

## Dean, School of Engineering

Comprising an exceptional community of students, scholars, researchers, educators, and engineering practitioners, the [MIT School of Engineering](#) educates the next generation of engineering leaders to create new engineering and scientific knowledge and to serve society. By generating innovative ideas and practical technologies and educating the people who will create solutions to the greatest technological and social problems of the 21st century, the MIT School of Engineering fulfills its obligation as a world-leading institution.

To advance this mission, the dean, Ian A. Waitz, in close consultation with the School's leadership, has continued to develop and evolve a vision and integrated strategy. The elements of this strategy include continuing to attract exceptionally talented students, faculty, and staff and support their education and professional development; building collaborative intellectual communities—within MIT and with external partners—that enable us to best tackle complex technological and social problems; developing new paradigms for university-led innovation; and inventing the future of engineering education.

The School of Engineering's eight academic departments, one division, one institute, many research centers and laboratories, and rich array of interdisciplinary co-curricular and graduate programs encompass a community of some of the world's most innovative and inventive thinkers. Approximately 37% of the Institute's faculty, 49% of graduate students, and about 72% of declared undergraduate majors collaborate in the School's 23 undergraduate degree programs and 52 graduate programs. The School's sponsored research expenditures were approximately \$397 million in FY2014, accounting for 58% of the on-campus total. The achievements of the School's departments, laboratories, centers, and programs are extensive. Separate reports highlight the activities and accomplishments of the students, faculty, and staff in each of these units over the past year.

In 2013–2014, a number of leadership transitions occurred within the School's departments, centers, and laboratories:

- In July 2013, Gang Chen was named head of the Department of Mechanical Engineering.
- In September, Elfatih Eltahir was named associate department head in Civil and Environmental Engineering; Philip Gschwend, Ford Professor of Engineering, was named director of the Parsons Laboratory for Environmental Science and Engineering; and Professor Daniele Veneziano was appointed head of the department's Materials, Infrastructure and Systems Group, also known as Pierce Laboratory. In the same month, Anette (Peko) Hosoi was appointed associate head for education in the Department of Mechanical Engineering, where John Leonard was appointed associate head for research.

- In October, Vladimir Bulović, of Electrical Engineering and Computer Science, was appointed the School of Engineering's associate dean for innovation; this announcement was simultaneous with one that Fiona Murray would serve the same role for MIT-Sloan, and that together they would coordinate the creation and launch of a new Institute initiative on innovation. Later that month, Jesús del Alamo of Electrical Engineering and Computer Science was named director of the Microsystems Technology Laboratories.
- In November, David Perreault was appointed associate department head of Electrical Engineering and Computer Science.
- In December, Munther Dahleh, of Electrical Engineering and Computer Science, was appointed acting director of the Engineering Systems Division, and director-designate of a proposed new organization that would incorporate the people and programs of Engineering Systems Division, the Laboratory for Information and Decision Systems, a significant new initiative in statistics, and possibly other programs and entities. (In June, Dahleh was also appointed interim director of the Laboratory for Information and Decision Systems.)
- In January, after seven and a half years as dean of undergraduate education, Daniel Hastings of Aeronautics and Astronautics was appointed director of the Singapore-MIT Alliance for Research and Technology (SMART).
- In February, Martin Schmidt of Electrical Engineering and Computer Science was named provost, and Cynthia Barnhart, professor in Civil and Environmental Engineering and associate dean of the School of Engineering, was named chancellor. Later that month, Robert Shin was named director of the MIT Lincoln Laboratory Beaver Works Center.
- In April, Karen Gleason, professor in Chemical Engineering and former associate dean of the School of Engineering, was appointed associate provost.
- In May, Timothy M. Swager, professor in Chemistry, was named faculty director of the Deshpande Center for Technological Innovation.

As a result of this year's faculty searches, 16 candidates accepted faculty appointments in the School of Engineering, including six women. Their appointments will add to the excellence, excitement, and energy critical to maintaining the School's high standards.

