

## MIT Washington Office

The Washington, DC, Office of the Massachusetts Institute of Technology was established within the Office of the President in 1991. The mission of the [MIT Washington Office](#) is twofold: to support the science advocacy activities of MIT's president, other senior officials, and faculty in Washington, DC, and to support MIT's historic role, as one of the nation's premier research universities, in providing national leadership on science and technology issues.

The Washington Office reports to MIT's president and also works closely with the vice president for research, managing a steady flow of information and ideas between MIT and Washington institutions including executive branch offices, departments, and agencies; Congress; and university, industry, and science associations. The staff of the office during FY2013 included William Bonvillian, director; Philip Lippel, assistant director; Amanda Arnold, senior policy advisor; Helen Haislmaier, program coordinator; and Lisa Miller, office representative.

### Connecting the Institute with the Policy Agenda in Washington, DC

The office supports MIT's national role in science and technology policy at several levels. Washington Office staff facilitate Institute leaders' engagement with federal agencies and key federal officials and other national figures and help identify and then work with campus experts to inform policy discussions. With leadership changes at MIT and at several important federal agencies, the office worked this year to sustain existing relationships while building new ones. We helped introduce MIT president L. Rafael Reif into Washington policy discussions and worked extensively with vice presidents for research Claude Canizares (through January) and Maria Zuber (from January on). We continued to work with Vice President Canizares in his new roles overseeing Lincoln Laboratory and MIT's international interactions. Other campus leaders working especially closely with the Washington Office in 2013 included associate provost Martin Schmidt, director of digital learning Sanjay Sarma, MIT Energy Initiative (MITEI) directors Ernest Moniz and Robert Armstrong, and the cochairs of MIT's "Production in the Innovation Economy" (PIE) study, professor Suzanne Berger and Institute Professor Phillip Sharp, who is also leading MIT's convergence efforts (discussed later in this report).

The appendix to this report lists key meetings and other interactions that took place between federal officials and MIT administrators, faculty, or staff, either in Washington or on campus, from July 2012 through June 2013.

### Science Research and Development Support

#### Sequestration and the FY2013 Federal Budget

The federal research and development (R&D) funding environment in MIT fiscal year 2013, which included the last three months of federal fiscal year 2012 and the first nine months of federal fiscal year 2013, was dominated by budget battles and uncertainties, both before and after the November 2012 presidential election. The Budget Control

Act of 2011 (BCA) set austere funding levels for overall discretionary spending for a 10-year period and included provisions to “sequester” an additional \$105 billion of federal spending in 2013 if Congress could not agree on a budget achieving the prescribed deficit reductions. The entire \$1.2 trillion 10-year sequestration cut would be equally divided between defense discretionary programs and nondefense discretionary programs. Discretionary programs, which account for less than 40% of the total federal budget, include almost all federally funded research and development activities.

Congress was unable to reach a consensus on appropriations levels for FY2013, and so it passed an omnibus funding bill in late September that set base funding levels for research and development under a series of continuing resolutions. Without definitive full-year appropriations and facing the prospect of additional budget cuts due to sequestration, most R&D agencies began operating their research programs at 80% to 90% of their 2012 support levels. Congress showed little will to negotiate until after the election and was then faced with the prospect that the country would reach the so-called “fiscal cliff,” potentially shutting down the federal government and risking sending the country into default on its debt in early January. A last-minute deal brokered by congressional leadership averted this fate and reduced the potential sequester by \$20 billion but extended funding only through the end of March. Congress made little further progress on normal appropriations, instead passing a bill in late March combining modified appropriations for agriculture, homeland security, defense, veterans’ affairs, and commerce, justice, science, and related agencies (including the National Aeronautics and Space Administration [NASA], the National Science Foundation [NSF], and the National Institute of Standards and Technology [NIST]), with a continuing resolution for seven other appropriations bills. Since this bill did not meet the BCA’s deficit reduction targets, President Obama was required to order sequestration at the end of March, further reducing FY2013 federal spending by 6.9% across the entire nondefense discretionary budget and by 9.6% across the defense discretionary budget.

Agency spending plans conforming to the appropriated levels as modified by sequestration were still being finalized as the MIT fiscal year ended. According to [estimates by the American Association for the Advancement of Science \(AAAS\)](#) and the Congressional Budget Office, the BCA (including sequestration) would reduce total defense and nondefense FY2013 R&D by approximately \$11 billion relative to FY2012, making FY2013 R&D levels equivalent to 2002 levels (adjusted for inflation). The percentage cuts for FY2013 due to sequestration vary by agency and are still not final. According to AAAS, total R&D (defense and nondefense) spending cuts would total approximately \$57 billion over the first five years of sequestration, remaining below \$55 billion through 2017 (compared to \$63 billion in FY11) if sequestration remains in place.

