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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. International projects and collaborations can also present a distinctive set of risks and questions. MIT cannot protect itself fully from these risks but can take actions to mitigate them.

## A Global Strategy for MIT

A Global Strategy for MIT (<http://web.mit.edu/global-strategy/>) was published by the Associate Provost for International Activities in May 2017. 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 identifies eight core principles to help guide the Institute's future international activities, and proposes seven new initiatives in support of our global engagement objectives.

Among its recommendations, the plan calls for building new MIT Partnerships for a Better World to promote and coordinate faculty and Institute-level collaborations in different regions of the world, and calls for an increased focus on China, Latin America, and Africa.

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 also proposes several mitigating measures to help protect MIT against new risks in the international arena.

## New Review Process for 'Elevated-Risk' International Proposals

In April 2019, the Vice President for Research and the Associate Provost for International Activities announced a new review process for 'elevated-risk' international proposals. Given the increase in quantity and scope of global collaborations, this new effort was launched to strengthen MIT's internal processes for evaluating and structuring international agreements. Currently, engagements with China, Russia, and Saudi Arabia have been identified as meriting additional faculty and administrative review by the International Coordinating Committee, the International Advisory Committee, and the newly created Senior Risk Group. This new review process is designed to enable MIT to engage with the world effectively, with responsible management of risks and in keeping with the values of the MIT community.

## International Initiatives

The following are some of MIT's many international activities.

### 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 center outside of Cambridge, Massachusetts, and its largest international research endeavor. For more information: <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. The first phase of this joint effort between MIT, Skoltech, and the Skolkovo Foundation comprised a wide span of agreed activities leading to the launch and early growth of Skoltech. The second phase of the MIT-Skoltech relationship, known as the MIT Skoltech Program, began in March 2016 and was oriented around a narrower set of collaborative activities promoting the continued development of Skoltech and the Skolkovo ecosystem. The Program featured a focused set of core research and advisory activities, including an MIT faculty advisory committee, a joint annual conference, and multiple collaborative research projects. This phase of the collaboration ended in February 2019. For more information about the initiative: <http://skoltech.mit.edu/>

### **Asia School of Business (ASB)**

In 2015, MIT Sloan announced a partnership with Bank Negara Malaysia, the nation's central bank, to establish the Asia School of Business (ASB) in Kuala Lumpur. ASB offers a full-time, 20-month MBA program based on the rigor of MIT Sloan's curriculum and focused on Asia's dynamic business environment. The inaugural class of ASB students earned their MBA degrees in 2018. MIT Sloan professor Charles Fine leads ASB as president and founding dean. This collaboration comprises the following components: MIT Sloan faculty teach courses at ASB; International Faculty Fellows Program enables ASB faculty to spend time on MIT campus; ASB students visit MIT for one month to take courses and learn about MIT's innovation ecosystem; and, MIT Sloan senior administrators share best practices with ASB counterparts.

### **Center for Excellence in Energy, Egypt**

MIT received a \$30 million award in February 2019 from the U.S. Agency for International Development (USAID) to support the development of a Center of Excellence in Energy at Ain Shams University, Mansoura University, and Aswan University, in Egypt. Over the next five years, MIT will work to build the research, education, and entrepreneurial capacity of the universities to address the country's most pressing energy-related problems. The USAID award will also enable MIT to bring faculty and graduate students from Egypt to the Institute, to learn how to approach large, energy-related challenges from an MIT perspective. The Center of Excellence in Energy will be led by Ahmed Ghoniem, the Ronald C. Crane Professor in MIT's Department of Mechanical Engineering, and Daniel Frey, a professor of mechanical engineering and the faculty research director for MIT D-Lab.

### **Centers for Mechanical Engineering Research and Education**

MIT and the Southern University of Science and Technology (SUSTech) in Shenzhen, China launched the Centers for Mechanical Engineering Research and Education in June 2018. The two centers aim to inspire intellectual dialogue, innovative research and development, and new approaches to teaching and learning between experts in China and at MIT. The five-year collaboration will enable faculty and students from MIT to observe the innovation system in Shenzhen, and will enable SUSTECH faculty and students to visit MIT to conduct research and observe education practices. Gang Chen, the Carl Richard Soderberg Professor of Power Engineering, serves as the faculty director for the MIT center.

