVE EXPANDS

Junior Varsity (JV) InvenTeams practice invention-based design activities to enhance STEM learning. JV InvenTeams expanded in 2016 with 37 teams of students from 27 schools, and added California to its geographic line-up of teams in Oregon, Massachusetts, and Texas.

Learn more at lemelson.mit.edu.



Profile **Katelyn Sweeney**



Katelyn Sweeney is a mechanical engineering major in the Class of 2018 at MIT. The Lemelson-MIT Program discovered her talent for invention when she was a high school senior on the Natick High School InvenTeam. She led a group that invented a remotely operated vehicle for ice search and rescue dive teams. Katelyn worked with her teacher to successfully petition the school district's administration and school board for an organizational structure that allows for student-led oversight of incoming licensing money from protected intellectual property to support ongoing science, technology, engineering, and math programs.

Katelyn seeks to help girls envision themselves as engineers and inventors. She has engaged audiences of younger children at the MIT Museum talking about the fun of invention. Katelyn represented the Lemelson-MIT Program at the fourth White House Science Fair and the Lemelson Foundation 20th Anniversary Celebration and Gala at the Smithsonian. She is an undergraduate researcher in the Newman Labs and traveled to Uganda as a global outreach fellow sponsored by a Priscilla King Gray Fellowship.

MARTIN TRUST CENTER FOR MIT ENTREPRENEURSHIP

The Martin Trust Center for MIT Entrepreneurship provides the expertise, support, and connections needed to train the next generation of innovation-driven entrepreneurs. Founded in 1990, the Trust Center serves all MIT students across all schools and all disciplines.

In 2015, the center refined and integrated a range of programs focused on MIT students, while also implementing a number of new offerings and continuing to extend its outreach.

Focusing on the fields of energy, health care, creative arts, and financial, the Sector Practice Leaders Program was launched to teach industry-specific skills and build supportive communities for each area. The Trust Center cut the ribbon on the ProtoWorks maker-space in April to allow students the ability to make prototypes that speed ideation and development. The Global Founders' Skills

Accelerator, a three-month-long student venture accelerator at MIT, produced its greatest cohort yet and has become the worldwide model for similar programs.

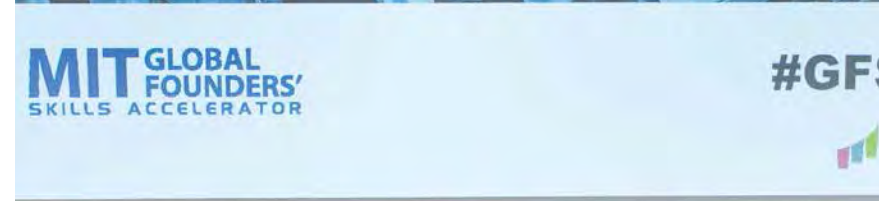
Additionally, the center took on responsibility for MIT Launch, a four-week summer program for aspiring high school entrepreneurs aimed at preparing them for real-world success, instilling a self-starter mentality by teaching tangible, practical business skills, and introducing entrepreneurship as a career path.

Over 300,000 people have participated in the Trust Center's edX course offerings, and the Entrepreneurship Educators Forum has helped over 400 entrepreneurship educators around the globe by teaching them MIT's methodologies and practices for instructing students using the 'Disciplined Entrepreneurship' approach. The MIT Regional Entrepreneurship Acceleration Program continued to

help different global regions see economic growth and job creation through innovation-driven entrepreneurship.

The Trust Center's first floor space in E40 continues to be some of the most utilized real estate on the MIT campus outside of the Infinite Corridor. The variety of activities seen on a daily basis include academic classes, pitchathons, hackathons, team meetings, co-working space, guest speakers, prototype building, club meetings, or serendipitous collisions between like-minded individuals that help support entrepreneurial journeys. Co-founders, advisors, critical pieces of information, and network connections have all been found around the center's wonderful coffee maker and white board walls. In June 2016, the Trust Center unveiled its much anticipated renovated and expanded space for entrepreneurs.

Learn more at entrepreneurship.mit.edu.



Profile Katie Taylor



Katie Taylor SM '15 and her team at Khethworks—Marcos Esparza '15; Kevin Simon SM '15; and Victor Lesniewski SM '15—used their backgrounds and interests to develop a reliable, solar-powered irrigation system for use by small farmers in developing regions.

Thirty million potential customers live in East India, where farmers depend on expensive diesel systems and unreliable monsoon rains for a successful harvest. Katie took several trips to do initial market research and knew Khethworks had a technology that would work, but not how to make it a business.

During the 2015 Global Founders' Skills Accelerator program, Katie and Khethworks learned about structure and framework, a sense of the road ahead of them, and how to face initial challenges, conducting extensive market research with lengthy visits to India. In the fall, she met with Indian Prime Minister Narendra Modi, who later featured Khethworks in his speeches.

In early 2016, Khethworks began a 10-pump pilot program running from the start of India's cultivation season straight through to harvest with the goal of becoming the impactful company and product they first envisioned back when the idea germinated at MIT.

MIT D-LAB

D-Lab's mission is to harness innovation to help improve the lives of people living in poverty around the world. With more than 20 MIT courses, community partners in nearly 30 countries, 23 current and former social entrepreneur fellows, and an international network of more than 600 innovators, D-Lab strives to develop technologies and ventures that can make a meaningful impact on poverty. D-Lab's on-campus workshop and 15 innovation centers throughout Africa, Asia, and Latin America, make possible experiential learning, real-world projects, community-led development, and scalability of innovations that matter.

In 2015, around 250 D-Lab students in the 14 subjects offered, worked on 77 project teams producing designs, prototypes, and working models of technologies, services, processes, and educational curricula to meet the needs of D-Lab's developing world community partners on four continents. These

projects ranged from a biodigester design for a rural community in El Salvador; to a means of fermenting cacao in small batches for a partner in Puerto Rico; to a prototype of a mechanism for extracting oil from avocados in Tanzania; to a prototype of an affordable, comfortable, and robust prosthetic socket designed for implementation in refugee camps in Jordan.

How are 3D printer filament from waste, banana fiber sanitary pads, agricultural waste charcoal, multicrop threshers, micro energy grids, and mobile financial apps related? They are all innovative products intended for developing world markets developed by D-Lab Scale-Ups Fellows. Over the course of the year, this social entrepreneurship program worked with 10 fellows—graduates of MIT or members of D-Lab's International Development Innovation Network—working in Brazil, Ethiopia, India, Lesotho, Pakistan, Tanzania, Uganda, and Zambia.



In its third year, D-Lab's International Development Innovation Network (IDIN) supported its growing network of over 600 inventors, technologists, and social entrepreneurs from more than 60 countries and trained 403 participants in its Creative Capacity Building methodology. With IDIN Innovation Centers already established in Uganda, Brazil, and Tanzania, this year also saw new centers under development in India, Kenya, Nepal, Sierra Leone, and Zambia. Last but not least, IDIN organized three International Development Design Summits in 2015, including a two-week-long waste summit in Cali, Colombia; a month-long health-focused summit in Chennai, India; and a two-week summit in D'Kar, Botswana centered around livelihood technologies for the San communities.

Learn more at d-lab.mit.edu.



Profile Tachmajal Corrales Sanchez

Tachmajal Corrales Sanchez '15, known as Ta, is originally from Costa Rica and came to D-Lab as a freshman, taking D-Lab: Discovery, a hands-on freshman seminar. Over the next four years, through three additional D-Lab courses, four D-Lab trips to the field, a D-Lab thesis on agricultural waste charcoal, and serving as D-Lab's tour guide for three semesters, Ta demonstrated consistent passion for D-Lab's mission of designing innovative solutions for and with people living in poverty around the world.

During the spring of 2015, as a part of D-Lab: Design, she worked with a team on a device to allow riders who have only one arm to propel a wheelchair for a partner in Guatemala. Ta's work as a designer—on this project, and all she designs—is marked by her deep and genuine engagement of field partners to understand their needs and engage end-users in the design. She initiates

her design process by proposing unreasonable ideas. She uses simple sketches and words to quickly create options that may or may not be possible, but that allow collaborators to see a problem from many sides, to envision a full universe of possible solutions, before settling on the best one.

Over the course of her MIT career, she has traveled with D-Lab to Tanzania to work on water filtration, a multicrop thresher, and agricultural waste charcoal. In addition, Ta went to Zambia to research the needs of smallholder farmers; to Peru co-leading a student trip to work on the system design of the community use of a composting toilet in a mixed-income settlement outside of Lima; and she participated in a month-long health-focused design summit in Chennai, India organized by members of D-Lab's International Development Innovation Network.

MIT EDGERTON CENTER

Given the chance, MIT students will hack and design and build and invent. The Edgerton Center supports students in these kinds of endeavors, providing a dozen student-led teams and individuals with the resources to engage in passion projects for their own satisfaction and edification.

The roughly 8,000 square feet of space in Area 51 CNC Machine Shop (N51), the Milk Drop Shop (N52), and the Edgerton Student Shop (44) provide students with the tools and equipment to design and fabricate their projects—solar cars, formula-one style race cars, planetary rovers, all terrain vehicles, and more—supplementing their education in ways not found within the classroom.

Team accomplishments over the past year are notable. The MIT Hyperloop team won the first round (the design phase) of the SpaceX Hyperloop contest; the Solar Electric Vehicle Team participated in the 2015

Bridgestone World Solar Challenge in Australia, a 3,000 km trip across the Australian outback; and the MIT Rocket Team placed first in the Basic (10,000 feet) category of the 2015 International Rocket Engineering Competition.

Experiences gained on teams, student-led collaboration, problem solving, hands-on engineering, fundraising, and a sense of community, give students the skills to launch their own businesses upon graduation. For instance, Jonathan Downey '06 founded the Unmanned Aerial Vehicle Team and A²RES while a student at MIT. *USA Today* recently named him its Small Business Innovator of the Year for his company Airware, which makes operating systems for the safe operation of commercial drones.

Candace Forbes and Bert Forbes '66 endowed the Edgerton Center directorship, enabling the center to attract and retain the

most qualified leadership in future years, thereby continuing the spirit of Institute legend, Professor Harold “Doc” Edgerton.

Learn more at edgerton.mit.edu.



Profile Jarrod Smith



When not in class or at the dorm, Jarrod Smith '16 can often be found cutting metal in an Edgerton Center student shop, at work on one of his many projects, such as skateboards that can reach 30 mph on loose sand. A mechanical engineering major, Jarrod joined the Electric Vehicle Team (EVT) as a freshman and has served as team captain his junior and senior year. The 30-member team is restoring and converting a 1972 Opel GT from gas to electric. The car itself is a gift from their faculty advisor, Professor Dan Frey. The team is also transforming an electric motorcycle into a highly efficient vehicle that they will race in the Pikes Peak International Hill Climb in Colorado.

Other points on the Edgerton Center map for Jarrod include co-teaching EC.S02 (Applied Introduction to Bicycle Dynamics), mentoring high school students in the Engineering Design Workshop, and driving the Porsche 914 (converted to electric) with EVT teammates up Mt. Washington.

“When you have 30 people willing to work with you on a project and stay up all night doing it and it’s not for course credit, that’s what is unique and worthwhile and complements what we do at MIT,” says Jarrod.

MIT HONG KONG INNOVATION NODE



The MIT Hong Kong Innovation Node convenes MIT students, faculty, and researchers to work on various entrepreneurial and research projects alongside students, faculty, alumni, entrepreneurs, and businesses based in Hong Kong. By combining resources and talent, the Innovation Node strives to help students learn how to move ideas more rapidly from lab to market.

Announced in November 2015 by MIT President Rafael Reif, the Innovation Node aims to be a collaborative space to connect the MIT community with unique resources—including advanced manufacturing capabilities—and other opportunities in Hong Kong and the neighboring Pearl River Delta.

Initially, the Hong Kong Innovation Node will carry out activities to boost the innovative and entrepreneurial capabilities of MIT students, faculty, researchers, and alumni, in collaboration with the Hong Kong commu-

nity. These include internship opportunities, educational programs, engagement opportunities, and innovation-focused events. MIT is currently in the process of building out a Hong Kong-based team that will officially establish a physical space and offer formalized, regular programming.

As a prelude to the activities and programming taking shape for the Node, a group of MIT students traveled to the southern-most province in China for the first-ever Guangdong Manufacturing Innovation Ecosystems Tour during the 2016 January Independent Activities Period. Hosted by the MIT International Science and Technology Initiatives China program, students enjoyed a behind-the-scenes look at China's manufacturing hub during the trip.

In June 2016, the MIT Hong Kong Innovation Node launched with an inaugural program that brought together 12 MIT students with

12 students from universities throughout Hong Kong for a week-long workshop, with programming led by a team of MIT faculty, MIT alumni, and local entrepreneurs.

Learn more at hkinnovationnode.mit.edu.



Profile Zachary Churukian & Jorlyn Le Garrec



The first two students to sign up for the Guangdong Manufacturing Innovation Ecosystems Tour were Zachary Churukian and Jorlyn Le Garrec, both mechanical engineering majors in the Class of 2017.

