Section 7
Global Engagement

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Global Engagement

International activities are central to MIT’s mission of educating tomorrow’s global leaders, advancing the frontiers of knowledge, and bringing forefront knowledge to bear on solving the world’s great problems. Our faculty and students are active in more than 75 countries. These activities include faculty research collaborations; opportunities for students to participate in research, problem-solving projects in the field, and study abroad; and major Institute projects to help build new educational and research institutions and strengthen national and local innovation systems around the world. Digital learning programs are expanding the Institute’s global reach. At home, MIT hosts many international students and scholars, and offers cultural and historical education and language training for MIT students preparing to go overseas. The following are some of MIT’s many international activities.

Capacity Building

**Asian School of Business, Malaysia**
In 2016, a collaboration of MIT Sloan with the Bank Negara Malaysia established the Asia School of Business (ASB). The School merges the power of Asian ambition with the best in Western education to produce Asia-ready change-makers and entrepreneurs. The ASB will take a practice-oriented approach to management, which is one of the hallmarks of MIT Sloan and reflects the central bank’s desire for education for practical application. The vision of ASB is to be a global knowledge and learning center infused with regional expertise, insights and perspectives of Asian and emerging market economies.

**Dubai Institute for Design and Innovation, United Arab Emirates**
The MIT School of Architecture and Planning (SA+P) is collaborating with the Dubai Design and Fashion Council (DDFC) to develop the Dubai Institute for Design and Innovation (DIDI). Faculty from MIT SA+P—led by the Department of Architecture but drawn from disciplines across the school—will help develop the curriculum for the new institute. The agreement reflects the increasing importance placed by industry, government, and educational institutions on design as a mode of inquiry and a critical skill for innovation and economic development.

Set to launch in the second half of 2017 as a private, nonprofit education institution that will be accredited by the Dubai Ministry of Higher Education, DIDI will offer the region’s first-ever Bachelor of Design degree with concentrations in Product Design, Strategic Design Management, Media, Visual Art, and Fashion Design.

**MIT and Masdar Institute Cooperative Program, United Arab Emirates**
Since 2006, MIT has been collaborating and assisting the Masdar Institute of Science and Technology (Masdar Institute) to establish a graduate research university focused on alternative energy, sustainability, and advanced technology. Currently, Masdar Institute has a faculty body of 83 Assistant, Associate and Full Professors and over 400 graduate students.

MIT and Masdar Institute have collaborated on 72 research projects to date supporting Abu Dhabi’s goal of developing human capital for a diversified knowledge-based economy. By ensuring high-quality, graduate education and advanced research, Masdar Institute prepares a high-caliber workforce to keep pace with ever-increasing technological changes and a growing research and development culture. The Cooperative Program offers MIT and Masdar Institute faculty and students access to new talent, ideas, and rich research and educational collaborations.

**Singapore-MIT Alliance for Research and Technology Centre, Singapore**
The Singapore-MIT Alliance for Research and Technology (SMART) Centre is a research enterprise established by MIT in partnership with the National Research Foundation of Singapore. The SMART Centre serves as an intellectual hub for research interactions between MIT and Singapore at the frontiers of science and technology. This partnership allows faculty, researchers, graduate students, and undergraduate students from MIT to collaborate with their counterparts from universities, polytechnics, research institutes, and industry in Singapore and throughout Asia. The SMART Centre is MIT’s first research centre outside of Cambridge, Massachusetts, and its largest international research endeavor. See page 109 for information on Singapore-MIT Undergraduate Research Fellowships.

http://smart.mit.edu/
Singapore University of Technology and Design, Singapore

The MIT-SUTD Collaboration, which builds on more than a decade of MIT education and research activities in Singapore, is to date the largest and most complex university capacity-building endeavor in MIT’s history.

The fifth cohort of students at the Singapore University of Technology and Design (SUTD) began their 3.5-year journey on May 16, 2016. Of the approximately 467 students, 38 percent were female, a percentage that is slightly below the previous years. There was also an increase of 81 students from the 2015 to the 2016 cohort. Once again MIT offered a winter program to 60 SUTD students. A third winter program in January 2017 is being planned again for 60 students. In this program, students from SUTD join MIT students for three weeks during IAP taking approximately 25-30 classes funded by the collaboration. All 87 of the contracted courses for development at MIT have been completed and transferred to SUTD. MIT is on track to complete its co-teaching obligation by the end of Summer 2016, when MIT faculty will have spent 40 two-week and 40 four-week residencies. The pillar head residencies will also be completed as of the end of Summer 2016. In 2016, MIT International Science and Technology Initiatives (MISTI) Singapore program sent 30 MIT students to SUTD to help with establishing clubs and extracurricular activities and leadership training. Summer 2016 will also mark the arrival to MIT of 34 students from SUTD for the fourth offering of a 10-week Global Leadership Program (GLP).

Current budgets for research at MIT in the MIT-SUTD collaboration run about $2 million per year for a total of $20 million over the 10-year research component contract. Approximately 57 faculty researchers and students at MIT are working on projects associated with the IDC. Two important hires were made to address the IDC’s future: Deb Payson, Director of Strategy and Outreach (February 2015), and Dr. Lennon Rodgers, Research Scientist (June 2015). It is hoped both hires will result in a more outward-facing IDC. This past year has seen progress toward developing an industry consortium, including two Industry Day forums where interested companies were invited for a day to learn more about the IDC.

