Provost

MIT's activities in academic areas continue to expand as we embrace new opportunities in research and education. Key academic leadership appointments marked the 2012–2013 year. This report describes some of the prominent events and accomplishments that took place across the Institute during the past year.

The events of the past year should not be reviewed without remembering the tragic loss of MIT Police Officer Sean Collier in April 2013 in the immediate aftermath of the Boston Marathon bombings. The outpouring of support at the Institute in Officer Collier's memory reminded us of the strength that we all draw from being part of the MIT community, especially in times of shared sorrow.

People

Chris A. Kaiser began his appointment as provost in July 2012. Professor Kaiser, a professor of biology, has been a member of the MIT faculty since 1991 and he served as head of the Department of Biology from 2004 until early in 2012. He received his PhD in biology from MIT.

In November 2012, Sanjay Sarma, the Fred Fort Flowers and Daniel Fort Flowers professor of mechanical engineering, was appointed to the new position of director of digital learning, reporting jointly to the provost and the chancellor.

In January 2013, Maria Zuber was appointed vice president for research. Professor Zuber is the E. A. Griswold professor of geophysics and a former head of the Department of Earth, Atmospheric, and Planetary Sciences. She succeeds Claude Canizares, who had served as vice president for research since 2006. Professor Canizares transitioned to the position of vice president with responsibility for leading MIT's global partnerships and for overseeing the activities of Lincoln Laboratory.

Also in January 2013, professor of electrical engineering and associate provost Martin Schmidt expanded his duties to include oversight of MIT's industrial partnerships and manufacturing initiatives, with responsibility for the Industrial Liaison Program and the Technology Licensing Office.

Dennis Freeman, professor of electrical engineering and a faculty member in the Department of Electrical Engineering and Computer Science since 1995, was appointed dean for undergraduate education, effective June 2013. He succeeds Daniel Hastings, who had served as dean for undergraduate education since 2006.

Edmund Bertschinger, professor of physics, was appointed to the new position of Institute community and equity officer, effective July 2013. Professor Bertschinger had served as head of the Department of Physics since 2008. MIT is most grateful for the leadership of professors Barbara Liskov and Wesley Harris, who stepped down from their joint service as associate provosts for faculty equity in July 2013.

We were greatly saddened this year by the deaths of professor Joseph LeConte Smith of the Department of Mechanical Engineering and Institute Professor Emeritus Chia-Chiao Lin, who was a member of the Department of Mathematics.

Academic Programs and Activities

A diversity of new programs arose in AY2013 while several existing programs experienced an expansion of activities. A small sample of these activities is described below. Please refer to the separate reports of individual academic areas for detailed information about these and other programs.

In October 2012, the Picower Institute for Memory and Learning at MIT was chosen as one of three co-recipients of a $25 million gift from the Robert A. and Renee E. Belfer Family Foundation intended to create the Neurodegeneration Consortium, which will study Alzheimer's and other neurodegenerative diseases and translate research findings into new treatments for such diseases. The Picower Institute is joining the University of Texas MD Anderson Cancer Center and the Baylor College of Medicine in this effort. Li-Huei Tsai, Picower professor of neuroscience at MIT and director of the Picower Institute, is the lead investigator of this collaboration. The consortium will bring together highly specialized researchers at all three partner institutions to better understand the mechanisms that underlie these diseases and develop effective, targeted treatments.

Also in October, the Skolkovo Institute of Science and Technology, a private graduate research university located in Moscow and known commonly as Skoltech (developed collaboratively by MIT and the Skolkovo Foundation in Russia), marked the completion of its first year of activities. During the previous 12 months, Skoltech witnessed the matriculation of its first class of students and the appointment of its first 10 faculty members. First-year activities included the launch of educational programs in energy science and information science, two of the five planned areas of focus at Skolkovo. The programs in biomedical science and technology, space science and technology, and nuclear science and technology are expected to begin soon. All of these programs will provide collaborative opportunities for MIT faculty, researchers and students. By the end of the decade, Skoltech aims to employ roughly 200 faculty, 300 postdoctoral associates, and 1,200 graduate students. Skoltech's founding president is MIT Ford professor of engineering Edward Crawley.