Zachary took an immediate interest because "it gave me an opportunity to get a firsthand look at the manufacturing industry in Southern China." He continues, "In addition, I'm interested in robotics, so I was excited to see how the companies there are transitioning to a more automated manufacturing process."

The group toured several factories in the Guangdong province, one of China's key manufacturing hubs. On day two, the students visited Derneng, a manufacturer of smart packaging of lithium batteries. "The outing to Derneng was eye opening," says Jorlyn. "While they have automated many of their assembly lines, they also have retained the same number of employees by increasing production."

Additionally, the group made a stop in the city of Shenzhen to explore a major commercial development aiming to be the center of innovation in China. "Not only did I get to learn about the Chinese manufacturing industry, but I also got exposed to the emerging entrepreneurial scene in Shenzhen when visiting Qianhai, something I did not know existed prior to this trip," shares Zachary.

MIT IDEAS GLOBAL CHALLENGE

The MIT IDEAS Global Challenge, a program of the Priscilla King Gray Public Service Center, seeds and supports student social entrepreneurs and innovators. The program provides funding, feedback, and mentorship as students apply their education in real-world situations to tackle quality of life issues for people around the world.

In the 2015 IDEAS Global Challenge, 40 teams participated in the final round. They represented 15 different departments and included 36 MIT undergraduates, 75 MIT graduate students, and 66 additional collaborators. Eleven teams received grants totaling \$75,000. The final round of the competition capped a year of project development, advice and feedback, and campus and community gatherings, involving more than 500 people.

Since 2001, the IDEAS Global Challenge has awarded more than \$750,000 to 128 teams. These teams have implemented innovative projects in 44 countries, serving the needs of hundreds of thousands of people. These projects often form the basis of new companies and organizations, and about half remain active today.

Learn more at globalchallenge.mit.edu.



2015 WINNING PROJECTS

Navi-Chem (India): Converting low-cost organic municipal solid waste into high-value chemicals using microbial bioprocesses

Sensen (Uganda): A low-cost data logging system to remotely collect near real-time data on product performance and usage

CVDiagnostics (United States): An impedance-based biosensor for self-monitoring/point-of-care detection of heart attack and stroke

change:WATER: Revolutionizing sanitation in refugee camps by using innovative membrane technology to massively shrink sewage

Latin American Science Education Network (Mexico): Expanding access to high-quality STEM education through science clubs

RARE Education (Kenya): Low-cost personalized learning for students from low-income families

Voca (Tanzania): Avocado oil extraction process

Kepler-MIT Laboratory (Rwanda): A low-cost physics and chemistry laboratory course for students at Kepler University

GreenPath Food (Ethiopia): Training farmers in high-yield organic agriculture, operating cold stores, and managing supply chain

Prepify (United States): Revolutionizing higher-education access for low-income students by providing free, adaptive SAT prep

Squirrel Devices (United States): Connecting assistive technology devices over wireless networks to give output from a dedicated device to increase accessibility for the blind



Profile Amit Gandhi & Prithiviraj Sundararaman



Amit Gandhi PhD '17 and Prithiviraj Sundararaman SM '16 from the Department of Mechanical Engineering, led their team Sensen to claim one of the two top prizes in the 2015 IDEAS Global Challenge. Their team has developed an affordable plug-and-play solution for remote data collection, which can be employed by researchers and developers to help better understand how products are being used and how effective they are. Sensen features a fully integrated service with hardware and software, a robust design for difficult field conditions, and a flexible data collection platform that allows it to be operated with a variety of sensors and data analysis tools on a variety of products.

In 2015, Amit and Prithiviraj worked closely with the Teso Women Development Initiatives (TEWDI) to run their first pilot on cook stoves in Uganda. The remote monitoring of stove usage and household air pollution is being conducted using low-cost sensors developed and assembled by the Sensen team. TEWDI will be able to leverage this information to better understand their customers, create cooking products that better cater to their needs, and improve cooking technologies.

MIT INITIATIVE ON THE DIGITAL ECONOMY

The MIT Initiative on the Digital Economy (IDE) explores how people and businesses will work, interact, and prosper in an era of profound digital transformation. IDE is leading the conversation on the digital economy.

Digital technologies are driving change, disruption, and opportunity in business, the economy, and society. The pace of these changes and their effects are accelerating. Companies, governments, and organizations are seeking to understand these changes and find methods and strategies for coping, surviving, and succeeding in the digital age.

The MIT Initiative on the Digital Economy is led by MIT Sloan School of Management's Erik Brynjolfsson and Andrew McAfee, co-authors of *The Second Machine Age: Work, Progress and Prosperity in a Time of Brilliant Technologies*, a research-based articulation of impacts, trends, and issues.

Learn more at mitsloan.mit.edu/ide.



MIT IDE'S SINGULAR FOCUS IS THE DIGITAL ECONOMY

FIVE PRIMARY ACTIVITIES:

Research, Convenings, Education, Visiting Fellows, and the Inclusive Innovation Competition.

AREAS OF RESEARCH:

Productivity, Employment, and Inequality (Erik Brynjolfsson)

Big Data and Information Privacy (Alex 'Sandy' Pentland)

New Digital Business Models (Andrew McAfee)

Social Analytics and Digital Experimentation (Sinan Aral)

2016 CALENDAR OF EVENTS:

Spring and Fall 2016: IDE Seminar Series

March 14-15, 2016: The On-Demand Economy Roundtable and Conference

May 18, 2016: MIT Sloan CIO Symposium

May 19, 2016: IDE Annual Conference

June 1, 2016: Executive Education Course: Platform Strategies

July 15, 2016: Platform Strategy Summit

Fall 2016: Analytics Lab, Action Learning Student Projects

September 25, 2016: MIT IDE Inclusive Innovation Competition Awards Announced at HUBweek in Partnership with MIT Solve

October 14-15, 2016: Conference on Digital Experimentation (CoDE)

MIT IDE INCLUSIVE INNOVATION COMPETITION

Celebrating organizations
that create economic
opportunity in the digital era.

Profile Inclusive Innovation Competition



The MIT IDE has launched the Inclusive Innovation Competition (IIC), an awards program identifying and celebrating organizations that are inventing a more inclusive, productive, and sustainable future for all.

The first competition of its kind, IIC grants \$1 million in prizes to organizations that strive on behalf of working people at the middle and base of the economy.

IIC AWARD CATEGORIES

Grand prizes and other awards will be presented to organizations that compete in the following four categories:

SKILLS: How do we re-skill members of our workforce to prepare them for opportunities of the future?

MATCHING: How do we connect qualified individuals with open opportunities for work?

HUMANS + MACHINES: How do we augment human labor with technology?

NEW MODELS: How do we create new operational practices and business models to revolutionize the existing labor market?

Winners will be announced and celebrated in partnership with MIT SOLVE during Boston's HUBweek in September.

MIT INNOVATION INITIATIVE LAB FOR INNOVATION SCIENCE AND POLICY

The MIT Innovation Initiative Lab for Innovation Science and Policy is an Institute-wide lab recently established to help develop the area of innovation science—an emerging field that rigorously studies the process of innovation ideas from inception to impact, effectively applying the scientific method to the practice of innovation.

The Institute-wide lab uses a diversity of methods to empirically investigate how innovation occurs, and pioneer more systematic assessments of possible interventions (such as policies, programs or incentives) to achieve desired innovation outcomes (such as the creation of innovation-driven enterprises, and in the longer-run, job creation, economic and social impact, and a vibrant innovation economy).

The MIT Innovation Initiative Lab for Innovation Science and Policy aims to become the place that policymakers, senior executives, and entrepreneurial leaders turn to for

evidence-based guidance on the design of innovation-focused policies and programs in their organizations, local regions, and nations.

Over the past year, the lab has supported research by MIT faculty and students in innovation science, issuing new metrics on the rate of U.S. entrepreneurship that account for the quality as well as the quantity of new ventures, and investigating the inter-relationship between space and output with respect to academic collaboration.

In addition to convening multi-stakeholder roundtables on critical challenges to the innovation economy, the lab has engaged with thought leaders such as the U.S. Secretary of Commerce, Penny Pritzker, regarding the factors that shape outcomes in innovation ecosystems as well as specific challenges that hard-science startups face in translating their ideas to wide-scale impact. The lab also hosted panel discussions with Visiting

Innovation Fellow and former Governor of Massachusetts, Deval Patrick, to explore how technology platforms are changing the nature of entrepreneurship and social impact investing.

With a clear focus at the intersection of innovation science and policy, the lab will ensure that findings not only advance the academic literature, but also shape the actions and decisions of innovation policymakers, university leaders, and corporate decision-makers around the world, and inform MIT's own teaching, research, and educational activities.

Learn more at innovation.mit.edu.



Profile **Matthew Claudel**



Using the MIT campus as a case study, Matthew Claudel examines the effect of spatial configuration on communication patterns and scholarly output of the MIT community. His thesis work will map faculty to space to investigate if location and proximity serves as an initiator of collaboration and productivity. More generally, Matthew, who is pursuing a master's of science degree in urban studies and planning, is interested in exploring whether built environments support a higher instance of cross-disciplinary activity within a community.

As the inaugural Innovation Scholar for the MIT Innovation Initiative Lab for Innovation Science and Policy, Matthew's research focus on place-based collaboration strongly ties into his interest in the interplay between innovation, entrepreneurship, social change, and the built environment.

"There's a reason why we aggregate and join a community like MIT. It's not only a relational and social community, but also a spatial community. Particularly in the context of digital communications and the ubiquity of networked technologies, the relevance of physical space is an urgent question," says Matthew. "It's now just as easy for me to collaborate with anyone in the world as it is to collaborate with someone one floor up. And yet, here we are, there's something about space, and that's really what I'm looking at."

MIT INTERNATIONAL SCIENCE AND TECHNOLOGY INITIATIVES

The MIT International Science and Technology Initiatives (MISTI) supports the educational mission of the Institute by creating hands-on, international learning experiences for students related to their course of study. Through rigorous preparation, the internship experience, in-country activities, and post-internship reflection, MISTI strengthens students' competence and confidence to navigate the global workplace.

MISTI matches over 800 students with internship, teaching, and research opportunities in 19 locations around the world each year. MIT's flagship international education program, MISTI is housed within the School of Humanities, Arts and Social Sciences.

MISTI has developed programs to engage students in global innovation and entrepreneurship:

GLOBAL INNOVATION INTERNSHIPS

Interns are placed with startups, other innovation-driven companies, or innovation-focused labs in universities or research

institutions. To prepare for their experiences abroad, MISTI students complete coursework and training in the language and culture of the host country. Projects are carefully aligned with students' skills and the needs of the host.

INNOVATION DIPLOMATS (IDIPOMATs)

MISTI has partnered with the MIT Innovation Initiative to provide global innovation-practice opportunities. In addition to their internships or as a stand-alone project, students gain a deep cultural understanding of their host country by engaging with the local innovation ecosystem. Meeting with stakeholders in government, the corporate sector, entrepreneurship, risk capital, and academia, iDiplomats analyze the policies and programs that enable (or hinder) innovation and entrepreneurship, keeping in mind the underlying cultural context.

GLOBAL STARTUP LABS (GSL)

An opportunity for MIT students to promote development in emerging regions by cultivating young technology entrepreneurs.

MISTI great ideas
change the world
MIT SCHOOL OF HUMANITIES
ARTS AND SOCIAL SCIENCES

Working in teams of four, student instructors deliver courses on technology and entrepreneurship that enable undergraduates at universities abroad to innovate in mobile technologies. Since 2000, GSL has offered 59 programs in 14 countries, resulting in the creation of businesses and the addition of course offerings at partner universities.

GLOBAL TEACHING LABS

An experiential teaching program in which MIT students develop and deliver STEM and entrepreneurship course modules using MIT online course materials in high school classrooms around the world. Students work in teams to synthesize and develop curricula adapted to the needs of the host classroom. While in country, students lead the classroom, deliver course material, and guide students through experiments and other hands-on projects. Created in 2008, the program has sent 350 students to teach in eight countries.

Learn more at misti.mit.edu.



Profile Beth Hadley



"Innovation and entrepreneurship have been in my blood for years," says MIT alumnae Beth Hadley '15. One of over 6,000 MISTI students who have interned and researched abroad since 1995, Beth has developed an in-depth understanding of international innovation and entrepreneurship through her multiple MISTI experiences.

As an MIT undergraduate, Beth interned through MISTI in Munich and in Paris where she explored assistive technologies and software development. Through the Priscilla King Gray Public Service Center, she also created and deployed InstaAid—an iPad app that enables individuals with limited mobility to call for help—which is still being used at The Boston Home in Dorchester.

After graduation in 2015, Beth moved to Paris to work at Capgemini, a tech consulting firm. Within its innovation lab, a space dedicated to helping clients address their business and technology challenges with innovative approaches and solutions, Beth acted as a technical consultant to key clients. She plans to resume her work on digital innovation projects at Capgemini Australia in March 2016.