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### **Dubai Institute for Design and Innovation, United Arab Emirates**

The MIT School of Architecture and Planning (SA+P) has collaborated 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—have helped to 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. Opened in fall 2018 as a private, nonprofit education institution accredited by the Dubai Ministry of Higher Education, DIDI offers the region's first-ever Bachelor of Design degree with concentrations in Product Design, Strategic Design Management, Media, Visual Art, and Fashion Design.

### **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. MIT leads another effort that is based at CERN, although the detector is located on the International Space Station. The Alpha Magnetic Spectrometer (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.

### **Global Supply Chain and Logistics Excellence Network**

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 (Spain and Luxembourg), South America (Colombia), and Asia (Malaysia and China). Each 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. The network also features partnerships with over a hundred global corporations that sponsor research, participate in events, and recruit students. Research projects recently undertaken by the network include projects on decision making under uncertainty, supply chain resilience, humanitarian logistics, sustainable supply chains, and global transportation reliability.

### **Laser Interferometer Gravitational-wave Observatory**

The Laser Interferometer Gravitational-wave Observatory (LIGO) gives scientists insights into ripples in space-time caused more than a billion years ago by immense cosmic phenomena such as the merging of black holes and dense neutron stars. LIGO is funded by the National Science Foundation and operated by Caltech and MIT, which conceived of LIGO and led the Initial and Advanced LIGO projects. Financial support for the Advanced LIGO project was led by the NSF with Germany (Max Planck Society), the U.K. (Science and Technology Facilities Council) and Australia (Australian Research Council-OzGrav) making significant commitments and contributions to the project. Approximately 1,300 scientists from around the world participate in the effort through the LIGO Scientific Collaboration. In total, since making history with the first-ever direct detection of gravitational waves in 2015, the network, including Virgo, located at the European Gravitational Observatory (EGO) in Italy, has spotted evidence for four neutron star mergers; 16 black hole mergers; and one possible black hole-neutron star merger.

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

Since 2015, the Hong Kong Innovation Node has focused 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 to help strengthen the region's innovation ecosystem. The Node is deepening MIT's links to the Greater Bay Area and 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. The Node has created an engaging physical space for collaboration, connection, and making that has enabled MIT students, faculty, and alumni to connect with local universities, entrepreneurs, and companies. In 2019, the Node is offering 15 different programs that will engage more than 30 MIT faculty, 100 MIT students, 300 alumni, and 60 start-up companies from MIT and the Greater Bay Area.

### **MIT Norman B. Leventhal Center for Advanced Urbanism**

The mission of the MIT Norman B. Leventhal Center for 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 Australia, Canada, China, India, Spain, Turkey, China, the UAE, and Ukraine, the LCAU is also undertaking a multi-year research effort on equitable resilience, which brings to the forefront questions of equity when designing for urban resilience. Research is currently underway in Argentina, Boston, Colombia, Florida, India, Philippines, Puerto Rico, South Africa, and Tajikistan.

### **MIT Portugal Program, Portugal**

The MIT Portugal Program (MPP) is a strategic partnership between Portuguese universities and research centers, MIT, and the Portuguese government. The program is in its third phase of funding, the MIT Portugal Partnership 2030 (MPP2030). MPP2030'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). MPP2030 has shifted the program's focus to research in the areas of Climate Science & Climate Change, Earth Systems, Digital Transformation in Manufacturing and Sustainable Cities. Despite this shift in focus from education to research, the program is proud of its educational impact in Portugal. Phases 1 and 2 yielded over 500 students from partner universities in Portugal and engaged over 270 Portuguese and 70 MIT faculty members. MPP is widely recognized as a model for international alliances involving universities, industry, and governmental agencies. For more information about the program: <http://www.mitportugal.org/>

### **MIT Regional Entrepreneurship Acceleration Program**

Since 2012, MIT Regional Entrepreneurship Acceleration Program (REAP) has provided opportunities for communities around the world to engage with MIT in an evidence-based, practical approach to strengthening innovation-driven entrepreneurial (IDE) ecosystems. Eight teams from regions around the world annually participate in this 2-year program. Each team is led by a regional team champion and comprises leaders from five major groups of stakeholders: government, corporate, academia, risk capital, and the entrepreneurial community. The program seeks to educate regional IDE ecosystem leaders through team-based learning, and impact regions through the development of new programmatic and policy interventions tailored to their IDE ecosystems. MIT REAP includes four workshops and interspersed action phases. Over the past seven years, the program has engaged with over 52 regions worldwide.

