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# *Section 7*

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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.

## A Global Strategy for MIT

*A Global Strategy for MIT* was published by the Associate Provost for International Activities in May 2017. This plan addresses three important questions for MIT over the coming decade:

- How can our international activities best contribute to advancing the frontiers of knowledge in science, technology, and other areas of scholarship?
- How can they help bring forefront knowledge to bear on solving the world's most challenging problems?
- How can they contribute to educating future leaders who will work creatively, cooperatively, effectively, and wisely for the betterment of humankind?

The 2017 *Global Strategy for MIT* stated as one of its eight core principles, "MIT is an American institution. When members of the MIT community operate internationally they must be in compliance with relevant U.S. laws and regulations, and when MIT considers major new international engagements it must be cognizant of the national interest."

Individual faculty members initiate and implement most of MIT's international activities. The role of the MIT administration is to encourage and support these activities and to safeguard faculty members' freedom to pursue them. In addition, MIT sometimes seeks to act internationally on a larger scale.

MIT's strategic plan is designed to create a more robust and durable platform to support the international initiatives of individual faculty, while also establishing a principled framework for selecting and undertaking larger-scale activities to increase MIT's impact in the world.

The plan calls for MIT to:

1. Build new *MIT Partnerships for a Better World*.
2. Commit to providing an MIT-quality international educational experience to every undergraduate who desires one.
3. Streamline our approach to international institution- and capacity-building.
4. Explore the feasibility of a new MIT Global Leaders graduate program.
5. Review the cap on international undergraduate admissions.
6. Strengthen the governance of MIT's international activities.
7. Improve operational support.

The plan also considers whether MIT can pursue its global goals and aspirations successfully in the present international environment. Working across borders, collaborating with international partners, and tackling some of the world's most difficult problems are fundamental to MIT's institutional values, and the plan calls for MIT to remain steadfast in our commitment to international engagement. The plan proposes several mitigating measures to help protect MIT against new risks in the international arena.

See <http://web.mit.edu/globalstrategy/> for full report.

## 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 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 open in Fall 2018 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.

### **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 113 for information on Singapore-MIT Undergraduate Research Fellowships.

<http://smart.mit.edu/>

### **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. The first phase of this joint effort between MIT, Skoltech, and the Skolkovo Foundation (the MIT Skoltech Initiative) comprised a wide span of agreed activities leading to the launch and early growth of Skoltech. This phase of the collaboration ended in February 2016 and the second phase of the MIT-Skoltech relationship, known as the MIT Skoltech Program, began immediately thereafter.

In this second phase, the MIT Skoltech Program is oriented around a narrower set of collaborative activities to promote the continued development of Skoltech and the Skolkovo ecosystem. The Program features a focused set of core research and advisory activities, including an MIT faculty advisory committee, a joint annual conference and multiple collaborative research projects, such as the Next Generation Program and Seed research funds, as well as two Centers for Research, Education, and Innovation (CREIs) that continued from the first phase. There is also the flexibility to initiate additional collaborative projects that faculty from MIT and Skoltech will work on together, building on existing strengths and mutual interest.

<http://skoltech.mit.edu/>

## **Tata Center for Technology and Design, India**

The MIT Tata Center for Technology and Design, founded in 2012, provides comprehensive support to MIT faculty members who apply their skills and knowledge to the pressing challenges in India and the rest of the developing world. Some 40 faculty members from all five Schools have participated, along with over 100 Tata Fellows enrolled in Master's and PhD programs across the Institute. Their projects address large-scale opportunities for social impact using science, technology, and policy. Tata Center researchers travel to India at least twice a year to gather data, conduct field trials, and engage with communities to understand their needs and discover opportunities. Researchers work closely with on-the-ground collaborators in the corporate, nonprofit, and government spheres.

The Tata Center's project portfolio has continued to grow with several promising projects transitioning to the implementation stage through products and government programs. One project, led by Professor Kripa Varanasi, uses electrical fields to recapture up to 80% of water vapor plumes that would normally escape from cooling towers of power plants. Varanasi's team is now doing an industrial pilot test and plans to launch a spinoff soon so that they can expand into not only the power industry, but also commercial HVAC, large data centers, hospitals, and large industrial facilities. Another project led by Professor Alan Hatton is tackling child malnutrition in India, which affects an estimate of 8 million children in India alone, and 20 million children per year worldwide—with a fatality rate as high as 30%. Hatton and Tata Fellow Tonghan Gu are using local ingredients to adapt a ready-to-use therapeutic food (RUTF) to cater to the palette of Indian children, who do not like the taste of the conventional RUTF made with peanut butter. In addition, Tata Center alumni Katie Taylor and Victor Lesniewski have established Khethworks, a startup company that hopes to make low-cost solar pumping systems available to millions of Indian smallholder farmers. They plan to ship their first commercial products next spring, after an extensive period of field-testing.