MIT.nano

THE PRACTICE OF INNOVATION

MIT is building an ambitious new facility—MIT.nano—that aims to harness the power of nanotechnology to seed major advances in materials and structures, human health and health care, energy and sustainability, and the future of computing and communications. Located in the center of campus with ready access to other major research labs, MIT.nano will bring even greater vibrancy to the center of the MIT Campus.

At MIT we aim to harness the power of nanotechnology in service to humanity's greatest challenges. An advanced facility open to the entire community of faculty, researchers, and students, MIT.nano will be a convening space to spark collaboration and cross-pollination. A hive for tinkering with atoms, one by one, and for constructing,

from these fantastically small building blocks, a future of infinite possibility.

WHERE CAN NANO MAKE A DIFFERENCE? EVERYWHERE.

Nano is not a specific technology. It does not belong to a particular industry or discipline. It is, rather, a revolutionary way of understanding and working with matter. Faculty in departments across MIT, more than 20 percent of all researchers, are now taking advantage of new power to synthesize and manipulate molecules with breathtaking precision. Everywhere they look, MIT faculty and students see thrilling potential for impact.

MANIPULATING AT THE NANOSCALE

ALLOWS US TO REIMAGINE MATTER

Consider graphite, a form of carbon familiar to us as the lead in a No. 2 pencil. A decade ago researchers figured out how to create

sheets of graphite just one atom thick. This is graphene, the thinnest material known to exist. Flexible, lightweight, and incredibly conductive electrically, it's also the strongest material known to humanity, 200 times stronger than steel.

Learn more at mitnano.mit.edu.



Profile Farnaz Niroui



At the nanoscale, a speck of dust is a wrecking ball.

Just ask Farnaz Niroui, a graduate student researching energy-efficient electronics who is using her multidisciplinary knowledge to integrate nanofabrication, device physics, and chemistry. Making her single prototype is an expedition to five different MIT facilities.

With the prototype packed in an air tight container, her stops are: initial assembly in Building 13; Building 24 for electron beam lithography; Building 39 to process the resist; Building 18 to grow molecules; back to Building 13 to complete the device assembly and perform optical characterization; and Building 38 for electrical testing. This process can be inefficient and time consuming. Getting a dust particle on the device while completing the fabrication and testing at the different facilities would require the process to be repeated.

By standing up MIT.nano we will create a single, comprehensive facility with multi-scale tools for interdisciplinary nanoscale work, allowing researchers to do more. Explorers and innovators will be able to conduct their research, from imaging to synthesizing to prototyping, entirely within the building's protective environment. And we will spend less time waiting because, at 200,000 square feet, MIT.nano will double the campus capacity for nano innovation.

MIT SANDBOX INNOVATION FUND PROGRAM

The MIT Sandbox Innovation Fund Program (Sandbox) is an Institute-wide program that supports student-initiated ideas, launched on January 25, 2016.

Designed to open more pathways for all types of student innovators, Sandbox is a non-competitive endeavor that provides educational experiences, mentoring, and up to \$25,000 to help qualified participants nurture their creative brainstorm.

Led by the School of Engineering in partnership with the MIT Innovation Initiative, Sandbox is already collaborating with numerous existing campus organizations, such as the Martin Trust Center for MIT Entrepreneurship, the Gordon-MIT Engineering Leadership Program, the Venture Mentoring Service, the Undergraduate Practice Opportunities Program, Start Studio, the Hobby Shop, and the Communications Lab.

The pilot cohort of participants was drawn from StartMIT and StartIAP as both programs equip students with the basics of entrepreneurship. Fifty proposals have been approved and the student teams are busy working on developing their ideas. The first open application cycle for all MIT undergraduate and graduate students began in mid-March.

The MIT Sandbox Innovation Fund Program is supported by founding contributors who represent an impressive and diverse group of investors, corporate sponsors, and generous philanthropists (including representation from the investment, manufacturing, e-commerce, health care, and biotech sectors).

In addition to providing financial resources, these contributors will also serve on a funding board, providing expert feedback and advice to student teams for how best to

approach moving their ideas from early stages to successful products or startups ready to spread their wings.

Learn more at sandbox.mit.edu.



Profile MIT Student Innovators



Sandbox has attracted a range of MIT student innovators—and an even wider range of ideas.

There are those just getting started. The female-led Prana Energy is bundling innovation software, energy intelligence, and educational technology solutions to improve efficiency and lower costs for the building sector.

Other groups are taking technology to the next level. De-Ice is a startup commercializing technology that uses electric systems in lieu of harmful chemicals to de-ice planes. Likewise, Andy Trattner '17 and a team launched Lean on Me, a support hotline platform for MIT students that is poised to expand to other campuses.

Still, others are about to enter the market. Stello, a wearable medication dispenser, is at the prototype and consumer testing stage. The fashionable smart bracelet came to life thanks to Malena Ohl '16 and her fellow innovators.

MIT VENTURE MENTORING SERVICE



The MIT Venture Mentoring Service (VMS) is a free and confidential service exclusively for MIT students, alumni, faculty, and staff. VMS harnesses the knowledge and experience of volunteer business leaders to help innovators and prospective entrepreneurs learn to bring their ideas and inventions to market. Participants receive practical hands-on coaching from teams of three to five skilled volunteer mentors, starting with concept development and continuing through to team formation, launch, and growth.

During 2015, 310 new MIT entrepreneurs involved with 208 startup ideas enrolled in the program. Of these, 42% were students, 10% staff, 14% postdocs, 3% faculty, and 30% alumni. Their venture ideas ranged from an advanced basketball shot-training system to solid-state micro-actuators with micron and millimeter scale movement.

VMS mentors provided nearly 4,000 hours of service during 705 mentoring sessions. The 2015 VMS Demo Day featured presentations by 20 ventures ready for a first round of financing to an audience that included over 120 investors. Thirteen of the presenters have secured funding since the event.

The Venture Mentoring Service received an NSF I-Corps Site Award to provide training and micro-grants to university researchers to explore moving new discoveries from the lab bench to commercialization. In 2015, VMS worked with faculty, students, and postdocs in over 50 projects, providing over \$70,000 in support and securing \$200,000 in additional funding.

In conjunction with the NSF I-Corps program, VMS delivered this training as well as mentoring to 16 postdocs who completed the Translational Fellows Program at MIT in

2015, and has enrolled 26 new fellows who began the program in late 2015.

Part of the VMS mission is to disseminate the MIT mentoring model. In 2015, the Venture Mentoring Service trained leadership teams from eight universities and other organizations, bringing the total to over 50 institutions around the world now using the VMS model.

Learn more at vms.mit.edu.



Profile Adam Paxson



Adam Paxson '09, SM '11, PhD '14, along with fellow PhD researcher David Borrelli and MIT Professors Karen Gleason and Kripa Varanasi, brought their passion for improving the global energy outlook from their work in the labs at MIT to form Dropwise in late 2014.

Dropwise develops durable coating solutions that solve problems related to heat transfer, fouling, and corrosion, increasing efficiency and extending the lifetime of a wide variety of industrial equipment.

A 2014 Lemelson-MIT Student Prize finalist, Adam enrolled in VMS in June 2014 and is supported by a team of seven mentors. During 2015, Dropwise continued developing both their technology and their venture, meeting with their mentors for guidance in launching the company. Dropwise announced a joint development agreement with Henkel, was a recipient of the MassCEC Clean Energy Innovation Award, and is one of 15 companies selected for the launch of the first TiE Scale Up Accelerator cohort.

PROJECT MANUS

Making has always been an integral part of learning at MIT. While the Institute has over 130,000 square feet of makerspaces, student access to those facilities outside of classes can be improved. In October 2015, MIT Provost Martin Schmidt initiated Project Manus under the guidance of Professor Martin Culpepper, MIT's Maker Czar, to identify and begin improving the Institute's makerspaces, equipment, tools, and technology for staff and students.

In addition to upgrading MIT's legacy spaces and equipment, Project Manus has a mandate to introduce new technologies; create new makerspaces on campus; foster maker communities; and collaborate with peer universities, companies, and the government.

MIT students are eager makers, but their 'making' experience could be made better. Students often face barriers when trying to take something from an idea to making it real. Project Manus' first priority was to

address this problem by creating the Mobius system, including an app that they can use to find equipment to make and measure. Mobius is one of a kind in the world of academic makerspaces.

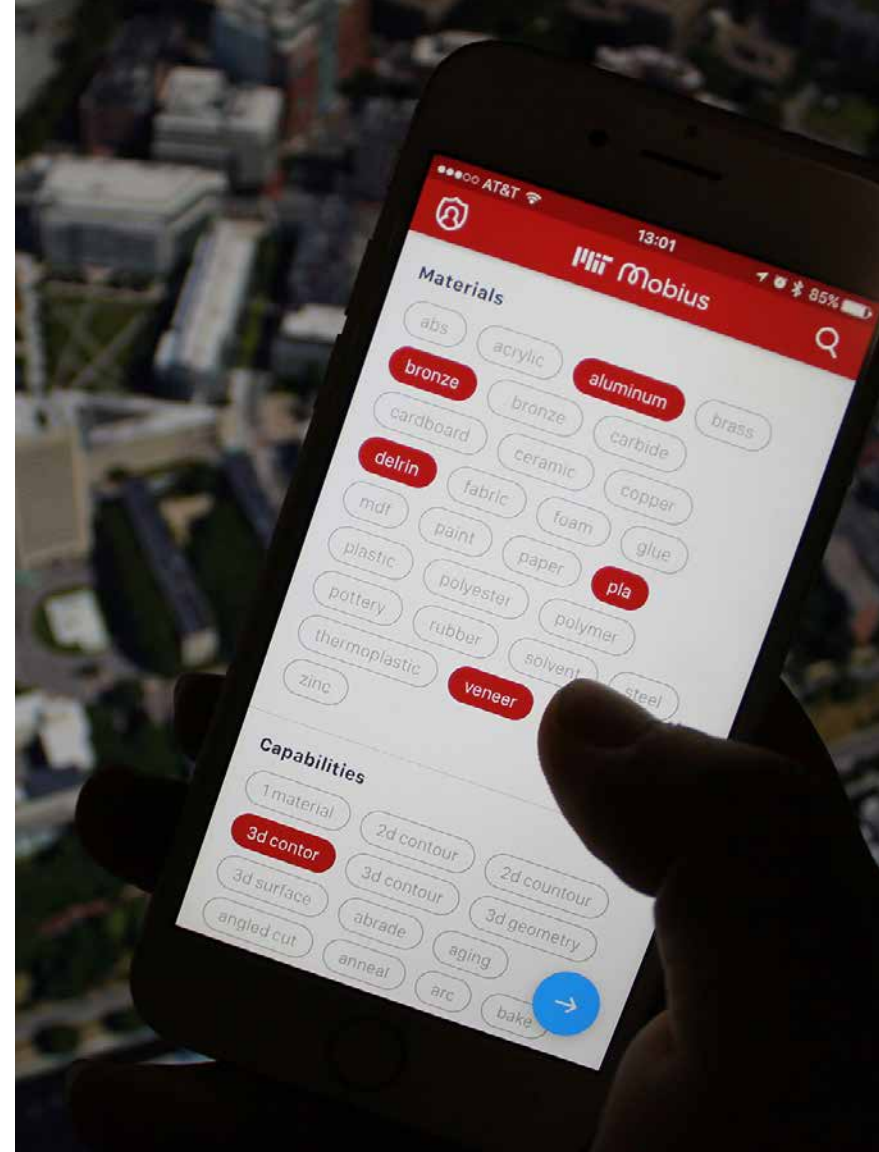
The Mobius app brings the details about MIT's over 40 makerspaces to students' fingertips. Whether they need to work on a class project, or want to make a prototype for an entrepreneurial endeavor, Mobius enables them to find where the makerspaces are, what kind of equipment is in the space, and information on who to contact for permission to use the equipment. For example, if a student needs to use a water jet cutter, she can find out which shops have one, what training is needed, and anything else needed to get to work cutting her parts on the machine.

The app also serves the makerspace staff by giving them access to users' proficiency with the equipment, enables them to endorse

the students' skills, and incorporates a payment system.

To show MIT's leadership and help grow the broader university maker community, Professor Culpepper has brought together experts from other academic institutions and hosted a first-of-its-kind class on Making Academic Makerspaces at MIT in March 2016.

Learn more at project-manus.mit.edu.



Profile Aaron Ramirez



Aaron Ramirez '10 got his first taste of hands-on engineering as a high school senior in the Minority Introduction to Engineering and Science outreach program in summer 2005, and has been enamored with MIT ever since. He arrived on campus as a freshman in fall 2006 with minimal hands-on experience, but lots of enthusiasm and a strong willingness to learn about anything involving measurement, machinery, and machine tools, and immediately became a member of the MIT Hobby Shop.

Aaron joined the Precision Compliant Systems Laboratory as an undergraduate researcher studying mechanical micromilling under the direction of Professor Martin Culpepper, MIT's Maker Czar. He went on to complete his bachelor's and master's degree in mechanical engineering and is now a doctoral student in the same lab.