### **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: Knowledge Creation; Regional Awareness; Admissions; Action Learning; and Strengthen the Alumni Network. The office supports research, teaching, and knowledge-sharing opportunities for MIT Sloan and MIT faculty and has focused its efforts on three main themes that are relevant to the region: 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.

### **MIT-Africa Initiative**

The MIT-Africa Initiative seeks mutually beneficial engagement in research, education, and innovation, contributing to economic and intellectual trajectories of African countries, while advancing MIT scholarship and research. The Initiative communicates activities across MIT related to Africa, while inviting new connections. MIT faculty, staff, and students are engaged in projects in half the countries of Africa, including research collaborations, projects that promote educational excellence, entrepreneurship workshops and competitions. A growing number of MIT students travel to Africa for internships with universities, schools, corporations and governments. The Initiative welcomes dignitaries to campus through the MIT-Africa Forum, and celebrates achievements of MIT personnel and alumni in a monthly Newsletter and at [africa.mit.edu](http://africa.mit.edu). An eminent faculty Working Group, and a Team including staff and students advance MIT-Africa organization.

### **Transiting Exoplanet Survey Satellite**

The Transiting Exoplanet Survey Satellite (TESS) is the newest planet hunting mission led and operated by MIT and managed by NASA's Goddard Space Flight Center. George Ricker of MIT's Kavli Institute for Astrophysics and Space Research serves as principal investigator for the mission and Professor Sara Seager acts as deputy science director for TESS. More than a dozen universities, research institutes, and observatories worldwide are participants in the mission, which in its first year of scientific operations, has discovered 28 planets outside of our solar system that are orbiting bright, nearby stars. MIT scientists, including Seager and Julien de Wit can determine these exoplanets' characteristics, such as atmospheres and chemical compositions, leveraging international observatories such as the SPECULOOS project (Search for habitable Planets Eclipsing ULtra-cOOl Stars) based in Spain.

## **International Education Opportunities**

There is a broad range of global activities for students to choose from. These run the gamut from varied study-abroad programs to innovative short-term projects, but most are infused with the Institute's philosophy of *mens et manus*. Based on the results of the 2018 Graduating Student Survey, 54.4% of graduating seniors and 40.2% of students graduating with a master's degree reported completing at least one global experience while at MIT.

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

### **IAP Faculty-led Programs**

Six for-credit courses taught by MIT faculty will be offered this coming IAP (including two new offerings). Three literature courses (in Madrid, London, and Sao Paulo) will allow students to focus on topics in literature for the month of January, and three foreign language courses (two courses in Spain and one course in China) will help them hone foreign language skills.

### **Semester Study Abroad Options**

During academic semesters, students can study abroad through exchange programs and by enrolling directly at foreign universities who offer this option. Some exchanges span several departments and others are focused in one department only. The Exchange with Imperial College London includes eight departments: Materials Science and Engineering; Chemistry; Electrical Engineering and Computer Science; Chemical Engineering; Earth, Atmospheric and Planetary Sciences; Aeronautics and Astronautics; Mathematics; and Nuclear Science and Engineering. The Exchange with ETH Zurich involves two departments: Mechanical Engineering, and Electrical Engineering and Computer Science. The Exchange with the University of Tokyo spans two departments: Mechanical Engineering and Materials Science and Engineering. The Exchange with Sciences Po allows students from any major to participate if they plan to take courses in political science and related fields. The Exchange with the University of Oxford is focused in one department: Materials Science and Engineering. The Department of Aeronautics and Astronautics offers study at the University of Pretoria in South Africa through an exchange. Beyond the exchange program in Materials Science and Engineering, University of Oxford receives our students from other majors through a direct enrollment option. Examples of other universities that offer a direct enrollment option for our students include: National University of Singapore, University of Hong Kong, Seoul National University, University of Manchester, University of New South Wales and University of Melbourne.

