5 Global Engagement

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Global Engagement

The expanding global connections of the 21st Century provide MIT with increasing opportunities to engage in projects and collaborations outside the United States. As President Susan Hockfield noted in a speech delivered to the Confederation of Indian Industries in Mumbai, India in November 2007,

It has never been more clear that the future of innovation will be told in many, many different languages. In a world with so much talent, no one has a monopoly on good ideas. As researchers, if we are driven to find the most gifted collaborators and the most intriguing ideas, we must be prepared to look far beyond our own backyards. And as educators, if we fail to help our students learn to live and work with their peers around the world, then we have failed them altogether.

MIT strives to encourage the free flow of people and ideas through engaging in international research collaborations, providing international study and research opportunities for its students, and by hosting international students and scholars. The following are some of MIT's many international research collaborations:

MIT-Singapore

Singapore University of Technology and Design

In 2010, MIT and the Singapore University of Technology and Design (SUTD) signed an agreement formalizing a detailed collaboration between the two institutions. The partnership is MIT's most significant educational collaboration to date, and includes both education and research components. The alliance will give MIT new opportunities to push the boundaries of design research through cooperation on teaching, curriculum development, and faculty recruitment and development. MIT will also assist in designing programs to encourage innovation and entrepreneurship. A key feature of the research component of the agreement is the establishment of an International Design Centre (IDC). Situated at the heart of SUTD, with a mirror facility at MIT, the IDC is intended to become the world's premier hub for technologically intensive design. The IDC will be a focal point for faculty and students from SUTD, MIT, and partner institutions to collaborate in the design of devices, systems, and services that address the needs of Singapore and the world. In doing so, the IDC will seek to address design challenges facing the world today — including sustainable built environments, engineering for the developing world, and Information and Communication Technology-enabled devices for better living.

Singapore-MIT Alliance

The Singapore-MIT Alliance (SMA) is an innovative engineering education and research collaboration among the National University of Singapore (NUS), Nanyang Technological University (NTU), and the Massachusetts Institute of Technology (MIT). Founded in November 1998 to promote global engineering education and research, SMA brings together the resources of three premiere academic institutions — MIT, National University of Singapore, and Nanyang Technological University — while providing students with unlimited access to exceptional faculty expertise and superior research facilities. http://web.mit.edu/sma/index.htm

Singapore-MIT Alliance for Research & Technology (SMART) Centre

Established in 2007, the SMART Centre is MIT's first research centre outside of Cambridge, MA and its largest international research endeavor. The Centre is also the first entity in the Campus for Research Excellence and Technological Enterprise (CREATE) currently being developed by Singapore's National Research Foundation.

The SMART Centre will: identify and carry out research on critical problems of societal significance and develop innovative solutions through its interdisciplinary research groups (IRGs); become a magnet for attracting and anchoring global research talent to Singapore; develop robust partnerships with local universities and institutions in Singapore; engage in graduate education by co-advising local doctoral students and post-doctoral associates; and help instill a culture of translational research, entrepreneurship and technology transfer through the SMART Innovation Centre.

MIT Energy Initiative (MITEI)

MITEI, established in September 2006, is an Institute-wide initiative designed to help transform the global energy system to meet the needs of the future and to help build a bridge to that future by improving today's energy systems. MITEI strives to address the technical and policy challenges of the coming decades, such as meeting the world's growing demand for energy; minimizing related impacts on the environment; and reducing the potential geopolitical tensions associated with increased competition for energy.

To solve these problems, MITEI pairs the Institute's world-class research teams with varied entities across the global research spectrum. For example, the Initiative is launching a new multi-disciplinary program addressing the energy challenges of the developing world. It has also formed international alliances with research institutions in key regions of the world. One of these alliances is the Low Carbon Energy University Alliance (LCEUA), which is a partnership among MIT, Tsinghua University, and the University of Cambridge. MITEI is also a resource for policy makers and the public, providing unbiased analysis and serving as an honest broker for industry and government. http://web.mit.edu/mitei

The following are examples of MITEI's research:

MIT researchers and their collaborators from South Africa and England have demonstrated that it is possible to create elegant, energy-efficient buildings with little energy consumption and essentially no energy-intensive materials. http://web.mit.edu/mitei/research/spotlights/innovative-buildings.html

MIT researchers are working with Chiquita Brands International Inc. to help gauge the carbon footprint of the supply chain that transports bananas by truck and ship from Central America to the United States. The case study will lead to a Web-based tool that will help other companies calculate and potentially reduce the energy consumption of products moved by land, water, and/or air. http://web.mit.edu/mitei/research/spotlights/bananas.html

MIT-Greater China Initiative

There are currently approximately 100 research initiatives and activities between MIT and China, including the following:

Tsinghua-MIT-Cambridge Alliance (TMCA)

Founded in 2009, the TMCA is a research collaboration focused on low carbon energy, including: clean-coal technology and carbon-capture and sequestration; energy-efficient buildings, urban design, and sustainable transportation systems; biomass energy; and nuclear energy. The Alliance will provide seed funding for early stage research projects on low carbon energy solutions; support development of the MIT Emissions Prediction and Policy Analysis (EPPA) model for integrated assessment of the Chinese energy economy in response to carbon dioxide emission mitigation (with close collaboration from Tsinghua in providing the necessary inputs for the model); fund studies of policy and energy sector decision-making in China, the U.S. and the U.K.; fund visits by faculty, students and research scientists participating in Alliance work to other parties and to explore mechanisms for joint training programs; and support a major annual conference and workshops.