MIT Skoltech Initiative, Russia

In 2011, MIT and Russia initiated a multi-year collaboration to help conceive and launch the Skolkovo Institute of Science and Technology (Skoltech), a new graduate research university in Moscow, focused on a small number of pressing global issues and designed to stimulate the development of a robust innovation ecosystem in Russia. MIT served as a key collaborator and advisor on programs, structures, policies, and operations in three key domains: research, education, and innovation/entrepreneurship. MIT helped establish the main elements of Skoltech’s educational programs, including a PhD program and Master of Science programs in IT, Energy, Space, Design and Manufacturing, and Biomedicine. MIT helped design and implement a faculty hiring and recruitment process as well as a student recruitment strategy and admissions process. MIT has hosted over 120 Skoltech Master’s students in Cambridge. Part of Skoltech’s effort to address specific real-world problems, which are also of high priority to the Russian Federation, is the establishment of a network of globally distributed Centers for Research, Education, and Innovation (CREIs). MIT designed and implemented a multi-stage submission and international peer-review process, and launched new MIT-led CREIs in Biomedicine, Electrochemical Energy Storage, and Energy Systems. Promoting innovation and entrepreneurship is central to Skoltech’s mission. Toward that end, MIT helped develop an entrepreneurship and innovation curriculum designed to provide foundational understanding in an action-based learning environment for Skoltech students, and helped build the administrative and operational foundations for knowledge transfer and commercialization of emerging technologies. The first phase of the collaboration ended in February 2016 and a new MIT Skoltech Program—reduced in scale and with a narrower focus on strategic advice and faculty-driven, collaborative research activities—launched immediately thereafter.

http://web.mit.edu/sktech/
Tata Center for Technology and Design, India

Now concluding its fourth year, the MIT Tata Center for Technology and Design provides holistic support—funding, education, and logistics—to MIT PIs applying their research to grand challenges in India and the developing world. Approximately 60 MIT faculty members from all five Schools have received support from the Center, and the Center has sponsored more than 100 graduate student Tata Fellows enrolled in Master’s and PhD programs across the Institute. These students, along with their faculty advisors, develop thesis projects that respond to large-scale opportunities to use technology and policy to improve the lives of people at the bottom of the economic pyramid. The researchers travel to India at least twice a year, generally during IAP and summer, to gather data, conduct field trials, and develop community connections. Researchers work closely with on-the-ground collaborators in the corporate, nonprofit, and government spheres.

This year, the Center’s project portfolio matured substantially, with several projects transitioning into commercialization or policy action and attracting follow-on funding. For example, a solar-powered water purification system using electrodialysis is being piloted in India and Gaza with substantial support from USAID; a team led by Professor James Wescoat has entered a formal collaboration with the Government of India to improve water supply management; and Khethworks, an agricultural company founded by graduates of the Tata program, is now headquartered in Pune, India. This year also saw the first annual Tata Center Symposium at MIT, bringing together the MIT community with influential visitors from India to explore areas of need and form new collaborations. The second, larger edition of the Symposium will be held in Fall 2016. The Tata Center adds twelve new projects to its portfolio in the 2016-17 academic year.

http://tatacenter.mit.edu/

Faculty and Research Collaboration

Accelerating Innovation in Brazil, Brazil

In 2014, the MIT Industrial Performance Center (IPC) launched a five-year research project, Accelerating Innovation in Brazil, which focuses on building greater innovation capacity in Brazil particularly as it relates to the new network of Institutes of Innovation created by SENAI, Brazil’s National Service for Industrial Training. Building upon the German Fraunhofer model, SENAI (the sponsor of the IPC research) is creating a network of 25 Innovation Institutes (ISIs), each of which specializes in a particular technology or group of technologies associated with one or several industries in which Brazil has existing capabilities. IPC research examines the ISIs and their relationships with firms, universities and other important actors within Brazil’s “innovation ecosystem” to provide insight into how to position the ISIs to support greater innovation in Brazil and encourage a more innovative, open, globally competitive economy.

Center for Clean Water and Clean Energy at MIT and KFUPM, Saudi Arabia

Technologies related to the production of fresh water and low-carbon energy are the focus of a research and educational partnership between MIT’s Department of Mechanical Engineering and King Fahd University of Petroleum and Minerals (KFUPM) in Dhahran, Saudi Arabia. The joint program operates through the Center for Clean Water and Clean Energy and focuses on topics such as desalination, solar energy, nanoengineered membranes, pipeline leak detection, and advanced manufacturing. The eight-year collaboration has included fifteen large-scale collaborative research projects, eleven education and curriculum development projects, and several administration development projects. Approximately 30 MIT professors have participated, along with 90 faculty at KFUPM, 260 MIT graduate students and postdocs and 60 at KFUPM. KFUPM faculty and graduate students have had the opportunity to do work at MIT, amounting to 140 visits. The project to date has produced more than 500 papers and 65 US patents. In 2009, the Center created the Ibn Khaldun Fellowship for Saudi Arabian Women which brings PhD holders to MIT for research with our faculty. The Center is directed by Professor John H. Lienhard V and co-directed by Professor Kamal Youcef-Toumi.
CSAIL-Qatar Computing Research Institute, Qatar

The CSAIL-Qatar Computing Research Institute (QCRI) research collaboration is a medium for knowledge joint-creation, transfer, and exchange of expertise between MIT-CSAIL and QCRI scientists. Scientists from both organizations are undertaking a variety of core computer science research projects—Arabic speech and language processing, content-adaptive video re-targeting, Cross-cloud: a decentralized architecture for social networks, database management, understanding health habits from social media pictures, understanding and developing for cultural identities across platforms, a vertically-integrated approach to resource-efficient shared computing, and video magnification and video comparison for sports, urban data analytics to improve mobility for growing cities in the context of mega events—with the goal of developing innovative solutions that can have a broad and meaningful impact. The agreement also offers CSAIL researchers and students exposure to the unique challenges in the Gulf region. Scientists at QCRI are benefiting from the expertise of MIT’s eminent faculty and researchers through joint research projects that will enable QCRI to realize its vision to become a premier center of computing research regionally and internationally.