MIT joined other research universities and science organizations in pointing out that major cutbacks in R&D due to the Budget Control Act and sequestration would be economically counterproductive. By curtailing the nation’s investments in inputs to our innovation system, these cuts are expected to limit economic growth and thus increase the very fiscal pressures they are intended to relieve. The Washington Office worked with the Association of American Universities (AAU) and the Association

of Public and Land-Grant Universities (APLU) to encourage a September 2012 report by the Information Technology and Innovation Foundation, “[Eroding Our Foundation: Sequestration, R&D, Innovation and U.S. Economic Growth](#),” that models the consequences of these economic policies for the nation’s innovation system and workforce. The office provided information for President Reif’s widely circulated [op-ed](#) piece on the effects of sequestration on innovation, coauthored with former Intel CEO Craig Barrett, which appeared in the Financial Times on February 25.

### **President’s FY2014 Budget Proposal**

The Obama administration presented its FY2014 budget request on April 10, 2013, two months after the usual release date. The administration proposed slowly rebuilding federal support for science, with a special emphasis on innovation in selected fields including clean energy, biology and neuroscience, information technology, and advanced manufacturing. The budget would undo the cuts to R&D accounts due to sequestration but would not restore funding to the levels proposed at the beginning of President Obama’s first term.

The administration’s 2014 spending plan (defense and nondefense) includes a total of \$33.2 billion for basic research, an increase of about 4% over FY2012 levels. (All comparisons are made with FY2012 levels because final FY2013 levels had not yet been determined by the end of June.) It proposes total R&D spending of \$143 billion, about 1.3% more than the fiscal 2012 total.

Among specific agencies, the administration’s 2014 budget proposes \$31.3 billion (1.5% above FY2012) for the National Institutes of Health (NIH), the largest provider of basic research funds at MIT and at US universities overall.

The president’s budget would provide \$7.6 billion for the National Science Foundation, up 8.4% from 2012 levels. This includes \$6.2 billion for the research and related activities account (+9.2%), \$880 million for education and human resources (+6.2%), and \$210 million (+6.6%) for major research equipment and facilities construction (including full final-year funding for the Advanced LIGO [Laser Interferometer Gravitational-Wave Observatory] construction project led by MIT).

The administration proposed \$5.15 billion for the Department of Energy (DOE) Office of Science, an increase of 5.7% (after adjusting for transfers from other offices into the Office of Science to support small business research). The Advanced Research Projects Agency for Energy (ARPA-E) would receive \$379 million, an increase of \$104 million.

The National Institute of Standards and Technology would receive \$928 million, up 23% over 2012 levels. Included in the increase is financing for new manufacturing institutes where universities, companies, and government agencies would cooperatively develop advanced manufacturing technologies.

The president’s budget proposed major changes in funding for science, technology, engineering, and mathematics (STEM) education. While overall funding would increase by 6.7%, to \$3.1 billion, most R&D agencies would lose education funding. Three

agencies—the Department of Education, the National Science Foundation, and the Smithsonian Institution—would receive increases. The number of STEM education programs across the federal government would be reduced from 226 to 112, with many programs combined or eliminated. The Department of Education would assume a new leadership role for STEM education programs in schools in grades K–12 and would receive the largest funding increase. NSF would become the leader for undergraduate and graduate education programs, while the Smithsonian (which received no STEM education appropriation in FY2012) would become the lead agency for outreach and public engagement activities.

These proposed 2014 funding levels for education, research, and development were presented as part of an overall budget that the administration calls the start of a “balanced” 10-year, \$1.8 trillion deficit reduction plan. After canceling the \$1.2 trillion sequester, the plan would reduce deficit spending by about \$600 billion, to be offset by tax hikes on the wealthy and tax revenue increases through closing of loopholes in both individual and corporate tax codes.

#### House and Senate FY2014 Budget Resolutions

As this report was prepared, each chamber of Congress had approved its own budget resolution and was working on a full slate of appropriations bills. The Senate resolution adopted the top-line figure of the president’s budget request, an approach also favored by House Democrats. The House resolution reduced the total discretionary budget by \$91 billion, roughly 9% of the entire budget for domestic and defense discretionary spending. This approach, in turn, was supported by Senate Republicans. While this figure is derived by reducing the overall FY2014 authorization by the specified sequester, the House’s allocation across spending bills does not honor the BCA principle of “sharing the pain” equally between the defense and nondefense sectors, sparing almost all defense cuts while deepening cuts to domestic programs. It would drop nondefense discretionary spending as a percentage of the gross domestic product to below its lowest level since 1970.