MIT China Educational Technology Initiative (CETI)

The goal of MIT-CETI is to promote cultural exchange between American and Chinese students by exploring science and technology. Each summer since 1996, CETI has sent between 15 and 21 MIT students to high schools in the cities and towns of Anxian, Beijing, Chengdu, Guangzhou, Guilin, Kunming, Mianyang, Nanjing, Shanghai, and Xi'an. Teaching in teams of three, some of the past CETI participants have taught curriculums on web design, programming, robotics, electrical engineering, civil engineering, English, biology, aerospace engineering and more. http://web.mit.edu/mit-ceti/www/

MIT-India Initiative

Launched in 2007, the MIT-India Initiative seeks to lead the Institute into a dramatic new phase in its historic relationship with India. The primary mission of the MIT-India Initiative is to foster collaboration between the faculty and students at MIT, and faculty and students at academic and research institutions in India. Among its specific goals are enabling the creation of long-term projects involving groups from both MIT and Indian institutions; and promoting inclusive growth, sustainable development, educational leadership, entrepreneurship, new models of governance, and advanced, results-focused research in India. http://web.mit.edu/india/

The following are some of the many elements that the Initiative encompasses:

The Abdul Latif Jameel Poverty Action Lab (J-PAL)
The Abdul Latif Jameel Poverty Action Lab, based in the MIT Department of Economics, pioneered the use of controlled trials as a means of gauging the effectiveness of anti-poverty strategies. There are more JPAL projects in India than in any other country. Topics under study include health, education, indoor air pollution, government corruption, and the optimal use of micro-credit. Indian organizations collaborating in the Lab's work include government agencies, non-profit organizations, and leading corporations. http://www.povertyactionlab.org/

J-PAL South Asia at the Institute for Financial Management and Research (IFMR)

J-PAL South Asia at IFMR is a regional office of the Jameel Poverty Action Lab at MIT, which is a focal point for development and poverty research based on randomized trials. Based at the Institute for Financial Management and Research, a leading business school in Chennai, India, IFMR also houses the Centre for Microfinance and the Centre for Development Finance. Both are key partners of J-PAL South Asia. http://povertyactionlab.org/southasia/

MISTI India Program
The MIT-India Program, part of the MIT International Science and Technology Initiatives (MISTI), arranges summer internships in Indian research, corporate, and nonprofit settings for MIT students. Among participating organizations are the ICICI Bank, Hikal Pharmaceuticals, and Dr. Reddy's Laboratories. MIT students have also worked in labs at IIT Madras, IIT Bombay, the National Centre for Biological Sciences, and the Indian Institute of Information Technology, Bangalore. The program similarly helps MIT faculty arrange research partnerships with Indian counterparts. http://web.mit.edu/misti/mit-india/

THSTI
The Translational Health Science and Technology Institute (THSTI), in Faridabad, India is modeled after the Harvard-MIT Division of Health Sciences and Technology, and will include physicians, engineers and scientists working together to generate discoveries and inventions that are translated to advance health in the region and around the world. MIT is working with THSTI to recruit and mentor the founding faculty of THSTI. http://thsti.org/

MIT Urban Laboratory

The MIT Urban Laboratory (UrbLab) is a collaborative effort between MIT and the southern Indian town of Erode. UrbLab responds to the challenges associated with India's rapid growth, increasing industrialization, and urbanization. The project builds on a long history of cooperation between India and MIT, including a relationship with the Institute for Financial Management and Research in Chennai, and planning officials in Southern India. As a result of MIT's efforts, the Indian government has taken steps to better integrate physical planning and economic planning at the local level. Future collaborations will be aimed at environmental and urban renewal. http://sap.mit.edu/resources/portfolio/erode/

Other Global Initiatives

MIT Portugal Program

The MIT Portugal Program is a large-scale international collaboration involving MIT and government, academia, and industry in Portugal to develop education and research programs related to engineering systems. The high-level partnership represents a strategic commitment by the Portuguese government to science, technology, and higher education that leverages MIT's experience in these important areas in order to strengthen the country's knowledge base through an investment in human capital and institution building. http://www.mitportugal.org/

Global Supply Chain and Logistics Excellence (SCALE) Network

The Center for Transportation and Logistics created the Global SCALE Network to increase the development and adoption of new innovations in supply chain management across the world. The SCALE Network consists of independent yet collaborating centers dedicated to shaping the future of education and research in transportation, logistics and supply chain management. Currently there are two international centers in the network located in Europe and South America. The network plans to continue opening centers in Asia, Africa, and elsewhere.

Alliance for Global Sustainability

Established in 1995, the Alliance for Global Sustainability (AGS) is an international partnership among MIT, the Swiss Federal Institute of Technology, the University of Tokyo, and the Chalmers University of Technology in Sweden. AGS brings together scientists, engineers, and social scientists from government, industry, and other organizations to address the environmental issues that affect social and economic progress. With research focused on six sectors — energy, mobility, water, urban systems, cleaner technologies, and climate change — AGS advances the understanding of complex global problems and develops policies and practices that are urgently needed to solve them. http://globalsustainability.org/

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Center for Clean Water and Clean Energy at MIT and KFUPM

A collaboration between MIT and King Fahd Univeristy of Petroleum & Minerals in Saudi Arabia. research focuses on the production of fresh water and low-carbon energy and participating faculty from each Institution conduct research on topics of mutual interest. This collaboration allows faculty and graduate students the opportunity to spend time at each Institution transferring technology, culture and promoting world-wide projects through Mechanical Engineering and other engineering related technologies. The experience of this collaboration has led to curriculum development moving forward the academic teachings to compliment the ever-changing technological environment and its mechanical applications. The Center at MIT also includes a unique outreach program that will bring Saudi women engineers and scientists to MIT to participate in its research and educational projects. http://ccwce.mit.edu/

Skolkovo Institute of Science and Technology

In June, 2011 MIT and the Skolkovo Institute of Science and Technology signed a preliminary agreement to create the Skolkovo Institute of Science and Technology in Skolkovo, Russia. Under the proposed collaboration, MIT will assist the Skolkovo Foundation in building SIST as a unique, world-class graduate research university. MIT faculty will assist in defining the structure and organization of SIST and its educational and research programs, with a strong emphasis on innovation and entrepreneurship. SIST is envisioned to connect international scientists to their peers in Russia, in an effort to help make SIST a global, collaborative project. SIST is meant to advance the missions of both MIT and the Skolkovo Foundation, a nonprofit organization in Russia charged by Russian President Medvedev with creating a new science and technology city in the Moscow suburb of Skolkovo. The university will be funded by the Russian government with support from the Russian and international business community.

