

Report of the President

Technological Change and Shared Prosperity

As the applications of artificial intelligence (AI) expand rapidly, harnessing the power of this revolutionary technology to make a better world stands as a defining challenge of our time. This year, we launched two Institute-wide initiatives that will position our community to lead in AI research and shape its development for the common good.

The first is the [MIT Quest for Intelligence](#), led by Antonio Torralba, professor of electrical engineering and computer science and MIT director of the MIT-IBM Watson AI Lab, founded in September to advance joint research in AI hardware, software, and algorithms. The initiative has two parts: The Core, which will advance the fundamental science of both human and machine intelligence and cross-pollinate ideas between the two, and The Bridge, which will provide custom-built AI tools for MIT researchers in all disciplines to accelerate their research. In the process of solving important practical problems for our community, we anticipate The Bridge will spin off new tools with the potential for broad impact beyond our campus.

The second significant initiative we launched this year is the [MIT Task Force on the Work of the Future](#), led by David Autor, Ford Professor of Economics and associate head of the Department of Economics; David Mindell, professor of aeronautics and astronautics and Dibner Professor of the History of Engineering and Manufacturing; and Elisabeth Reynolds, executive director of the MIT Industrial Performance Center and a lecturer in the Department of Urban Studies and Planning.

Automation has transformed many jobs and eliminated others, a trend that developments in AI are sure to accelerate. While every past technological revolution ultimately produced more jobs than it destroyed, this time the change might be so fast and so disruptive that it may threaten not only individual livelihoods, but society itself. At the same time, many employers in technology-dominated workplaces cannot find people with the specific skills they need. What is required is a constructive public conversation on the societal impacts and policy opportunities of advancing technologies, and beyond that, a thoughtful reinvention of work itself. I explored these themes in an [op-ed in *The Boston Globe*](#).

The task force includes faculty and student researchers representing MIT strengths in fields that range from engineering to economics, management, political science, cognitive science, anthropology, educational innovation, and the history of technology. Together, this distinguished group will conduct an empirical, interdisciplinary, and global study that will help us answer three fundamental questions:

1. How are emerging technologies transforming the nature of human work and the skills that enable humans to thrive in the digital economy?
2. How can we shape and catalyze technological innovation to complement and augment human potential?

3. How can our civic institutions ensure that the gains from these emerging innovations contribute to equality of opportunity, social inclusion, and shared prosperity?

As an institution that is leading and benefiting from the technology revolution, MIT takes these questions very seriously. I believe it is our responsibility to play a leading role in reinventing the future of work to help build a stronger, less divided society.

Innovations in Teaching and Learning

This year, we have seen great progress in expanding the reach and impact of the MITx MicroMasters credential. More than 1,000 learners have completed the first MITx Supply Chain MicroMasters program. Thirty-nine of those learners are now completing a full master's degree on the MIT campus, and 11 other universities are offering MicroMasters learners a pathway to a master's degree. We have also launched a new Principles of Manufacturing MicroMasters, and will begin offering a Statistics and Data Science MicroMasters in September 2018.

edX, too, continues to grow at a breathtaking pace. This year, the platform surpassed 16 million learners, up from 11.8 million just a year ago, with 26 universities now offering a MicroMasters program. Professional certificate programs of two to six months—designed by universities and leading companies as preparation for specific careers—are also gaining in popularity, with 62 programs now offered, 10 available in Spanish. Open edX, aimed at businesses and governments as well as colleges and universities, now has more than 35 million learners, making it the world's largest education platform.

One hundred MITx courses have now reached more than three million learners in 195 countries, with many more courses in development. On our own campus, faculty are using the MITx platform for creating and distributing online course content. In the fall semester, 50 courses used MITx, and in the spring, 52.

Elsewhere in teaching and learning this year, we considered two very important questions: How can we improve the first-year undergraduate experience? And how can we better understand our history so that we can shape a more inclusive future? For both, we enlisted the help of our students.

In the spring, we introduced “Designing the First Year at MIT,” a class developed and taught by faculty and staff from all five schools. The subject used the undergraduate first-year experience to teach MIT students fundamental methods of designing systems and products. Team based and project focused, it offered students an opportunity to present options for change to the MIT community and gave us a remarkable source of new ideas for shaping an MIT education.