In addition to Aaron's current research on embedded tissue cutting mechanics, he is a founding member of the MIT Mechanical Engineering MakerWorks and its current president. He has also been involved with the Mobius app development since its inception and helped to shape its vision. He has twice served as a teacher's assistant for the lathe design-and-build class 2.72 (Elements of Mechanical Design) and is currently working with a team in the Hobby Shop to build new cabinets for the Muddy Charles.

StartMIT provides MIT entrepreneurs with the resources to take their ideas from wherever they start and get them into the world. A two-week program of seminars, workshops, and training offered during Independent Activities Period (IAP), StartMIT immerses students, postdocs, and staff from across disciplines in entrepreneurship, providing them with the building blocks to translate their passions into needed technologies for the marketplace.

The entrepreneurial path does not follow a straight line, and it isn't easily learned from a textbook. From financial models to marketing, scalability, and team building, StartMIT offers practical training on the nuts and bolts of creating startups. Students learn what it will really take to shape their innovative ideas into successful businesses.

Hosted by the Department of Electrical Engineering and Computer Science (EECS), in collaboration with the MIT Innovation

Initiative, StartMIT is taught by successful entrepreneurs and leaders in venture capital—innovators who have been there, done that.

THE VOICES OF EXPERIENCE

How do I perfect my pitch? How do I secure funding? How do I split equity with my partners? What is my value proposition?

The best real-world answers come from real-world practitioners. StartMIT guest speakers have included Bob Metcalfe '68 founder of 3Com; Paul English cofounder of Kayak; Mike Evans '99, MEng '00 cofounder of GrubHub; and Max Krohn SM '05, PhD '08 cofounder of OkCupid.

BUILDING NETWORKS

StartMIT students get more than lectures, conference rooms, and brainstorming sessions during IAP. Participants attend alumni receptions and meet with venture capitalists. The program provides students opportunities

to engage with the broader MIT innovation community.

SPRING BREAK IN SILICON VALLEY

StartMIT students spend spring break in Silicon Valley visiting and networking at Airware, AppDynamics, Khan Academy, Lemnos Labs, Nutanix, Pinterest, Quizlet, Wearable Intelligence, and others.

Learn more at startmit.mit.edu.

StartMIT



Profile Keertan Kini & Anelise Newman



Students in the 2016 StartMIT class had the opportunity to interact with successful entrepreneurs, including Jeremy Wertheimer, VP, Google (pictured). Here's what they had to say about the experience:

"Hearing from people who are just recently out of MIT ... was incredibly meaningful and incredibly impactful. The alumni could relate easily to our experiences, or some of the doubts we have about our own abilities, or discuss how certain classes might actually make an impact, or relate to the challenges we'd faced as first-time founders because we don't have the track record that a lot of the other professionals have."
—Keertan Kini '16

"It opened my eyes to the hustle that you have to get used to if you want to be an entrepreneur. Not only do you need to define your product...you have to define your goals and go about them and vigorously pursue them in whatever way possible."
—Anelise Newman '19

SUPERUROP

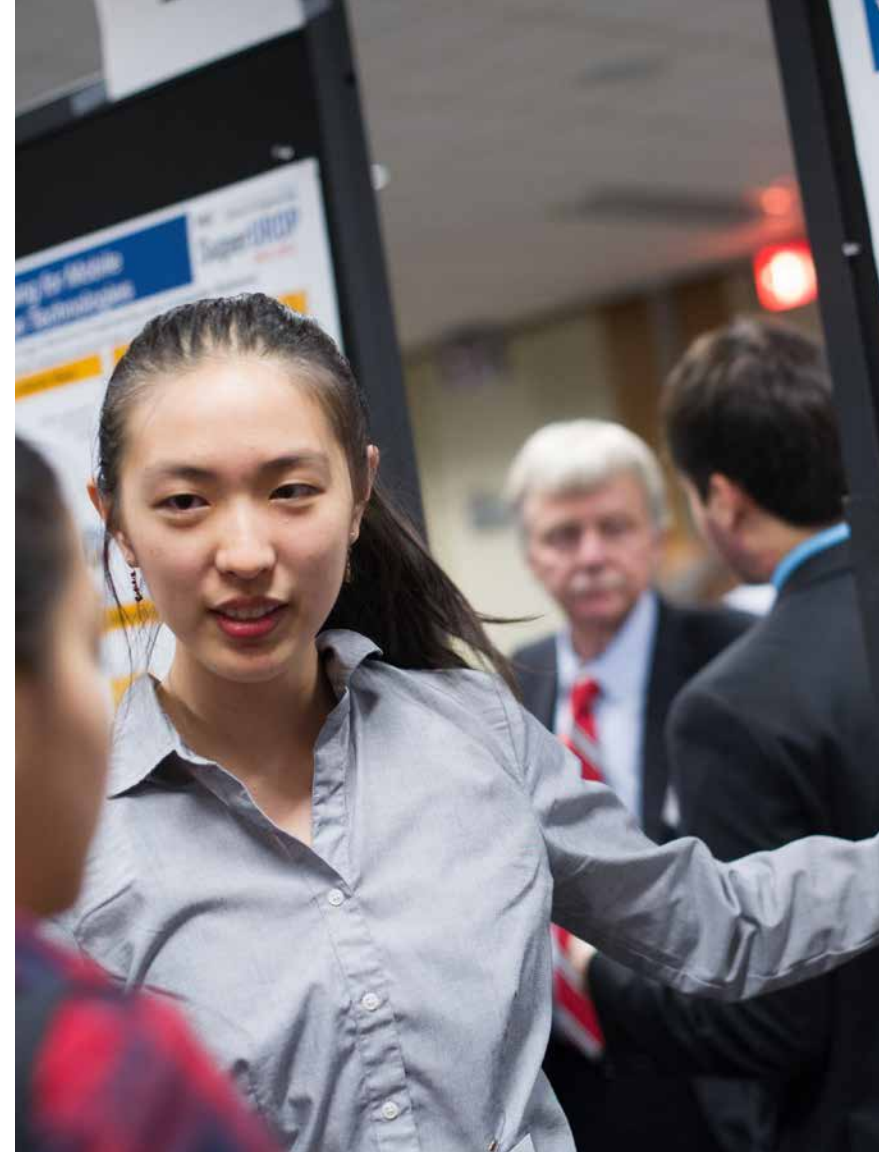
SuperUROP, launched in 2012, is an expanded version of MIT's flagship Undergraduate Research Opportunities Program (UROP). "It's like UROP on steroids," says one student. The yearlong program, which is available to juniors and seniors, enables students to tackle nettlesome problems and strive for publication-worthy findings. It affords them the time, training, resources, and guidance necessary for deep scientific and engineering inquiry.

Throughout the program students attend a class devoted to issues that surround modern research. Guest speakers and faculty provide insight on topics ranging from technical communications to intellectual property to ethics in engineering. Students also pitch their research findings during poster sessions. "We are teaching students how to explain concepts at a deep technical level, but also at the 10,000-foot level," says Anantha Chandrakasan, the Vannevar Bush Profes-

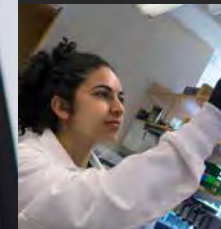
sor of Electrical Engineering and Computer Science and head of the Department of Electrical Engineering and Computer Science.

SuperUROP is supported through the Research and Innovation Scholars Program. This named scholars program, which is funded by both private donors and corporate sponsors, provides research stipends to students and discretionary funding to their academic advisor. This program also enables select MIT industry partners to support research, initiate joint projects, and keep abreast of the research. "SuperUROP is a tremendous opportunity for students and companies to make connections that foster future innovations and that launch the careers of engineering leaders," says Desh Deshpande, a member of the MIT Corporation.

Learn more at superurop.eecs.mit.edu.



Profile Ava Soleimany



Senior Ava Soleimany, the Wertheimer Undergraduate Research and Innovation Scholar, conducted research at the intersection of biology and computer science. Her project aimed to expand the scope of biological computation by constructing higher-order biological state machines. She described her SuperUROP experience as a "much nuanced understanding of what research involves."

"Just like you can use circuit elements to engineer logic into an electronic circuit, you can use gene regulatory parts to build a gene circuit that executes some type of logic," she explains.

The project, for which Ava received the 2015 SuperUROP Outstanding Research Award, took "engineering logic" a step further by building state machines in *E. coli*.

"With these bacterial machines, we're able to detect all orders and identities of several chemical inputs, and systematically program gene expression patterns. This project can provide a new way to study natural systems where the timing and combination of environmental events is important, like biofilm development," Ava says. "It enables living diagnostics that could detect orders of disease-relevant markers, for example in microbiome applications."

SUSTAINABILITY INITIATIVE AT MIT SLOAN

The Sustainability Initiative at MIT Sloan started in 2006 with the creation of the Laboratory for Sustainable Business Action Learning course. Today, the initiative comprises a broad portfolio of people, programs, and projects, with four strategic objectives:

- Engage students with rigorous courses and programming related to sustainability, and an in-depth Sustainability Certificate for those who wish to become leaders in the field.
- Fuel alumni innovation through professional development and lifelong learning opportunities, including networking, mentoring, and executive education.
- Change the conversation and influence industry and policy by demonstrating the impact of faculty research and cutting-edge tools on the field of sustainability.
- Build an institution with an international reputation for bringing value to business

and society across organizations, markets, and communities.

The Sustainability Initiative underscores MIT's commitment to action with impact, and advances MIT Sloan's mission to develop principled, innovative leaders who improve the world and to generate ideas that further management practice.

In a world where performance and impact are often seen at odds, it's hard to imagine having the best of both worlds. However, there are a handful of startups and corporations breaking the mold with innovative products and services, technologies, and business models. These breakthroughs are sustainability-oriented innovations (SOI). The initiative's successes in SOI include:

RESEARCH

Sustainability Initiative Director Jason Jay generated a paper, with support from Lockheed Martin, to introduce the concept of SOI—the creation of new products and ser-

Sustainability Initiative

vices that lead to environmental and social benefits. Additionally, the initiative produced a four-post series on SOI with *Sloan Management Review*.

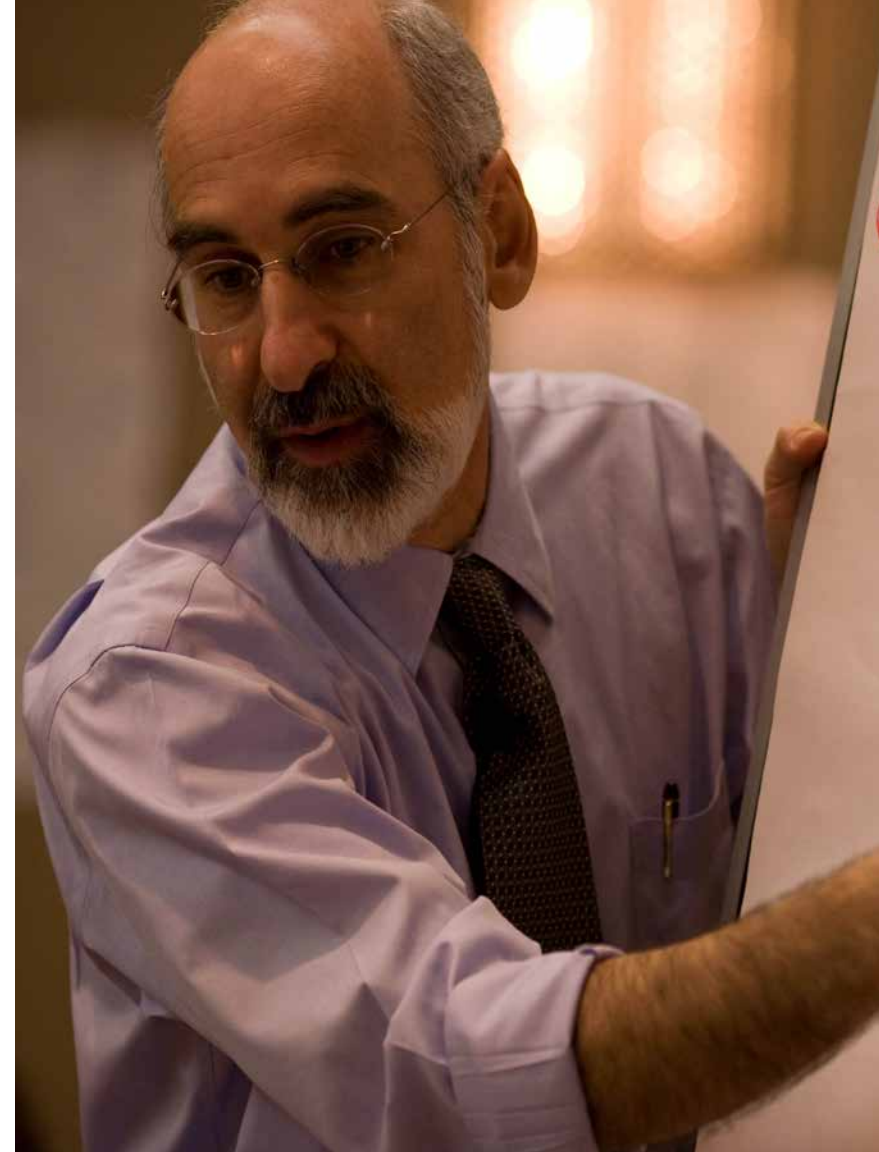
CURRICULAR

The Sustainability Initiative launched a new course, Sustainability-Oriented Innovation and Entrepreneurship, which shows how varied actors can contribute to SOI, yielding a combination of financial and social return on their investments.