Hong Kong Innovation Node, Hong Kong

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

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. In June 2016, the MIT Hong Kong Innovation Node formally launched with MIT Kickstart, a unique hardware system accelerator program. The inaugural program brought together 12 MIT students with 12 students from universities throughout Hong Kong for an immersive week-long workshop led by a team of MIT faculty, alumni and local entrepreneurs.

MIT and the Instituto Tecnológico de Monterrey, Mexico

Launched in 2015, this is a partnership established between MIT and the Instituto Tecnológico de Monterrey with the goal of fostering exchanges and collaborations among researchers at both institutions focused on the general area of nanotechnology and nanoscience. The ultimate goal is to support the Tec in its quest to become a research university with global reach. The program was funded by a gift from the family of Eugenio Garza Sada, founder of Tec de Monterrey, on the occasion of the 100th anniversary of his graduation from MIT Sloan School. The program is housed at MIT’s Microsystems Technology Laboratories (MTL).

A key element of the Tec de Monterrey and MIT Nanotechnology Program is the creation of opportunities for students, postdocs and professors from Monterrey Tec to carry out extended research stays at MIT in areas of nanoscience and nanotechnology. In its inaugural year, three faculty members and five postdoctoral researchers spent time at MIT working with MIT faculty in areas of telecommunications, biotechnology, microfluidics and nanofabrication. In the second cohort, one faculty member, two postdocs, three graduate students and two undergraduate students will participate in a wide range of research activities in visits that will span between 3 and 12 months. The program also includes participation of MIT faculty, postdocs and students in MTL’s nanoLab course that provides a hands-on introduction to nanotechnology. To date, 46 Tec members have attended this course. In addition, the program fosters technical visits by MIT faculty to the Tec. In June 2016, an MIT Day at the Tec brought 11 MIT graduate students, postdocs and faculty for a day long workshop on Sensors and Actuators.
MIT Portugal Program, Portugal

The MIT Portugal Program (MPP) is a strategic partnership between Portuguese universities and research centers, MIT, and the Portuguese government. Launched in 2006 and renewed in 2013, MPP’s goal is to strengthen Portugal’s knowledge base and international competitiveness through strategic investments in people, knowledge, and innovative ideas. Program funding is provided by the Portuguese Science and Technology Foundation (FCT) and by industrial partners. The first program phase focused on the internationalization of Portuguese universities in the areas of Bioengineering, Engineering Design and Advanced Manufacturing, Sustainable Energy, and Transportation. MPP’s well-designed programs enabled Portuguese universities to overcome patterns of isolation by encouraging inter-university cooperation through joint partnerships with MIT, facilitating a build-up of critical mass in priority areas. Moreover, MPP contributed to the strengthening of innovation and entrepreneurship at Portuguese universities through a variety of activities, including entrepreneurial education. The objectives of MPP’s second phase include the support of a higher education ecosystem connected to technology development and innovation, the promotion of close research collaborations involving students, faculty, and industry, and further development of trans-disciplinary innovation and entrepreneurship. By early 2016, MPP has enrolled 950 students in Portugal, supported 200 MPP students and scholars at MIT, and involved 270 faculty in Portugal as well as 80 faculty at MIT. Over the years, MPP has become a widely known success and a model for international alliances involving universities, industry, and government with the goal of increasing international competitiveness by fostering skill and knowledge creation and exchange, leading to innovation, entrepreneurship, and societal impact.

www.mitportugal.org

MIT Sloan Latin America Office, Chile

In 2013, MIT Sloan established its first physical presence outside the United States in Santiago, Chile. The mission of the MIT Sloan Latin America Office (MSLAO) is to develop and nurture meaningful activities throughout Latin America that benefit the region, the School, and the Institute, and support the creation and transfer of knowledge and the advancement of management education and practice.

MIT Sloan’s presence in the region has provided opportunities for establishing significant impact in five primary areas that are critical to the School’s high-level goals: Knowledge Creation; Regional Awareness; Admissions; Action Learning; and Strengthen the Alumni Network. The office encourages and supports research, teaching, and knowledge-sharing opportunities for MIT Sloan and MIT faculty. The office has as one of its goals to increase brand awareness of MIT in order to enhance connections with area alumni and create avenues for potential corporate partnerships and research collaborations in academic institutions in Latin America.

For more information about the office: http://mitsloan.mit.edu/office-of-international-programs/mit-sloan-latin-america-office/
Multi-Scale Materials Science for Energy and Environment, France

The joint, CNRS-MIT unit, UMI <MSE>2 (Multi-Scale Materials Science for Energy and Environment) was opened in Summer 2012, hosted by MITEI. Under the leadership of Roland Pellenq (CNRS Research Director and MIT-CEE Senior Research Scientist) and Franz-Josef Ulm (CEE-MIT Professor), the UMI has emerged as an active research center fully integrated into the research and educational fabric of MIT. As of today, the UMI has 5 senior CNRS researchers, around 10 postdocs and students working with MIT faculty of various departments on exciting projects related to the fundamental physics of materials for energy and the environment ranging from cement, shale gas, nuclear waste to urban physics. The UMI is supported through the Laboratory of Excellence ICoME2 grant from the French NSF (3M euros grant for 4 years, with 2M€ allocated to the UMI).