Separately, MIT began to explore its historical connections with slavery through a class created by Professor Craig Wilder, the leading authority on the interconnections between American colleges and universities and the history of slavery. “MIT and Slavery” began meeting in the Institute Archives in the fall, and in December, the students and archivist Nora Murphy presented their findings. They uncovered a range of evidence showing how

MIT's early decades were shaped by the post-Civil War process of reconstruction. They also found an 1850 census document showing that before William Barton Rogers moved to Boston to establish MIT, he and his wife, Emma, held six human beings as slaves.

In February, I shared the students' findings in a letter to the community, and my office joined with the Black Students' Union, Black Graduate Student Association, MIT Libraries, and School of Humanities, Arts, and Social Sciences in hosting an Institute-wide event where we invited our community to hear directly from the students about what they had uncovered.

Finally, for the seventh year in a row, MIT ranked first in the *QS World University Rankings*, and *Times Higher Education* ranked MIT second in the world for arts and humanities. Indeed, we consider the arts and humanities critical to the MIT experience—a complement to scientific and technological exploration and a way for our students to develop a range of skills vital for success in any field. With that in mind, we were proud this year to dedicate a renovated [W97 Theater Arts Building](#) as a home for MIT's exceptional theater arts community.

Championing Research

This year, we celebrated Professor Rainer “Rai” Weiss '55, PhD '62, who shared the 2017 Nobel Prize in Physics with Kip Thorne and Barry Barish from Caltech. The trio was awarded the prize for the first direct observation of gravitational waves, using the [Laser Interferometer Gravitational-Wave Observatory \(LIGO\)](#). The idea of LIGO came to Professor Weiss in 1967 while teaching a class at MIT on general relativity, when he began thinking about simple ways to prove to students that detecting the influence of a gravitational wave was within the realm of possibility. It took decades of ingenuity, optimism, and perseverance to create the scientific triumph that is LIGO, and the entire MIT community is inspired by it.

Separately, with the [MIT Quest for Intelligence](#), we aim to spur fundamental breakthroughs in human and machine intelligence. Although major tech firms are squeezing brilliant new applications out of existing AI approaches, the foundations of AI currently in use are relatively old. To fully realize AI's promise, we need new science. At a kickoff symposium in March, we made clear that we intend to advance that science at MIT.

And, as we continue our work to fulfill the MIT Plan for Action on Climate Change, in December we released the report of the MIT Climate Action Review Committee to inform the MIT community about the status of ongoing activities, recommendations for accelerating progress, and the risks and opportunities we face.

Accelerating Innovation and Entrepreneurship

Last year, concerned that potentially transformative technologies based on new science were languishing in the lab, MIT launched [The Engine](#) to provide patient capital, affordable space near campus, and specialized equipment to entrepreneurs whose innovations have the potential to help address complex global challenges.

This year, leaders from Greater Boston joined us to celebrate the formal opening of The Engine's headquarters and lab spaces at 501 Massachusetts Avenue in Cambridge. In April, The Engine closed its first investment fund with more than \$150 million and selected its first 11 companies. They include Kytopen, which is accelerating the discovery and manufacturing of cell therapies, and Form Energy, which is developing ultra-low-cost, long-duration energy storage, with the goal of making renewables our dominant energy source.

We are also supporting entrepreneurs through [MIT Bootcamps](#), intensive one-week programs around the world that bring together aspiring innovators. Participants in the first 12 Bootcamps have started more than 100 companies that have raised more than \$52 million in venture capital funds. Six of the Bootcampers have been selected for the *Forbes* "30 Under 30" list of exceptional entrepreneurs and innovators, and eight have been admitted to MIT.

[MIT Solve](#), which brings together innovators from around the world to pitch potential solutions to global problems, continues to grow in influence. This year, we held the Solve Challenge Finals in New York City with speakers including Ursula Burns, Chairman of VEON, and Her Majesty Queen Rania Al Abdullah of Jordan. Solve's annual flagship event, Solve at MIT, drew Canadian Prime Minister Justin Trudeau, cellist Yo-Yo Ma, and Lauren Powell Jobs, founder and CEO of the Emerson Collective. Solve also helped local groups hold their own Solveathons in more than 20 sites on six continents, and engaged many thousands of people online through its challenges, with nearly 1,000 solutions submitted from 103 countries.

Heightening Our Impact, Globally and Locally

Over the course of this academic year, MIT used its voice to address issues in Washington, DC, and in society at large, that we believe bear directly on our mission.