<http://tatacenter.mit.edu/>

## **Faculty and Research Collaboration**

### **Accelerating Innovation in Brazil**

The MIT Industrial Performance Center (IPC) is engaged in a five-year research project focused on building greater innovation capacity in Brazil. At the center of the research is a new network of Institutes of Innovation created by SENAI, Brazil's National Service for Industrial Training. Building upon the German Fraunhofer model, SENAI (the research sponsor) 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 the role of SENAI within the broader Brazilian innovation ecosystem while also addressing a range of issues of importance to building stronger innovation capacity in the country. Topics include assessments of how Brazilian industries fit into global value chains, institutional innovations in Brazil, the role of universities, and the role of the state. The project will run through the Spring of 2019.

### **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, 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, urban data analytics to improve mobility for growing cities in the context of mega events and accurate map making with mobile sensor data—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 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.

### **European Council for Nuclear Research, Switzerland**

Several MIT research groups in particle and nuclear physics are active at the European Council for Nuclear Research (CERN) in Geneva, Switzerland. CERN has a number of particle accelerators and detectors to study the constituents of matter and the fundamental laws of nature. MIT researchers use the Large Hadron Collider (LHC), the world's most powerful particle accelerator, which collides protons and/or heavy ions. Particles from these collisions are detected in several experiments; MIT participates in both the CMS (Compact Muon Solenoid) and LHCb (LHC beauty) experiments, under the leadership of 7 faculty members.

MIT leads another effort that is based at CERN, although the detector is located on the International Space Station. The Alpha Magnetic Spectrometer (AMS) experiment is under the direction of 2 MIT faculty members. The AMS detects cosmic ray events in a precision search for dark matter, antimatter and the origin of cosmic rays. The payload operations control center for AMS is located at CERN.

Altogether, approximately 70-80 people affiliated with MIT either work at CERN or work on CERN-related research. This includes undergraduate and graduate students, postdoctoral associates, senior/principal/research scientists and engineers, and staff scientists and administrators. Each year, a number of MIT undergraduates participate in research at CERN through the MISTI and IROP programs.

### **Hong Kong Innovation Node, Hong Kong**

The creation of MIT's Hong Kong Innovation Node was announced in November 2015. The focus of the Node is on cultivating the innovation capabilities of MIT students, increasing opportunities for students and faculty to participate in the innovation process, and accelerating the path from idea to impact—working together with alumni, affiliates and friends in the Hong Kong community to help strengthen the region's innovation ecosystem. By bringing MIT to Hong Kong and Hong Kong to MIT, the Innovation Node is deepening MIT's links to Hong Kong, Shenzhen and China's Pearl River Delta.

The Hong Kong Innovation Node is working to enrich the educational experiences of MIT and Hong Kong students in key areas of innovation practice, including entrepreneurship, making, and rapid scale-up of prototypes. Twice a year the Node's flagship program, MEMSI (MIT Entrepreneurship and Maker Skills Integrator) brings 15 MIT students together with 15 local Hong Kong university students for 2 intense and immersive weeks in Hong Kong. MEMSI combines lectures drawn from Martin Trust Center's Disciplined Entrepreneurship Program with hands-on maker skills and visits to manufacturing facilities in China. The Node has created an engaging physical space for collaboration, connection and making in Kowloon Tong. The new space is enabling MIT students, faculty, and alumni to connect with local universities, entrepreneurs, and companies.

## **MIT and the Instituto Tecnológico de Monterrey, Mexico**

Launched in 2015, this partnership between MIT and the Instituto Tecnológico de Monterrey is designed to foster exchanges and collaborations among researchers at both institutions, with an initial focus on nanotechnology and nanoscience. 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 second year, one faculty member, two postdoctoral researchers, three graduate students and one undergraduate student spent time at MIT working with MIT faculty in areas of biotechnology, microfluidics and nanofabrication. For the third cohort, one faculty member, six postdocs, and one graduate student have been selected to participate in a wide range of research activities in visits that will span between 4 and 10 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, 70 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.

Yearly meetings of an Advisory Committee composed of two Tec faculty members and two MIT faculty members take place to review progress in the program, chart future activities and report to the MIT Provost.

## **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 programs have 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. MPP has also contributed to the strengthening of innovation and entrepreneurship at Portuguese universities, through entrepreneurial education. MPP's second phase focuses on extending the gains of Phase 1, including the promotion of an education and research ecosystem connected to trans-disciplinary innovation and entrepreneurship, and close collaborations between universities and industry. As of June 2017, almost 500 of the 1,100 MPP students have graduated in Portugal. MPP has supported 250 MIT visits of its students and scholars, and has involved 270 faculty in Portugal as well as 80 faculty and 30 staff at MIT. MPP is widely recognized as a model for international alliances involving universities, industry, and governmental agencies, that focus on knowledge creation, innovation, and entrepreneurship to increase the international competitiveness of the sponsoring country.