Thanks to this first-of-a-kind institutional agreement between CNRS and MIT, the UMI has become an integral part of the intellectual research and educational environment of MIT. On the MIT campus, the UMI plays a critical role in MIT’s ability to respond to the research challenges in the field of materials science and engineering for complex systems. On the educational side, the dual affiliation of CNRS researchers as “Visiting Professors” allowed the integration into the educational landscape of MIT. Furthermore, the UMI with MIT faculty organizes each January the Marseille winter school (now part of the MIT IAP program) on the science and engineering of multi-scale porous materials. On the resource development side, the UMI has become a privileged point of contact for large French firms.

In sum, the UMI has been fully integrated at MIT as a highly productive research unit dealing with critical research issues required for the sustainable development of key industrial sectors. By bringing CNRS researchers to the problem-/solution-driven engineering science context of MIT, new “out-of-the-box” approaches are emerging of high economic, societal and ecological value; relevant for both the United States and France. The UMI is as much a window for France to US academia, as it is for MIT to France and Europe. The UMI has now entered its “Phase II” and a new agreement is expected during fall 2016.

Other Global Initiatives

Center for Advanced Urbanism

The overall goal of the MIT Center for Advanced Urbanism (CAU) is to establish a new theoretical and applied research platform to transform the quality of urban life. The Center is committed to achieving this goal via collaborative interdisciplinary research projects, intellectual discourse, leadership forums and conferences, publications, education of a new generation of leaders in the field, and a distinctive, highly influential presence at international gatherings focused on urbanism.

China Leaders for Global Operations, China

The China Leaders for Global Operations (CLGO) program was started in 2005 as a collaboration of MIT and the Shanghai Jiao Tong University (SJTU). The program was launched at the request of LGO industry partners to strengthen LGO global content for faculty and students, help partner companies’ operations in China, and promote global manufacturing. CLGO offers China’s only dual-degree, graduate-level academic program. The CLGO program is jointly offered by SJTU’s two engineering schools, the SJTU Antai College of Economics and Management, and a dedicated group of CLGO industry partners. Graduates of the CLGO program receive the MBA degree from Antai, an SM degree from one of two SJTU engineering schools, and a certificate from the MIT LGO program. MIT supports the China LGO program by hosting SJTU faculty (36 to date) at MIT for extensive mentoring in courses that they in turn lead for the CLGO program, and by providing the all-English language CLGO curriculum. In addition, a review committee of MIT faculty makes periodic visits to meet CLGO stakeholders and assess the program’s quality. MIT LGO and China LGO students collaborate each year through visits to Shanghai and Cambridge, including joint plant tours of partner company sites.
Global Supply Chain and Logistics Excellence (SCALE) Network, multiple countries

The MIT Center for Transportation and Logistics (MIT CTL) created the MIT Global Supply Chain and Logistics Excellence (SCALE) Network in 2003 as an international alliance of leading research and education centers dedicated to the development and dissemination of supply chain and logistics innovation. This international network consists of six Centers spanning four continents: North America (MIT CTL), Europe (Zaragoza, Spain and Luxembourg City, Luxembourg), South America (Bogota, Colombia), and Asia (Kuala Lumpur, Malaysia and Ningbo, China). Each SCALE Center fosters relationships between its local students, faculty, and businesses as well as those across the network. More than 250 graduate students are enrolled annually in the various SCALE supply chain educational programs; many of which include a three week student and faculty exchange at MIT. The SCALE Network also features partnerships with over a hundred global corporations, such as Procter & Gamble, UPS, BASF, and Wal-Mart, that sponsor research, participate in events, and recruit students. Research projects recently undertaken by the SCALE network include projects on decision making under uncertainty, supply chain resilience, humanitarian logistics, sustainable supply chains, and global transportation reliability.

Digital Learning

MITx and MIT OpenCourseWare represent MIT’s largest and most far-reaching international outreach programs. MITx on edX is the Institute’s interactive learning initiative that offers online versions of MIT courses on edX, a collaboration in online education between MIT and Harvard University. MIT instructors teach these MITx courses to learners around the world. With support from the Residential Education team, and using the resources, platform, and pedagogical innovations of MITx, faculty also develop digital learning courses and modules for use in on-campus education.

Since the first MITx course was offered in August 2012, there have been more than 4 million enrollments in MITx courses, with nearly 1.9 million participants (some people register for a course but then fail to follow through with any studies or use of course materials). Individual registrants come from more than 200 different countries.

Cumulative Worldwide Impact of MITx since Inception

<table>
<thead>
<tr>
<th>Category</th>
<th>Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulative total enrollment</td>
<td>4.0 million*</td>
</tr>
<tr>
<td>Cumulative total participation</td>
<td>2.3 million</td>
</tr>
<tr>
<td>Certificates of Completion</td>
<td>142 thousand</td>
</tr>
<tr>
<td>ID-verified Certificates</td>
<td>48 thousand</td>
</tr>
</tbody>
</table>

*1.9 million unique enrollments

MIT OpenCourseWare (OCW) is a free, open, publicly accessible web-based resource that offers high-quality educational materials from more than 2,350 MIT courses, reflecting the undergraduate- and graduate-level teaching in all five MIT schools and 33 academic units. This coverage in all disciplines makes OCW unique among open education offerings around the world. MIT continually updates OCW, adding new courses as they become available and refreshing existing courses with new materials. More than 1,000 MIT OCW courses have been independently translated into at least 10 other languages.

On average OCW attracts about 2.3 million visits per month, and to date more than 200 million people from virtually every country on earth have accessed these resources. Since 2003, more than 200 million individuals have accessed MIT academic content through these programs, sometimes with astonishing results. Please see http://ocw.mit.edu/about/ocw-stories/ for inspiring examples.