EXTRA-CURRICULAR

Engaged the student organizing team for the 2016 Sustainability Summit to make SOI the leading topic for the event, focusing on three themes: disruptive product design and materials sourcing, transformative business models, and pipelines for innovation from idea to impact.

Learn more at mitsloan.mit.edu/sustainability.



Profile Sarah Nolet



As a member of the Sustainability Initiative's inaugural Sustainability-Oriented Innovation (SOI) research group, Sarah helped launch a pilot elective, Sustainability-Oriented Innovation and Entrepreneurship, and organized a course, The Future of Sustainable Protein, for seven companies and 35 MBA students.

As co-managing director of the 2016 Sustainability Summit, Sarah led a team of graduate students to develop a 40-speaker lineup that showcased how SOI can be a fundamental driver of business success.

Sarah also focused her master's thesis on SOI. Building on more than 30 interviews with agribusiness investors and practitioners, Sarah is developing resources that help unlock capital to fuel SOIs in the food system.

"Working with the Sustainability Initiative has been a highlight of my time at MIT. Beyond the academic foundation of coursework, programming, and events, they encouraged me to pursue projects I am passionate about, like organizing speakers on sustainability issues within the food and agriculture industry. The Sustainability Internship program provided financial support for my internship at Frontier Natural Products Co-Op last summer. The more-than-mentorship provided by the initiative has been amazingly valuable and has helped me take a significant step in my career," says Sarah.

TATA CENTER FOR TECHNOLOGY AND DESIGN

MIT's **Tata Center for Technology and Design** advanced its mission of designing solutions for resource-constrained communities in the developing world, broadened its network of international collaborators, and began to see its work make a real impact on the ground through entrepreneurship, policy, and social services.

In 2015, the program involved roughly 35 MIT faculty members and 60 graduate student fellows, along with approximately a dozen research scientists and postdoctoral fellows. The center hosted two international conferences, including the first annual Tata Center Symposium at MIT, bringing together faculty and researchers with representatives from leading companies and NGOs in India to forge new collaborations.

HIGHLIGHTS FROM 2015

Khethworks, a startup emerging from the Tata Center ecosystem, has begun field-test-

ing of their low-energy, high-efficiency solar irrigation system designed for Indian farmers. The company was recognized by India Prime Minister Narendra Modi as "changing lives."

Research on the seismic resilience of confined masonry by Tata Fellow Chris Porst SM '15 has been written into the building code of the state of Gujarat, India, while a team led by Professor James Wescoat of the School of Architecture and Planning has entered into a formal collaboration with the Government of India to provide rural water system planning tools. Two projects aimed at increasing access to electricity, the uLink micro-grid system and the REM electrification planning software, have begun field trials in rural Bihar and Jharkhand, India.

Tata Center projects won numerous awards in 2015, including the USAID Desalination Prize, the Vodafone Wireless Innovation Prize, the Dubai International Award for

Best Practices, the IDEAS Global Challenge, and the MGH Co.Create Prize. Projects were featured in best-of-2015 lists from *National Geographic*, *Mashable*, and *Forbes*.

Learn more at tatacenter.mit.edu.

TATA CENTER

TECHNOLOGY + DESIGN



Profile **Natasha Wright**



For Natasha Wright, a Tata Fellow and PhD candidate in the Department of Mechanical Engineering, 2015 was a year to remember. Together with her advisor, Assistant Professor Amos Winter, Natasha won the USAID Desal Prize, a global competition rewarding the most promising technology for providing safe, clean drinking water.

Natasha's project responds to a critical need she observed in India: millions of rural residents rely on groundwater that is either brackish, contaminated, or both. Natasha and Professor Winter set out to create a desalination system that could operate efficiently in an off-grid setting and serve the daily drinking water needs of a village.

The high-efficiency system uses solar power and electrodialysis filtration—a combination previously thought impractical due to electrodialysis' high energy demands—making it viable in villages without grid electricity access, where water issues are often most acute.

Natasha was named to *Forbes*' 30 Under 30 in the category of energy, and continues as a Tata Fellow in 2016. She and Professor Winter will stage pilots of the system in India and Gaza.

TRANSLATIONAL FELLOWS PROGRAM

Established in 2013 by the Research Laboratory of Electronics (RLE), the Translational Fellows Program (TFP) was created with the primary goals of accelerating the transfer of research-derived technologies into commercial products, and to generate professional development opportunities for postdoctoral associates.

The fellows are selected through a competitive process initiated by a principal investigator and are provided with 20% of their salary (one-day-a-week commitment) for a year, funded through discretionary resources. TFP has developed an integrated yearlong endeavor aimed at laying the foundations for a commercial launch of a research-derived technology. The alignment of resources available through MIT's rich entrepreneurial ecosystem bridges the gap in the chain of research-based innovation and accelerates the pace and volume of technology trans-

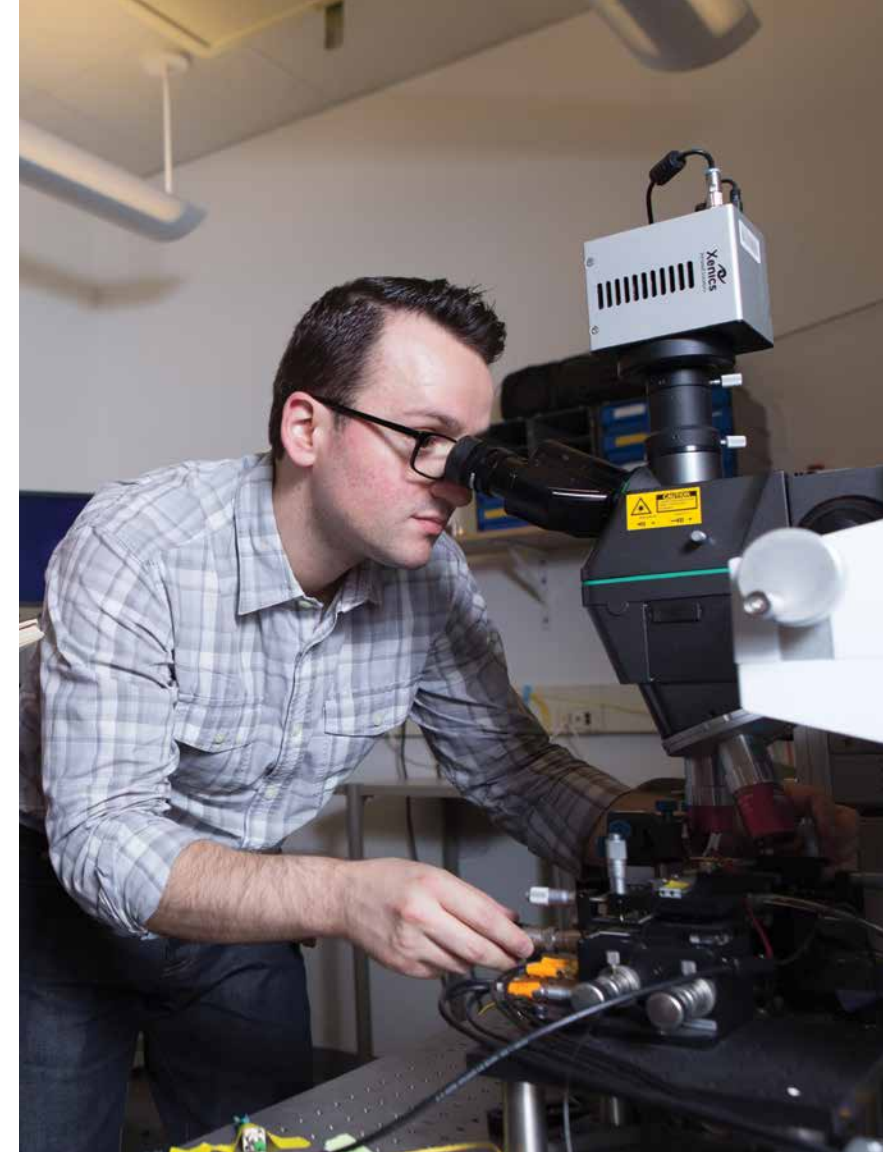
lation.

The program was founded by Professor Yoel Fink, director of the RLE, with five participating postdocs. Sponsored by the MIT Innovation Initiative, it was piloted at a larger scale in 2014, and a close collaboration was formed with the Venture Mentoring Service (VMS). Significant synergies were found between the TFP and VMS resources and goals. The VMS now manages two significant parts of the program—the NSF I-Corps program and industry mentor assignment. In 2015, the TFP became an official campus-wide program with a new cohort of 26 postdocs.

Over the past year, the Translational Fellows Program has shown excellent outcomes, as well as significant growth. Two companies have been launched—one currently closing a large-scale pilot and the other secur-

ing an investment from a strategic partner. Other companies are likely to be formed. In addition, two fellows completed accelerator programs over the summer in 2015, and another successfully completed the national NSF I-Corps program. One postdoc has been appointed faculty and NEU, and one is now leading a lab as an industry collaborator. Several fellows have been awarded commercialization grants, and continue to develop their technologies.

Learn more at rle.mit.edu/translational.



Profile Paulo Garcia



Dr. Paulo A. Garcia, from the MIT Laboratory for Energy and Microsystems Innovation, was a member of the Translational Fellows Program 2014-2015 cohort. During the program, he created commercialization plans for a technology that he developed with his PI, Professor Cullen Buie—a fast, high-throughput microfluidic electroporation assay.

Upon completion of the TFP in October 2015, Dr. Garcia went on to participate in the national NSF I-Corps program for the commercialization of science, which awards participants a grant of \$50,000 to pursue customer development activities. Professor Buie was actively engaged in the program and Beth Kahn, a VMS mentor, joined the team as industry mentor. They emerged as the top team in their cohort. Through his work in the TFP and the I-Corps program, Dr. Garcia produced enough evidence of market demand to launch a venture to commercialize his technology and has decided to pursue this opportunity. He plans to apply for an SBIR grant and launch his company over the next year.

UNDERGRADUATE PRACTICE OPPORTUNITIES PROGRAM

MIT students are redesigning data display tools at Aurora Flight Sciences, developing nanoforensic tags at MITRE Corporation, evaluating the effectiveness of the F-35 at Northrup Grumman, and exploring hundreds of other career paths before they graduate. The Undergraduate Practice Opportunities Program (UPOP) provides students with an avalanche of internship opportunities, and it doesn't stop there.

Launched in 2001, UPOP is an experiential learning program that gives MIT students the critical competencies needed to thrive in today's professional environment. The co-curricular program combines pragmatic skills building and training with advanced perception, cognition, and behavior exercises to enhance student learning in every context—not just the classroom.

UPOP works with nearly half of MIT sophomores each year. Students engage in one-on-one coaching, networking events, field trips, workshops, and practice interviews. The cornerstone of the yearlong program is a professional development boot camp taught by faculty and industry mentors during Independent Activities Period. The UPOP learning ecosystem infuses participants with workplace capabilities—communication, collaboration, adaptability, problem solving, critical observation, and conflict resolution—and empowers them with the confidence needed for long-term professional success.

Learn more at upop.mit.edu.

Each summer, hundreds of UPOP students work all over the U.S. and internationally, across industries, including:

Adobe, AirBnB, Air Liquide, Amazon, Apple, Akamai, Amazon, Amgen, Aurora Flight Sciences, Autodesk, Bank of America, Bell Helicopter, Biogen-Idec, Birchbox, Blizzard, BMW, Boeing, Booze Allen Hamilton, Boston Scientific, Bose, BP, Cessna Aircraft, Chevron, Chrysler, Cisco, Conoco Philips, Corning, Cummins, Cypress Semi Conductor, Dassault Systèmes, Deutsche Bank, Direct TV, Dow Chemical, Draper, Dropbox, DuPont Pioneer, eBay, Electronic Arts, Estee Lauder, Etsy, ExxonMobil, Facebook, Ford, Formlabs, GM, GE, Gameloft, General Atomics, Genetech, Genzyme, Goldman Sachs, Google, HP, Halliburton, IBM, IDEO, Intel, iRobot, JPL, Johnson & Johnson, JPMorgan Chase, Lincoln Labs, Lockheed Martin, Los Alamos Labs, Mass Challenge, Mathworks, McKinsey, Medtronic, MedImmune, Merck, Merrill Lynch, MGH, Microsoft, MITRE,

Morgan Stanley, NASA, the New York Times, the NIH, the NRC, the NSA, Nike, Nokia, Northrop Grumman, Novartis, Oracle, Orbital Sciences, P&G, Palantir, Panasonic, Pfizer, Pinterest, Pioneer Natural Resources, Pixar, Pratt & Whitney, P&G, Qualcomm, Raytheon, Sandia, Schlumberger, Shell, Sikorsky, SolidWorks, Sonos Electronics, SpaceX, St. Gobain, State Farm, Stryker, Synaptics, Takeda Pharmaceuticals, Terrafugia, Tesla Motors, Texas Instruments, Thomson Reuters, Tiffany & Company, Trip Advisor, Tumblr, UBS, US Army Corp of Engineers, US Senate, Vecna Technologies, Uber, Virgin Galactic, VMware, Vistaprint, Volpe National Transportation, Walt Disney Company, Washington Metro Transit Authority, Westinghouse, WL Gore, the World Bank, Xerox, Yahoo, as well as many early-stage startups, and more.