OpenCourseWare (OCW)

Launched in 2002, OpenCourseWare makes materials for MIT's courses freely available on the Web. Materials from more than 2,000 MIT courses — including lecture notes, multimedia simulations, problem sets and solutions, past exams, reading lists, and selections of video lectures — are now posted on the OCW website. OCW records an average of over 40,000 visits a day, with nearly a million unique visitors every month.

About half of OCW usage originates outside of North America. OCW materials are used extensively in China (110,000 visits per month), India (100,000 visits per month) and the Middle East (77,000 visits per month). OCW materials have been translated into Chinese, Spanish, Portuguese, Persian and Thai. OCW also distributes and maintains mirror copies of the site at universities in bandwidth-constrained regions, primarily Sub-Saharan Africa. To date, the OCW staff has distributed more than 200 such mirrors.

MIT is pursuing two missions with OCW — sharing its educational materials freely and openly, and, by creating a model other universities can follow and advance, promoting a universally available storehouse for human knowledge. About 43 percent of OCW's visitors identify themselves as self-learners, 42 percent as students enrolled in academic programs, and 9 percent as educators. The following are examples of ways educators, students, and self-learners in the international community use OCW content:

Kuala Lumpur, Malaysia

A secondary school mathematics teacher in Kuala Lumpur, Malaysia, Kian Wah Liew introduces his students to a range of complex concepts, such as matrices, determinants, and differential equations. "I sometimes use the lectures in the classroom. I let the students watch a lecture — for example, the 18.03 Differential Equations video — accompanied by my own explanations," Liew says. Having access to the lectures has impacted his own teaching style, Liew says. "The Western style spends more time on 'ideas' than 'examples.' Here, we spend 20 percent of the time introducing ideas and 80 percent in demonstrating these ideas through examples. At MIT, most of the time is spent on clarifying the ideas, and very few examples are given during the lectures."

Zaria, Nigeria

Kunle Adejumo is finishing up his fourth year of engineering studies at Ahmadu Bello University in Zaria, Nigeria. Though the university boasts a large and well-maintained physical infrastructure, its Internet access — like that of almost all Nigerian universities — is extremely limited. When Adejumo was first introduced to MIT's OpenCourseWare through a CD-ROM in the university computer lab he had only 20 minutes to look through the material. "For example, last semester, I had a course in metallurgical engineering," offers Adejumo. "For one of the lectures, having to do with ion making, I didn't have notes, and I couldn't find the information I needed, so I went to OCW. I was able to download a course outline on this, and also some review questions. I actually took these to the university and gave them to the lecturer to answer. He was able to answer these questions, and helped me gain a deeper understanding of the material." To improve access to OCW for other Nigerian students, Adejumo hopes to work with a local radio station to broadcast OCW course material, as well as publicize the site.

Saint Lucia

Robert Croghan, an entrepreneur in Saint Lucia, has spent the past several years looking for a way to harness geothermal energy created by a dormant volcano underneath the island to create an alternative energy source for the region. Croghan is now developing a high-voltage grid that would deliver energy to several islands through an undersea cable. Crogan used OCW to research the topic of geothermal heat sources. "When I saw OpenCourseWare," Croghan concludes, "it went right to the very core of what I believe: if we hoard information, we can't have progress. We get stagnant, and it gets accumulated in the hands of a few. And if that happens, we miss all sorts of incredible developments and opportunities."

http://ocw.mit.edu/OcwWeb/web/home/home/index.htm

International Scholars

MIT hosts many international researchers and faculty who come to the U.S. for teaching, research, and a variety of other reasons. During the year July 1, 2010 through June 30, 2011, MIT's International Scholars Office (ISchO) served 2,060 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 approximately 9.5% over last year (1,882). According to the most recent Institute of International Education Open Doors report (2009–2010), MIT ranked 12th nationally with regard to the numbers of international scholars at U.S. institutions. Postdoctoral associates and postdoctoral fellows accounted for 55% of MIT's international scholars.

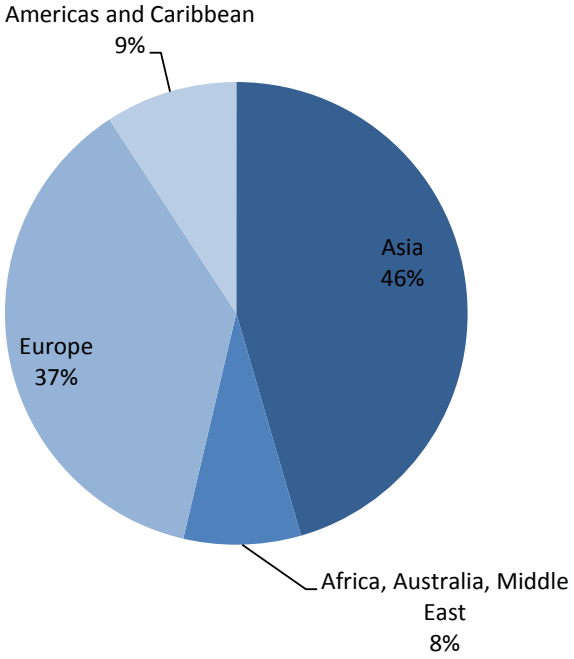
Foreign national scholars came to MIT from 91 countries, with the highest numbers coming from the People's Republic of China, the Republic of Korea, India, Germany, Canada, Japan, Italy, Spain, France, and Israel. The top ten countries of origin of the entire international scholar population in the U.S. are roughly the same. Scholars from these top 10 countries constituted 67% of MIT's international scholar population. 75% of international scholars were men and 22.5% were women.

http://web.mit.edu/scholars/

Top Ten Countries 2010-2011

Country	Number of Scholars
China	383
South Korea	162
India	154
Germany	130
Canada	118
Japan	107
Italy	92
Spain	90
France	76
Israel	65