In November 2012 it was announced that MIT would receive up to $25 million in funding from the United States Agency for International Development as part of a five-year program intended to develop and evaluate methods for combatting poverty. As part of a consortium of educational institutions, MIT's D-Lab (Development through Dialogue, Design, and Dissemination) will help to create an International Development Innovation Network whose aim is to bring technological innovation to developing countries. The Department of Urban Studies and Planning will lead a number of groups at MIT in the development of a Comprehensive Initiative on Technology Evaluation to assess the effectiveness of technologies aimed at alleviating poverty. A major goal of the project is to encourage and develop the capacity for innovation and problem solving in poor areas of the world at the local level.

An Institute-wide Task Force on the Future of MIT Education was established in February 2013, with a charge to "propose an ecosystem for ongoing research, learning, and innovation about the future of education." The formation of this group was motivated in large part by the remarkable advances in online learning opportunities, and part of the task force's charge is to examine how online learning tools might enhance MIT's residential model of education. The task force also was asked to evaluate the sustainability of MIT's current financial model for delivering education to its students and to propose possible alternative approaches in this area. The task force, which is co-chaired by Professor Sarma, director of digital learning, and Israel Ruiz, executive vice president and treasurer, is composed of three separate working groups: the Working Group on MIT Education and Facilities for the Future, the Working Group on the Future Global Implications of edX and the Opportunities It Creates, and the Working Group on a New Financial Model for Education. Each working group contains faculty from all five MIT schools and includes staff representatives as well as undergraduate and graduate students. All together, approximately 50 individuals serve on the task force, whose goal is to produce a final report in spring 2014.

In March 2013, MIT and Harvard University hosted a two-day summit titled "Online Learning and the Future of Residential Education," which took place at the MIT Media Lab. Participants included the presidents and provosts of MIT and Harvard, as well as several leaders in online education from both academic institutions and companies. The summit meeting included discussions of the advantages in interactive learning that online teaching methods might offer relative to traditional classroom models, and there was general agreement that the rapid improvement of online learning tools is causing universities to reexamine assumptions about the relative effectiveness of different pedagogical systems.

Meanwhile, edX, the online learning initiative begun in 2012 under the joint leadership of MIT and Harvard, continued to expand its xConsortium, a network of leading universities that share the edX online teaching platform. Most recently, the xConsortium welcomed its first Asian universities to its membership and also expanded the representation of Ivy League universities, bringing the total number of participating institutions to 29. The total number of courses to be offered by edX in fall 2013 has increased to approximately 70.

Campus Planning

In September 2012, MIT announced plans to build a Technology Children's Center on Vassar Street. The new facility, to be opened in September 2013, nearly doubles the number of childcare slots available on campus to MIT faculty, staff, postdocs, and graduate students. The new center was made possible by gifts from MIT alumni David H. Koch and Charles W. and Jennifer C. Johnson. It will join four existing children's centers on campus in helping MIT community members balance careers with the responsibilities of raising young children.

In April 2013, the Cambridge City Council approved MIT's rezoning petition for the development of Institute-owned property in Kendall Square, capping a three-year process of discussions within the MIT and Cambridge communities on the best ways

to continue to enliven this important area of the campus. This rezoning approval will allow MIT to propose up to 1.1 million square feet of new development in this sector, including housing, retail, commercial, laboratory, and open space. MIT will continue with the right to develop up to 800,000 square feet of academic space in this area of campus. Next steps will involve an exploration of urban design concepts for an "East Campus/MIT Gateway," led by faculty from the School of Architecture and Planning, and taking into consideration the recommendations made by the Task Force on Community Engagement in 2030 Planning. A steering group co-led by the provost and the executive vice president will guide the overall east campus study and manage MIT community engagement and input as well as ongoing discussions with the broader Cambridge community.

Council, Committee, and Task Force Activities

In October 2012 the Task Force on Community Engagement in 2030 Planning submitted a report focused on the development of MIT property in Kendall Square. The task force, chaired by professor Thomas Kochan, had been charged earlier that year with advising the provost on a proposed rezoning petition to the City of Cambridge that would allow the Institute to proceed with planning, design, and construction of a series of capital projects in Kendall Square over roughly the next decade. In its report, the task force recommended moving ahead with the rezoning petition provided that a more comprehensive urban design plan is developed for the areas of campus that adjoin Kendall Square, and that faculty groups continue to be closely involved in the planning process. In addition, the report put forward a number of design principles for the purpose of helping to guide decisions about the development of this important section of the MIT campus.