To support those challenging the federal travel bans affecting the citizens of majority-Muslim nations, MIT filed an amicus brief in the United States Supreme Court. We also supported the restoration of Deferred Action for Childhood Arrivals, or DACA. We filed five related amicus briefs, and I wrote an [op-ed for *The Boston Globe*](#) arguing against the repeal of DACA.

We also [condemned a white supremacist rally](#) in Charlottesville, Virginia, that shook our country, and came together as a community to defend the ideals of our civil society.

And we responded to changes to the tax code signed into law in December, working behind the scenes in Washington, DC, and in partnership with the Association of American Universities, to oppose a proposed endowment tax and a tax on graduate student tuition remission. Thanks to the [advocacy of our graduate students](#) and their peers across the country, the final bill did not include a measure that would have treated tuition remission as taxable income for graduate students. However, despite the efforts of MIT and its peer institutions, the bill did include a [tax on net income from the endowment](#) and other investments for universities that meet a certain endowment threshold, including MIT.

This is the first time Congress has taxed university endowments and the first time it has targeted a tax at specific universities. We must do a better job helping lawmakers understand the value of America’s research universities. With essential support from the MIT Washington Office, Vice President for Research Maria Zuber and I are deeply focused on this work.

We also responded this year to concerns some raised about a visit by His Royal Highness Mohammed bin Salman, Crown Prince of the Kingdom of Saudi Arabia, to campus, [sharing a framework for how we think about engaging with the world](#). When MIT is invited to work on projects of shared interest by parties whose values and actions in other areas we reject, we make our best assessment in each case, asking ourselves: Do we see a significant opportunity to do good or drive progress? If the answer is yes, we seek to develop a carefully focused relationship. In the Saudi case, over time, this path has led to Saudi Aramco’s sustained support for the [MIT Energy Initiative’s](#) renewable energy research, and the [Ibn Khaldun Fellowship](#), which has brought 27 Saudi women PhDs to our campus and was recently extended for the next decade.

Cultivating a Caring Community

MIT’s Class of 2022 will mark a milestone: For the first time in MIT’s history, we admitted more undergraduate women than men. While we recorded a slightly lower yield with women than men, 49% of those enrolling in the fall of 2018 will be women.

As proud as we are of that milestone, we continue to foster a culture that treats [sexual harassment, coercion, and assault](#) as unthinkable for anyone in our community in any context. A central component of this effort is ensuring that every member of our community understands what constitutes sexual misconduct, how to intervene against it, and how to respond effectively to someone affected by it.

We are in the process of including all faculty and staff, as well as students, in online training. To ensure that all of the measures we take are informed by data, our new training mechanisms for faculty and staff provide ways to indicate whether one has experienced sexual misconduct at MIT. Next year, we will again survey our students.

Starting with a baseline of sound policies against harassment, we are making sure that our procedures for raising complaints and reviewing them are fair, effective, and clear. We have significantly expanded the resources we offer, including confidential personal support and guidance about options for reporting. I have also asked members of my leadership team to work with the community to review our policies and practices regarding faculty and staff misconduct, and strengthen them as appropriate.

As we seek to make MIT a community that values and supports every one of its members, the Academic Council Working Group on Community and Inclusion—a team of student, faculty, and administrative leaders—is [driving important progress](#). Thanks to the working group, we now hold interactive sessions on diversity during undergraduate and graduate student orientations. We have recruited and trained mental health staff to offer culturally competent care. And to make an MIT education more accessible to students from all backgrounds, over the past two years we have raised financial aid by

\$23.4 million and decreased student self-help requirements by nearly 40%. We are also focusing on more systemic issues, including the long-term challenge of recruiting more graduate students and faculty from underrepresented minority groups and making sure they are positioned to succeed.

This year, MIT lost one of its finest citizens. In September, [President Emeritus Paul Gray](#), a devoted leader whose lifetime career at the Institute included turns as a student, professor, dean of engineering, associate provost, chancellor, president, and MIT Corporation chair, died after a lengthy battle with Alzheimer's disease. A leader who helped open the door to MIT more widely for underrepresented minorities and women, President Gray proved that in the life of a community, cultural change and moral growth are possible and imperative. He is a worthy guide as we work to invent a better future for us all.

L. Rafael Reif
President