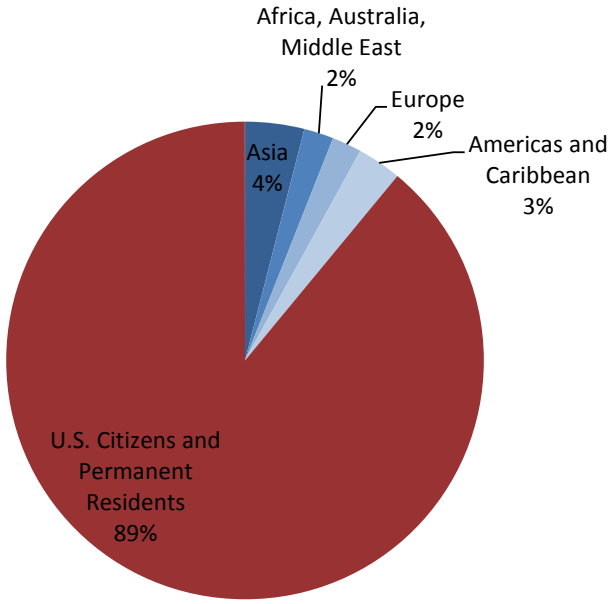
International Scholars by Geographic Region



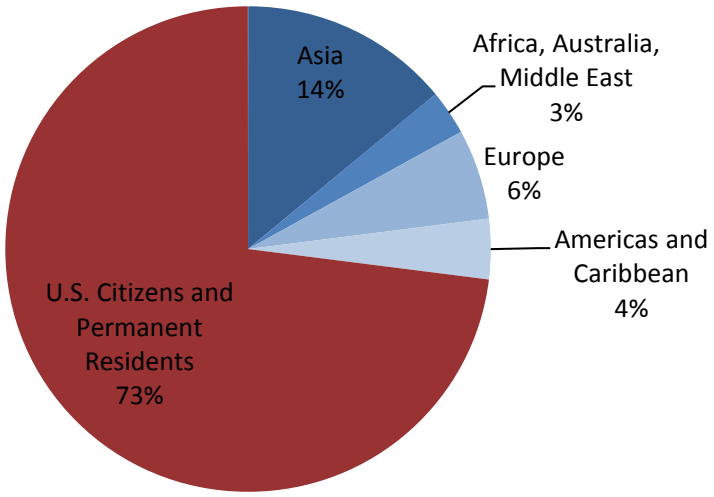
International Students

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. As world events and political decisions impact immigration, so MIT's international student population fluctuates in response to a changing international environment. World wars decrease the international student population, while peacetime pressures, such as changing immigration laws, the demise of the iron curtain, the Vietnam War protests, and the Asian financial crisis cause their respective ebbs and surges.



Total Student Population Country of Residence 1961

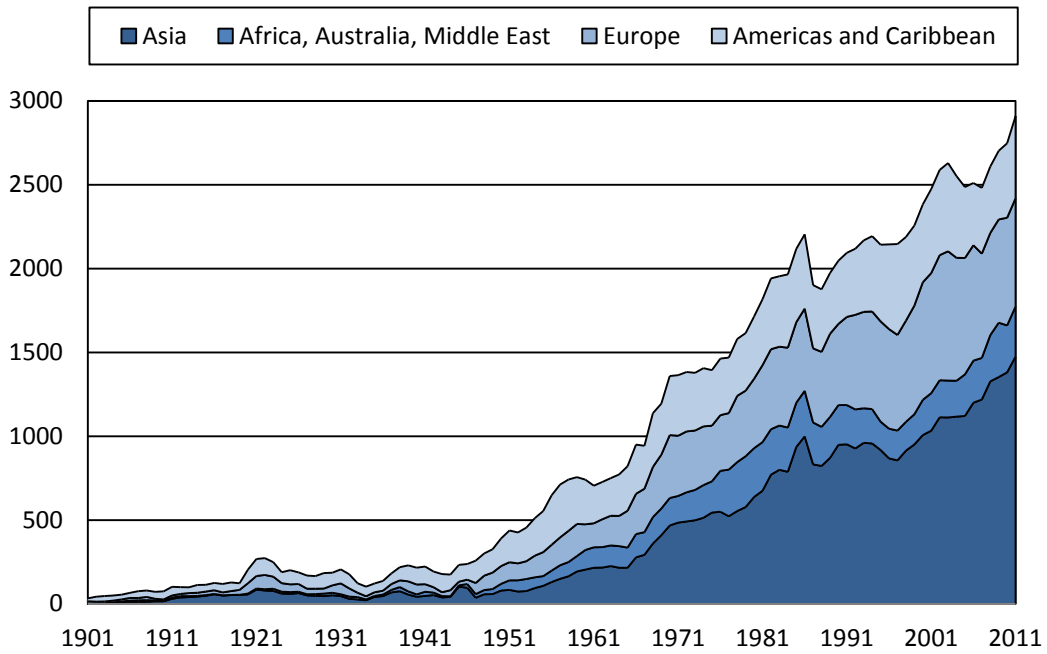


Total Student Population Country of Residence 2011

The United States has been the destination of choice for international students and scholars for the past 50 years. The number of foreign students has risen steadily since the 1970s, and, according to the 2009 Open Doors Report published by the Institute of International Education, there were 671,616 international students enrolled in U.S. colleges during the 2008-2009 academic year. The same report found that these international students contributed $17.8 billion to the U.S. economy in tuition and fees, and living expenses. According to the Open Doors Report, 65 percent of international students receive the majority of their funds from personal and family sources, and 70 percent of all international students' primary funding comes from sources outside the United States. (see www.opendoors.iienetwork.org).

Of the 75 MIT-affiliated Nobel Prize winners (including faculty, researchers, alumni, and staff), about one-third were foreign born. International faculty recruited through international searches for tenure-track positions remain in the U.S. to teach the next generation of American cancer researchers, physicists, biomedical engineers, business leaders, and computer scientists.