### **Awards and Honors**

Every year, members of the MIT engineering community receive numerous honors in recognition of their research, scholarship, service, and overall excellence. This year was no exception. The reports of the School's departments, divisions, laboratories, centers, and programs make note of many of these awards. The following is a small sample of the honors and awards garnered by the School of Engineering in AY2014:

- Robert Langer of Chemical Engineering and of Biological Engineering received the Kyoto Prize, Japan's highest private award for global achievement, created by Japanese philanthropist Kazuo Inamori.
- Sallie "Penny" Chisholm of Civil and Environmental Engineering was named the 2014 recipient of MIT's highest honor for full-time faculty members, the James R. Killian Jr. Faculty Achievement Award, in recognition of her "extraordinary

- professional accomplishments.” Chisholm also received the 2013 Ramon Margalef Prize in Ecology from the government of Catalonia, an autonomous community in Spain.
- Dina Katabi, Electrical Engineering and Computer Science, was one of two MIT professors awarded a 2013 MacArthur Fellowship.
  - Carolina Osorio, Civil and Environmental Engineering, received the 2014 Early Career Award from the National Science Foundation.
  - Cullen Buie and Sangbae Kim of Mechanical Engineering both received a Defense Advanced Research Projects Agency (DARPA) Young Faculty Award (YFA).
  - The MIT Leaders for Global Operations program won the prestigious UPS George D. Smith Prize from the Institute for Operations Research and the Management Sciences (INFORMS).
  - Piotr Indyk of Electrical Engineering and Computer Science was among 13 mathematicians, theoretical physicists, and theoretical computer scientists selected by the Simons Foundation as 2013 Simons Investigators.
  - Kwanghun Chung, of Chemical Engineering and the Institute for Medical Engineering and Science, was awarded the 2014 Searle Scholarship.
  - Steven Dubowsky, Dan Frey, and Maria Yang, of Mechanical Engineering, received the American Society of Mechanical Engineers (AMSE) award at the AMSE 2013 International Design Engineering Technical Conferences. Dubowsky received the Mechanism and Robotics Award, Frey received the Best Paper Award at the International Conference on Advanced Vehicle Technologies, and Yang received a Best Paper Award at the Design Theory and Methodology Conference.
  - Feng Zhang of Biological Engineering was named the 2014 recipient of the Alan T. Waterman Award from the National Science Foundation (NSF).
  - Joseph Minervini, Nuclear Science and Engineering, received the 2013 Institute of Electrical and Electronics Engineers (IEEE) Council on Superconductivity Award.
  - Kripa Varanasi of Mechanical Engineering received the 2013 Bergles-Rohsenow Young Investigator Award in Heat Transfer. C. Justin Kamp and Alex G. Sappok of Mechanical Engineering were presented with the 2014 Arch T. Colwell Merit Award from the Society of Automotive Engineers (SAE).
  - Ian Hutchinson from Nuclear Science and Engineering, Wojciech Matusik from Electrical Engineering and Computer Science, Asu Ozdaglar from Electrical Engineering and Computer Science, and Maria Yang from Mechanical Engineering and Engineering Systems received the Ruth and Joel Spira Awards for Excellence in Teaching.
  - Joseph M. Sussman of Civil and Environmental Engineering and Engineering Systems received the Transportation Research Forum’s (TRF) Distinguished Researcher Award.
  - Jeremiah Johnson and William Tisdale, Chemical Engineering, received the 2014 3M Non-Tenured Faculty Award.

- Lallit Anand, Mechanical Engineering, was awarded the 2014 Daniel C. Drucker Medal.
- Jacopo Buongiorno, Nuclear Science and Engineering; Tomás Lozano-Pérez, Electrical Engineering and Computer Science; and Kristala L. J. Prather and Theodore T. Miller, Chemical Engineering, were among five MIT professors named 2014 MacVicar Faculty Fellows.
- Jeffrey Grossman of Materials Science and Engineering received the Bose Award for Excellence in Teaching.
- Anne White of Nuclear Engineering and Engineering received the Junior Bose Award.
- Maria Yang, Mechanical Engineering and Engineering Systems, received the Capers and Marion McDonald Award for Excellence in Mentoring and Advising.
- William A. Tisdale, Chemical Engineering, received the Everett Moore Baker Memorial Award for Excellence in Undergraduate Teaching.

### **Educational Activities**

The School of Engineering continued to make progress advancing its world-leading educational programs during AY2014. In August 2014, after 18 months of investigation and analysis, the Institute-wide Task Force on the Future of MIT Education released its [final report](#) outlining the Institute's plans in this area. Led by co-chairs Israel Ruiz, MIT executive VP and treasurer, Sanjay Sarma, professor in Mechanical Engineering and director of Digital Learning, and Karen Willcox, professor in Aeronautics and Astronautics, the task force made 16 recommendations around four themes: laying a foundation for the future, by creating a proposed Initiative for Educational Innovation; transforming pedagogy, largely through "bold experiments" sponsored by the proposed new initiative; extending MIT's educational impact, to teachers and learners well beyond its own campus; and enabling the future of MIT education, by cultivating new revenue streams and envisioning new spaces to support learning at MIT.