Profile Allison M. Hallock



Allison M. Hallock '16, a chemical engineering major with a minor in biology, joined UPOP because she felt it was a good way to get a step up in the industrial world and to develop skills crucial to success.

"All these skills are so valuable—negotiation, communication, crucial conversations, how to work as a team, how to function as a project manager," she says, "and UPOP is a really safe place to learn, practice and fine-tune them."

Her sophomore summer plans to work on a MISTI research project in Spain dramatically changed after talking to Tim Dove '79—president and COO of Pioneer, and a UPOP alumnus and mentor—at a UPOP workshop.

Allison's internship at Pioneer was a great learning experience, she says. "I found I loved what people around me were doing and that was really motivating for what I wanted to do in the real world." She went on to senior positions in the Society of Women Engineers, and is now the vice president of internal relations within the American Institute for Chemical Engineers.

"I don't think I could have taken on those leadership positions without the skills that UPOP taught me. I feel UPOP is that first stepping stone to realizing that we can each make a difference in industry, whether in startups or research or within an engineering field."



Student Groups

HACKING ARTS

Hacking Arts is MIT's annual festival celebrating innovation and entrepreneurship in the creative arts. Founded in 2013, Hacking Arts has established itself as one of the premier community events at MIT.

Held each year at the MIT Media Lab, the weekend-long festival presents two major events—a conference and a hackthon—and focuses on the areas of design, fashion, film and video, gaming, music, performing arts, virtual reality, and the visual arts.

The conference hosts panels on each industry as well as a tech expo showcasing the latest innovations in these fields. The hackathon is specifically designed for creative technologists and brings together resources and mentors to promote even further innovation.

Panelists, exhibitors, and sponsors of Hacking Arts include Spotify, Artsy, Brooklyn

Ballet, Sonos, Formlabs, Auro Technologies, Google VR, JUMP, and more.

In 2015, Hacking Arts grew attendance by 150% and introduced a VIP event to better connect students with the panelists, exhibitors, and artists who helped contribute to the festival. In addition, DJ Young Guru, “the most influential man in hip-hop you’ve never heard of” according to *The Wall Street Journal*, was the keynote speaker. The conference closed with a rousing performance by the Brooklyn Ballet, whose dancers brought the classic *Nutcracker* to life on stage. Costumes worn by the troupe’s ballerinas integrate technology such as LED lights, motion sensors, and fabricated microcontrollers to transform their tutus into interactive performance pieces.

The festival is organized by the MIT Sloan Entertainment, Media & Sports Club in partnership with the MIT Center for Art, Science

and Technology and the Martin Trust Center for MIT Entrepreneurship. Additionally, Hacking Arts enlists school partners to help bring in a diverse group of students. Partners for the 2016 festival include Berklee College of Music, the New England Conservatory, and the School of the Museum of Fine Arts.

Learn more at hackingarts.com.



Profile Natalie Pitcher



Hacking Arts is a student-run event. MIT students engage in the festival in a variety of ways, from running panels, to connecting with sponsors, to organizing the world's biggest arts-focused hackathon! Historically, the Hacking Arts hackathon has led to successful student startups that continue to contribute to the creative innovation and entrepreneurship community at MIT.

The 2015 chair, Natalie Pitcher, is a 2016 MBA candidate and a former documentary television producer. She enrolled at the MIT Sloan School of Management to combine her passion for media with MIT's strengths in innovation and technology. Through working on Hacking Arts, she has become passionate about supporting the creative arts entrepreneurial ecosystem at the Institute. Natalie works for the Martin Trust Center for MIT Entrepreneurship as the creative arts sector practice leader, advising student arts entrepreneurs and assisting on initiatives such as Arts at MIT's 15K Creative Arts Competition. Additionally, after seeing the explosion of interest in virtual reality as an artistic medium, she launched VR @ MIT, an initiative to improve entrepreneurial resources in virtual reality at MIT.

MIT CLEAN ENERGY PRIZE

The MIT Clean Energy Prize (CEP) is the nation's oldest and largest student-run clean energy business plan competition in the U.S. Founded in 2007, the mission of the CEP is to both inspire and prepare the next generation of leaders to take on the world's most pressing energy challenges.

Since its launch, the CEP has mentored over 160 student teams and has awarded over \$2.4 million in equity-free funding, leading to more than \$240 million in subsequent capital raised by CEP alumni companies. Utilizing an established network of partnerships, the Clean Energy Prize hosts energy innovation events that are widely attended in major cleantech hubs, including Boston, New York, and San Francisco. These events bring students, entrepreneurs, academics, and industry experts together to begin identifying and addressing energy opportunities.

The annual multi-stage competition begins with a robust two-month mentorship phase

where each team is coupled with a technology, business, and legal mentor. Teams from across the country enter their business ideas in one of three categories: energy efficiency, renewable energy, and infrastructure and resources. The competition culminates with the Grand Finals showcase where refined teams compete for significant cash prizes in front of crowds reaching 500 people.

OptiBit, a team comprised of academics and students from MIT, University of Colorado Boulder, and University of California, Berkeley, took home the coveted Grand Prize in 2015. OptiBit helps data centers keep up with skyrocketing volumes of data through revolutionary hardware that brings high bandwidth and energy efficiency offered by fiber optics directly inside computer chips.

The winners of the Track Prize included Next-Tint, CoolFlux, and Navi-Chem. The inaugural Development Prize, established in 2015 to incentivize global energy solutions, was

awarded to Safire—an organization scaling a low-cost pre-treatment and densification of biomass at source points.

In 2016, student entrepreneurial teams once again competed for over \$225,000 in category prizes, including the \$100,000 Grand Prize award. The winners were announced during the Grand Finals showcase on April 30, 2016 in Cambridge, MA.

Learn more at cep.mit.edu.



Profile Ryan Macpherson



Ryan Macpherson, the 2015-2016 co-managing director of the MIT Clean Energy Prize (CEP), is a first-year MBA candidate at the MIT Sloan School of Management. His focus is on the intersection of entrepreneurship, technology, and finance.

Prior to coming to MIT Sloan, Ryan served as lead engineer for a nonprofit government advisory firm in Washington, D.C., helping both defense and civilian agencies achieve more sustainable, resilient, and cost-effective operations through strategically deploying cleantech innovations at scale. As co-managing director, Ryan is responsible for CEP's overall strategic direction, team-formation, and execution.

"The Clean Energy Prize is a jewel in the cleantech venture space. The technology and business model innovations that funnel through the program are truly amazing, and continue to drive tangible impact in creating a more sustainable world. I'm proud to be a part of the CEP family," says Ryan.

MIT DESIGN FOR AMERICA

MIT Design for America (DFA) is dedicated to creating social impact through engineering and design. Established in 2012 by a group of MIT students, DFA was founded on the belief that making a difference did not have to wait until after graduation.

Throughout the year, the group partners with local organizations such as hospitals, schools, and homeless shelters to design real solutions to real problems in the community. In addition, the group runs hackshops and outreach events to help students build new technical skills and encourage the use of human-centered design in order to create products that are more meaningful.

Over 500 people have attended DFA events. As a result, more than 100 students have designed products for social impact, creating 11 different projects that have addressed problems ranging from reading with dyslexia to improving Boston food security for low-income residents.

During the 2015-2016 academic year, DFA supported six new projects that are making an impact in fields ranging from improving education to campus sustainability. By partnering with companies such as Autodesk, Microsoft, and Github, DFA is building the most impactful projects possible.

Design for America is passionate about helping students across MIT not only make a difference, but develop skills that cannot be learned in the classroom. Students are not limited by their age in the impact they can have and the group fosters that sentiment by teaching new skills, providing new opportunities to design solutions, and creating a community of changemakers eager to make an impact and help each other to do so. DFA students tackle unsolved problems, and in the process, develop the empathy, creativity, and passion that they carry forward with them.

Learn more at designforamerica.mit.edu.



Profile Kelly Liu



Kelly Liu is a computer science major in the Class of 2016, and was part of the founding team of MIT Design for America (DFA). She has been a dedicated leader in the organization ever since, leading the efforts to build DFA from a nascent idea to a community of hundreds of impact-driven engineers solving some of the most pressing problems in the nation. Outside of Design for America, Kelly has been heavily involved in using her technical skills to build impactful products for education and assistive technologies.

Kelly has been the driving force behind Design for America's campus-wide events, corporate sponsorships program, and project mentorship program. Her efforts have resulted in essentially doubling the size of DFA in less than a year, and raising tens of thousands of sponsorship dollars to support the impactful work of the group.

After MIT, Kelly hopes to build educational technologies that empower classrooms. If that's not enough, she's also an Ultimate Frisbee champ and a world-class doodler.

MIT FINTECH

The mission of MIT FinTech is to build an entrepreneurial ecosystem in financial technology and innovation at the Institute. An initiative of the Martin Trust Center for MIT Entrepreneurship, MIT FinTech is a group of dedicated students from different backgrounds and academic disciplines who have come together to explore, discuss, and collaborate on financial innovation.

The group believes that MIT is uniquely positioned to create successful entrepreneurs and innovators in financial services. The objective of MIT FinTech is to foster the MIT community's endeavors in this space through activities spanning all stages of entrepreneurial development: community creation, ideation, courses, competitions, industry connections, and early-stage incubation.

In 2015, the financial technology ecosystem at MIT saw some major developments. MIT

FinTech was created and the first-ever MIT FinTech Conference took place in May 2015. The conference brought together more than 400 students, startup founders and executives, bank innovation executives, and practitioners to discuss the latest innovations in financial technology, and featured a stellar lineup of speakers, including Daniel Nadler, founder of Kensho; Ben Milne, co-founder of Dwolla; and John Fawcett, founder of Quantopian.

The 2016 MIT FinTech Conference, Disruption Over the Next Decade, took place on April 16, 2016 at the MIT Media Lab. The group hosted more than 500 people and became not only the premier student-run FinTech conference in the world, but one of the key FinTech events on the East Coast. Speakers included Kathryn Petralia, co-founder of Kabage; Brian Peters, executive director of Financial Innovation Now; and Adrienne

Harris, Special Assistant to the President for Financial Policy.

Additionally, MIT introduced 15.S09 (FinTech Ventures), the first graduate course covering financial technology in the U.S. Throughout the seven-week course, students explored different sub-industries within the FinTech space, such as consumer finance, payments, trading, and cryptocurrencies. Enrolled students were also asked to develop business plans for their own FinTech ideas in teams that were eligible to compete in the new MIT FinTech Competition in early April 2016.

Learn more at mitfintech.com.



Profile Can Kisagun



Can Kisagun is a 2016 MBA candidate at the MIT Sloan School of Management. Before coming to MIT, Can was a business analyst at McKinsey & Company, where he served numerous large financial institutions and discovered how FinTech companies were starting to disrupt the space with more efficient and client-friendly solutions.

Can was one of the early members of MIT FinTech. This year he became the club's VP of treks and events, for which he is currently working to organize the first "blockchain" trek to New York and San Francisco. He is also an active member of the MIT Bitcoin Club and has done research on applications of digital currencies and blockchain with the Digital Currency Initiative at the MIT Media Lab.

Last fall, Can was part of the first cohort of students who enrolled in 15.S09 (FinTech Ventures). During the course, he started working on his current venture: a blockchain-based application to streamline the trade finance process by which most companies today manage their import and export operations.

The company was a semifinalist of the \$100K Accelerate and is one of the most promising projects of FinTech at MIT. "The evolution of the FinTech ecosystem has been really amazing this last year and a half," says Can. "MIT is now becoming the reference in student entrepreneurship in FinTech, and the best is yet to come!"

MIT FOOD AND AGRICULTURE CLUB

Feeding the growing population while eliminating negative social, economic, and environmental consequences is a critical challenge facing the world today. It is also an opportunity to create a more sustainable and equitable global food and agriculture system through collaboration, innovation, and leadership.

The MIT Food and Agriculture Club (FAC) brings together students and other members from the MIT community to coordinate and support work in the areas of food and agriculture. In addition to advocating for and supporting the development of a more sustainable food system on campus, the FAC works to enhance MIT's role in contributing to global agricultural innovation and sustainability.