<http://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 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 focused its efforts in three main themes that are relevant to the region and where MIT can assist in solving some of Latin America's greatest challenges: Energy, Water, and Sustainability; Innovation and Entrepreneurship; Growth and Productivity. This is being achieved by enhancing connections with local alumni and creating avenues for potential corporate, governmental, and academic partnerships and research collaborations for MIT faculty and researchers.

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. The CNRS-MIT UMI is hosted at MIT by MITEI. Under the leadership of Roland Pellenq (CNRS Director of Research (DR1) 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 4 senior CNRS researchers and about 10 postdocs and students working with MIT faculty

from various departments on projects related to the fundamental physics of materials for energy and the environment including cement sciences, shale gas, nuclear waste and urban physics. In the 2012–2016 period, UMI was supported through the Laboratory of Excellence ICoME2 grant as part of the French National Research Strategy. UMI senior researchers have co-Pi status at MIT and can apply for U.S. funds jointly with MIT faculty through MIT. Conversely, MIT faculty can apply with UMI researchers for grants from ANR and Europe as co-Pis through CNRS. In September 2016, the UMI contract was renewed with Aix-Marseille University (AMU) as a UMI co-sponsor. The CNRS-AMU CINaM laboratory (Centre Interdisciplinaire des Nanosciences de Marseille) is now the official mirror unit of the UMI in France. The interactions between the UMI and CINaM are being strengthened through research programs such as the MITEI/FASTER-Shale program sponsored by TOTAL.

Thanks to this first-of-a-kind institutional agreement, the UMI has become an integral part of the intellectual research and educational environment of MIT and beyond. 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 affiliation of UMI researchers as "Visiting Professors" allows the integration into the educational landscape of MIT. With AMU, UMI also organizes the Marseille Winter School (MWS) on the science and engineering of multi-scale porous materials. MWS is now part of the MIT-IAP program.

UMI also leads a focused international research network of universities and research centers in the U.S. and Europe, dedicated to "Multiscale Materials Under the Nanoscope" (incl. Georgetown, NIST, Princeton, UC-Berkeley, UC-Irvine, UC-LA, Cambridge U., Newcastle, San Sebastian, Bilbao and 12 CNRS labs). UMI has become an important point of contact for large French industrial corporations (Total...); as well as a close partner for the MIT-France program.

<http://umi.mit.edu/>

## Other International Initiatives

### 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.

### MIT-Africa Initiative

Present MIT engagements with Africa span half the countries on the continent and center on research, education and innovation. Multiple faculty members and a growing number of students are involved in these engagements. The MIT-Africa Initiative (<http://misti.mit.edu/mit-africa-initiative>) was set up in 2013 by Prof. Hazel Sive. The Initiative serves to communicate and coordinate engagement in Africa among the MIT community and is a point of entry for new partnerships.

The Initiative has been housed at the MIT International Science and Technology Initiative (MISTI) together with several other Africa-focused programs, including student internships through the MIT-South Africa and MIT-Africa Internship programs, and MIT-Global Startup Labs. These Internship Programs are the fastest growing at MIT, and in 2016–17 a total of 93 students traveled to Africa. The pedagogy programs Empowering the Teachers and MIT-Educator are also based at MISTI.

The MIT-Africa Fund and the MIT-South Africa Fund were established through the Office of Giving to welcome African alumni and friends. Alumni events have been organized in Nigeria and South Africa.

The Africa Advisory Committee (AAC) was set up as a strategic planning group for MIT-AFRICA, comprising faculty, staff and students. The AAC was pleased to advise Associate Provost Richard Lester and prepare a strategic plan for MIT engagement in Africa. The priorities in MIT's Campaign for a Better World resonate with enormous opportunities for collaboration with partners throughout Africa on issues of vital importance. The time has never been better to expand MIT engagement with Africa.

### **MIT-Haiti Initiative**

The MIT-Haiti Initiative, led by Prof. Michel DeGraff (Linguistics, P.I.), Dr. Vijay Kumar (J-WEL; co-P.I.) and Prof. Haynes Miller (Mathematics), is a collaboration between MIT and Haitian faculty to help provide training and resources for secondary and tertiary education that are founded on contemporary educational theory, active-learning methods and the use of Kreyòl in the classroom. As part of the Initiative, digital tools created at MIT and elsewhere are translated into Kreyòl and provide proof of concept that Kreyòl is indeed a necessary ingredient for active learning in Haiti. More generally, the Initiative is forging a model of the use of local languages such as Kreyòl as the primary language of instruction at all educational levels.

Making high-quality STEM materials openly accessible to Haitian faculty in Kreyòl will eventually allow greater and more democratic access to educational resources in the one language that the vast majority of Haitians are by far the most comfortable in. As a long-term side effect, wider access to Kreyòl materials can be expected to endow Haiti's national language with both scientific and cultural capital. The promotion of Kreyòl is a key component for nation building in a country where the use of the French language has long created a deep divide in a population where only a small minority of fluent French speakers (no more than 5%) have had access to quality education and political and economic power. Only through the systematic use of Kreyòl as language of instruction will the majority population become full participants in the economic and social development of the country.