In collaboration with Lincoln Laboratory, the School of Engineering initiated the creation of a new project-based learning and prototyping space, Beaver Works, which opened in November 2013. Beaver Works participants conduct research and run educational programs that strengthen and expand collaborative efforts between Lincoln Laboratory and MIT. Beaver Works leverages synergies between campus research and Lincoln Laboratory technology areas to generate innovative solutions, and exposes a new generation of students to opportunities in engineering, research, and service to the world. Open to all MIT students, faculty, and collaborators, the facility provides a nexus for innovation, collaboration, and hands-on development.

### **Innovation Initiative**

In October 2013, President Reif formally announced the launch of an Innovation Initiative at MIT, and charged a committee to make recommendations that would "focus and amplify MIT's natural strength in innovation to span the spectrum of need, in service to the world." The committee's co-chairs are Vladimir Bulovic and Fiona Murray,

who were appointed associate deans for innovation in the School of Engineering and MIT Sloan, respectively.

The president's charge asked that the initiative focus on engaging five key stakeholder groups—innovators themselves, entrepreneurs, large corporations, risk capital providers, and policy makers—and that it cover four areas: spaces and infrastructure, education, research, and innovation in action.

Professors Bulovic and Murray spent much of AY2014 consulting with faculty, students, and staff from across MIT to determine the best models for connectivity and interaction among existing academic and research units, and to assess the establishment of new activities. The committee's report will be released in AY2015.

### **Institute for Medical Engineering and Science**

Formally announced as a new entity in February 2012, the Institute for Medical Engineering and Science (IMES) held its first public events in AY2013, including a major academic symposium in September 2013; began hiring new faculty; and continued its efforts to build and coordinate the efforts of faculty and researchers from all over MIT. IMES's leadership is also continuing to work on expanding relationships with institutions outside MIT to increase the scope and contexts of their activities.

### **MIT.nano**

In AY2013, MIT gave approval to begin construction on one of its largest capital building projects in Institute history: MIT.nano, a 200,000-square-foot building that will house state-of-the-art cleanroom, imaging, and prototyping facilities supporting research with nanoscale materials and processes in fields including energy, health, life sciences, quantum sciences, electronics, and manufacturing. An estimated 2,000 MIT researchers may ultimately make use of the building. Associate dean of engineering Vladimir Bulović will be the faculty lead on the MIT.nano project.

### **A new organization in socio-technical systems, information and decision systems, and statistics**

Building on the work and recommendations that have come from three faculty committees (the Rivest Committee, focusing on socio-technical systems, and the Willcox and Sipser committees, focusing on statistics), a newly proposed organization to incorporate the people and programs of the Engineering Systems Division, the Laboratory for Information and Decision Systems, a significant new initiative in statistics, and possibly other programs and entities was proposed in fall 2013. Headed by Munther Dahleh, the proposed organization would amplify efforts in these areas across MIT.

Over the course of AY2014, Dahleh worked with four faculty committees to define the details of the organization and prepare its strategic plan. The committees devoted their efforts to four topics: defining the overall mission, strategy, and operating plans for the organization; developing world-class research and educational programs in statistics; recommending policies and procedures for effective interactions with other

organizations at MIT; and recommending changes to sustain and improve academic programs in the Engineering Systems Division. An announcement regarding the results of the committees' deliberations is expected in AY2015.

### **Communications and Development**

The development and communications staff in the School worked in close collaboration on a range of projects.

- In collaboration with the MIT Alumni Association, the School of Engineering dean's office launched a new email newsletter to all MIT engineering degree recipients. Sent on a quarterly basis to approximately 48,000, the email has been warmly received by alumni.
- The Dean's Advisory Council, a group of alumni and friends of the Institute who are committed to the ongoing educational and research excellence of the School of Engineering, was significantly expanded.
- In collaboration with faculty, staff, and students from across MIT, the School of Engineering dean's office led the creation and organization of the MIT Strong marathon team. Forty members of the MIT community ran the 2014 Boston Marathon and raised more than \$200,000 to honor the victims of the 2013 Marathon bombing, including MIT police officer Sean Collier.

### **Statistics for 2013–2014**

#### **Undergraduate Enrollment**

- 2,311 declared majors
- 1,014 women
- 196 international students

#### **Graduate Enrollment**

- 3,324 students
- 914 women
- 1,392 international students

#### **Degrees Awarded, 2012**

- 675 bachelor's degrees
- 774 master's degrees
- 355 doctoral and professional degrees

## **Faculty**

- 270 full professors
- 64 associate professors
- 50 assistant professors

**Ian Waitz**

**Dean**

**Jerome C. Hunsaker Professor of Aeronautics and Astronautics**