Appropriators in both the House and Senate spoke of a return to “normal order,” but, given the depth of the partisan divide between them, no bills were considered likely to move successfully through the normal appropriations process. Instead, that process will once again be co-opted by a series of fiscal crises Congress has imposed upon itself. Federal borrowing was expected to hit the authorized debt limit sometime this winter, perhaps triggering another attempt at a “grand bargain” involving direct negotiations between congressional and administration leadership. In the interim, another continuing resolution will be needed for FY2014.

University research, therefore, is likely to continue to face significant fiscal constraints in MIT FY2014. It is widely assumed that the Congress will once again have to pass a continuing resolution to keep the government functioning as federal FY2014 begins. There is little agreement as to what shape that resolution would take or how long it would last, with each party certain to try to shape it to conform to the total in its budget resolution.

Final FY2014 federal funding allocations are expected to be delayed at least several months, with some disruption to federal R&D programs as in FY2013. Many observers predict that a continuing resolution (or sequence of resolutions) will again be in place for the full year, at least for some agencies. It is unclear whether or how the FY2013 adjustments due to sequestration will carry over under a continuing resolution.

### Summary of Federal Research and Development Funding, in Millions of Dollars

Appropriations Subcommittee and Program	FY2010 Enacted	FY2011 Enacted	FY2012 Enacted	FY2013 Enacted (but before sequestration amounts subtracted)*	Expected FY2013 % Sequestration Cut or Increase (where available)*
<b>Commerce-Justice-Science</b>					
National Science Foundation	6,926	6,860	7,033	7,393*	-4.0%
National Aeronautics and Space Administration (NASA), Science Mission Directorate	4,469	4,945	5,090	5,144*	-6.6%
NASA, Aeronautics Research Directorate	497	535	570	570	
NASA, Space Technology	275	—	575	642	
NASA Space Grant	46	46	39	40	
National Oceanographic and Atmospheric Administration	439	427	384.7	391	
National Institute of Standards and Technology (NIST)	580	532	555	588	+5.5%
NIST, Manufacturing Extension Program	124.7	128.7	128.4	128.5	
<b>Defense</b>					
Department of Defense (DOD) Basic Research (6.1)	2,000	1,947	2,112	2,130	-4.6%
DOD Applied Research (6.2)	4,984	4,453	4,739	4,725	-4.6%
DOD, Defense Advanced Research Projects Agency	2,761	2,835	2,816	2,817*	-4.6%

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<b>Energy and Water Development</b>					
Department of Energy (DOE), Office of Science	4,904	4,897	4,874	4,876	-5.0%
DOE, Office of Science, Energy Frontier Research Centers	—	100	100	100	
DOE, Advanced Research Projects Agency for Energy	(Carried from FY2009)	180	275	265	
DOE, Cross-Agency Energy Innovation Hubs	66 (for three hubs)	72.9 (for three hubs)	113 (for six hubs)	113 (for existing hubs)	
DOE, Office of Energy Efficiency and Renewable Energy	2,242	1,893	2,091	1,882	
<b>Labor-Health and Human Services—Education</b>					
National Institutes of Health	31,168	30,688	30,640	30,640	-5.2%
<b>Homeland Security</b>					
Department of Homeland Security Science and Technology Directorate	857	760	617	773	

Note: Sequestration percentage cuts will be applied to FY2013 levels. Sources: Association of Public and Land-Grant Universities, Association of American Universities, American Association for the Advancement of Science.

\*Agencies are still estimating for FY2013 the exact size of sequestration cuts applied to their programs, including R&D; see the data above for approximate agency percentage cuts to be made to these figures (where available).

## MIT Innovation Policy Initiatives

The Washington Office works closely with senior Institute leaders to encourage sustained interactions in areas of national policy, an approach that has evolved into a new model for university engagement in areas of national need: the innovation policy initiative model. Each initiative emerges from the identification of policy issues with a technological or scientific dimension, with significant involvement across multiple MIT schools and academic disciplines, affecting areas of critical national or global need.

