Section 1
Facts and History

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The Massachusetts Institute of Technology is one of the world's preeminent research universities, dedicated to advancing knowledge and educating students in science, technology, and other areas of scholarship that will best serve the nation and the world. It is known for rigorous academic programs, cutting-edge research, a diverse campus community, and its long-standing commitment to working with the public and private sectors to bring new knowledge to bear on the world's great challenges.

William Barton Rogers, the Institute's founding president, believed that education should be both broad and useful, enabling students to participate in "the humane culture of the community" and to discover and apply knowledge for the benefit of society. His emphasis on "learning by doing," on combining liberal and professional education, and on the value of useful knowledge continues to be at the heart of MIT's educational mission.

MIT's commitment to innovation has led to a host of scientific breakthroughs and technological advances. Achievements by the Institute's faculty and graduates include the first chemical synthesis of penicillin and vitamin A, the development of inertial guidance systems, modern technologies for artificial limbs, and the magnetic core memory that enabled the development of digital computers. Today, MIT is making a better world by focusing its strengths in research, innovation, and education in such areas as: the secrets of the brain and mind and the origins and evolution of life; practical solutions for environmental sustainability, clean energy, and water and food security; the convergence of disciplines in tackling human health challenges, from disease prevention to personalized medicine to affordable health care; improved innovation and entrepreneurship systems that speed ideas to impact; and pedagogical innovation on campus and online thanks to new avenues in the science of learning and cutting-edge digital tools.

University research is one of the mainsprings of growth in an economy that is increasingly defined by technology. A study released by MIT in December 2015 estimated that MIT graduates had founded at least 30,000 active companies. These firms employed approximately 4.6 million people, and generated annual world sales of $1.9 trillion, or the equivalent of the tenth-largest economy in the world in 2014.

MIT has forged educational and research collaborations with universities, governments, and companies throughout the world, and draws its faculty and students from every corner of the globe. The result is a vigorous mix of people, ideas, and programs dedicated to enhancing the world's well-being.

Two of MIT's current major endeavors contributing to MIT's continued commitment to the evolution of education and research are the MIT Campaign for a Better World and the MIT Stephen A. Schwarzman College of Computing. They are described below:

MIT Campaign for a Better World

The MIT Campaign for a Better World is a $6 billion fundraising initiative that seeks to advance the Institute's work on some of the most urgent global challenges facing humanity. The Campaign—which spans the breadth of MIT's schools and departments, labs, and centers—focuses MIT's distinctive strengths in education, research, and innovation on defining the future of human health; transforming our world through fundamental scientific research; addressing mankind's critical environmental and sustainability challenges; accelerating pioneering research and innovation in computing and exploring the societal and ethical implications of advanced technologies; reimagining education for the 21st-century learner; accelerating the journey from idea to impact; and attracting extraordinary students and faculty to MIT and providing them with the tools and infrastructure to do their pioneering work.

As part of its commitment to strengthening the MIT Core, the Campaign is increasing resources for undergraduate financial aid, graduate fellowships, and professorships; reimagining residential living and educational spaces; and transforming MIT's presence in the innovation hub of Kendall Square.

Support for the Campaign from MIT's alumni and friends has been directed toward such areas as education, machine learning and health care, water and food security, autism research, human and machine intelligence, and urbanization. Across campus, new teaching, learning, and research spaces are providing MIT's faculty and students with the advanced facilities they need. Further, donor support means that MIT can invest in the daring, high-risk research that is the Institute's hallmark as well as sustain support for students, faculty, and the physical campus.

MIT Stephen A. Schwarzman College of Computing

The MIT Stephen A. Schwarzman College of Computing has been established as a bold initiative to accelerate pioneering research and innovation in computing, build a profound awareness of the ethical implications and societal impact, and, above all, educate leaders for the algorithmic future. The college aims to address the global opportunities and challenges presented by the ubiquity of computing—across industries and academic disciplines—perhaps most notably illustrated by the rise of artificial intelligence. The College, under the leadership of Dean Dan Huttenlocher, began operations in September 2019.

Fields of Study

MIT supports a large variety of fields of study, from science and engineering to the arts. MIT's five academic schools and college are organized into departments and other degree-granting programs. In addition, several programs, laboratories, and centers cross traditional boundaries and encourage creative thought and research.

School of Architecture and Planning
Architecture
Media Arts and Sciences
Urban Studies and Planning
Center for Real Estate

School of Engineering
Aeronautics and Astronautics
Biological Engineering
Chemical Engineering
Civil and Environmental Engineering
Electrical Engineering and Computer Science*
Materials Science and Engineering
Mechanical Engineering
Nuclear Science and Engineering

School of Humanities, Arts, and Social Sciences
Anthropology
Comparative Media Studies/Writing
Economics
Global Studies and Languages
History
Linguistics and Philosophy
Literature
Music and Theater Arts
Political Science
Science, Technology, and Society

Sloan School of Management
Management

School of Science
Biology
Brain and Cognitive Sciences
Chemistry
Earth, Atmospheric and Planetary Sciences
Mathematics
Physics

MIT Stephen A. Schwarzman College of Computing
Data, Systems, and Society
Electrical Engineering and Computer Science*

http://catalog.mit.edu/

*Reports to the School of Engineering and the MIT Stephen A. Schwarzman College of Computing

Research Laboratories, Centers, and Programs

In addition to teaching and conducting research within their departments, faculty, students, and staff work in laboratories, centers, and programs.

Some of these include:

Abdul Latif Jameel Poverty Action Lab (J-PAL)
Abdul Latif Jameel World Water and Food Security Lab (J-WAFS)
Center for Archaeological Materials
Center for Bits and Atoms (CBA)
Center for Collective Intelligence (CCI)
Center for Computational Engineering (CCE)
Center for Computational Research in Economics and Management Science (CCREMS)
Center for Energy and Environmental Policy Research (CEEPR)
Center for Environmental Health Sciences (CEHS)
Center for Global Change Science (CGCS)
Center for Information Systems Research (CISR)
Center for International Studies (CIS)
Center for Real Estate (CRE)
Center for Transportation and Logistics (CTL)
Clinical Research Center (CRC)
Computer Science and Artificial Intelligence Lab (CSAIL)
Concrete Sustainability Hub
D-Lab
Deshpande Center for Technological Innovation
Division of Comparative Medicine (DCM)
Edgerton Center
Haystack Observatory
Initiative on the Digital Economy (IDE)
Institute for Data, Systems, and Society (IDSS)
Institute for Medical Engineering and Science (IMES)
Institute for Soldier Nanotechnologies (ISN)
Institute for Work and Employment Research (IWER)
Internet Policy Research Initiative (IPRI)
Joint Program on the Science and Policy of Global Change
Knight Science Journalism Program
Koch Institute for Integrative Cancer Research (KI)
Laboratory for Financial Engineering (LFE)
Laboratory for Information and Decision Systems (LIDS)
Laboratory for Manufacturing and Productivity (LMP)
Laboratory for Nuclear Science (LNS)
Legatum Center for Development and Entrepreneurship
Leventhal Center for Advanced Urbanism (LCAU)
Lincoln Laboratory
Martin Trust Center for MIT Entrepreneurship
Materials Research Laboratory (MRL)
McGovern Institute for Brain Research (MIBR)
Microsystems Technology Laboratories (MTL)
MIT Center for Art, Science, and Technology (CAST)
MIT Energy Initiative (MITEI)
MIT Environmental Solutions Initiative (ESI)
MIT Innovation Initiative (MITII)
MIT Kavli Institute for Astrophysics and Space Research
MIT Media Lab
MIT.nano
MIT Portugal Program
MIT Program in Art, Culture, and Technology (ACT)
MIT Sea Grant College Program
MIT-Woods Hole Oceanography/Applied Ocean Science and Engineering
Nuclear Reactor Laboratory (NRL)
Operations Research Center (ORC)
Picower Institute for Learning and Memory (PILM)
Plasma Science and Fusion Center (PSFC)
Research Laboratory of Electronics (RLE)
Simons Center for the Social Brain
Singapore-MIT Alliance for Research and Technology (SMART)
Sociotechnical Systems Research Center (SSRC)
Women's and Gender Studies Program (WGS)

http://web.mit.edu/research/

Digital Learning

MIT is at the forefront of enhancing teaching and learning by leveraging educational technology. Individual faculty initiatives, departmental projects, and Institute-wide innovations enrich education at MIT and worldwide. Technology-enabled changes in how we teach and learn have accelerated, delivering:

- New pedagogies and tools. Digital technologies enable students to do more outside the class: view lectures via video, receive rapid feedback on homework, and access adaptive hints to foster learning. This approach carves out valuable in-class time for active discussion, hands-on instruction, problem solving, case studies and labwork. Technologies, such as the Residential MITx platform, provide flexibility in course delivery, enabling students to access content anytime, anywhere. Tools such as virtual reality, gaming, and other resources open new ways of presenting and understanding educational materials to enhance comprehension and learning.