### **UROP Overseas**

Resources are available for MIT undergraduates pursuing UROP research mentored by MIT faculty and requiring overseas travel. Such opportunities can 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, these experiences can 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**

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, during the summer break, to engage in research at the SMART Centre. The SMURFs work in MIT faculty supervisors' labs, actively participate in the research projects, and engage with postdoctoral scholars, graduate students, and other researchers. The programme provides undergraduates an international experience and inspire them to consider a career in research. Their research experiences are supplemented with numerous social activities and weekend trips to other South East Asia countries. Based on feedback from the students, the SMURFs greatly value their experiences at SMART and the community that forms among them.

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## 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. As of July 2019, MITx had built 176 massive open online courses (MOOCs), corresponding to more than 120 semester-long on-campus MIT courses, from 23 departments in all 5 schools. MITx also offers 4 (and soon 5) MicroMasters programs. The MicroMasters is a valuable professional credential earned by completing 4 or 5 online courses at the MIT Masters level, as well as a new path to a Master's degree at MIT and other universities.

Since the first MITx course was offered in August 2012, more than 3.8 million unique learners have enrolled 8.2 million times in MITx courses. Learners come from more than 200 different countries. Anyone in the world can explore and learn from MITx for free. Those who wish to earn an MITx certificate must verify their identity and pay a small fee. As of July 2019, MITx had awarded 195,000 certificates on edX.

MIT OpenCourseWare (OCW) is a free, open, publicly accessible web-based resource that offers high-quality educational materials from more than 2,450 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. OCW Educator helps education professionals around the globe to navigate this vast library of MIT teaching materials by sharing insights from MIT faculty about how they teach with these materials on campus.

On average OCW attracts about 2 million visits per month, and to date more than 300 million people from almost every country on earth have accessed MIT academic content through these resources. Learners also find OCW content on other platforms like YouTube, where OCW's 2 million subscribers make it the largest college/university channel. Please see <http://ocw.mit.edu/about/ocw-stories/> for inspiring examples.

## MIT International Science and Technology Initiatives

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 Africa, the Arab world, Australia, Belgium, Brazil, Chile, China, Denmark, France, Germany, India, Israel, Italy, Japan, Korea, Mexico, the Netherlands, New Zealand, Peru, Portugal, Russia/Eurasia, Singapore, Spain, Switzerland, and the United Kingdom. Over 1,200 student placements are made through MISTI each year.

Here are a few examples from the more than 10,000 students MISTI has placed since it began by sending a handful of interns to Japan over 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 Bryslawskyj 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.

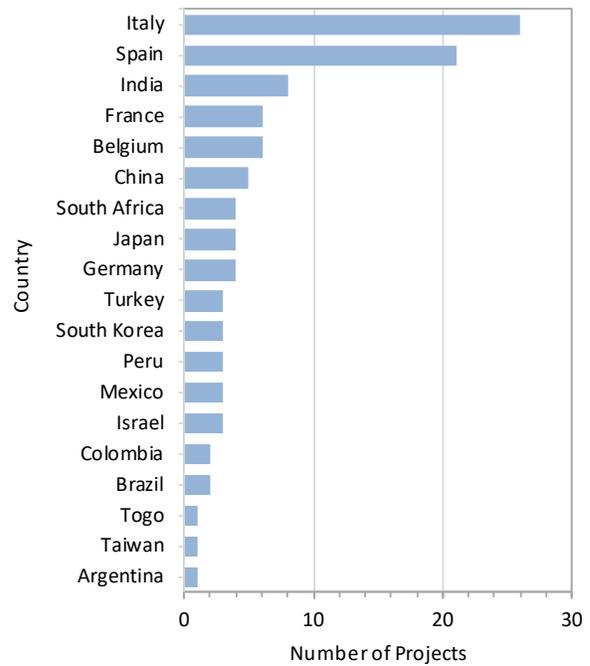
MISTI GSF grants enable participating teams to travel to collaborate with international peers, either at MIT or abroad, with the aim of developing and launching joint research projects. Grantees are encouraged to include both undergraduate and graduate students in their projects. The program comprises 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 2,105 proposals. Of these, 841 faculty projects were awarded \$17.7 million for projects in 52 countries. More than 650 MIT faculty members and 175 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, India, Israel, Italy, Japan, Korea, Peru, Spain, and the United Kingdom. The MISTI GSF General Fund accepts proposals for projects in any country with priority consideration for proposals from Africa and Latin America.