Total Number of International Students at MIT (1901-2011)



Region	1901	1911	1921	1931	1941	1951	1961	1971	1981	1991	2001	2011
Asia	2	31	86	47	48	84	216	485	675	952	1033	1475
Africa, Australia, Middle East	0	7	6	11	25	57	122	159	290	234	224	299
Europe	14	13	75	65	45	108	143	359	459	526	716	645
Americas and Caribbean	17	51	101	83	105	189	224	361	393	382	501	490
Total	33	102	268	206	223	438	705	1364	1817	2094	2474	2909

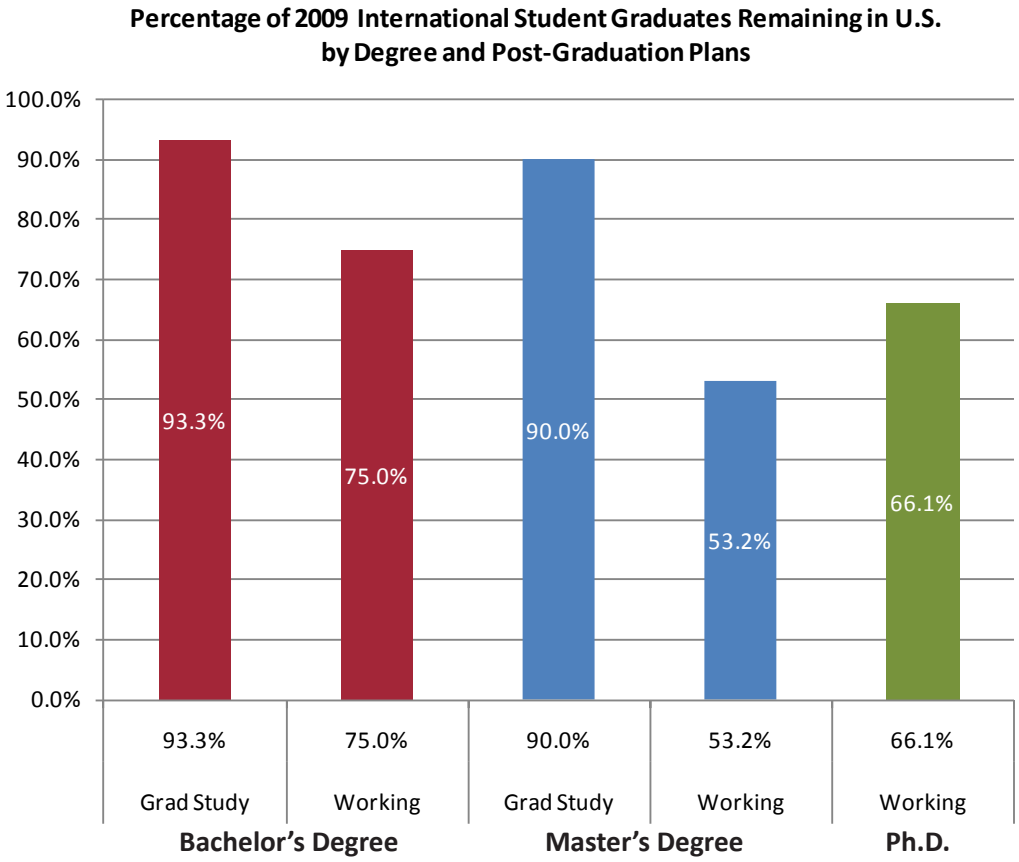
International Students

(continued)

Many international students remain in the U.S. after graduation. The graph below shows the post-graduation plans of international students graduating in 2009, as reported in a survey administered by MIT. Overall, 67 percent of international students plan to remain in the U.S. after graduation.

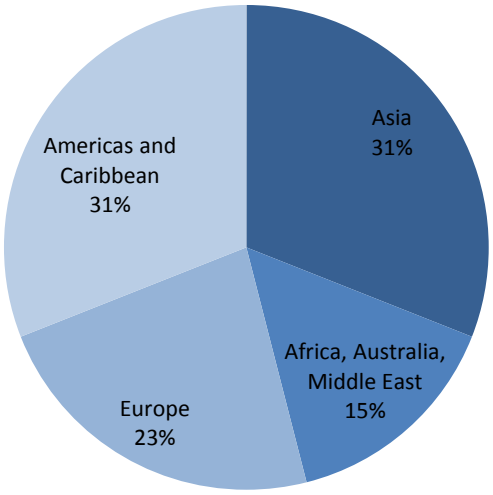
The majority of international students at MIT have F-1 Visa status. The majority of international non-student scholars at MIT were sponsored on MIT's J-1 exchange visitor program.

Currently MIT undergraduate freshman admissions policy has a target for international students of 8 percent of the total student population.



Top countries of International Undergraduates Enrolled in fall 2011

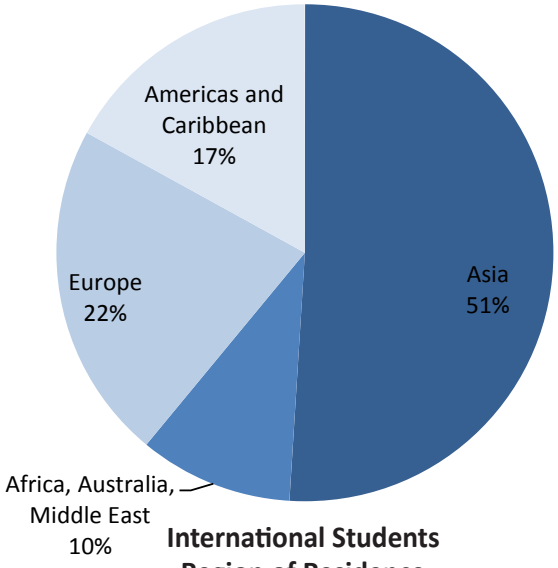
Home Country	Number of Students
China	46
India	33
South Korea	29
Canada	22
Thailand	17
Brazil	10
Taiwan	10
Saudi Arabia	9
Vietnam	9



International Students Region of Residence 1961

Top countries of International Graduate Students Enrolled in fall 2011

Home Country	Number of Students
China	426
India	253
Korea	234
Canada	217
Taiwan	84
Singapore	82
France	68
Japan	68
Germany	57
Spain	57