In November 2012, the MIT Global Environment Initiative Planning Group submitted a report outlining a plan for an MIT-wide environmental research initiative. This report, authored by professors John Lienhard and Maria Zuber, complements a report that had been issued by the Environmental Research Council earlier in 2012. The report describes the diversity of MIT research on environmental problems that demand practical solutions, and it identifies four broad research themes that characterize faculty activity in areas related to the environment: water, food safety and security, urban environment, and benign design. The report also delineates a proposed set of attributes for a successful environmental initiative going forward.

Faculty

Seventeen faculty members retired from MIT in 2012–2013 while faculty recruitment continued at a strong pace. A total of 42 new faculty members (33 men and nine women, including seven members of underrepresented minority groups) began their MIT appointments during 2012–2013. Twenty faculty members were awarded tenure within MIT, including eight women and four members of underrepresented minority groups. These promotions to tenure were effective July 2013.

The James R. Killian, Jr. Faculty Achievement Award is the highest honor bestowed by the MIT faculty on one of its own members. The award was established in 1971 "to recognize extraordinary professional accomplishments by full-time members of the

MIT faculty." The Killian Award for 2012–2013 was presented to Maria Zuber. Professor Zuber delivered the annual Killian Lecture in March. In May, it was announced that Stephen J. Lippard, the Arthur Amos Noyes professor of chemistry, was selected as the Killian Award recipient for 2013–2014.

The Harold E. Edgerton Faculty Achievement Award is the highest honor bestowed by the MIT faculty on one of its own junior faculty members. The Edgerton Award, a tribute to the late, beloved inventor and photographer "Doc" Edgerton, recognizes exceptional distinction in teaching and research. The 2013 Edgerton Award was presented to Graham Jones, an assistant professor of anthropology.

Four faculty members were appointed Margaret MacVicar Faculty Fellows this year in recognition of their outstanding contributions to the quality of undergraduate education at MIT. The awardees were Linda Griffith, School of Engineering teaching innovation professor of biological and mechanical engineering; Robert Miller, associate professor of computer science and engineering; Laura Schulz, Class of 1943 career development associate professor of cognitive science; and Emma Teng, associate professor of China studies and the T. T. and Wei Fong Chao professor of Asian civilizations. MacVicar Faculty Fellows are appointed for 10-year terms. These additions bring the total number of active fellows to 41—along with 49 emeritus fellows remaining at MIT—who together form a small academy of scholars committed to excellent teaching and innovation in education.

The Dr. Martin Luther King, Jr. Visiting Professor Program was established in 1995 to recognize the many contributions of outstanding minority scholars in the academy as well as to enhance their scholarship through intellectual interactions with MIT peers and enrich the intellectual life of MIT through their participation in MIT research and academic programs. The 2012–2013 Dr. Martin Luther King, Jr. visiting professors were Paul Ampadu, Electrical Engineering and Computer Science; Terrence Blackman, Mathematics; Carlos Castillo-Chavez, Aeronautics and Astronautics; Thomas Epps, Chemistry; Robert Hampshire, Engineering Systems Division; and Susan Perkins, MIT Sloan School of Management. In addition, five visiting scholars were sponsored by the program: Eilaf Ahmed, Chemistry; Ta-Nehisi Coates, Writing; Julio D'Arcy, Chemical Engineering; Sophia Inzunza, Physics; and Chanda Prescod-Weinstein, Physics.

The following represent some of the numerous faculty who were honored with outside awards or appointments this past year:

> Four faculty members were elected to the National Academy of Sciences: professor of chemistry Robert Field, professor of mathematics Victor Kac, professor of mathematics David Vogan, and professor of biology Graham Walker.

> Three faculty members were elected to the National Academy of Engineering: Anant Agarwal, professor of computer science and engineering; John Hansman, professor of aeronautics and astronautics; and Edward Merrill, professor emeritus of chemical engineering.

Ernest Moniz, professor of physics and director of the MIT Energy Initiative, was appointed US Secretary of Energy.

Maria Zuber, professor of geophysics and vice president for research, was appointed to the National Science Board.

Junot Diaz, professor of writing, was awarded a MacArthur Fellowship.

Professors of computer science and engineering Shafi Goldwasser and Silvio Micali were joint winners of the A. M. Turing Award.

Professor of environmental studies Sallie Chisholm was awarded the National Medal of Science, and Institute Professor Robert Langer was awarded the National Medal of Technology.