International Study Opportunities

There are a broad range of global activities for students to choose from. These run the gamut from traditional study-abroad programs to innovative short term projects, but most are infused with the Institute’s philosophy of mens et manus. In spring 2016, 50 percent of students graduating with a bachelor’s degree, and 39 percent of students graduating with a master’s degree reported having educational experiences abroad.

The following are examples of programs that provide students with experiences abroad:

Departmental Exchanges

The Department of Aeronautics and Astronautics offers study at the University of Pretoria in South Africa. The Department of Architecture has two exchange programs, one with Delft University of Technology in the Netherlands and the other with the University of Hong Kong. The Department of Materials
Science and Engineering has exchange programs with Oxford University, Imperial College London, and the University of Tokyo. The Department of Mechanical Engineering has exchange programs with ETH Zurich in Switzerland and the University of Tokyo. The Department of Nuclear Science and Engineering has exchange programs with the Imperial College London and the University of Tokyo. The Department of Political Science has an exchange program with Sciences Po in France.

**International Research Opportunities**

International Research Opportunities (IROP) is designed for MIT undergraduates who want to conduct UROP research mentored by MIT faculty in an international setting. These overseas research opportunities provide many of the same benefits offered through conventional study abroad experiences—including the chance to connect with individuals from diverse cultural backgrounds who share similar intellectual goals. In addition, IROP experiences help students enhance communication and leadership skills and refine collaborative and decision-making skills, while increasing understanding and awareness of ethical issues.

**MIT-Madrid Program**

The MIT-Madrid Program gives students the opportunity to study in Madrid for the spring term during their sophomore or junior year. Depending upon major and interests, students can choose engineering courses at the Universidad Politécnica de Madrid and/or science, humanities, arts, and social sciences courses at the Universidad Complutense de Madrid; instruction and coursework are in Spanish. In addition to academic courses, students can participate in an internship during this program.

**Singapore-MIT Undergraduate Research Fellowships (SMURF)**

The SMART Centre has established a summer research internship programme: the SMURF programme (Singapore-MIT Undergraduate Research Fellows programme). It is open to all undergraduates at MIT, NTU, NUS, and SUTD and gives them the opportunity to engage in research at the SMART Centre over the summer. The SMURFs work in MIT Faculty supervisors’ labs, actively participate in the research projects, and engage with postdoctoral scholars, graduate students, and other researchers. SMART hopes this opportunity excites them about research and they consider a career in research. Their research experiences are supplemented with numerous social activities that are arranged for them. Based on feedback from the students, the SMURFs greatly value their experiences at SMART and the community that forms among them.

**Professional Education**

Since 2012, MIT Professional Education has delivered its educational offerings to hundreds of industry professionals from diverse sectors such as government, manufacturing, and transportation in 11 countries, including India, Brazil, Taiwan, Hong Kong, South Africa, Italy, Mexico, and the United Arab Emirates.

To date, over 20,000 professionals from 70+ countries have participated in Professional Education’s programs. The top ten foreign countries represented over 50 percent of the 8,300+ international participants.

**International attendees of MIT Professional Education programs**

Top 10 countries represented (2012–2016)

For more information on Professional Education, see page 98.

**Other Study Abroad Options**

MIT students may also apply for admission directly to foreign institutions that offer study abroad programs or to a study abroad program administered by another US institution or study abroad provider. Examples of such opportunities include l’École Polytechnique in France, the London School of Economics, Oxford University and other UK institutions, and a number of programs in China.
MIT International Science and Technology Initiatives

MIT International Science and Technology Initiatives (MISTI), MIT’s flagship international education program, connects MIT students and faculty with research and innovation around the world. Working closely with a network of premier corporations, universities and research institutes, MISTI matches over 800 MIT students with internship, teaching, research and entrepreneurial opportunities abroad each year. After several semesters of cultural and language preparation on campus, MISTI students participate in rigorous, practical work experience in industry and in academic labs and offices. Projects are designed to align the skills and interests of the student with the needs of the host. MISTI programs are available in Africa, Belgium, Brazil, Chile, China, France, Germany, India, Italy, Japan, Korea, Mexico, the Netherlands, Portugal, Russia, Singapore, Spain, and Switzerland.

Through the MISTI Global Seed Funds program (GSF), MISTI provides grants for MIT faculty to develop research collaborations with their counterparts in foreign institutions. All grantees are encouraged to include both undergraduate and graduate students in their projects. Taking advantage of synergies between their student programs and the seed funds, MISTI offers tailored training modules to help seed fund students derive the most benefit from their international experiences. MISTI GSF grants often lead to new pathways for participating students, who learn firsthand the importance of international networks in the context of their own research interests. Seed funds are currently offered in Argentina, Belgium, Brazil, Chile, China, France, Germany, Israel, Italy, Japan, Korea, Mexico, Peru, Spain and Turkey.

MISTI’s approach to international education builds on MIT’s distinctive traditions of combining classroom learning and hands-on experience in Undergraduate Research Opportunities (UROPs), cooperative programs with industry, practice schools, and internships. In contrast to other universities’ internationalization programs that mainly involve study abroad, MISTI matches individual students with work or research opportunities in their own fields.

http://misti.mit.edu

Here are a few examples from the more than 6,500 students MISTI has placed since it began by sending a handful of interns to Japan at the end of the 80s:

In Chile, undergrad Maria Tou developed fog-harvesting technology to provide clean water to local communities as part of a faculty-led MISTI seed fund project.

Chemical Engineering student Nathalia Rodriguez worked on gene therapy for muscular dystrophy at Genpole, a French biotech cluster.

Postdoc Wiljeana Glover explored healthcare reform with peers at Technion-Israel Institute of Technology in Haifa through an MIT-Israel Seed Fund project.