International Students Region of Residence 2011

International Entrepreneurs

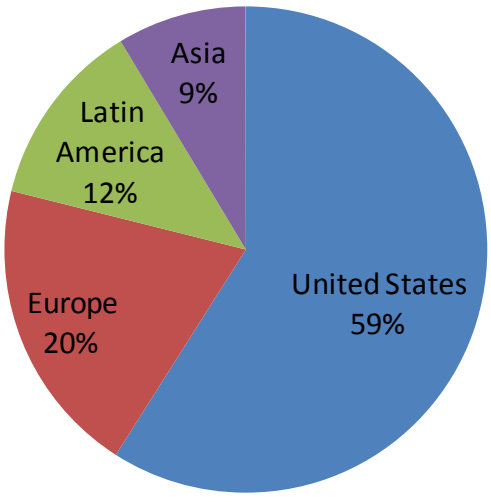
A 2009 Kauffman Foundation report on the Entrepreneurial Impact of MIT found the following:

"As a result of MIT's presence, Massachusetts is 'importing' company founders. More than 38 percent of the software, biotech, and electronics companies founded by MIT graduates are located in Massachusetts, while less than 10 percent of arriving MIT freshmen are from the state. Not only do MIT alumni, drawn from all over the world, remain heavily in Massachusetts, but their entrepreneurial offshoots benefit the state and the country significantly. Greater Boston, in particular, as well as northern California and the Northeast, broadly, are homes to the largest number of MIT alumni companies, but significant numbers of companies are also in the South, the Midwest, the Pacific Northwest, and in Europe. About 30 percent of MIT's foreign students form companies, of which at least half are located in the United States. Those estimated 2,340 current firms located in the United States but formed by MIT foreign-student alumni employ 101,500 people. In other words, talented foreign-born students attending MIT play an increasingly important role in creating U.S. companies, making MIT a magnet for worldwide talent that significantly benefits the U.S. economy."

Estimated Number of Companies Founded by International MIT Alumni

Location	Total
United States	2,340
Europe	790
Latin America	495
Asia	342

Location of Companies Founded by International MIT Alumni



International Alumni

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

Kofi Annan, M.S. 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 M.S. 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. In 2001 Kofi Annan and the United Nations received the Nobel Peace Prize for "their contributions to a better organized and more peaceful world."

Tony Tan, Singapore, S.M. 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 Co-ordinating Minister for Security and Defense.

Ngozi Okonjo-Iweala, Nigeria, M.C.P. 1978
Ph.D. Planning 1981

Currently the Managing Director of World Bank, Ngozi Okonjo-Iweala 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. http://sap.mit.edu/resources/portfolio/ngozi_okonjo-iweala/

Benjamin Netanyahu, S.B. Architecture 1975
S.M. Management 1976

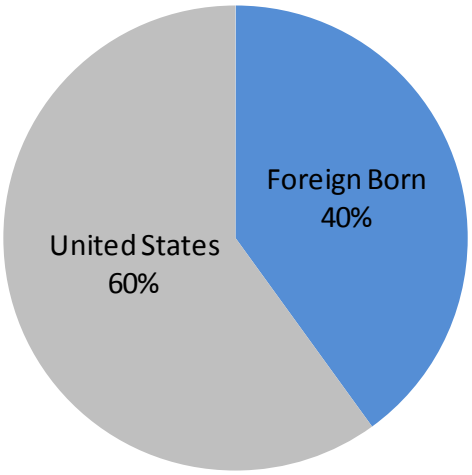
Current Prime Minister of Israel and formerly Israel's ambassador to the United Nations, Benjamin Netanyahu was born in 1948 in Tel Aviv, Israel and grew up in Jerusalem. He served as Israel's ambassador to the United Nations from 1984 to 1988, during which time he led the effort to declassify the United 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 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. http://www.netanyahu.org/

I. M. Pei, S.B. Architecture 1940

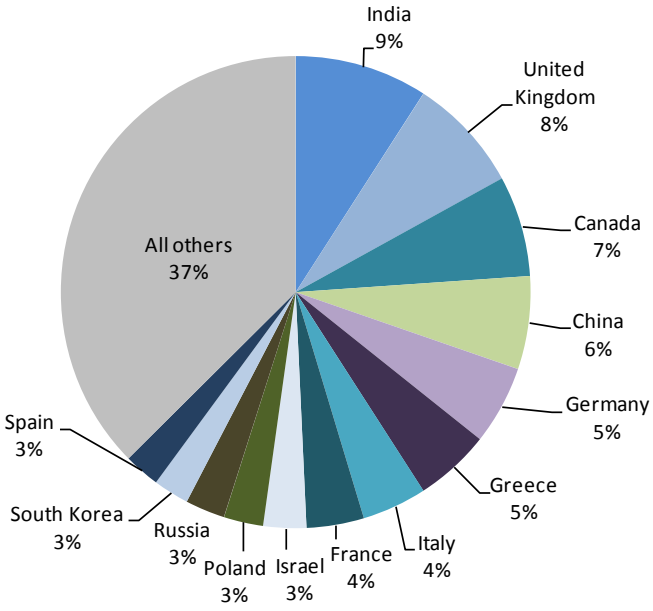
Ieoh Ming Pei, influential modernist architect and founder of the firm Pei Cobb Freed & Partners, was born in China in 1917. He completed his Bachelor of Architecture degree at MIT in 1940. Pei has designed more than 60 buildings, including the John Fitzgerald Kennedy Library in Boston, Massachusetts, 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.

Origin of MIT Faculty

Faculty Country of Origin



Country of Origin of Internationally Born Faculty



International Study Opportunities

Just as with other aspects of an MIT education, 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 the spring of 2009, 32 percent of students graduating with a Bachelor's Degree, and 41 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:

Cambridge-MIT Exchange

The Cambridge-MIT Exchange (CMI) is a collaboration between the University of Cambridge and MIT that allows MIT juniors to study at the University of Cambridge in England. Now in its eighth year of operation, 14 MIT departments and 10 Cambridge departments participate in the exchange. Funded by British government and industry, CMI's mission is to enhance competitiveness, productivity, and entrepreneurship in the United Kingdom. CMI supports student and faculty exchanges, educational innovation, and research partnerships between MIT and Cambridge faculty, particularly in the area of knowledge exchange among universities, government, and industry. CMI also works with other U.K. universities to share best practices and innovative approaches to education. http://web.mit.edu/cmi/ue/