- Scalable and open teaching. The open education movement, pioneered in large part by MIT's OpenCourseWare and joined by hundreds of institutions worldwide, lowers financial, geographical, and political barriers to accessing quality educational content. MITx brings MIT faculty and their courses to millions of learners via the edX platform. MicroMasters programs offer a valuable professional credential at the Masters level, and a new path to a Master's degree at MIT and other universities.

- Supporting pK–12 learning. MIT supports learning from infancy through high school, especially in the areas of science and technology. This includes efforts such as Scratch, a platform that teaches children to code and allows them to share their creations within online communities; the Edgerton Center's hands-on science and engineering challenges; as well as classroom and teacher support, through games, tools, curriculums and teacher training.

- Flexible workforce development. Online and blended classes tailored for professional education enable a global workforce to acquire new skills and keep pace with technological developments, making learning accessible anytime, anywhere. Online courses are sometimes combined with bootcamps, workshops, and other in-person experiences to deliver transformational learning experiences for entrepreneurs, technologists and professionals.

- Digital learning research and learning analytics. Online learning systems have the ability to amass huge volumes of data on student use and assessment as they work their way through courses, which can be used to model student learning approaches. The MIT Integrated Learning Initiative is a cross-disciplinary, Institute-wide effort that fosters rigorous, quantitative research on teaching and learning.

MIT Open Learning is an Institute-wide initiative that seeks to transform teaching and learning at MIT and around the globe through the innovative use of digital technologies. It is the umbrella entity for the Office of Digital Learning (ODL), which offers digital products and services; MIT Integrated Learning Initiative (MITili), which conducts research on teaching and learning (see page 112 for additional information); and the Jameel World Education Lab (J-WEL), which convenes a global community to spread research and best practice in teaching and learning (see page 113 for additional information).

MIT Open Learning: Supports MIT faculty and students in bold experiments to enhance our residential education; Promotes and enables research on teaching and learning; Provides platforms for digital education; Shares research and best practices by convening and partnering with schools, universities, companies, NGOs and governments; And extends MIT's knowledge and classrooms to the world.

http://openlearning.mit.edu/

Academic and Research Affiliations

Collaborative Partnership

edX

A not-for-profit enterprise of its founding partners Harvard University and MIT, edX is focused on transforming online and on-campus learning through ground-breaking methodologies, game-like experiences, and cutting-edge research on an open source platform.

https://www.edx.org/

Engineering Biology Research Consortium

"The Engineering Biology Research Consortium, or EBRC, aims to be the leading organization bringing together an inclusive community committed to advancing biological engineering to address national and global needs." EBRC is a network including biotechnology firms and research universities and institutions, including MIT, Caltech, Stanford, University of California at Berkeley, and Harvard University.

https://www.ebrc.org/

Idaho National Laboratory

The Idaho National Laboratory (INL) is dedicated to supporting the U.S. Department of Energy's missions in nuclear and energy research, science, and national defense. The INL established a National Universities Consortium (NUC) of universities from around the nation to engage in collaborative research in the nation's strategic nuclear energy objectives, clean energy initiatives, and critical infrastructure security goals. The NUC consists of MIT, Oregon State University, North Carolina State University, The Ohio State University, and University of New Mexico.

https://www.inl.gov/inl-initiatives/education/nuc/

Magellan Project

The Magellan Project is a five-university partnership that constructed, and now operates, two 6.5-meter optical telescopes at the Las Campanas Observatory in Chile. The telescopes allow researchers to observe planets orbiting stars in solar systems beyond our own and to explore the first galaxies that formed near the edge of the observable universe. Collaborating with MIT on the Magellan Project are Carnegie Institute of Washington, Harvard University, University of Arizona, and University of Michigan.

Massachusetts Green High Performance Computing Center

The Massachusetts Green High Performance Computing Center (MGHPCC) is a collaboration of five of the state's most research-intensive universities—Boston University, Harvard University, MIT, Northeastern University, and the University of Massachusetts—the Commonwealth of Massachusetts, Cisco Systems, and EMC Corporation. The MGHPCC is a datacenter dedicated to providing the growing research computing capacity needed to support breakthroughs in science.

http://www.mghpcc.org/

Northeast Radio Observatory Corporation

The Northeast Radio Observatory Corporation is a nonprofit consortium of educational and research institutions that was formed in 1967 to plan an advanced radio and radar research facility in the Northeast. Current member institutions are MIT, Boston College, Boston University, Brandeis University, Dartmouth College, Harvard University, Harvard-Smithsonian Center for Astrophysics, Merrimack College, University of Massachusetts—Amherst and Lowell, University of New Hampshire, and Wellesley College.

http://www.haystack.mit.edu/hay/neroc.html

Major Collaborator

Broad Institute

The Broad Institute seeks to transform medicine by empowering creative and energetic scientists of all disciplines from across the MIT, Harvard, and the Harvard-affiliated hospital communities to work together to address even the most difficult challenges in biomedical research.

http://www.broadinstitute.org/

Charles Stark Draper Laboratory

Since 1973, The Charles Stark Draper Laboratory, Inc. has created premiere guidance, navigation and control technologies, the expertise it became known for when it was the MIT Instrumentation Laboratory. Expanding its scope over the decades, Draper uses multidisciplinary approaches in designing, developing and deploying advanced technological solutions for the world's most challenging and important problems, spanning national security, space, biomedical solutions and energy.

http://www.draper.com/

Howard Hughes Medical Institute

The Howard Hughes Medical Institute (HHMI) is a scientific and philanthropic organization that conducts biomedical research in collaboration with universities, academic medical centers, hospitals, and other research institutions throughout the country. Sixteen HHMI investigators hold faculty appointments at MIT.

http://www.hhmi.org/

Ragon Institute of MGH, MIT and Harvard

The Ragon Institute was established at Massachusetts General Hospital, MIT, and Harvard in 2009. The Institute brings scientists and clinicians together with engineers in an interdisciplinary effort to better understand how the body fights infections and, ultimately, to apply that understanding against a wide range of infectious diseases and cancers. The dual mission of the Institute is to contribute to the discovery of an HIV/AIDS vaccine and the collaborative study of immunology.

http://ragoninstitute.org/

Whitehead Institute for Biomedical Research

The Whitehead Institute for Biomedical Research is a nonprofit, independent research institution whose research excellence is nurtured by the collaborative spirit of its faculty and the creativity and dedication of its graduate students and postdoctoral scientists. Whitehead's primary focus is basic science, with an emphasis on molecular and cell biology, genetics and genomics, and developmental biology. Specific areas of inquiry at Whitehead include cancer, transgenic science, stem cells, regenerative biology, genetics, genomics, membrane biology, vertebrate development, and neurological disorders. Whitehead is affiliated with MIT through its members, who hold faculty positions at MIT. A small number of junior investigators also hold positions at Whitehead Institute as part of the Whitehead Fellows program.

http://wi.mit.edu/

Other Affiliation

MIT-Woods Hole Oceanographic Institution Joint Program in Oceanography and Applied Ocean Science and Engineering