Matthew Zedler, a Mechanical Engineering graduate, examined Chinese auto growth and energy at Cambridge Energy Research Associates in Beijing.

Physics major Jason Bryslawskiy designed superconducting magnetic bearings for electric motors at Siemens in German. He wrote two patents at Siemens.

Ammar Ammar, an EECS undergrad, designed and tested a Google/YouTube project at Google Israel.
MISTI Programs and Start Year

- Arab World, 2014
- Belgium, 2011
- Brazil, 2009
- Chile, 2011
- China, 1994
- France, 2001
- Germany, 1997
- India, 1998
- Israel, 2008
- Italy, 1999
- Japan, 1983
- Korea, 2012
- Mexico, 2004
- Netherlands, 2012
- Portugal, 2014
- Russia, 2012
- Singapore, 2012
- South Africa, 2012
- Spain, 2006
- Switzerland, 2010

MISTI Global Seed Fund Projects by Country
2015–2016

- Mexico
- Italy
- Brazil
- France
- Israel
- Germany
- China
- Peru
- Belgium
- Japan
- United Kingdom
- Egypt
- Spain
- Australia
- Hong Kong
- Iceland
- Jordan
- New Zealand
- South Africa
- Switzerland
- Taiwan
- Turkey
- Uganda

Total Projects: 90

MISTI Annual Internship Placements
1994–2016*

* MISTI year runs from September 1–August 31. 2016 represents the 2015–2016 year.
International Students

MIT has welcomed international students essentially since its inception. The first student from Canada came to MIT in 1866, the second year MIT offered classes. This student was followed by a steady stream of students from around the globe throughout the 19th century. By 1900, some 50 foreign-born students had traveled to Massachusetts for study; however, the number increased dramatically after World War II when an influx of these students began attending the Institute. The rapid rise of international students from East Asia, led by students from China, changed the demographics of this group beginning in the 1950s. Changes in immigration law in 1965 opened up the doors to a steadily increasing pool of international talent.

The United States has been the destination of choice for international students and scholars for the past 50 years. According to the Institute of International Education Open Doors 2015 report, the number of international students enrolled in U.S. colleges during the 2014–2015 academic year reached a record high of 974,926 students. MIT has the fourth highest number of foreign students of the institutions in Massachusetts. NAFSA: Association of International Educators produced an economic analysis based in part on Open Doors data that states that during the 2014–2015 academic year, international students and their dependents contributed $30.5 billion to the U.S. economy through tuition, fees, and living expenses and support 373,381 jobs.
International Undergraduate Students
Top Countries of Citizenship, 2015–2016

<table>
<thead>
<tr>
<th>Country</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>57</td>
</tr>
<tr>
<td>India</td>
<td>32</td>
</tr>
<tr>
<td>Canada</td>
<td>24</td>
</tr>
<tr>
<td>South Korea</td>
<td>24</td>
</tr>
<tr>
<td>Brazil</td>
<td>23</td>
</tr>
<tr>
<td>Thailand</td>
<td>20</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>18</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>12</td>
</tr>
<tr>
<td>Mexico</td>
<td>10</td>
</tr>
<tr>
<td>Turkey</td>
<td>10</td>
</tr>
</tbody>
</table>

International Graduate Students
Top Countries of Citizenship, 2015–2016

<table>
<thead>
<tr>
<th>Country</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>634</td>
</tr>
<tr>
<td>India</td>
<td>304</td>
</tr>
<tr>
<td>Canada</td>
<td>234</td>
</tr>
<tr>
<td>South Korea</td>
<td>187</td>
</tr>
<tr>
<td>France</td>
<td>92</td>
</tr>
<tr>
<td>Singapore</td>
<td>87</td>
</tr>
<tr>
<td>Taiwan</td>
<td>70</td>
</tr>
<tr>
<td>Russia</td>
<td>70</td>
</tr>
<tr>
<td>Brazil</td>
<td>69</td>
</tr>
<tr>
<td>Germany</td>
<td>68</td>
</tr>
</tbody>
</table>

International Students by Geographic Region of Country of Citizenship
1884–2016

Academic Year
Number of Students

- Asia
- Europe
- Americas and Caribbean
- Africa, Middle East, Oceania
Many international students remain in the U.S. after graduation. The graph below shows the post-graduation plans of international students graduating in 2015, as reported in a survey administered by MIT. Seventy-eight percent of international students plan to remain in the U.S. after graduation.

**Percentage of 2015 International Student Graduates Remaining in the U.S. by Degree and Post-Graduation Plans**

International Alumni

MIT alumni and scholars have made extraordinary contributions in their home countries, the U.S., and the world. The following are some examples:

**Kofi Annan, SM Management 1972**
Kofi Annan, the seventh Secretary-General of the United Nations and recipient of the Nobel Peace Prize, was born in Kumasi, Ghana, and attended the University of Science and Technology in Kumasi before completing his undergraduate studies at Macalester College in St. Paul, Minnesota. He undertook graduate studies in economics at the Institut universitaire des haute etudes internationals in Geneva, and earned his SM in Management as a Sloan Fellow at MIT. Annan worked for the World Health Organization and the Ghana Tourist Development Company, but has spent most of his career at the United Nations.

**Rafael del Pino, SM Management ‘86**
After graduating from MIT, del Pino returned to the Ferrovial Group, a company founded by his father, where he became chief financial officer in 1989 and CEO in 1992. He was appointed chairman in 2000. During del Pino’s tenure as CEO and later as chairman, Ferrovial has been transformed from a mostly domestic, privately held construction company into an international leader in the development of private infrastructure, mainly toll roads and airports, with activity in more than 40 countries.