Departmental Exchanges

Several academic departments — Aeronautics/Astronautics, Architecture, and Materials Science and Engineering — have launched small departmental exchanges involving one to three students, most of whom are undergraduates. Partner institutions include Imperial College London, Delft University of Technology, the University of Hong Kong, and Oxford University. http://web.mit.edu/geo/

D-LAB and the Public Service Center

D-Lab and the Public Service Center help students undertake hands-on public service projects in developing countries. http://web.mit.edu/d-lab/ http://web.mit.edu/mitpsc/

G-LAB

The flagship international internship course offered at the Sloan School of Management, G-Lab is a mix of classroom learning matched with a global internship in an emerging market. http://actionlearning.mit.edu/g-lab/

SMART Centre

The Singapore-MIT Alliance for Research and Technology (SMART) Centre gives undergraduates the opportunity to spend the summer collaborating on research projects with faculty and students in Singapore. http://web.mit.edu/smart/

Study-Abroad Programs

MIT manages a variety of programs that provide students with educational experiences abroad. There are semester-long programs, such as MIT-Madrid, as well as shorter programs available during the winter Independent Activity Period, such as IAP-Madrid and IAP-Germany. http://web.mit.edu/geo/

MISTI The International Science and Technology Initiatives

MISTI, MIT's primary international 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 nearly 600 MIT students with internships and research abroad each year. After several semesters of cultural and language preparation on campus, MISTI students plunge into 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 also organizes the MISTI Global Seed Funds, which encourage MIT students to work on faculty-led international research and projects. MISTI programs are available in Africa, Brazil, Chile, China, France, Germany, India, Israel, Italy, Japan, Mexico, and Spain.

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. web.mit.edu/misti

Here are a few examples from the more than 4,000 students MISTI has placed since it began by sending a handful of interns to Japan at the end of the 80s:

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

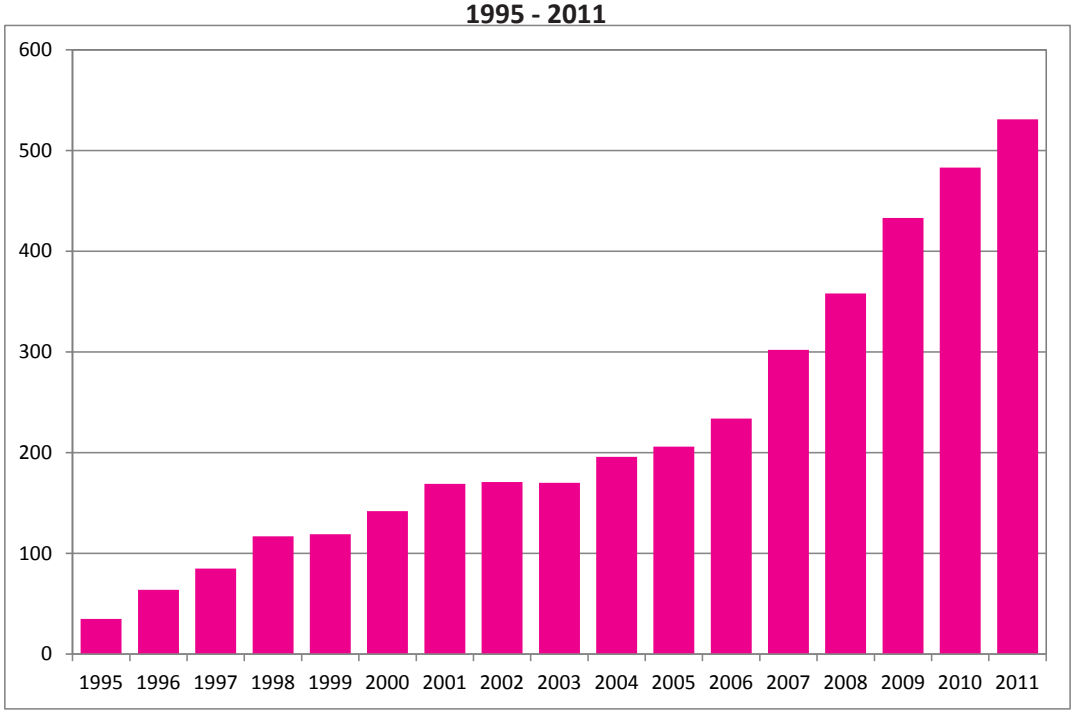
Photo Credit: MISTI

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 German. He wrote two patents at Siemens.

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

MISTI Annual Internship Placements
1995 - 2011



Year	Japan	China	Germany	India	Italy	France	Mexico	Spain	Israel	Brazil	Total
1983-1994	318										318
1995	36	2									38
1996	42	22									64
1997	37	28	22								87
1998	25	48	37	6							116
1999	32	35	33	15	5						120
2000	28	48	38	17	5						136
2001	17	57	36	14	8	28					160
2002	28	44	36	0	8	31					147
2003	35	15	40	6	13	49					158
2004	33	35	25	16	9	52	1				171
2005	32	42	45	26	9	33	9				196
2006	35	33	50	28	9	49	12	3	2		221
2007	32	40	60	26	25	40	20	27	0		270
2008	33	45	73	39	28	44	26	37	15		340
2009	33	43	77	41	32	78	23	47	33		40
2010	38	55	88	55	44	84	29	51	37	5	486
2011	24	65	107	47	50	97	36	49	50	6	531
Total	868	654	932	339	248	574	154	212	137	11	4,133

Campus Research Sponsored by International Organizations
Current Selected Projects

Center for Clean Water and Clean Energy at MIT and KFUPM

A group of Mechanical Engineering faculty have entered into a seven-year research and educational collaboration with King Fahd University of Petroleum and Minerals (KFUPM) in Dhahran, Saudi Arabia, leading to the creation of the Center for Clean Water and Clean Energy at MIT and KFUPM within the department. The Center's research focuses on water desalination and purification and on low-carbon energy production from both solar energy and fossil fuels. Additional research activities involve design and manufacturing, with a focus on technologies related to water and energy production. This collaboration began in fall 2008; and, during the first year, a diverse group of approximately 20 MIT faculty participated in the Center along with 35 MIT graduate students and 10 MIT postdocs. The Center will grow further in years two and three. Funds from the Center will support major space renovations in the Department over the coming years. In addition, the Center includes a program to bring Saudi Arabian women to MIT for research and educational activities. The Center is directed by Professor John H. Lienhard V and co-directed by Professor Kamal Youcef-Toumi.