Specifically, the club seeks to increase the MIT community's awareness of, and participation in, food and agriculture-related events; incorporate food and agricultural sus-

tainability and innovation into programming and coursework; and promote collaboration between students, faculty, and food and agriculture industry practitioners.

2015 was an especially exciting year for the club. The FAC presented a series of monthly events, such as tours, tastings, cooking classes, and featured guest speakers. Additionally, the group co-hosted a case competition, went live with a new website, and launched the first-ever MIT Food and Agribusiness Innovation Prize.

Sponsored by Rabobank and the MIT Abdul Latif Jameel World Water and Food Security Lab, the Innovation Prize is an entrepreneurship competition to support early-stage food and agribusiness ideas. After receiving over 25 applications, a judging panel of leading academics and industry professionals narrowed down the field to nine finalists. These finalists worked with expert mentors and presented their business plans and competed

for \$25,000 in prize money at the final event on April 28, 2016.

The Food and Agriculture Club is proud to play an integral role in growing the level of interest in food systems innovation among MIT students and more broadly, in the community. The club plans to build upon this momentum with more great events and activities, including a regular happy hour night to convene food and agriculture professionals and enthusiasts, and the upcoming Food Tech Trek, where a group of graduate students will visit leading food and agribusiness companies in Silicon Valley.

Learn more at food-ag.squarespace.com.



MIT FOOD AND AGRIBUSINESS INNOVATION PRIZE

Profile Jessica Newman



Jessica Newman is a master in public policy candidate at the Harvard Kennedy School and an MBA candidate at the MIT Sloan School of Management.

Jessica has been integral to the success of the Food and Agriculture Club (FAC) this year. As a member of the executive team, she manages the website, develops resources, and coordinates events. She also took on a leadership role with the Food and Agribusiness Innovation Prize, including organizing the kickoff event with over 80 attendees, and coordinating mentor outreach for the prize finalists.

After winning the Anheuser-Busch InBev Case Competition, which is co-sponsored by the FAC, Jessica will spend the summer interning with the company in St. Louis, MO. The club will miss Jessica when she returns to Harvard in 2016, but knows she will continue to promote collaboration and innovation across the two schools.

MIT HACKING MEDICINE

MIT Hacking Medicine's mission is to energize and connect the best minds across the healthcare ecosystem to solve the industry's biggest challenges, and to teach healthcare entrepreneurship and digital strategies to scale medicine.

To foster this process, MIT Hacking Medicine brings together engineers, clinicians, entrepreneurs, designers, and corporate partners to collaborate around shared interests and develop health solutions over hackathons (ranging from two hours to full two-day events) with potential for greater impact in the healthcare industry. In these events, MIT Hacking Medicine guides participants through the healthcare design thinking process and strategies developed to constructively tackle systemic healthcare issues and generate tangible solutions.

In just four years, MIT Hacking Medicine has facilitated nearly 70 hackathons across

a dozen countries and multiple U.S. states. Teams coming out of these events have had successes joining prestigious accelerators—such as TechStars, Y Combinator, Healthbox, Rock Health, and MassChallenge—raising significant investment funding and partnering with healthcare institutions or companies towards implementing their hack ideas.

To date, the group has contributed to the formation of more than 15 companies that have raised over \$90 million in financing. Successful products that have been inspired from these events span from solutions targeted towards improving medication adherence, developing a better breast pump, improving neonatal resuscitation, and diabetic wound care.

MIT Hacking Medicine routinely collaborates with prominent organizations and corporations, including the Kauffman Foundation, Massachusetts General Hospital, Emergency

Nurses Association, Pfizer, Microsoft, GE, Samsung, Merck, and AthenaHealth. The group has also been featured in avenues such as South by Southwest, *The Wall Street Journal*, *Slate*, and *Wired*.

In the 2015–2016 academic year, MIT Hacking Medicine awarded over \$50,000 in prizes, and led a total of 20 healthcare innovation events and hackathons that spanned seven domestic states, including Ecuador, Singapore, Puerto Rico, Spain, Brazil, and the UK.

Learn more at hackingmedicine.mit.edu.



Profile Christopher Lee



Christopher Lee is a PhD candidate, expected in 2018, advised by Professor Michael Cima in the joint Harvard-MIT Division of Health Sciences and Technology, working in the MIT Koch Institute for Integrative Cancer Research with a focus on urological diseases. Prior to MIT, Christopher received a master's degree from Johns Hopkins University and a bachelor's degree from the University of Connecticut. Christopher is also co-founder of Recon Therapeutics, a startup focused on providing an improved platform to help patients mix, dose, and inject therapeutics that are delivered in a powdered form.

Since 2014, Christopher has been actively involved with MIT Hacking Medicine. In mid-2015, he became co-director, overseeing the group's operations and partnerships. Christopher has personally helped lead, plan, and execute over 30 events and has been a featured speaker at venues such as South by Southwest and the BIO International Convention. His work with MIT Hacking Medicine has also enabled him to actively assist in teaching the course HST.978/15.367 (Healthcare Ventures).

Notable recent awards and honors include selection as a 2015 *Forbes* 30 Under 30 honoree, World Economic Forum Global Shaper, 2015 MassChallenge winner, and *Inc.* Top 50 Young Entrepreneur Under 25.

MIT IMPACT INVESTING INITIATIVE

A few years ago, a force capable of solving the world's toughest problems emerged. Harnessing entrepreneurship, innovation, and capital, impact investing has proven success in powering social and environmental change.

As one of the world's preeminent universities, MIT is in a unique position to bring business and societal leaders together with academics and students to drive innovation and address the most pressing social and environmental challenges.

As a result, with the support of Net Impact and the Sustainability Initiative at MIT, the MIT Impact Investing Initiative (MI3) was created to bridge the gap between the lack of formal training in impact investing at business schools and to advance the growing importance of this field. A hands-on experiential program, MI3 provides students at the MIT Sloan School of Management

with tools and immersion opportunities to gain the skills they need to succeed as an impact investor.

The MIT Impact Investing Initiative seeks to increase the MIT community's awareness of and participation in impact-investing events; incorporate impact investing and sustainable finance innovation into coursework; and promote collaboration between students, faculty, investment practitioners, and social entrepreneurs.

In 2015, MI3 offered an Action Learning activity in which 30 graduate students simulated the creation of five different impact-investing funds. The group met weekly and invited faculty and industry practitioners to speak on related topics. Guests included Michael Chu, co-founder, IGNIA Fund and senior lecturer, Harvard Business School; Lisa Thomas, co-founder and chief investment officer, Vested World; Lauren Cochran,

director of private investments, Blue Haven Initiative; and David Shrier, managing director, MIT Connection Science.

Each fund went through the steps an investor would take—investment thesis creation, deal sourcing, and due diligence—to evaluate real startups raising a financing round. During MI3's capstone event, MIT Impact Investing Soirée, each group pitched their investment idea to a judging committee which evaluated the investment based on commercial and impact potential.

Several members of the initiative are working with MIT Sloan professors Jason Jay and Gita Rao to create the first-ever course on impact investing, which is slated to launch in spring 2017.

Learn more at facebook.com/mitimpactinvesting.



Profile David Sanchez



Passionate about his Colombian roots, David Sanchez has spent his career working to promote economic prosperity in developing economies. As a management consultant at Accenture, David supported companies in Latin America by formulating and implementing strategic initiatives that created jobs and strengthened the regional economy.

David decided to pursue his MBA at MIT Sloan School of Management to find alternative professional paths that could generate an immediate impact by pursuing MIT's Sustainability Certificate and focusing his MBA on social entrepreneurship.

David co-created the MIT Impact Investing Initiative (MI3). He led the MI3 Impact Investing Lecture Series in which industry practitioners shared their work experiences, and the MIT Impact Investing Soirée, an event in which current investors evaluate the work of impact-investing funds created by students.

Currently, David is working with MIT Sloan professors Jason Jay and Gita Rao to launch the first course at MIT on impact investing.

MIT SLOAN ENTREPRENEURSHIP AND INNOVATION CLUB

MIT Sloan Entrepreneurship and Innovation Club (E&I Club) serves as a critical resource for MIT students interested in building businesses and driving innovation. One of the largest groups at Sloan, the E&I Club has seen its membership nearly double over since 2015, as more and more students are becoming interested in alternatives to more traditional MBA careers.

The E&I Club offers MIT Sloan students and students from the broader MIT community, a wide variety of speaking events, pitchathons, study treks, and recruiting opportunities. Weekly speaker events in 2015-2016 featured many notable entrepreneurs, including Uber CEO Travis Kalanick and Okta founder Frederic Kerrest. Study treks included student-run trips to visit companies in Silicon Valley, Boulder, Colorado, and New York, helping students foster relationships in these innovation hubs.

The E&I Club also seeks to help students recruit for positions at early-stage ventures. The E&I Winternship Academic Study during the Independent Activities Period in January matched over 60 students with startups in Boston and San Francisco for a three-week internship where students evaluated the inner workings of a startup against the framework of Bill Aulet's 'Disciplined Entrepreneurship.'

Starting in spring 2017, the E&I Club will also be offering a Startup Recruitment Job Fair, to provide MIT Sloan students with a more formal avenue for startup recruiting.

Learn more at sloaneiclub.wordpress.com.



Profile Adam Mitchell



Adam Mitchell is a 2017 MBA student in the entrepreneurship and innovation track at the MIT Sloan School of Management. Prior to MIT, Adam worked in a corporate entrepreneurship role at News Corp, where he was responsible for building News America Marketing's Canadian digital advertising services business. Adam is interested in the intersection of technology and music, and enrolled at MIT Sloan to study entrepreneurship in the hopes of one day founding his own business.

Adam is co-president of the MIT Sloan Entrepreneurship and Innovation Club, and has held leadership roles in the MIT \$100K Competition and the Sloan Entertainment, Media and Sports Club. Adam also helps to oversee the MIT Hip Hop Speaker's Series that brings high-profile rap artists to campus. Notable accomplishments at MIT have included winning the Sonos Ultimate User Experience Prize at the 2015 Hacking Arts Hackathon, as well as winning the 2016 MBA Team Sales Competition hosted at MIT Sloan. This summer, Adam will be interning at Microsoft in an innovation strategy role within the Worldwide Enterprise Group.

MIT SUSTAINABILITY SUMMIT

The **MIT Sustainability Summit** is an annual event that has grown to include more than 350 attendees ranging from professionals, academics, and students.

Past summits have featured discussions with thought leaders and expert practitioners, including Jeremy Grantham (GMO), Jim Hanna, (Starbucks), Mindy Lubber (Ceres), Nancy Gillis (General Services Administration), Jeffrey Hollender (Seventh Generation), Scot Horst (U.S. Green Building Council), James Balog (Chasing Ice), Rick Ridgeway (Patagonia), and many more.

In a moment when environmental sustainability and social equity appear to be in tension with economic prosperity, the innovator's sensibility is essential.

The 2016 MIT Sustainability Summit accelerated the theme of Sustainability-Oriented Innovation (SOI)—creating value for cus-

tomers while making an environmentally and socially sustainable future possible—and engaged the audience around three key areas:

CORPORATE INNOVATION

Focusing on the ways in which corporates are acting and reacting through internal and external sustainability-oriented innovations—specifically through corporate R&D, corporate venture capital, internal venturing, mergers and acquisitions, and joint partnerships with industry, government, and startups.

SOI FINANCING & POLICY

Examining how public and private investing is looking into alternative modes of financing, assessing the return on investment of SOI, and using policy as a driver of SOI.

INNOVATION PIPELINES

Analyzing the biggest challenges and best



MIT SUSTAINABILITY SUMMIT

practices within each of these stages, as well as explore how greater enabling conditions can be created for sustainability-oriented innovation to scale.

Learn more at sustainabilitysummit.mit.edu.



Profile Sarah Day Kalloch



A second-year MBA candidate at the MIT Sloan School of Management, Sarah Day Kalloch focuses on business and social impact, sustainable supply chains, and market-based solutions to poverty. She is co-president of MIT Sloan's Net Impact Chapter and served as a procurement-environment intern at Apple last summer.

Prior to MIT Sloan, Sarah worked at Oxfam America, supporting global food security policy and leading on partnerships for the organization's Behind the Brands campaign, which assesses the agricultural sourcing policies of the world's top food and beverage companies, and advocates for better policies for communities in their supply chain. She also served as director of outreach at Physicians for Human Rights, scaling two human rights organizations in Uganda and Kenya, and advocating for improved HIV/AIDS and global health funding.

MIT VENTURESHIPS CLUB

MIT Ventureships Club aims to enhance the startup working experiences of MIT students. Launched in 2004, the goal of the club is to help hatch more brilliant MIT ideas into startups and to propel the startup ecosystem evolution at the Institute.

The Ventureships Club experienced a successful year in 2015. The club presented two programs in the fall and spring, and hosted six major events, including two kickoffs, two midterm socials, and two final competitions. These events offered students the opportunity to learn more and network and collaborate with some of the premier startups getting off the ground at MIT.

The eight startups selected for the Ventureships program included MIT 100K finalists and winners, and over 400 students were engaged. Mentored by the MIT Venture Mentoring Service, the club runs its program every semester and proves to bring great value to both MIT startups and students.