**Ilan Goldfajn, PhD Economics ‘95**
Ilan Goldfajn is an economist whose career has spanned the public and private sectors. Since 2009, he has served as chief economist at Itaú Unibanco in Brazil, the largest Latin American bank and one of the fifteen largest banks worldwide, with over 100,000 employees and revenue of $72 billion in 2011. Prior to Itaú, Goldfajn was a founding partner at consulting firm Ciano Consultoria (2008 to 2009) and hedge fund Ciano Investimentos (2006 to 2008). From 2003 to 2006, he was chief economist and risk officer at the investment firm Gávea Investimentos.
Global Engagement

Benjamin Netanyahu, SB Architecture 1975, SM Management 1976
Currently serving his second term as Prime Minister of Israel, Benjamin Netanyahu was born in 1949 in Tel Aviv, Israel and grew up in Jerusalem. He served as Israel’s ambassador to the United Nations from 1984 to 1988, during which time he led the effort to declassify the United Nations’ archive on crimes committed by Nazi Germany. Netanyahu, a member of the Likud party, was Israel’s Prime Minister from 1996 until 1999. During his first term as Prime Minister, Netanyahu implemented policy that combined fighting terror with advancement of the peace process. Its cornerstone was the conclusion of well-measured agreements with the Palestinians that insisted on reciprocity. During his three-year term, the number of terror attacks drastically decreased.

Ngozi Okonjo-Iweala, MCP 1978, PhD Planning 1981
Former Managing Director of the World Bank, Ngozi Okonjo-Iweala is a globally renowned Nigerian economist. She was the first woman to hold the position of Finance Minister in Nigeria. During her term from 2003 to 2006, she launched an aggressive campaign to fight corruption. She implemented a series of economic and social reforms, including a zero-tolerance policy for corruption; international and local governmental contract bidding; privatizing state-owned refineries; and the Extractive Industry Transparency Initiative, which aims to bring openness to the oil sector. Under her leadership, the country has tripled its reserves from $7 billion to $20 billion; the annual GDP grew at 6 percent; and inflation is down from 23 percent to 9.5 percent. Okonjo-Iweala started her career at the World Bank, where she was the first woman ever to achieve the positions of vice president and corporate secretary.

I. M. Pei, SB Architecture 1940
Ieoh Ming Pei, influential modernist architect and founder of the firm Pei Cobb Freed & Partners, was born in China in 1917. He completed his Bachelor of Architecture degree at MIT in 1940. Pei has designed more than 60 buildings, including the John Fitzgerald Kennedy Library in Boston, Massachusetts, the Grand Louvre in Paris, France, the Miho Museum in Shiga, Japan, the Bank of China Tower in Hong Kong, and the Gateway Towers in Singapore.

Amnon Shashua, PhD Brain and Cognitive Sciences ‘93
In 1999, Shashua co-founded Mobileye, an Israeli company developing a system-on-chip and computer vision algorithms for a driving assistance system, providing a full range of active safety features using a single camera. Today, approximately 10 million cars from 23 automobile manufacturers rely on Mobileye technology to make their vehicles safer to drive. In 2014, Mobileye claimed the title for largest Israeli IPO ever, by raising $1 billion at a market cap of $5.3 billion. In 2010 Shashua co-founded OrCam which harnesses the power of artificial vision to assist people who are visually impaired or blind. The OrCam MyEye device is unique in its ability to provide visual aid to hundreds of millions of people, through a discreet wearable platform. Within its wide-ranging scope of capabilities, OrCam’s device can read most texts and learn to recognize thousands of new items and faces.

Tony Tan, SM Physics 1964
Following his degrees from MIT and his Ph.D. from the University of Adelaide in applied mathematics, Tan taught mathematics at the University of Singapore. Tan was elected to the Parliament of Singapore in 1979, and has served in numerous leadership positions in the Singapore government. In December 1991, Tan stepped down from the Cabinet to return to the private sector as the Overseas-Chinese Banking Corporation’s Chairman and Chief Executive Officer. He rejoined the Cabinet in 1995 as Deputy Prime Minister and Minister for Defense. In August 2003, Tan became Deputy Prime Minister and Coordinating Minister for Security and Defense. Tan won the Singapore presidential election in 2011 and is currently serving as the 7th President of Singapore.

Songyee Yoon, PhD Brain and Cognitive Sciences ’00
Since 2008, Yoon has served as the Global Chief Strategy Officer of NCSOFT. Previously, she served as head of the Communication Intelligence Division at SK Telecom Co. Ltd., leading platform and artificial intelligence strategy. She has taught media and entertainment industry strategy at Seoul universities, and writes for major newspapers, covering technology and humanity. Additionally, she has worked as a consultant at McKinsey and Co., as part of corporate finance and strategy practice, and is running a nonprofit organization, Common Planet, which helps endangered species.
International Scholars

MIT hosts international scholars from around the world who come to the U.S. for teaching, research, collaboration, and other purposes. This diverse group of professionals includes visiting scientists, professors, artists, and scholars, as well as postdoctoral fellows and associates, lecturers, instructors, research associates and scientists, and tenure-track faculty. During the year July 1, 2015 through June 30, 2016, The International Scholars Office (ISchO) served 2,436 international scholars affiliated with MIT and their accompanying family members (“international” is defined as non-U.S. citizen, non-U.S. permanent resident).

This reflects an increase of 1.4 percent over last year (2,403). According to the most recently published Institute of International Education Open Doors report (2015), MIT ranked 11th nationally with regard to the numbers of international scholars at U.S. institutions. Postdoctoral associates and postdoctoral fellows accounted for 57 percent of MIT’s international scholars.