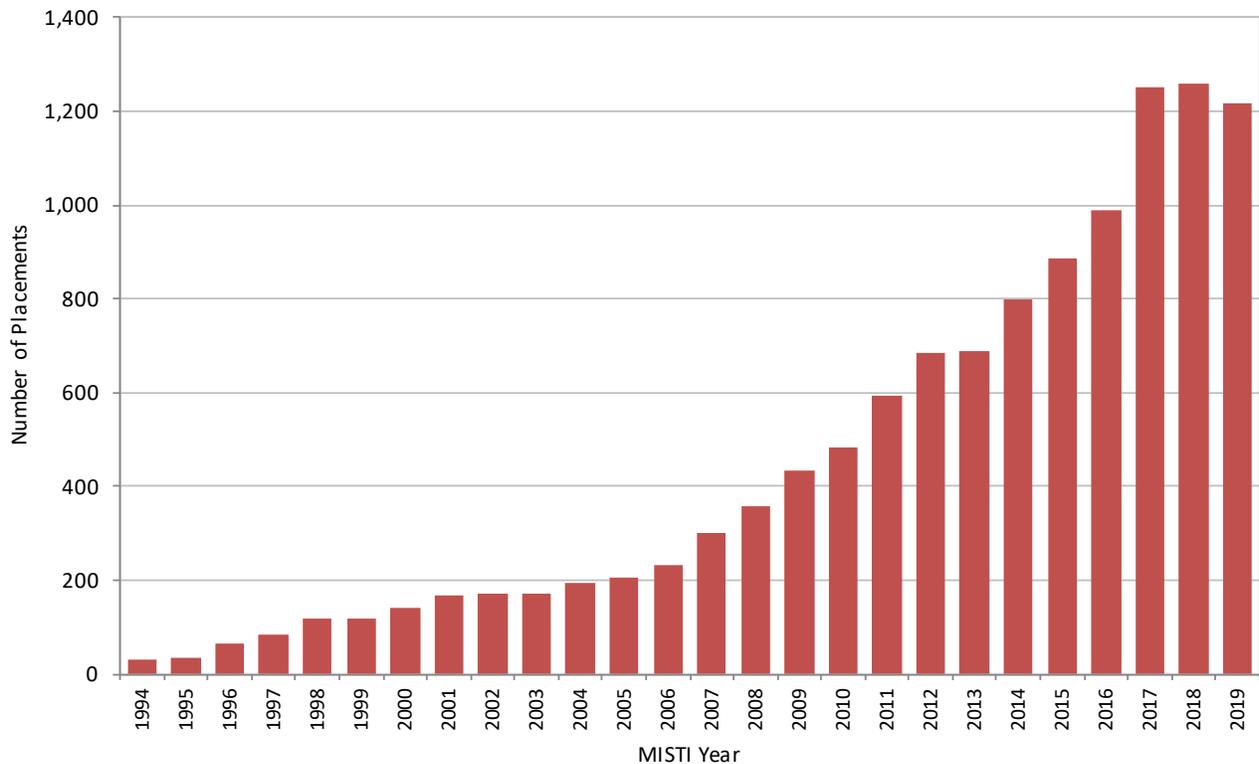
### MISTI Programs and Start Year

- 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
- Denmark, 2018

### MISTI Global Seed Fund Projects by Country 2018–2019



### MISTI Annual Internship Placements 1994–2019\*



\*MISTI year runs from September 1–August 31. 2019 represents the 2018–2019 year.