The Woods Hole Oceanographic Institution (WHOI) is the largest independent oceanographic institution in the world. The MIT/WHOI Joint Program provides a high quality doctoral education leading to an internationally-recognized Ph.D. degree awarded by both institutions. The Joint Program is organized within five sub-disciplinary areas, each administered by a Joint Committee consisting of MIT faculty and WHOI scientists: Applied Ocean Science and Engineering, Biological Oceanography, Chemical Oceanography, Marine Geology and Geophysics, and Physical Oceanography.

http://mit.whoi.edu/

Naval Construction and Engineering

The graduate program in Naval Construction and Engineering (Course 2N) is intended for active duty officers in the U.S. Navy, U.S. Coast Guard, and foreign Navies who have been designated for specialization in the design, construction, and repair of naval ships. The curriculum prepares Navy, Coast Guard, and foreign officers for careers in ship design and construction and is sponsored by Commander, Naval Sea Systems Command. Besides providing the officers a comprehensive education in naval engineering, the program emphasizes their future roles as advocates for innovation in ship design and acquisition.

http://web.mit.edu/2n/

Reserve Officer Training Corps Programs

Military training has existed at MIT since students first arrived in 1865. In 1917, MIT established the nation's first Army Reserve Officer Training Corps (ROTC) unit. Today, Army, Air Force, and Naval ROTC units are based at MIT. These programs enable students to become commissioned military officers upon graduation. More than 12,000 officers have been commissioned from MIT, and more than 150 have achieved the rank of general or admiral.

Study at Other Institutions

MIT has cross-registration arrangements with several area schools. At the undergraduate level, students may cross-register at Harvard University, Wellesley College, and the Massachusetts College of Art and Design. At the graduate level, qualified students may enroll in courses at Harvard University, Wellesley College, Boston University, Brandeis University, and Tufts University.

Education Highlights

MIT has long maintained that professional competence is best fostered by coupling teaching with research and by focusing education on practical problems. This hands-on approach has made MIT a consistent leader in outside surveys of the nation's best colleges. MIT was the first university in the country to offer curriculums in architecture (1865), electrical engineering (1882), sanitary engineering (1889), naval architecture and marine engineering (1895), aeronautical engineering (1914), meteorology (1928), nuclear physics (1935), and artificial intelligence (1960s). More than 4,000 MIT graduates are professors at colleges and universities around the world. MIT faculty have written some of the best-selling textbooks of all time, such as *Economics* by Paul A. Samuelson and *Calculus and Analytic Geometry* by George Thomas. The following are some notable MIT teaching milestones since 1968.

1968 MIT and Woods Hole Oceanographic Institute create a joint program for graduate studies in oceanography. This is the first higher education partnership of its kind.

1969 MIT launches the Undergraduate Research Opportunities Program (UROP), the first of its kind. The program, which enables undergraduates to work directly with faculty on professional research, subsequently is copied in universities throughout the world.

1970 The Harvard-MIT Program in Health Sciences and Technology is established to focus advances in science and technology on human health and to train physicians with a strong base in engineering and science.

1970 The Department of Mechanical Engineering initiates the course 2.70 (now 2.007) design contest, created by professor Woodie C. Flowers. The competition was to build a mechanical device, out of a set of relatively simple wooden and metal parts, that would roll down a ramp at a precisely controlled rate.

1971 MIT holds its first Independent Activities Period (IAP), a January program that emphasizes creativity and flexibility in teaching and learning.

1974 The Minority Introduction to Engineering and Science (MITES) program is established to provide a rigorous six-week residential, academic summer program for promising high school juniors who are interested in careers in science and engineering.

1977 MIT organizes the Program in Science, Technology, and Society to explore and teach courses on the social context and consequences of science and technology—one of the first programs of its kind in the United States.

1981 The MIT-Japan Program is created to send MIT students to Japan for internships. In 1994, the program becomes part of the MIT International Science and Technology Initiatives (MISTI). Today, the program also fosters research collaboration between faculty at MIT and in Asia through the MISTI ULVAC-Hayashi Seed Grant.

1981 MIT launches Project Athena, a $70 million program to explore the use of computers in education. Digital Equipment Corporation and IBM each contribute $25 million in computer equipment.

1981 The MIT Sloan School of Management launches its Management of Technology program, the world's first master's program to focus on the strategic management of technology and innovation.

1983 MIT establishes the Center for Real Estate and the first Master of Science in Real Estate Development (MSRED) degree program in the U.S.

1984 MIT establishes the Media Laboratory, bringing together pioneering educational programs in computer music, film, graphics, holography, lasers, and other media technologies.

1990 MIT initiates an artist-in-residence program to provide students with opportunities to interact with nationally and internationally recognized artists through master classes, lecture-demonstrations, performances and workshops.

1992 MIT establishes the MacVicar Faculty Fellows Program, named in honor of the late Margaret A. MacVicar, to recognize outstanding contributions to teaching. MacVicar, a professor of physics, had conceived of, designed, and launched UROP (see 1969, above).

1992 MIT launches the Laboratory for Advanced Technology in the Humanities to extend its pioneering work in computer- and video-assisted language learning to other disciplines. Its first venture was a text and performance multimedia archive for studies of Shakespeare's plays.

1992 MIT Faculty approves the Master of Engineering program in Electrical Engineering and Computer Science, an integrated five-year program leading to the simultaneous award of a bachelor's and a master's degree.

1993 In recognition of the increasing importance of molecular and cell biology, MIT becomes the first college in the nation to add biology to its undergraduate requirement.

1994 The MIT International Science and Technology Initiatives (MISTI) are created to connect MIT students to internships and research around the world. MIT's primary international program, MISTI is a pioneer in applied international studies—a distinctively MIT concept.

1995 The School of Engineering and the Sloan School of Management join to create a graduate program in system design and management (SDM), in which students can complete most course requirements at their job sites through interactive distance-learning.

1998 MIT teams up with Singapore's two leading research universities to create a global model for long-distance engineering education and research. This large-scale experiment, the first truly global collaboration in graduate engineering education and research, is a model for today's distance education.

1998 The Division of Bioengineering & Environmental Health (BEH) begins operation with the mission of fostering MIT education and research fusing engineering with biology.

1998 The School of Engineering establishes the Engineering Systems Division (ESD), focused on the development of new approaches, frameworks, and theories to better understand engineering systems behavior and design.

2000 MIT Faculty approve the Communication Requirement (CR). The CR integrates substantial instruction and practice in writing and speaking into all four years and across all parts of MIT's undergraduate program. Students participate regularly in activities designed to develop both general and technical communication skills.

2001 Studio Physics is introduced to teach freshman physics. Incorporating a highly collaborative, hands-on environment that uses networked laptops and desktop experiments, the new curriculum lets students work directly with complicated and unfamiliar concepts as their professors introduce them.

2001 MIT launches OpenCourseWare, a program that makes materials for nearly all of its courses freely available on the web and serves as a model for sharing knowledge to benefit all humankind.

2001 MIT establishes WebLab, a microelectronics teaching laboratory that allows students to interact remotely on the Web with transistors and other microelectronics devices anywhere and at any time.

2001 MIT's Earth System Initiative launches Terrascope, a freshman course in which students work in teams to solve complex earth sciences problems. Bringing together physics, mathematics, chemistry, biology, management, and communications, the course has enabled students to devise strategies for preserving tropical rainforests, understand the costs and the benefits of oil drilling in the Arctic National Wildlife Refuge, and plan a mission to Mars.

2002 To give engineering students the opportunity to develop the skills they'll need to be leaders in the workplace, MIT introduces the Undergraduate Practice Opportunities Program (UPOP). The program involves a corporate training workshop, job seminars taught by alumni, and a 10-week summer internship.

2003 MIT Libraries introduce DSpace, a digital repository that gathers, stores, and preserves the intellectual output of MIT's faculty and research staff, and makes it freely available to research institutions worldwide. Within a year of its launch, DSpace material had been downloaded more than 8,000 times, and more than 100 organizations had adopted the system for their own use.

2007 MIT makes material from virtually all MIT courses available online for free on OpenCourseWare. The publication marks the beginning of a worldwide movement toward open education that now involves more than 160 universities and 5,000 courses.