Foreign national scholars came to MIT from 96 different countries, with the highest numbers coming from China, India, Canada, South Korea, Germany, Japan, France, Italy, Israel, and Spain. The top ten countries of origin of the entire international scholar population in the U.S. are roughly the same. Scholars from these top 10 countries constituted nearly 65 percent of MIT’s international scholar population. Seventy-six percent of international scholars at MIT were men and 24 percent were women. The greatest number of international scholars came to join departments in the School of Engineering, followed by the School of Science, interdisciplinary laboratories and centers under the Vice President for Research, and the School of Architecture and Planning.

### International Scholars


<table>
<thead>
<tr>
<th>Country</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>434</td>
</tr>
<tr>
<td>India</td>
<td>173</td>
</tr>
<tr>
<td>Canada</td>
<td>155</td>
</tr>
<tr>
<td>South Korea</td>
<td>149</td>
</tr>
<tr>
<td>Germany</td>
<td>139</td>
</tr>
<tr>
<td>Japan</td>
<td>128</td>
</tr>
<tr>
<td>France</td>
<td>110</td>
</tr>
<tr>
<td>Italy</td>
<td>106</td>
</tr>
<tr>
<td>Israel</td>
<td>105</td>
</tr>
<tr>
<td>Spain</td>
<td>93</td>
</tr>
</tbody>
</table>
Selected Projects

**Can today’s EVs make a dent in climate change?**

Could existing electric vehicles (EVs), despite their limited driving range, bring about a meaningful reduction in the greenhouse-gas emissions that are causing global climate change? Researchers at MIT have just completed the most comprehensive study yet to address this hotly debated question, and have reached a clear conclusion: Yes, they can.

The study, which found that a wholesale replacement of conventional vehicles with electric ones is possible today and could play a significant role in meeting climate change mitigation goals, was published in the journal *Nature Energy* by Jessika Trancik, along with graduate student Zachary Needell, postdoc James McNerney, and recent graduate Michael Chang SM ’15.

“Roughly 90 percent of the personal vehicles on the road daily could be replaced by a low-cost electric vehicle available on the market today, even if the cars can only charge overnight,” Trancik says, “which would more than meet near-term U.S. climate targets for personal vehicle travel.” Overall, when accounting for the emissions today from the power plants that provide the electricity, this would lead to an approximately 30 percent reduction in emissions from transportation. Deeper emissions cuts would be realized if power plants decarbonize over time.

The work was supported by the New England University Transportation Center at MIT, the MIT Leading Technology and Policy Initiative, the Singapore-MIT Alliance for Research and Technology, the Charles E. Reed Faculty Initiatives Fund, and the MIT Energy Initiative.

**New system can rapidly switch glass from transparent to dark—and keep it that way without power**

A team of researchers at MIT has developed a new way of making windows that can switch from transparent to opaque, potentially saving energy by blocking sunlight on hot days and thus reducing air-conditioning costs. While other systems for causing glass to darken do exist, the new method offers significant advantages by combining rapid response times and low power needs. Once the glass is switched from clear to dark, or vice versa, the new system requires little to no power to maintain its new state; unlike other materials, it only needs electricity when it’s time to switch back again.

The results are reported in the online journal *Chem*, in a paper by Mircea Dincă, doctoral student Khalid Al-Kaabi, and former postdoc Casey Wade.

The research was partly funded by an organization in a region where such light-blocking windows would be particularly useful: The Masdar Institute, based in the United Arab Emirates, through a cooperative agreement with MIT. The research also received support from the U.S. Department of Energy, through the Center for Excitonics, an Energy Frontier Center.

**New microfluidic device offers means for studying electric field cancer therapy**

Researchers at MIT’s research center in Singapore have developed a new microfluidic device that tests the effects of electric fields on cancer cells. They observed that a range of low-intensity, middle-frequency electric fields effectively stopped breast and lung cancer cells from growing and spreading, while having no adverse effect on neighboring healthy cells.

The device, about the size of a U.S. dollar coin, is designed to help scientists narrow in on safe ranges of electric fields to noninvasively treat breast, lung, and other forms of cancer. The results are published online in *Scientific Reports*.

The paper’s co-authors include Roger Kamm, research scientists Andrea Pavesi and Giulia Adriani, postdoc Majid Ebrahimi Warkiani, and student Andy Tay of the Singapore-MIT Alliance for Research and Technology (SMART). Senior research officer Wei Hseun Yeap and associate professor Siew Cheng Wong of the Singapore Immunology Network also contributed to the report. This research was supported, in part, by the National Research Foundation of Singapore through the SMART BioSystems and Micromechanics interdisciplinary research group.
Campus Research Sponsored by International Organizations

International Organizations Campus Research Expenditures (in U.S. Dollars)
Fiscal Years 2012–2016

<table>
<thead>
<tr>
<th>International Sponsor Type</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundations and other nonprofits</td>
<td>25,025,346</td>
<td>29,381,412</td>
<td>35,830,415</td>
<td>36,301,791</td>
<td>33,597,572</td>
</tr>
<tr>
<td>Government</td>
<td>37,712,878</td>
<td>32,651,167</td>
<td>28,803,960</td>
<td>26,712,520</td>
<td>26,673,866</td>
</tr>
<tr>
<td>Total</td>
<td>110,872,115</td>
<td>103,954,737</td>
<td>106,762,179</td>
<td>110,620,964</td>
<td>108,990,231</td>
</tr>
<tr>
<td>Constant dollars*</td>
<td>116,090,594</td>
<td>107,065,634</td>
<td>108,266,041</td>
<td>111,368,443</td>
<td>108,990,231</td>
</tr>
</tbody>
</table>

*Constant dollars are calculated using the Consumer Price Index for All Urban Consumers weighted with the fiscal year 2016 equaling 100.