The MIT-Haiti Initiative is already having a profound impact on the way educators and policy makers in Haiti think about teaching STEM in their native Kreyòl. This Initiative can also serve as an important model for similar initiatives around the globe where indigenous or other local languages continue to face systemic marginalization, with disastrous impact for the wellbeing and the socio-economic development of these communities. The model that is set up by the use of Kreyòl in the MIT-Haiti Initiative is all the more important when we consider that some 200 million children are still being educated in what is, in effect, a foreign language that they barely speak, if at all.

For more details about the Initiative and its rationale, including research articles, please see: <http://haiti.mit.edu> and <http://mit.edu/degraff>

### **MIT Ibn Khaldun Fellowship for Saudi Arabian Women, Saudi Arabia**

This competitive fellowship program is open to Saudi Arabian women scientists and engineers who hold a doctoral degree. Fellows are supported to spend one year doing research at MIT in collaboration with an MIT faculty member. The Fellowship was launched by MIT in 2009, in collaboration with Saudi universities. This successful and highly competitive program has flourished thanks to a substantial expansion in 2013 supported by Saudi Aramco. The MIT Ibn Khaldun Fellowship for Saudi Arabian Women is uniquely positioned to facilitate the development of Saudi Arabian women scientists and engineers as leaders in their respective fields of research as well as the Kingdom's top educational managers and teachers. Fellows have returned to Saudi Arabia equipped for advanced technical research, and they have achieved positions of leadership in both their institutions and their local governments.

### **MIT Norman B. Leventhal Center for Advanced Urbanism, multiple countries**

The mission of the MIT Norman B. Leventhal Center of Advanced Urbanism (LCAU) is to establish a new theoretical and applied research platform to create knowledge that can be used to transform the quality of life throughout the urbanized world. LCAU is committed to achieving this goal both domestically and internationally, through collaborative interdisciplinary research projects using design as a mode of inquiry, intellectual discourse, and dissemination through leadership forums, conferences, publications, and teaching.

In addition to ongoing research in Colombia, China, UAE and the U.S., the LCAU is also exploring the global condition of affordable housing as part of its fourth biennial theme. Five graduate-level workshops have already been offered, with site visits occurring to: Cartagena, Colombia, Kigali, Rwanda, Gujarat, India, Sao Paulo, Brazil, and Hangzhou, China. Two more workshops will be offered during IAP 2018, with potential sites in Guyana and Bangladesh.

## Digital Learning

MITx and MIT OpenCourseWare represent MIT's largest and most far-reaching international educational outreach programs. MITx on edX is the Institute's interactive learning initiative that offers online versions of MIT courses on edX, a university collaboration in online education founded by 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. MITx also now offers the MicroMasters online credential, which represents a new path to an MIT master's degree.

Since the first MITx course was offered in August 2012, there have been more than 5.7 million enrollments in MITx courses, with nearly 2.7 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

Cumulative total enrollment	5.7 million*
Cumulative total participation	3.3 million
Certificates of Completion	160 thousand
ID-verified Certificates	51 thousand

\*2.7 million unique enrollments

MIT OpenCourseWare (OCW) is a free, open, publicly accessible web-based resource that offers high-quality educational materials from more than 2,400 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 almost 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 remarkable results. Please see <http://ocw.mit.edu/about/ocw-stories/> for inspiring examples.

## International Study Opportunities

There is 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 at least one educational experience 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 Imperial College London and the University of Tokyo. The Department of Political Science has an exchange program with Sciences Po in France.

**Other Study Abroad Options**

MIT students may also apply for admission directly to foreign institutions that offer study abroad programs. Examples of direct enroll programs include l'École Polytechnique in France, the London School of Economics, in the UK, University of Sydney in Australia, and Tsinghua University in China.

**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.

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

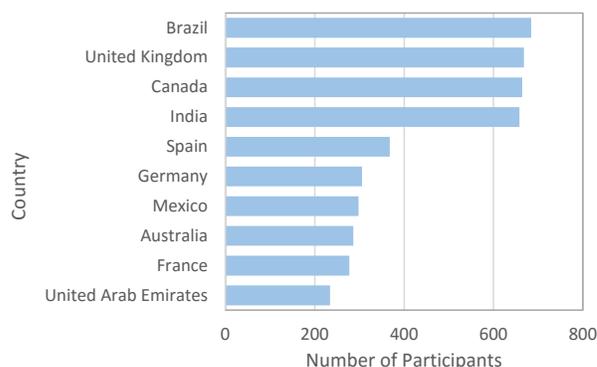
The SMART Centre has established a summer research internship programme: the SMURF programme (Singapore-MIT Undergraduate Research Fellows programme). It is open to all undergraduates at MIT, NTU, NUS, and SUTD and gives them the opportunity to engage in research at the SMART Centre over the summer. 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 encourages them to consider a career in research. Their research experiences are supplemented with numerous social activities. 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 35,000 professionals from 150+ countries, including the U.S., 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 101.