http://engineering.mit.edu/research/labs_centers_programs/kfupm.php

Novartis-MIT Center for Continuous Manufacturing

The Novartis-MIT Center for Continuous Manufacturing is a $65 million Center fully funded by Novartis with the aim of transforming pharmaceutical manufacturing. Currently, pharmaceutical manufacturing is performed in batch mode, in which each step of a manufacturing process is physically separated from the other steps. The contents from a given process unit must be removed after completion of the operation, placed in a transportation vessel, and moved to the next process unit, through perhaps 20 steps. Each time the equipment must be cleaned and potential variation in batches must be watched vigilantly. On the other hand, continuous processing, in which materials flow uninterrupted through the process, offers the potential for leaner processing, higher quality, more flexibility, and in the end, cost savings. In order to accomplish this goal of continuous pharmaceutical processing, the Center is developing new technologies across a diverse range of areas, including chemical reactions, reactors, separations approaches, final finishing steps, and process modeling and control. In addition to pursuing these research activities, the team is working on developing a full, end-to-end continuous bench scale pharmaceutical plant at MIT. This bench scale plant will be a modular research tool, in which various approaches to continuous manufacturing will be evaluated, in addition to the various technologies that will be developed by the Center. The plant will produce a Novartis drug, and in addition to yielding important research results, it will be an excellent educational tool for our students.

http://engineering.mit.edu/research/labs_centers_programs/novartis.php

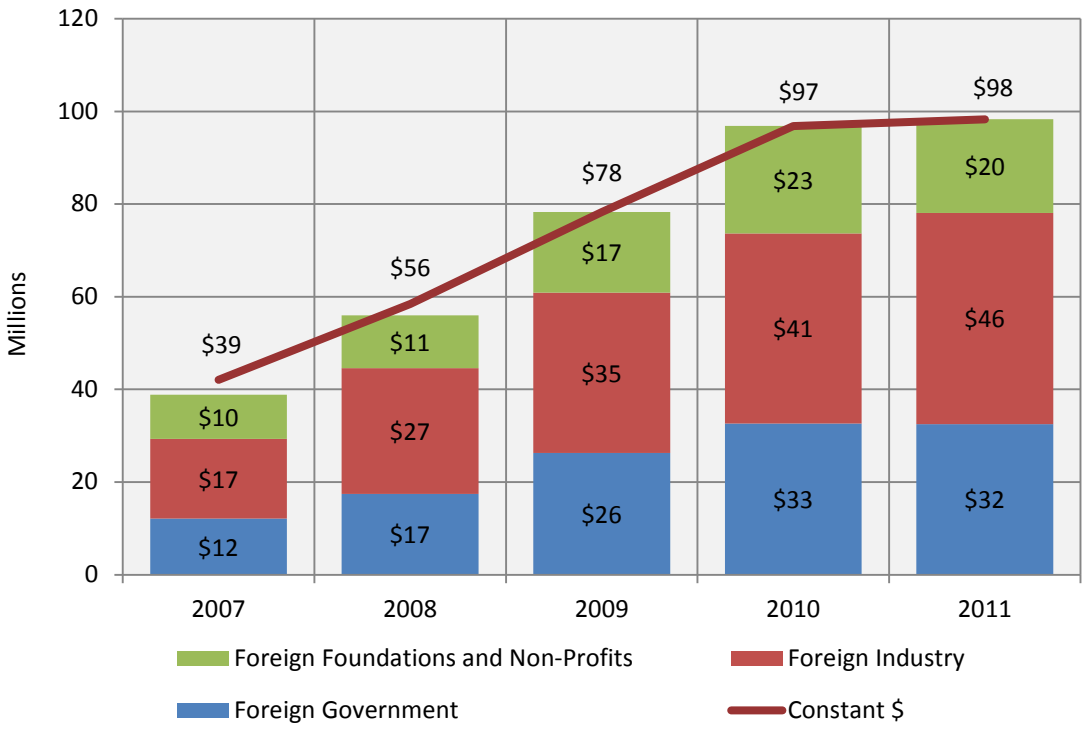
Reinventing the Wheel

A new bicycle wheel designed by MIT researchers can boost a rider's power while tracking the rider's friends, fitness, smog, and traffic. The wheel, called the Copenhagen Wheel, stores energy every time the rider brakes, which can then be used to assist the rider in going up a hill or add a burst of speed in traffic. In addition to storing power, the Copenhagen Wheel uses a series of sensors and a Bluetooth connection to the rider's iPhone to collect data about the bicycle's speed, direction and distance traveled, as well as picking up data on air pollution, and even the proximity of the rider's friends. The resulting data can both help the individual rider – for example, by providing feedback on fitness goals – and help the city (if the user opts to share the information) by building a database of air quality, popular biking routes, and areas of traffic congestion. The Copenhagen Wheel was developed by Associate Professor Carlo Ratti, and was funded by the city of Copenhagen, the Italian company Ducati, and the Italian environment ministry.

http://web.mit.edu/newsoffice/2009/ratti-copenhagen-1216.html

Campus Research Sponsored by International Organizations
Fiscal Years 2007-2011

International Primary Sponsor Type	2007	2008	2009	2010	2011
International Foundations and Non-Profits	$9,516,858	$11,392,919	$17,375,071	$23,170,052	$20,233,545
International Government	$12,133,685	$17,444,906	$26,299,968	$32,633,438	$32,471,318
International Industry	$17,188,998	$27,146,950	$34,592,066	$41,030,728	$45,603,282
Total International Sponsorship	$38,839,542	$55,984,776	$78,267,104	$96,834,218	$98,308,146
Expenditures in Constant $	$42,064,345	$58,466,645	$80,611,356	$98,778,668	$98,308,146



Constant $ calculated using the CPI-U weighted for the fiscal year with 2010 = 100