2009 MIT launches the Bernard M. Gordon-MIT Engineering Leadership Program. Through interaction with industry leaders, faculty, and fellow students, the program aims to help undergraduate engineering students develop the skills, tools, and character they will need as future engineering leaders.

2009 MIT introduces a minor in energy studies, open to all undergraduates. The new minor, unlike most energy concentrations available at other institutions, and unlike any other concentration at MIT, is designed to be inherently cross-disciplinary, encompassing all of MIT's five schools.

2010 MIT introduces the flexible engineering degree for undergraduates. The degree, the first of its kind, allows students to complement a deep disciplinary core with an additional subject concentration. The additional concentration can be broad and interdisciplinary in nature (energy, transportation, or the environment), or focused on areas that can be applied to multiple fields (robotics and controls, computational engineering, or engineering management).

2011 MIT announces MITx, an online learning initiative that will offer a portfolio of free MIT courses through an online interactive learning platform. The Institute expects the platform to enhance the educational experience of its on-campus students and serve as a host for a virtual community of millions of learners around the world. The MITx prototype course—6.002x or "Circuits and Electronics"—debuts in March 2012 with almost 155,000 people registering for the course.

2012 MIT and Harvard University announce edX, a transformational new partnership in online education. Through edX, the two institutions will collaborate to enhance campus-based teaching and learning and build a global community of online learners. An open-source technology platform will deliver online courses that move beyond the standard model of online education that relies on watching video content and will offer an interactive experience for students. The University of California at Berkeley later joins edX. The three institutions offer the first edX courses in fall 2012.

2012 MIT announces the launch of the Institute for Medical Engineering and Science (IMES). IMES brings together research and education efforts at the nexus of engineering, science, and clinical medicine to advance human health.

2013 The School of Engineering and Lincoln Laboratory launch Beaver Works. This initiative facilitates project-based learning by leveraging partnerships between faculty and students at MIT and practicing engineers at Lincoln Laboratory to promote collaborative research and to enable the fabrication of prototype systems. The initiative's signature collaboration is the Beaver Works capstone project in areas such as unmanned aerial vehicles, small satellites, autonomous underwater systems, energy systems, cybersecurity, communications, big data analytics, and advanced devices.

2014 MITx on edX registers its one-millionth learner on May 27, 2014.

2014 MIT Professional Education, in cooperation with the Office of Digital Learning and edX, begins offering online courses designed specifically for industry and active professionals. Based on research in areas ranging from big data, cybersecurity, and entrepreneurship, these courses enable MIT to disseminate knowledge at scale to professionals around the world, in areas critical to industry. The first course on big data enrolled more than 7,000 paid enrollees from over 100 countries.

2015 SuperUROP, an amplified version of the Undergraduate Research Opportunities Program, is launched in the School of Engineering. First conceived and implemented in 2012 under the leadership of the Department of Electrical Engineering and Computer Science, SuperUROP is a year-long program that enables students to tackle complex problems and affords them the time, training, resources, and guidance necessary for deep scientific and engineering inquiry.

2015 MIT creates the MIT-Woodrow Wilson Academy of Teaching and Learning to advance pre-K through 12 education by combining MIT's "mind and hand" approach to learning with recent breakthroughs in cognitive science and digital learning. The program develops STEM teachers and school leaders around the world.

2015 The Residential MITx platform hosts its 100th course. Nearly 90 percent of MIT undergraduates have participated in one or more courses that use the platform.

2015 The Institute for Data, Systems, and Society (IDSS) is launched. A collaboration among all five of MIT's schools, IDSS brings together researchers working in the mathematical, behavioral, and empirical sciences to capitalize on their shared interest in tackling complex societal problems.

2015 MIT launches the first MicroMasters, a series of online courses that provide a professional and academic credential. MicroMasters certificate holders can apply for accelerated, on-campus master's degree programs at MIT and other top universities.

2016 MIT Integrated Learning Initiative (MITili) launches, aimed at conducting interdisciplinary research on learning and education.

2017 Abdul Latif Jameel World Education Lab (J-WEL) launches. Leveraging MIT's resources, J-WEL convenes a global community of collaborators for sustainable, high-impact transformation in education through research, policy, pedagogy, and practice.

2019 MIT Stephen A. Schwarzman College of Computing established to: (i) accelerate research, education and innovation in computer science and artificial intelligence for continued rapidly-growing need, (ii) develop the power of computing in disciplines across MIT, and (iii) establish profound awareness of and attention to ethical implications and societal impact of computing and artificial intelligence.

Research Highlights

The following are selected research achievements of MIT faculty and staff over the last five decades.

1969 The MIT Instrumentation Laboratory's (now Draper) Apollo guidance computer is used to send the first astronauts to the Moon's surface during the Apollo 11 mission. The 1-cubic-foot computer was the first significant use of silicon integrated circuit chips and greatly accelerated the development of the microchip technology that has gone on to change virtually every consumer product.

1970 David Baltimore reports the discovery of reverse transcriptase, an enzyme that catalyzes the conversion of RNA to DNA. The advance, which led to a Nobel Prize in Physiology or Medicine for Baltimore in 1975, provides a new means for studying the structure and function of genes.

1972 Lincoln Laboratory's Moving Target Detector (MTD) achieves a new performance level for the detection of aircraft in the presence of radar clutter, such as ground, weather, and birds. It employs an antenna with two fan beams to provide coverage from the immediate vicinity of an airport to a distance of 60 nautical miles. The MTD became the world-recognized standard for Airport Surveillance Radar.

1973 Jerome Friedman and Henry Kendall, with Stanford colleague Richard Taylor, complete a series of experiments confirming the theory that protons and neutrons are made up of minute particles called quarks. The three receive the 1990 Nobel Prize in Physics for their work.

1974 Samuel C. C. Ting, Ulrich Becker, and Min Chen discover the "J" particle. The discovery, which earns Ting the 1976 Nobel Prize in Physics, points to the existence of one of the six postulated types of quarks.

1975 The Lincoln Laboratory Experimental Test System (ETS) becomes operational. The ETS is used for deep-space surveillance, daylight satellite tracking, searching the geostationary belt, and making astronomical measurements.

1975–1977 Barbara Liskov and her students design the CLU programming language, an object-oriented language that helps form the underpinnings for languages like Java and C++. As a result of this work and other accomplishments, Liskov later wins the Turing Award, considered the Nobel Prize in computing.

1976 H. Gobind Khorana and his research team complete chemical synthesis of the first human-manufactured gene fully functional in a living cell. The culmination of 12 years of work, it establishes the foundation for the biotechnology industry. Khorana won the 1968 Nobel Prize in Physiology or Medicine for other genetics work.

1977 Phillip Sharp discovers the split gene structure of higher organisms, changing the view of how genes arose during evolution. For this work, Sharp shares the 1993 Nobel Prize in Physiology or Medicine.

1977 Ronald Rivest, Adi Shamir, and Leonard Adleman invent the first workable public key cryptographic system. The new code, which is based on the use of very large prime numbers, allows secret communication between any pair of users. Still unbroken, the code is in widespread use today.

1979 Robert Weinberg reports isolating and identifying the first human oncogene—an altered gene that causes the uncontrolled cell growth that leads to cancer.

1981 Alan Guth publishes the first satisfactory model, called cosmic inflation, of the universe's development in the first 10–32 seconds after the Big Bang.

1982 Alan Davison discovers a new class of technetium compounds that leads to the development of the first diagnostic technetium drug for imaging the human heart.

1985 Susumu Tonegawa describes the structure of the gene for the receptors—"anchor molecules"—on the white blood cells called T lymphocytes, the immune system's master cells. In 1987, Tonegawa receives the Nobel Prize in Physiology or Medicine for similar work on the immune system's B cells.

1985 The Terminal Doppler Weather Radar (TDWR) program is initiated at Lincoln Laboratory to develop an automated system for detecting weather hazards in the airport terminal area and to help pilots avoid them. A successful TDWR prototype leads to the procurement of 47 TDWRs from Raytheon in the 1990s, and there has not been a major U.S. wind-shear-related accident since 1994.