## MIT International Science and Technology Initiatives

MISTI works with MIT students, faculty, and international partners and sponsors to build strong intercultural connections, advance crucial research with global implications, and help MIT students develop into true world leaders capable of shaping the future.

### Student programs

Rooted in the *Mens et Manus* tradition, MISTI creates tailored internship, research and teaching opportunities abroad for MIT undergraduate and graduate students. MISTI's internship program matches students with rigorous, hands-on projects in companies and labs around the world. Through MISTI's teaching programs, students learn how to communicate with international peers by teaching STEM and entrepreneurship in foreign high schools and universities.

To prepare for their experiences abroad, MISTI students complete coursework in the language, culture, history and politics of their host country. Students also participate in a series of location-specific training modules covering topics such as cross-cultural communication, current events, technology and innovation in the host country, navigating the workplace, logistics, and safety.

MISTI student programs are available in Australia, Belgium, Brazil, Chile, China, France, Germany, India, Israel, Italy, Japan, Jordan, Kazakhstan, Korea, Mexico, Morocco, the Netherlands, New Zealand, Portugal, Peru, Russia, Singapore, South Africa, Spain, Switzerland, and the United Kingdom. Over 1,200 students participate in MISTI each year.

Here are a few examples from the more than 9,500 students MISTI has placed since it began by sending a handful of interns to Japan 35 years ago:

- 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 Bryslawskij designed superconducting magnetic bearings for electric motors at Siemens in Germany. He wrote two patents at Siemens.
- Ammar Ammar, an EECS undergrad, designed and tested a Google/YouTube project at Google Israel.

### Faculty seed funds

The MISTI Global Seed Funds (GSF) grant program promotes and supports early-stage collaborations between MIT researchers and their counterparts around the globe. Many of the joint projects lead to additional grant awards and the development of valuable long-term relationships between international researchers and MIT faculty and students.

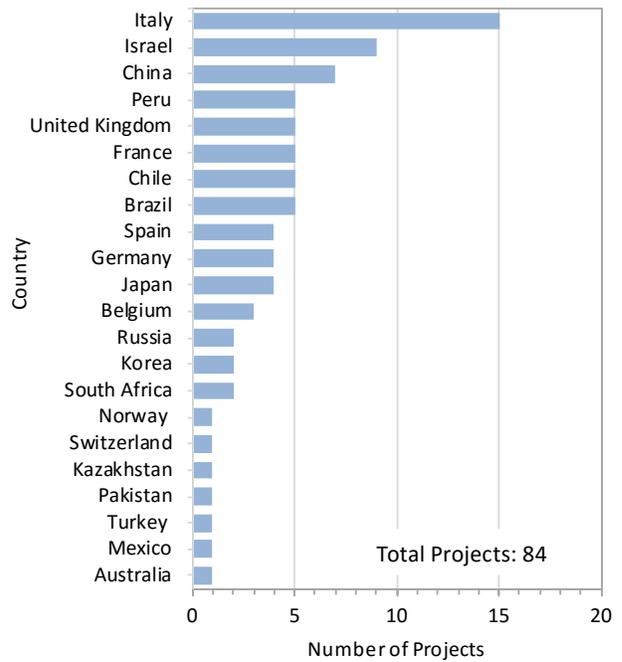
MISTI GSF grants enable participating teams to travel to collaborate with international peers, either at MIT or abroad, with the aim of developing and launching joint research projects. Grantees are encouraged to include both undergraduate and graduate students in their projects. The program comprises a general fund for projects in any country and several funds for projects in specific countries.

Since the launch of GSF in 2008, MISTI has received 1,359 proposals. Of these, 536 faculty projects were awarded \$11.7 million for projects in 72 countries. No fewer than 544 MIT faculty members and 169 research scientists have applied for a MISTI GSF grant at least once. Seed funds are currently offered in Africa, Belgium, Brazil, Chile, China, Colombia, France, Germany, Israel, Italy, Japan, Mexico, Spain, Turkey and the United Kingdom. The MISTI GSF General Fund accepts proposals for projects in any country.