MIT focused on three ongoing national innovation policy efforts this year: advanced manufacturing; convergence of the life, engineering, and physical sciences; and energy. The MIT Washington Office provided extensive support for each of these efforts, which are discussed below. Work began on two additional policy initiatives: one focusing on health, with guidance from associate provost Martin Schmidt, and one focusing on online education, with support from director of digital learning Sanjay Sarma. The Washington Office assisted in the early development of these new initiatives and in laying the groundwork for a potential initiative on water, food, and the environment.

### Advanced Manufacturing

MIT leaders are playing a significant role in the design of national efforts to confront structural problems inhibiting innovation in the manufacturing sector. The Washington Office provided extensive support for MIT activities in the Advanced Manufacturing Partnership (AMP) and for the [Production in the Innovation Economy](#) study. We continued to support the development of a network of regional institutes to promote manufacturing innovation and added to a series of surveys and reports on manufacturing, available on the MIT website. In addition, we helped connect the Office of Digital Learning (ODL) and MIT manufacturing researchers with two consortia of community colleges responding to a solicitation from the Department of Labor seeking online technologies to enhance workforce training in advanced manufacturing. These efforts are helping to define an emerging campus initiative on advanced manufacturing.

### Advanced Manufacturing Partnership

The Washington Office supported former MIT president Susan Hockfield, cochair of the Advanced Manufacturing Partnership, and Associate Provost Schmidt, AMP's technical colead, as the initial partnership steering committee completed its work. We also worked with Professor Schmidt and federal officials to explore options for future AMP activities, including an expected leadership role for President Reif.

The original AMP work culminated in the release of a report by the President's Council of Advisors on Science and Technology on July 17, 2012. The [AMP report](#), which includes 16 specific recommendations, calls for research and development in 11 advanced manufacturing fields, investments in manufacturing test beds and implementation infrastructure, and improvements in the quality and availability of advanced skills training for manufacturing workers and engineers.

### ***Production Innovation Economy Study***

The Production in the Innovation Economy (PIE) study at MIT made major progress in FY2013, and the Washington Office worked closely with PIE leadership to bring the study to the attention of national leaders.

President Reif led a delegation of MIT faculty and researchers who visited Washington in February to present preliminary observations from the two-year study regarding the strengths and weaknesses of the US innovation ecosystem. On February 21, Vice President for Research Zuber and Vice President Canizares, as well as Associate Provost Schmidt, joined President Reif in briefing senior administration leaders, led by National Economic Council (NEC) director Gene Sperling, acting secretary of commerce Rebecca Blank, and presidential science advisor John Holdren, on the study. A [preliminary study report](#) was released the following day, and the delegation held three separate briefings for the Washington policy community.

National Academy of Engineering (NAE) president (and former MIT president) Charles Vest and director of the Program on Technology, Innovation, and Entrepreneurship Charles Wessner hosted the first briefing, in the National Academies' historic "Lecture Room." President Reif and PIE Commission cochair Suzanne Berger summarized the study results for a packed house of federal officials and representatives from industry, universities, and nongovernmental organizations. Professor Richard Locke then moderated a panel discussing specific findings regarding scale-up, advanced manufacturing technology, and skills and training. NIST director and undersecretary of commerce Patrick Gallagher, Defense Advanced Research Projects Agency (DARPA) director Arati Prabhakar, and Semiconductor Industry Association president Brian Toohey reacted to the MIT presentations, giving their own perspectives on the links between manufacturing and innovation on a panel moderated by President Reif.

The MIT group repeated their presentations at an 80-person Capitol Hill briefing hosted by the Congressional Research & Development Caucus, with Associate Provost Schmidt handling the introductory chores. Finally, the MIT delegation discussed the PIE study results with key White House officials including Office of Science and Technology Policy (OSTP) director John Holdren, associate director Pat Falcone, and assistant directors Henry Kelly and Arun Seraphin, along with Susan Helper from the Council on Economic Advisers.

### ***Manufacturing Institutes***

One of the major recommendations of the AMP report was to form a series of public-private partnerships where researchers and technologists from industry and universities would collaborate to support new manufacturing technologies and processes. President Obama proposed a network of institutes for manufacturing innovation last year, asking Congress to provide \$1 billion in funding over 10 years. A pilot institute was established in Youngstown, OH, to advance additive manufacturing technologies (such as 3D printing), with industry and state contributions matching federal funds from multiple agencies, led by the Department of Defense (DOD) through its MANTECH program. Offerings for three additional pilot institutes were released in May, with multiple federal agencies again contributing to each institute through existing manufacturing

R&D efforts. DOD led solicitations for one institute to advance utilization of lightweight structural materials and a second to promote digital manufacturing, while DOE took the lead on an institute to accelerate the development of efficient power-handling systems using wide bandgap semiconductor devices. MIT researchers contributed to proposed teams for the power electronics and digital manufacturing institutes, with assistance from the Washington Office.