1986 H. Robert Horvitz identifies the first two genes found to be responsible for the process of cell death, which is critical both for normal body development and for protection against autoimmune diseases, cancer, and other disorders. Going on to make many more pioneering discoveries about the genetics of cell death, Horvitz shares the 2002 Nobel Prize in Physiology or Medicine for his work.

1988 Sallie Chisholm and associates report the discovery of a form of ocean plankton that may be the most abundant single species on Earth.

1990 Julius Rebek, Jr. and associates create the first self-replicating synthetic molecule.

1990 Building on the discovery of the metathesis—the process of cutting carbon-carbon double bonds in half and constructing new ones—Richard Schrock devises a catalyst that greatly speeds up the reaction, consumes less energy, and produces less waste. A process based on his discovery is now in widespread use for efficient and more environmentally friendly production of important pharmaceuticals, fuels, synthetic fibers, and many other products. Schrock shares the 2005 Nobel Prize in Chemistry for his breakthrough.

1993 H. Robert Horvitz, together with scientists at Massachusetts General Hospital, discover an association between a gene mutation and the inherited form of amyotrophic lateral sclerosis (Lou Gehrig's disease).

1993 David Housman joins colleagues at other institutions in announcing a successful end to the long search for the genetic defect linked with Huntington's disease.

1993 The Traffic Alert and Collision Avoidance System (TCAS) is deployed. TCAS reduces midair collisions by sensing nearby aircraft and issuing an advisory to the pilot. Lincoln Laboratory developed the surveillance technology used by TCAS and built and flight-tested the TCAS prototype. Now mandated on all large transport aircraft, TCAS has been credited with preventing several catastrophic accidents.

1995 Wolfgang Ketterle's research group achieves Bose-Einstein condensation (BEC) in a gas of sodium atoms. BEC is a state of matter of a dilute gas of low densities called bosons cooled to temperatures very close to absolute zero. For this work, Ketterle won the Nobel Prize in Physics jointly with Eric Cornell and Carl Wieman from the University of Colorado at Boulder NIST-JILA lab. This early effort led to founding the field of ultracold atoms.

1996 A group of scientists at MIT's Center for Learning and Memory, led by Matthew Wilson and Nobel laureate Susumu Tonegawa, use new genetic and multiple-cell monitoring technologies to demonstrate how animals form memory about new environments.

1997 MIT physicists create the first atom laser, a device that is analogous to an optical laser but emits atoms instead of light. The resulting beam can be focused to a pinpoint or made to travel long distances with minimal spreading.

1998 An interdisciplinary team of MIT researchers, led by Yoel Fink and Edwin L. Thomas, invent the "perfect mirror," which offers radical new ways of directing and manipulating light. Potential applications range from a flexible light guide that can illuminate specific internal organs during surgery to new devices for optical communications.

1999 Michael Cima, Robert Langer, and graduate student John Santini report the first microchip that can store and release chemicals on demand. Among its potential applications is a "pharmacy" that could be swallowed or implanted under the skin and programmed to deliver precise drug dosages at specific times.

1999 Alexander Rich leads a team of researchers in the discovery that left-handed DNA (also known as Z-DNA) that is critical for the creation of important brain chemicals. Having first produced Z-DNA synthetically in 1979, Rich succeeded in identifying it in nature in 1981. Rich also discovers its first biological role and received the National Medal of Science for this pioneering work in 1995.

2000 Scientists at the Whitehead Institute/MIT Center for Genome Research and their collaborators announce the completion of the Human Genome Project. Providing about a third of all the sequences assembled, the Center was the single largest contributor to this international enterprise.

2003 Enhanced Regional Situation Awareness (ERSA) system is developed by Lincoln Laboratory for the U.S. Air Force to provide improved defense of the airspace surrounding the National Capital Region (NCR). ERSA capabilities have improved airspace surveillance, threat assessment and decision support, distribution of a common air picture to multiple agencies, and new ways to respond to aircraft violating the NCR airspace.

2003 MIT scientists cool a sodium gas to the lowest temperature ever recorded—a half-a-billionth of a degree above absolute zero. Studying these ultra-low temperature gases provides valuable insights into the basic physics of matter; and by facilitating the development of better atomic clocks and sensors for gravity and rotation, they also could lead to vast improvements in precision measurements.

2005 MIT physicists, led by Nobel laureate Wolfgang Ketterle, create a new type of matter, a gas of atoms that shows high-temperature superfluidity.

2007 MIT mathematicians form part of a group of 18 mathematicians from the U.S. and Europe that maps one of the most complicated structures ever studied: the exceptional Lie group E8. The "answer" to the calculation, if written, would cover an area the size of Manhattan. The resulting atlas has applications in the fields of string theory and geometry.

2008 Mriganka Sur's laboratory discovers that astrocytes, star-shaped cells in the brain that are as numerous as neurons, form the basis for functioning brain imaging. Using ultra high-resolution imaging in the intact brain, they demonstrate that astrocytes regulate blood flow to active brain regions by linking neurons to brain capillaries.

2009 Gerbrand Ceder and graduate student Byoungwoo Kang develop a new way to manufacture the material used in lithium ion batteries that allows ultrafast charging and discharging. The new method creates a surface structure that allows lithium ions to move rapidly around the outside of the battery. Batteries built using the new method could take seconds, rather than the now standard hours, to charge.

2010 Michael Strano and his team of graduate students and researchers create a set of self-assembling molecules that can turn sunlight into electricity; the molecules can be repeatedly broken down and reassembled quickly by adding or removing an additional solution.

2010 Lincoln Laboratory develops the Space Surveillance Telescope (SST), an advanced ground-based optical system designed to enable detection and tracking of faint objects in space while providing rapid, wide-area search capability. The SST combines innovative curved charge-coupled device imager technology developed at Lincoln Laboratory with a very wide field-of-view, large-aperture (3.5 meter) telescope.

2011 A team, including Karen Gleason, Vladimir Bulović, and graduate student Miles Barr, develops materials that make it possible to produce photovoltaic cells on paper or fabric, nearly as simply as printing a document. The technique represents a major departure from the systems typically used to create solar cells, which require exposing the substrates to potentially damaging conditions, either in the form of liquids or high temperatures.

2011 Researchers, led by Daniel Nocera, produce an "artificial leaf"—a silicon solar cell with different catalytic materials bonded onto its two sides. The artificial leaf can turn the energy of sunlight directly into a chemical fuel that can be stored and used later as an energy source.

2012 NASA's Gravity Recovery And Interior Laboratory (GRAIL) twin spacecraft successfully enters lunar orbit. By precisely measuring changes in distance between the twin orbiting spacecraft, scientists constructed a detailed gravitational model of the Moon that is used to answer fundamental questions about the moon's evolution and its internal composition. GRAIL's principal investigator is Maria T. Zuber.

2013 A system being developed by Dina Katabi and her graduate student Fadel Adib, could give us the ability to see people through walls using low-cost Wi-Fi technology. The system, called "Wi-Vi," is based on a concept similar to radar and sonar imaging. But in contrast to radar and sonar, it transmits a low-power Wi-Fi signal and uses its reflections to track moving humans.

2014 Bryan Hsu PhD '14 and Paula Hammond, working with Myoung-Hwan Park of Sahmyook University in South Korea and Samantha Hagerman '14, develop a new drug-delivery system method that could enable pain medication and other drugs to be released directly to specific parts of the body. The method uses biodegradable, nanoscale "thin films" laden with drug molecules that are absorbed into the body in steady doses over a period of up to 14 months.

2014 Researchers at MIT, including John Foster, and at the University of Colorado, including Daniel Baker, and elsewhere, find there's a hard limit to how close ultrarelativistic electrons can get to the Earth. The team determines that no matter where these electrons are circling around the planet's equator, they can get no further than about 11,000 kilometers from the Earth's surface—despite their intense energy.

2016 Scientists, including MIT's Susan Solomon and Diane Ivy, identify signs that the Antarctic ozone hole has shrunk by more than 4 million square kilometers since 2000. The team used "fingerprints" of the ozone changes with season and altitude to attribute the ozone's recovery to the continuing decline of atmospheric chlorine originating from chlorofluorocarbons (CFCs). Susan Solomon was among the U.N.'s Intergovernmental Panel on Climate Change (IPCC) scientists who, together with the former Vice President Al Gore, were awarded the 2007 Nobel Peace Prize for their work to help the world understand the severity of global warming.