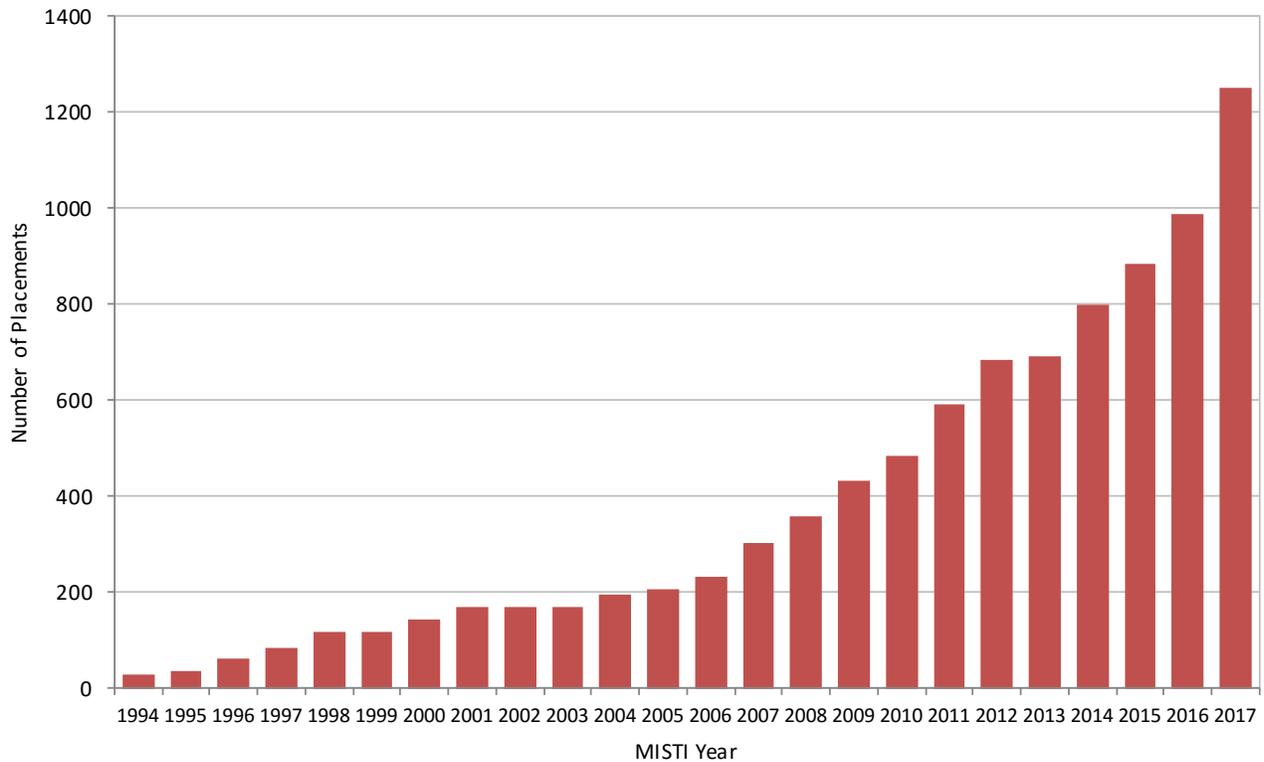
**MISTI Programs and Start Year**

- Japan, 1983
- China, 1995
- Germany, 1997
- India, 1998
- Italy, 1999
- France, 2001
- Singapore, 2002
- Switzerland, 2002
- Mexico, 2004
- Spain, 2007
- Israel, 2008
- Belgium, 2009
- Brazil, 2010
- MEET, 2011
- Netherlands, 2011
- Chile, 2012
- Korea, 2012
- Russia, 2012
- Global Startup Labs, 2012
- Global Teaching Labs, 2012
- Turkey, 2013
- Argentina, 2013
- Africa, 2013
- ANZ, 2014
- UK, 2015
- Arab World, 2015
- Portugal, 2015
- Peru, 2015

**MISTI Global Seed Fund Projects by Country 2016–2017**



**MISTI Annual Internship Placements 1994–2017\***



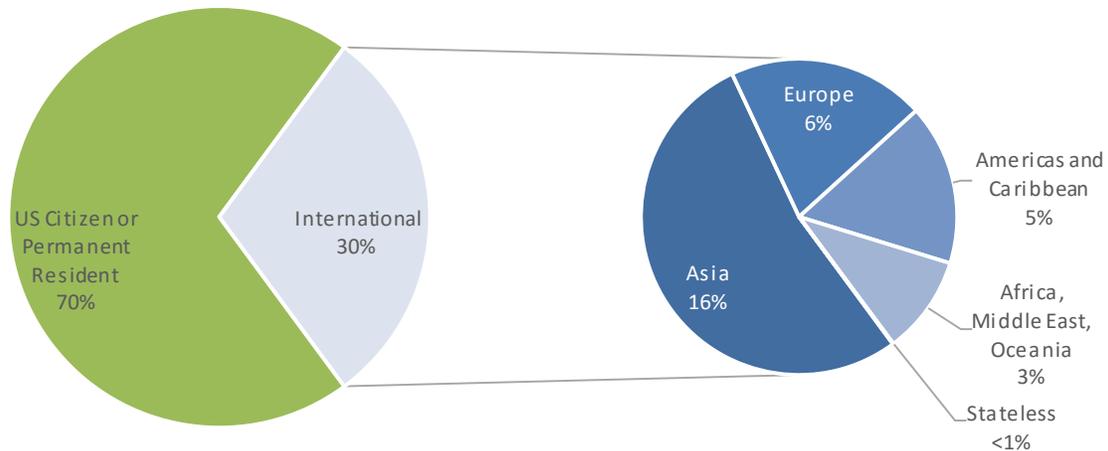
\*MISTI year runs from September 1–August 31. 2017 represents the 2016–2017 year.