Erik Demaine, professor of computer science and engineering, and Martin Demaine, visiting scientist in the Computer Science and Artificial Intelligence Laboratory, were awarded Guggenheim Fellowships.

Graduate Student Fellowships

The Presidential Graduate Fellowship Program provides full financial support to many of the Institute's most promising first-year graduate students. In AY2013, this program awarded a total of 103 fellowships over a wide range of MIT's academic departments. Following is a list of existing fellowships that are named for individual and corporate donors, some indicating specific areas of support that have been designated by the donor.

Akamai Technologies, Inc. (mathematics, electrical engineering and computer science)

Agencourt Bioscience Corp. /Alnylam Pharmaceuticals

Homer A. Burnell (architecture, urban studies and planning)

Richard A. Denton

Morton E. Goulder (1942)

Herbert and Dorothy Grier

Robert T. Haslam (chemistry, chemical engineering)

Irwin Mark Jacobs and Joan Klein Jacobs

J. Kenneth Jamieson

Grayce B. Kerr Fund, in honor of Charles M. Vest

The Kurtz Family Foundation, in honor of Charles M. Vest

James A. Lash

William M. Layson (physics)

Edward H. Linde (civil and environmental engineering)

Curtis Marble

Samuel H. and Luleta Maslak

> Momenta Pharmaceuticals
>
> Neurometrix, Inc.
>
> The Picower Foundation, in honor of Norman B. Leventhal
>
> Charles A. Piper
>
> Praecis Pharmaceuticals, Inc. (biology, school of science)
>
> Walter A. Rosenblith
>
> Kenan Sahin (humanities, arts, and social sciences)
>
> Henry E. Singleton (brain and cognitive sciences)
>
> Stata Family Presidential Fellowship Fund
>
> Craig and Rose Tedman, for Robert M. Rose
>
> Edward Clark Walsh (chemical engineering)

Also, five students, one from each school, hold Provost's Women and Minority Fellowships, which are considered part of the Presidential Graduate Fellowship Program.

The Lemelson Foundation provided funding for eight underrepresented minority students with interests in engineering innovation; these fellowships were intended for incoming students. The School of Engineering designates the Lemelson Foundation Fellowships as part of the Presidential Graduate Fellowship Program.

In order to build community among the fellows, the Society of Presidential Fellows hosted a lecture and dinner series co-sponsored by the Sidney-Pacific Graduate Residence.

Fundraising for the support of the Presidential Fellowship Program continues to be a high priority for the Institute.

Finances

MIT tuition was increased by 3.25% to $41,770 in AY2013. Approximately 62% of all undergraduates received need-based MIT scholarships this year. MIT remains committed to a policy of need-blind admissions and to meeting the full financial need of all undergraduates it admits. Again this past year, MIT's total financial aid commitment increased at a higher rate (4.7%) than rising tuition. 2012–2013 was the third year of a phased increase in undergraduate enrollment to 4,500 by AY2014, which contributed to an increase in gross tuition revenue.

Five million dollars was made available in fiscal year 2013 for new academic and administrative programs. Because of an operating surplus at the end of the fiscal year, the Institute also was able to add funds to a reserve that is used for capital renewal projects, building repair and maintenance, and to help support budget flexibility and strategic initiatives in future years.

The market value of investments in the Institute's endowment as of June 30, 2013, was $11 billion, representing an increase of nearly 9% over the June 30, 2012, value of $10.1 billion.

Research

Expenditures on sponsored research conducted on campus totaled $674.3 million in AY2013, representing a decrease of 1.0% from the 2012 volume of $681.1 million. The slight decrease is correlated with the winding down of funding MIT had received from the American Reinvestment and Recovery Act of 2009, which had contributed to a rise in campus research volume between 2010 and 2012.

The federal government continues to be the largest sponsor of campus research funding, accounting for approximately 69% of the total volume. The Department of Defense is the single largest sponsor of campus research, with an approximate 19% share of total research expenditures. The National Institutes of Health, part of the Department of Health and Human Services, accounted for approximately 18% of total research expenditures, followed by industrial sponsors (16%), the Department of Energy (13%), and the National Science Foundation (12%).

Lincoln Laboratory research volume was $884 million in AY2013, an increase of 4.5% over the 2012 volume of $846 million.

Chris A. Kaiser
Provost