2016 Scientists and engineers at MIT's Plasma Science and Fusion Center set a new world record for plasma pressure in the Institute's Alcator C-Mod tokamak nuclear fusion reactor. Plasma pressure is the key ingredient to producing energy from nuclear fusion, and MIT's new result achieves over 2 atmospheres of pressure for the first time.

2017 MIT physicists, led by Wolfgang Ketterle, create a new form of matter, a supersolid, which combines the properties of solids with those of superfluids. By using lasers to manipulate a superfluid gas known as a Bose-Einstein condensate, the team is able to coax the condensate into a quantum phase of matter that has a rigid structure—like a solid—and can flow without viscosity—a key characteristic of a superfluid.

2017 For the first time, scientists directly detect gravitational waves—ripples in space-time—in addition to light from the spectacular collision of two neutron stars. The discovery is made using the U.S.-based Laser Interferometer Gravitational-Wave Observatory (LIGO); the Europe-based Virgo detector; and some 70 ground- and space-based observatories. The LIGO observatories were conceived, constructed, and operated by Caltech and MIT. Virgo is operated by the European Gravitational Observatory.

2018 MIT researchers, including Fadel Adib, working with scientists from Brigham and Women's Hospital, develop a way to power and communicate with devices implanted within the human body. The implants have no batteries and are powered by radio frequency waves, which can safely pass through human tissues. The prototype is about the size of a grain of rice.

2019 An international team of over 200 scientists, including researchers from MIT's Haystack Observatory and the MIT campus, capture the first direct image of a black hole. The images were taken by the Event Horizon Telescope (EHT) a planet-scale array comprised of eight radio telescopes spread throughout the globe. EHT was conceived by Sheperd Doeleman while leading a pioneering VLBI program at the Haystack Observatory and enabled by advances in digital systems created by Haystack engineers.

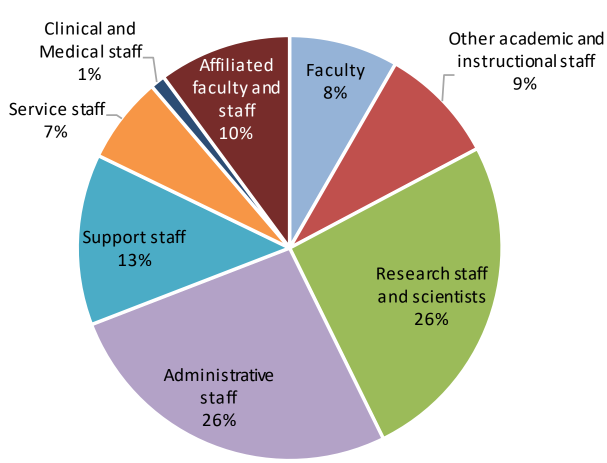
Faculty and Staff

As of October 31, 2018, MIT employs 12,707 persons on campus. In addition to the faculty, there are research, library, and administrative staff, and many others who, directly or indirectly, support the teaching and research goals of the Institute.

Faculty and Staff, 2018–2019

Employee Type	Count
Faculty	1,056
Other academic and instructional staff	1,136
Research staff and research scientists (includes postdoctoral positions)	3,237
Administrative staff	3,356
Support staff	1,655
Service staff	838
Clinical and Medical staff	143
Affiliated faculty, scientists, and scholars	1,286
Total campus faculty and staff	**12,707**

Faculty and Staff, 2018–2019



Each year, MIT employs about 1,370 graduate students as teaching assistants and 3,935 graduate students as research assistants.

MIT Lincoln Laboratory employs about 3,875 people, primarily at Hanscom Air Force Base in Lexington, Massachusetts. See page 82 for additional Lincoln Laboratory staffing information.

Faculty

The MIT faculty instruct undergraduate and graduate students, and engage in research and service.

Faculty Profile, 2018–2019

	Count	Percent of Total
Professors	663	63
Associate professors	226	21
Assistant professors	167	16
Total	**1,056**	**100**
Male	805	76
Female	251	24

See page 40 for a chart of faculty and students from 1865–2019.

Seventy-five percent of faculty are tenured.

Faculty by School, 2018–2019

School	Count	Percent of Total
Architecture and Planning	84	8
Engineering	385	36
Humanities, Arts, and Social Sciences	180	17
Management	116	11
Science	281	27
Other	10	1
Total	**1,056**	**100**

Sixty-three percent of the faculty are in science and engineering fields.

Twenty-one percent of faculty are members of a U.S. minority group; seven percent of faculty identify with an underrepresented minority (Hispanic or Latino, African American, American Indian or Alaskan Native, or Native Hawaiian or Other Pacific Islander) group.

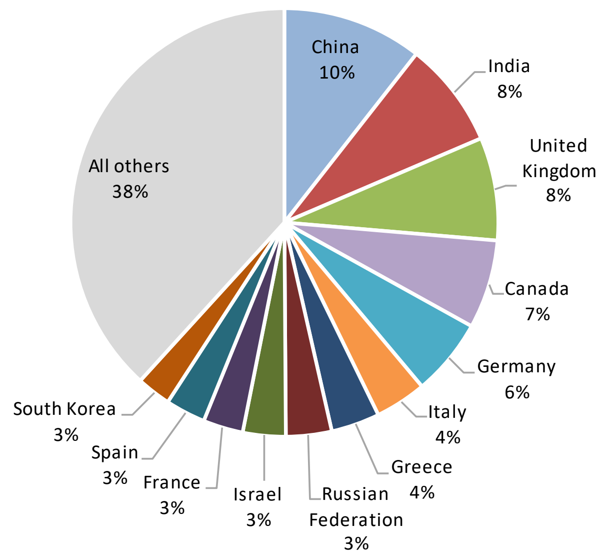
Faculty by U.S. Minority Group, 2018–2019*

Ethnicity	Female Count	Male Count
Asian	32	111
Hispanic or Latino	8	36
African American	9	27
American Indian or Alaskan Native	0	1
Native Hawaiian or Other Pacific Islander	1	0

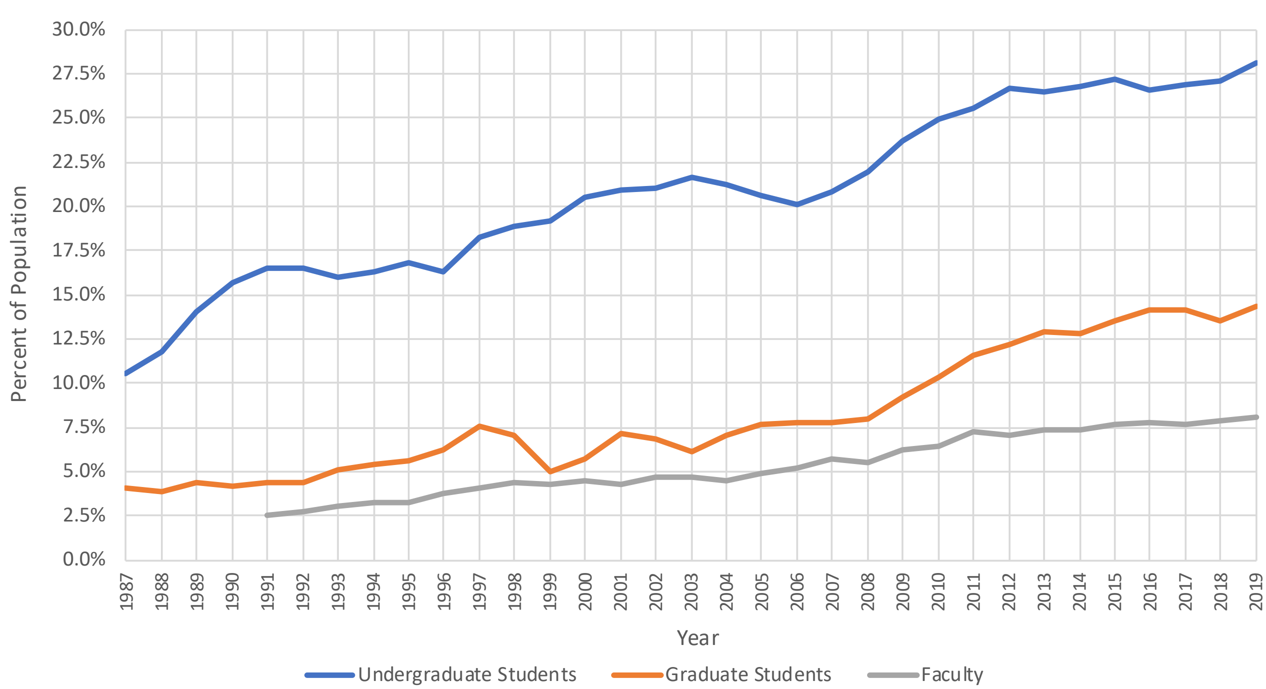
*Ethnicity is self-identified. Faculty members may identify with more than one group.