## International Students

MIT has welcomed international students essentially since its inception. The first student from Canada came to MIT in 1866, the second year that 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 2017* report, the number of international students enrolled in U.S. colleges during the 2016–2017 academic year reached a record high of 1,078,822 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 2016–2017 academic year, international students contributed \$36.9 billion to the U.S. economy and support 450,331 jobs.

**Total Enrollment by Citizenship  
and Geographic Region of Country of Citizenship  
2017–2018**



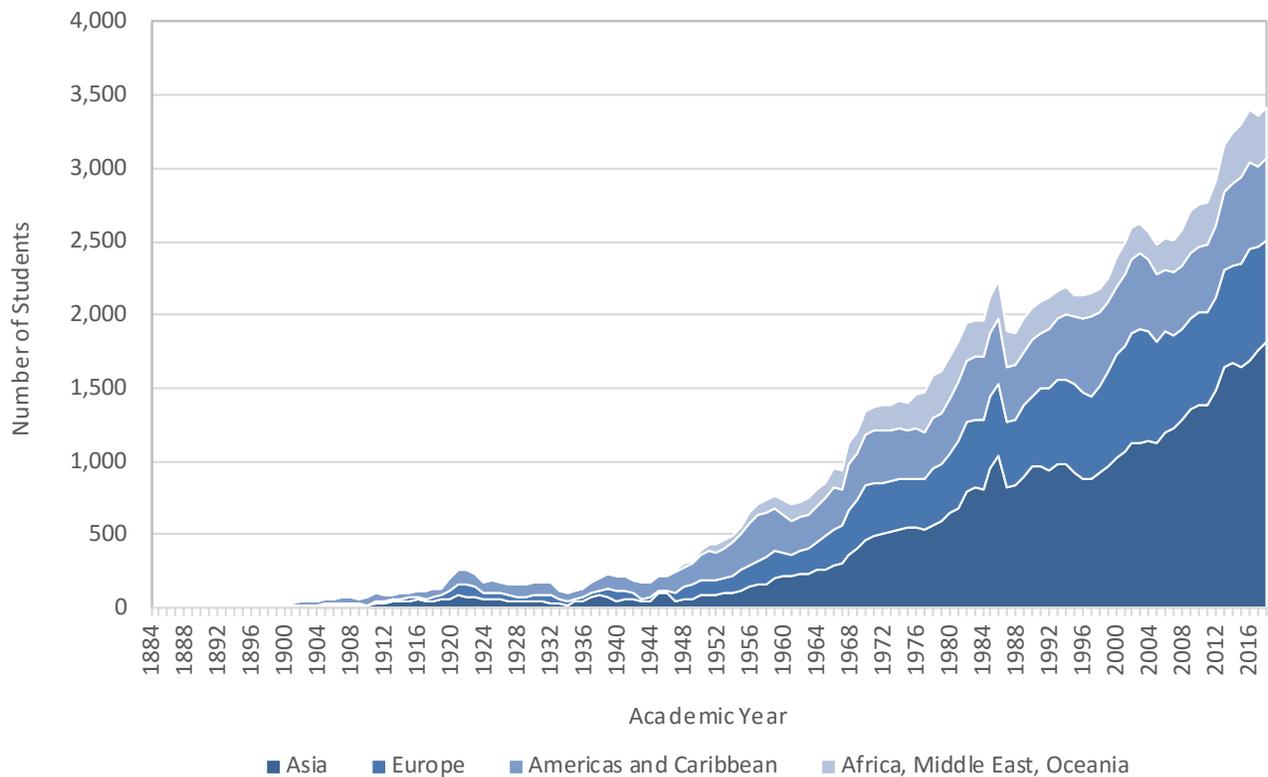
**International Undergraduate Students  
Top Countries of Citizenship, 2017–2018**

Country	Count
China	91
India	29
Canada	22
South Korea	21
Thailand	21
United Kingdom	18
Mexico	13
Singapore	12
Brazil	11
Taiwan	11

**International Graduate Students  
Top Countries of Citizenship, 2017–2018**

Country	Count
China	724
India	310
Canada	239
South Korea	183
France	104
Singapore	86
Brazil	63
Germany	61
Israel	60
Spain	60

**International Students by Geographic Region of Country of Citizenship  
1884–2018**



## 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 hautes études internationales 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.

### **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 & Cognitive Sciences 1993**

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 master's 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 served as the 7th President of Singapore, holding office from 2011 to 2017.

### **Songye Yoon, PhD Brain & 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 July 1, 2016 through June 30, 2017 year, the International Scholars Office (ISchO) served 2,379 international scholars affiliated with MIT and their accompanying family members (“international” is defined as non-U.S. citizen, non-U.S. permanent resident).