In the past year, the Ventureships Club's programs attracted students from various backgrounds in—roughly 30% are from business, finance, and management, and 70% are from engineering. About 20% of applicants are undergraduates, 5% are post-docs, and the rest are graduate students.

The Ventureships Club expanded its partnership with Microsoft and became a BizSpark Network Partner to offer MIT startups quick and free access to the Azure cloud services. The club also partnered with Angel Global and Xtecher to provide startups with fundraising and public relations services.

Additionally, the Ventureships Club built strategic collaborations with a number of student organizations across campus, including the MIT Sloan Entrepreneurship and Innovation Club. The club was also a participant in the MIT Startup Ecosystem Conference in December 2015, and increased its mailing list to over 940 subscribers.

The Ventureships Club will continue to work hard to bring the greatest value and benefits to MIT students and startups.

Learn more at ventureshipsclub-mit.squarespace.com.



Profile Andrew Ramirez



Andrew Ramirez is a part-time graduate student in the MIT Advanced Study Program (ASP) while he works full-time as a business analyst in MIT's Information Systems & Technology (IS&T) department. Through the ASP program, he takes MBA courses at the MIT Sloan School of Management and plans to enroll as a full-time MBA candidate in fall 2017.

Starting as a project coordinator, Andrew helped facilitate the Ventureships program and engage students in working with MIT startups. As vice president of the club, he is helping to foster the strategic strength and increase the group's visibility on campus and in the greater Boston area.

At MIT, Andrew works in the Emerging Solutions group of IS&T and participates in the discovery and implementation of new software solutions. His particular focus on the team is user experience and design. Prior to coming to MIT, Andrew worked in the oil and gas division of General Electric where he developed strategy recommendations for global network infrastructure expansion to help reduce data transmission latency.

MIT WATER CLUB

The **MIT Water Club** is the premier network for water-related innovation at MIT. Its mission is to connect and inspire passionate individuals to explore ways by which cutting-edge research, innovation, and policy can help solve the most pressing challenges in the water sector.

The club hosts a number of conferences, competitions, lectures, and social gatherings throughout the year, including three annual flagship events: MIT Water Summit, MIT Water Night, and the MIT Water Innovation Prize.

MIT WATER SUMMIT

Bringing together leaders from industry, government, and the scientific community to discuss the greatest challenges and opportunities in the water sector.

The theme of the 2015 summit was Thriving with Change. The changing climate will challenge the existing framework in which

all water resource management has existed for generations. The summit explored how we can better understand and cope with the water challenges we face; how innovation, technology, research, and policy can build a more resilient water system; and how we can navigate organizational and geopolitical systems to build a more resilient world.

MIT WATER NIGHT

A research showcase providing an energizing platform for individuals and research groups to present their latest achievements and work in water-related fields.

In March 2016, the fourth annual MIT Water Night filled MIT's Walker Memorial with over 200 attendees. Prizes were awarded for the best posters in five categories: Desalination & Water Treatment; Earth & Oceans; Teaching in Water, Management & Human Development; Water Chemistry & Nanotechnology; and Water Policy. This year also marked the launch of the first-ever Fresh-

man Challenge, sponsored by the Department of Civil & Environmental Engineering, where freshmen participants proposed a future research study inspired by a poster at the event. Other highlights included a great keynote by Dr. Matt Silver '01, CEO of Cambrian Innovation.

MIT WATER INNOVATION PRIZE

A solutions-to-market competition aimed at supporting the next breakthrough in the water sector. In 2015, the inaugural event awarded innovation grants to the winning teams totaling \$20,000. Thanks in part to returning sponsor PepsiCo, teams who participated in the 2016 competition had the opportunity to win grants totaling \$30,000, including the new Veraqua Prize for demonstratable technologies that focus on the challenges facing water in China.

Learn more at mitwater.org.



Profile Alexis Fischer & Matthew Willner



The MIT Water Club is a student-run group and is led by co-presidents, Alexis Fischer and Matthew Willner.

Alexis is a PhD candidate in biological oceanography in the MIT-Woods Hole Oceanographic Institution Joint Program. Her research focuses on harmful algal blooms ("red tides"), and in particular how warming temperatures will affect the timing and intensity of blooms. She is interested in using biosensors to better understand how a changing climate and anthropogenic stressors (e.g. wastewater effluent) will impact the health of our coastal waters so that we can better protect human and ecosystem health.

Matthew is a master of city planning candidate at MIT, focusing on climate change adaptation and the resilience of urban drinking water systems. Prior to arriving at MIT, Matthew was an energy and environment policy aide to both the U.S. House Natural Resources Committee's Democratic staff and Massachusetts Senator Edward J. Markey. A graduate of Oberlin College, Matthew is also a fellow in the MIT Office of Sustainability and is working with the Institute to develop its first campus-wide climate change vulnerability assessment.

MIT WATER INNOVATION PRIZE

The MIT Water Innovation Prize is the first solutions-to-market competition focused on water startups at MIT. Launched in 2015, the idea for the prize was born after a group of students spanning disciplines across the Institute—from mechanical engineering and chemical engineering to business and urban planning—identified a growing interest in water innovation on campus and decided to do something about it.

Using a competitive platform, the MIT Water Innovation Prize promotes the creation and development of innovative products and services aimed at solving the world's most pressing water challenges.

The group's objectives include:

- Establish a platform to foster water innovation at MIT and the surrounding community.
- Contribute to student and team learning, and expand their relevant network.

- Support the commercialization of breakthrough, scalable water technologies and processes across a range of domestic and global sectors.

The inaugural competition hosted seven MIT teams, with three winning innovation grants totaling \$20,000. Winners included WellDone, a remote monitoring technology for rural water infrastructure; AquaFresco, a next generation laundry technology that regenerates 95% wastewater; and ED4India, an in-home desalination technology for urban India. The winning teams have gone on to compete in larger competitions and have also been featured in the media. WellDone was named to *Forbes* 30 Under 30 for energy and AquaFresco was featured in *The Atlantic* for their contributions.

The 2016 competition was held in April and awarded up to \$30,000 to winning teams.

The MIT Water Innovation Club is a flagship

event of the MIT Water Club, the leading student network for water research and innovation at MIT.

Learn more at mitwaterinnovation.com.



Profile Katie O'Connor



Katie O'Connor SDM '16 exemplifies the MIT Water Innovation Prize from all angles. Katie came to MIT to pursue a master's degree in the System Design & Management program, intent on building on her environmental consulting experience and to learn how to tackle environmental issues from a holistic perspective, combining engineering and business.

She first came across the MIT Water Innovation Prize during the fall activities fair. Along with members of her team, ED4India, she was a winner of the inaugural 2015 competition with their plan to affordably and securely bring electrolysis water filtration technology to India's urban markets. Katie's thesis work continues the team's vision, as she looks more deeply at the market to better understand customer needs.

Now, as a key member of this year's MIT Water Innovation Prize, Katie curates mentorship opportunities for participating student teams. Her cross-functional perspective, as a student participant and a competition organizer, and with the lens of supportive mentors, enables her to identify opportunities to leverage the strengths of each group. Her goal is to improve the support structure for the prize's second cohort.

Katie is also an active member of the MIT Water Club and supports their lecture series on water research and innovation.



PROFESSIONAL PROGRAMS

MIT PROFESSIONAL EDUCATION, SCHOOL OF ENGINEERING

MIT Professional Education provides a gateway to renowned MIT research, knowledge, and expertise for those engaged in science and technology worldwide. MIT Professional Education is central to MIT's mission, as it provides lifelong learning opportunities to industry professionals in science, technology, and other areas of scholarship that will best serve the world in the 21st century. More than 100 MIT faculty teach courses, enabling them to serve and enhance MIT's connections with the global practitioner community.

SHORT PROGRAMS

MIT Professional Education Short Programs has addressed the education needs of more than 86,000 science and technology professionals worldwide for over 66 years. The program offers more than 50 on-campus courses that explore wide-ranging topics led by prominent MIT faculty. In 2015, over

1,500 students from 70 countries participated in more than 45 courses. In summer 2016, Short Programs will offer a groundbreaking Professional Certificate Program in Innovation and Technology. This program aims to empower new global innovators with proven innovation strategies addressing a wide range of disciplines.

DIGITAL PROGRAMS

MIT Professional Digital Programs delivers timely, relevant online courses to professionals located across the nation and around the world. By utilizing online platforms, Digital Programs provide flexible, convenient, and comprehensive learning experiences. In 2014, the program introduced its first online course, Tackling the Challenges of Big Data, and after seven runs, the course crossed the milestone of over 10,000 enrollees from 122 countries. To continue building on this success and to further meet the needs for innovation-driven

education for professionals, MIT Professional Education has broadened its offerings to include programs on data science, cybersecurity, the Internet of Things, negotiations for entrepreneurs, and systems engineering.

INTERNATIONAL PROGRAMS

MIT Professional Education expanded its global footprint in 2015 through offering locally relevant short courses in international locations such as Taiwan, Dubai, and Bangalore. In Taiwan, a course offered focused on improving the livability of cities, and in Dubai and Bangalore, courses attended by industry and government leaders, explored multiple facets of what we call radical innovation.

Learn more at professional.mit.edu.



Profile Jim Melzer



In 1977, Jim Melzer earned his master's degree from MIT's Department of Chemistry, and in 2015, he returned to campus to complete the MIT Professional Education Short Programs course, Technology, Organizations, and Innovations: Putting Ideas to Work.

"As an alum, I can tell you that the caliber of MIT faculty has always been superb," says Jim. "This class is no different. These are high-caliber individuals who are well-read and excellent researchers in their field."

A Technical Fellow at Rockwell Collins in Carlsbad, California, Jim came to Cambridge to gain the strategies to overcome organizational inertia in the pursuit of innovative ideas. He returned to his organization armed with the right questions to ask to break through these challenges.

"MIT Professional Education has become the gateway for alumni to return to campus," says Bhaskar Pant, executive director of MIT Professional Education. "They're coming back to acquire new skills, learn about the latest developments and research in their fields, and gain new perspectives."

MIT REGIONAL ENTREPRENEURSHIP ACCELERATION PROGRAM

The MIT Regional Entrepreneurship Acceleration Program (REAP), a capstone global initiative, helps regions accelerate economic growth and social progress through innovation-driven entrepreneurship (IDE). Partner regions form multidisciplinary teams and commit to a two-year learning engagement during which teams work with MIT faculty and the broader REAP community to build and implement a custom regional strategy for enhancing their IDE ecosystems.

REAP participants are comprised of a team of 5-8 leaders drawn from 5 key stakeholder groups (government, risk capital, universities, entrepreneurs, and corporates). Stakeholders work collectively with others from their region and with MIT thought leaders to build out their action-based strategy for change. Teams do so by deploying the MIT framework to assess the region's capacities and comparative advantages and how they influence the entrepreneurial ecosystem.

This research serves as a foundation for the team's strategy and implementation of that strategy.

Participants attend highly interactive two-and-a-half day educational workshops twice each year where they work directly with MIT faculty to develop their regional strategy. This is done in cadence with 16 global teams, allowing for a deeper understanding of economic development around the world.

Between workshops, teams engage in significant action-oriented activities in their region and leverage faculty coaching along the way. Each team determines its own "Must Win Battle" and begins the implementation of this project over the 2nd, 3rd, and 4th Action Phases. Another component that teams are able to take advantage of during this time is the Global Innovation Network, an online community hosting the latest discussions, articles, and research papers produced by

MIT and partner regions. The online community enables regions to more effectively share analysis, execute action plans, and sustain impact.

The MIT REAP program emphasizes the distinct, yet interdependent roles of innovative capacity and entrepreneurial capacity as it relates to an 'innovation ecosystem.' The program does so by enabling regional team members to learn from MIT experts, catalyze regional action, and leverage global best practice through cross-regional collaboration. This hybrid educational and economic development program ultimately enables regional stakeholders to accelerate economic growth and social progress at its core.

Learn more at reap.mit.edu.



Profile Team Scotland



Team Scotland, a member of the first REAP cohort, defined five elements to support the strategy they had formulated during the program. The first element was to analyze the weaknesses of the current ecosystem based on a review of seven main areas: Opportunity Perception, Risk Capital, Startup (mentors, entrepreneurs), International, High Growth, and Networking. The second element was for the team to build a REAP strategy that targeted these areas.

The third and fourth elements included a way to engage stakeholders and to use this input to influence government policy. Finally, the Scotland team wanted to measure the effect of the changes to the ecosystem. By the end of the program they were able to develop metrics that helped them evaluate the changes.

"We don't see the solution as a series of small interventions, but rather a repositioning of the pieces of the ecosystem so that they all work more effectively and the linkages are continuous. Transformational change doesn't happen overnight; you need to understand the system very well and how to facilitate mindset change and create societal role models. REAP is playing an important role in influencing the direction that we want to take to this end."



MIT Innovation Initiative

Massachusetts Institute of Technology

Building E70, 12th Floor

One Broadway

Cambridge, MA 02142