Forty-four percent of current faculty are internationally born. Over seventy countries are represented by these faculty members.

Country of Origin of Internationally Born Faculty, 2018–2019



Underrepresented Minority Faculty and Students*, 1987–2019



*Includes only domestic students (i.e., U.S. citizens and permanent residents)

Researchers

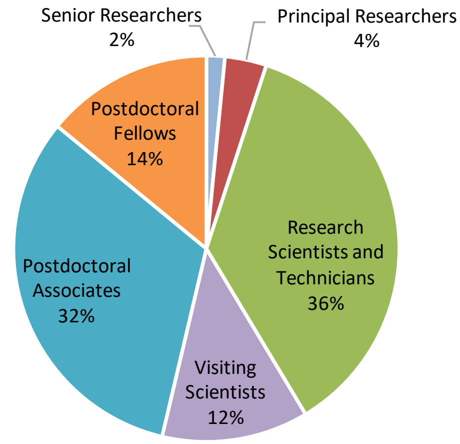
MIT campus research staff and scientists total 3,237. These researchers work with MIT faculty and students on projects funded by government, nonprofits and foundations, and industry.

Campus Research Staff and Scientists, 2018–2019

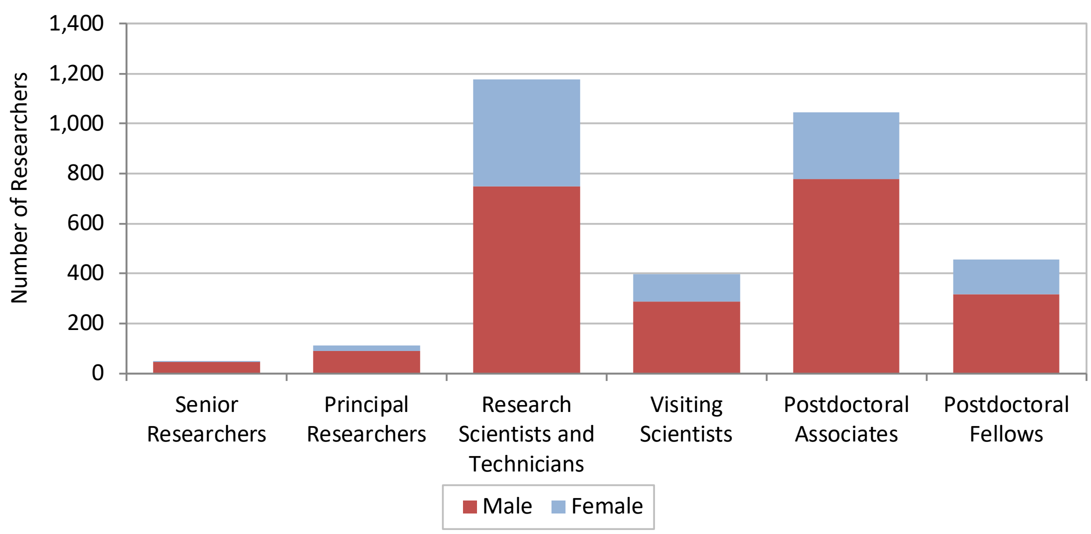
Employee Type	Count
Senior Researchers	50
Principal Researchers	113
Research Scientists and Technicians	1,177
Visiting Scientists	398
Postdoctoral Associates	1,044
Postdoctoral Fellows	455
Total	**3,237**

Approximately 3,935 graduate students were research assistants in academic year 2018–2019.

Campus Research Staff and Scientists, 2018–2019



Campus Research Staff and Scientists by Gender, 2018–2019



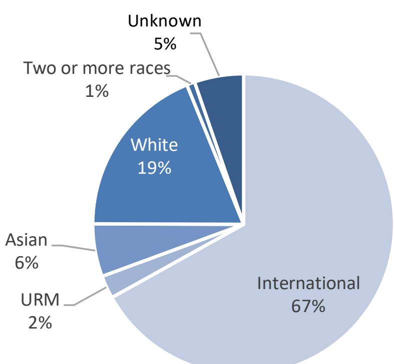
Postdoctoral Scholars

The MIT campus hosts 1,499 postdoctoral associates and fellows—404 females and 1,095 males. These individuals work with faculty in academic departments, laboratories, and centers.

U.S. Citizen and Permanent Resident Postdoctoral Scholars by Ethnicity, 2018–2019

Ethnicity	Count
Hispanic or Latino	31
African American	4
American Indian or Alaskan Native	1
Native Hawaiian or Other Pacific Islander	**1**
Total underrepresented minorities (URM)	**37**
White	282
Asian	85
Two or more races	13
Unknown	79
Total	**496**

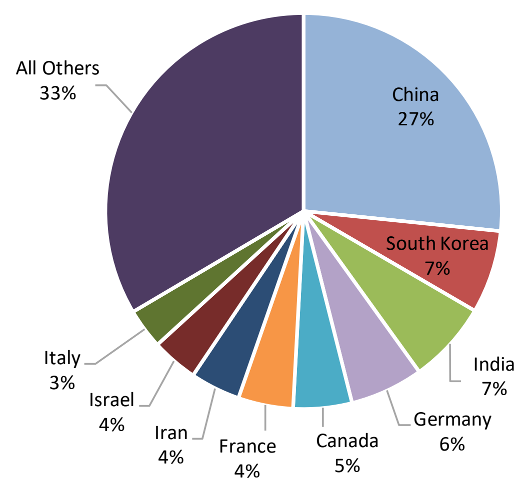
Ethnicity of Postdoctoral Scholars, 2018–2019



International Postdoctoral Scholars be Country of Citizenship, 2018–2019

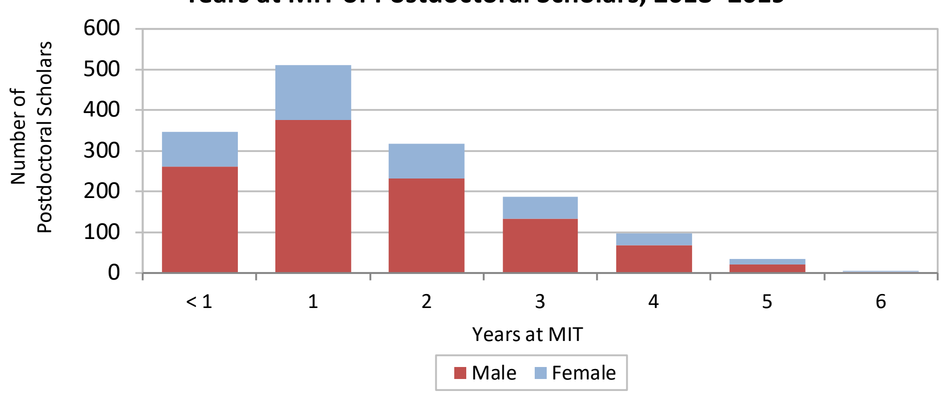
Country of Citizenship	Count
China	267
South Korea	68
India	67
Germany	60
Canada	48
France	45
Iran	41
Israel	38
Italy	33
All other countries	336
Total	**1,003**

Country of Citizenship of International Postdoctoral Scholars, 2018–2019



Postdoctoral scholars come from approximately eighty foreign countries.