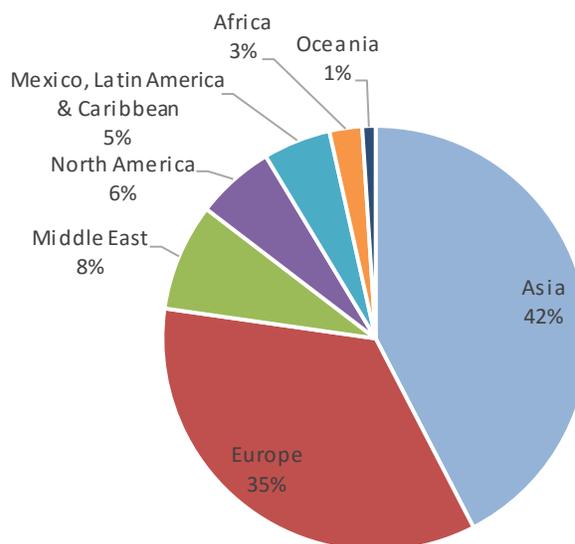
This reflects a decrease of 2 percent since last year (2,436). According to the most recently published Institute of International Education *Open Doors* report (2016), MIT ranked 10th nationally with regard to the numbers of international scholars at U.S. institutions. Postdoctoral associates and postdoctoral 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. Scholars from these top 10 countries constituted nearly 65 percent of MIT’s international scholar population. Seventy-five percent of international scholars at MIT were men and 25 percent were women. In descending order, the areas hosting the greatest number of international scholars were School of Engineering, followed by the interdisciplinary laboratories and centers under the Vice President for Research, School of Science, School of Architecture and Planning, School of Humanities, Arts and Social Sciences, Office of the Provost, and Sloan School of Management.

**International Scholars  
Top Countries of Origin, 2016–2017**

Country	Count
China	438
India	175
Canada	142
South Korea	140
Germany	137
Japan	117
France	112
Italy	100
Israel	92
Spain	83

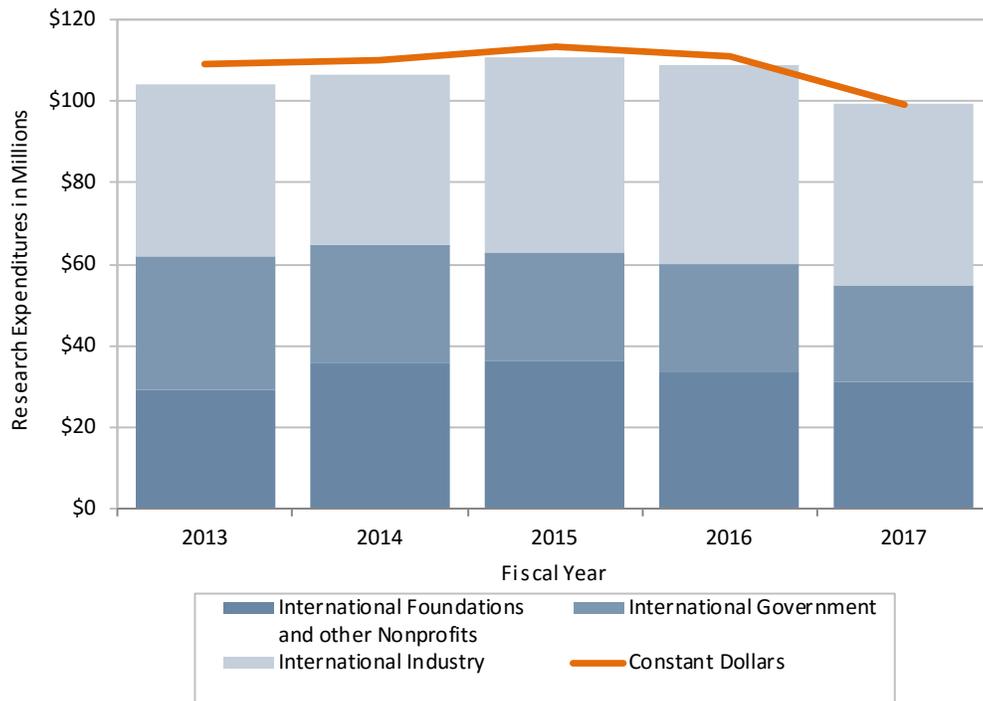
**International Scholars  
by Geographic Region, 2016–2017**



## Campus Research Sponsored by International Sponsors

International Sponsor Campus Research Expenditures (in U.S. Dollars)  
Fiscal Years 2013–2017

International Sponsor Type	2013	2014	2015	2016	2017
Foundations and other nonprofits	29,381,412	35,830,415	36,301,791	33,597,572	31,138,637
Government	32,651,167	28,803,960	26,712,520	26,673,866	23,458,426
Industry	41,922,158	42,127,804	47,606,652	48,718,794	44,757,590
<b>Total</b>	<b>103,954,737</b>	<b>106,762,179</b>	<b>110,620,964</b>	<b>108,990,231</b>	<b>99,354,653</b>
Constant dollars*	109,034,808	110,257,293	113,416,755	110,995,074	99,354,653



\*Constant dollars are calculated using the Consumer Price Index for All Urban Consumers weighted with the fiscal year 2017 equaling 100.