Years at MIT of Postdoctoral Scholars, 2018–2019



International Scholars

MIT hosts international scholars from around the world who come to the U.S. to teach, collaborate, observe, conduct research, and other purposes. This diverse group of professionals includes visiting scientists, professors, artists, and scholars, as well as postdoctoral fellows and associates, lecturers, instructors, research associates and scientists, and tenure-track faculty. During the year July 1, 2018 through June 30, 2019, The International Scholars Office (ISchO) served 2,456 international scholars affiliated with MIT and their accompanying family members ("international" is defined as non-U.S. citizen, non-U.S. permanent resident).

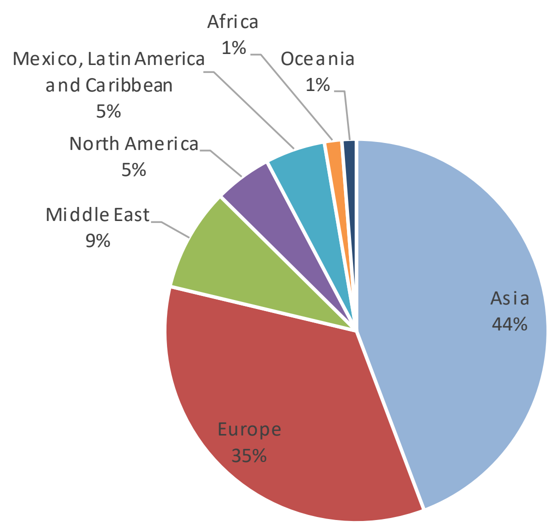
According to the most recently published Institute of International Education *Open Doors* 2018 report, MIT ranked 11th nationally with regard to the numbers of international scholars at U.S. institutions.

Foreign national scholars came to MIT from 99 different countries, with the highest numbers coming from China, India, South Korea, Germany, Japan, Canada, France, Italy, Spain, and Israel. Scholars from these top 10 countries constituted 65 percent of MIT's international scholar population. Seventy-five percent of international scholars at MIT were men and 25 percent were women. Postdoctoral associates and postdoctoral fellows accounted for 60 percent of MIT's international scholars. In descending order, the areas hosting the greatest number of international scholars were School of Engineering, followed by School of Science, the interdisciplinary laboratories and centers under the Vice President for Research, School of Architecture and Planning, School of Humanities, Arts and Social Sciences, Sloan School of Management, and Office of the Provost.

International Scholars by Country of Origin, 2018–2019

Country	Count
China	520
India	157
South Korea	146
Germany	140
Japan	126
Canada	102
Italy	102
France	101
Spain	96
Israel	89
All other countries	877
Total	**2,456**

International Scholars by Geographic Region, 2018–2019



Awards and Honors of Current Faculty and Staff

Nobel Prize

Nine current faculty members at MIT have received the Nobel Prize. They are:

Holmstrom, Bengt	Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel (shared)
Horvitz, H. Robert	Nobel Prize in Medicine/Physiology (shared)
Ketterle, Wolfgang	Nobel Prize in Physics (shared)
Merton, Robert C.	Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel (shared)
Sharp, Phillip A.	Nobel Prize in Medicine/Physiology (shared)
Solomon, Susan	Nobel Prize in Peace (co-chair of IPCC Working Group One recognized under Intergovernmental Panel on Climate Change (IPCC), shared)
Ting, Samuel C. C.	Nobel Prize in Physics (shared)
Tonegawa, Susumu	Nobel Prize in Medicine/Physiology
Wilczek, Frank	Nobel Prize in Physics (shared)

Number of recipients of selected awards and honors current faculty and staff have received

Recipients	Award Name and Agency
153	American Academy of Arts and Sciences Member
95	American Association for the Advancement of Science Fellow
13	American Philosophical Society Member
91	American Physical Society Fellow
22	American Society of Mechanical Engineers Fellow
34	Association for Computing Machinery Fellow
4	John Bates Clark Medal, American Economic Association
2	Crafoord Prize, Royal Swedish Academy of Sciences
4	Dirac Medal, Abdus Salam International Centre for Theoretical Physics
9	Fulbright Scholar, Council for International Exchange of Scholars (CIES)
9	Gairdner Award, Gairdner Foundation
63	Guggenheim Fellow, John Simon Guggenheim Memorial Foundation
16	HHMI Investigator, Howard Hughes Medical Institute (HHMI)
57	Institute of Electrical and Electronics Engineers, Inc. Fellow
1	Japan Prize, Science and Technology Foundation of Japan
2	Kavli Prize, Norwegian Academy of Science and Letters
1	Kyoto Prize, Inamori Foundation of Japan
28	MacArthur Fellow, John D. and Catherine T. MacArthur Foundation
2	Millennium Technology Prize, Millennium Prize Foundation
74	National Academy of Engineering Member, National Academies
26	National Academy of Medicine Member, National Academies
85	National Academy of Sciences Member, National Academies
7	National Medal of Science, National Science & Technology Medals Foundation
1	National Medal of Technology and Innovation, National Science & Technology Medals Foundation
2	Rolf Nevanlinna Prize, International Mathematical Union (IMU)
41	Presidential Early Career Awards for Scientists and Engineers (PECASE)
3	Pulitzer Prize, Pulitzer Board
2	Queen Elizabeth Prize for Engineering, The Queen Elizabeth Prize for Engineering Foundation
4	Royal Academy of Engineering Fellow, Royal Academy of Engineering
6	A. M. Turing Award, Association for Computing Machinery
1	Von Hippel Award, Materials Research Society
4	Alan T. Waterman Award, National Science Foundation
4	Wolf Prize, Wolf Foundation

Award Highlights

Joseph Checkelsky, Kwanghun Chung, James M. LeBeau, Yen-Jie Lee, Benedetto Marelli, Tracy Slatyer, and Yogesh Surendranath
2019 Presidential Early Career Awards for Scientists and Engineers
Seven MIT faculty members, Joseph Checkelsky, Kwanghun Chung, James M. LeBeau, Yen-Jie Lee, Benedetto Marelli, Tracy Slatyer, and Yogesh Surendranath, were among the more than 300 recipients of the 2019 Presidential Early Career Awards for Scientists and Engineers (PECASE), the highest honor bestowed by the U.S. government to science and engineering professionals in the early stages of their independent research careers.

All of the 2019 MIT recipients were employed or funded by the following U.S. departments and agencies: Department of Defense, Department of Energy, and the Department of Health and Human Services.
https://bit.ly/2Hi877G

Sallie “Penny” Chisholm
2019 Crafoord Prize
MIT Institute Professor Sallie “Penny” Chisholm of the departments of Civil and Environmental Engineering and Biology is the recipient of the 2019 Crafoord Prize. Chisholm was awarded the prize “for the discovery and pioneering studies of the most abundant photosynthesizing organism on Earth, Prochlorococcus.”

Prochlorococcus is a type of phytoplankton found in the ocean that is able to photosynthesize like plants on land. The process of photosynthesis is responsible for the oxygen humans breathe, which makes it critical to life on Earth. Prochlorococcus accounts for approximately 10 percent of all ocean photosynthesis, which draws carbon dioxide out of the atmosphere, provides it with oxygen, and forms the base of the food chain.
https://bit.ly/2DsJPGC

Stephen Buchwald
2019 Wolf Prize for chemistry
Camille Dreyfus Professor of Chemistry Stephen L. Buchwald has been named one of seven laureates across five categories honored with Israel’s 2019 Wolf Prize. Buchwald shares the award in chemistry with Professor John Hartwig of the University of California at Berkeley for their development of the Buchwald-Hartwig amination, a process used to improve the synthesis of large organic molecules.

“This award is due to the hard work and creativity of the graduate students and postdoctoral coworkers that I have been fortunate enough to have in my group during my over 30 years at MIT,” said Buchwald. “It also reflects the importance of funding basic research. In this case, the key finding came from work that had no practical application. However, based what we learned, we (and others) were able to develop new chemistry that is now widely used in industry as well as in academia.”
https://bit.ly/2KVSZxK