## Convergence

The MIT Washington Office continued to support the convergence model across the life, engineering, and physical sciences for biomedical research, drawing on the 2009 National Academies report “The New Biology for the 21st Century” and the 2011 MIT white paper “Third Revolution: Convergence of the Life Sciences, Physical Sciences and Engineering.” Support for this approach grew, with the White House featuring a section on fostering convergent science in its “Blueprint for Action,” released in January, which also included advancing the convergence approach among four goals for the year.

At the AAAS annual meeting in January, professors Phillip Sharp, Tyler Jacks, and Andrew Lo joined Northwestern University professor Chad Mirkin on a panel, “Convergence of Physical, Engineering, and Life Sciences: Next Innovation Economy,” moderated by Robbie Barbero from the White House Office of Science and Technology Policy. Washington Office staff worked with professor Joseph DeSimone of the University of North Carolina to develop an expanded convergence panel for the January 2014 AAAS meeting, which will feature President Emerita Hockfield, DeSimone, Mirkin, Belinda Sato of the National Institute of Biomedical Imaging and Bioengineering, and Dennis Ausiello of Massachusetts General Hospital.

A report of an NSF-sponsored workshop (“Convergence of Knowledge, Technology, and Society”), published in May, included a chapter on human health and physical potential developed by Robert Urban, then executive director of the Koch Institute for Integrative Cancer Research, and coauthor Amanda Arnold of the Washington Office.

Washington Office staff worked throughout the year to design and support “Key Challenges in the Implementation of Convergence,” a National Academies workshop on convergence scheduled for September 2013. Participants will include Sharp, DeSimone, NIH director Francis Collins, Anna Barker of Arizona State University, and National Academy of Sciences president Ralph Cicerone; President Emerita Hockfield is cochairing the study panel.

On April 2, 2013, President Obama announced the new BRAIN (Brain Research through Advancing Innovative Neurotechnologies) initiative, a public-private partnership involving a convergence-like approach; participants include NIH, NSF, and DARPA. Washington Office staff are supporting MIT’s involvement. Five MIT faculty were in attendance at the president’s announcement, and professor Emery Brown is a member of the NIH advisory committee for the initiative. The working group is scheduled to deliver a strategic plan to NIH director Collins in fall 2013. Progress will be reported at the September National Academies convergence workshop and the February AAAS panel on convergence.

## Energy

Although energy and environmental issues were far less prominent in the 2012 presidential election cycle than they had been four years earlier, they received renewed attention from the Obama administration as its second term began. Congressional action on the presidential agenda, however, remained stalled. The Republican-controlled House and the Democratic-controlled Senate remained divided in their priorities for energy research and, even more so, in their willingness to respond to global climate change.

Senator Ron Wyden (D-OR) took over leadership of the important Senate Energy Committee as the 113th Congress began, following the retirement of chairman Jeff Binghman. The appointment of Massachusetts senator John Kerry as secretary of state triggered additional committee changes, with Representative Edward Markey, long a champion of clean energy and environmental causes in the House, winning a June special election for Kerry's Senate seat. In February, secretary Steven Chu announced his intention to leave the Department of Energy and return to Stanford University. The following month, the president nominated MITEI director Ernest Moniz to lead the department. Professor Moniz was sworn in as secretary of energy on May 21. In the first six weeks under his leadership, Moniz announced several organizational changes at DOE and affirmed his commitment to the president's [Climate Action Plan](#), released in June. Several major DOE positions requiring Senate confirmation were still open at the time of this report, including the directors of the Office of Science and ARPA-E (both key supporters of energy research) and the newly combined undersecretary slot, with oversight of both basic and applied research at DOE.

DOE's support for research in fusion energy science was a major issue this year. Faced with an escalating commitment to the International Thermonuclear Experimental Reactor (ITER) project now in the early phases of construction in France, the Department of Energy Office of Fusion Energy Sciences proposed shutting down MIT's Alcator C-Mod tokamak in FY2013. The Washington Office worked closely with the Office of the Vice President for Research and the leadership of the Plasma Science and Fusion Center (PSFC) in an attempt to maintain MIT's historic role as a leader in this field. The Washington Office worked with Vice Presidents for Research Canizares and Zuber, PSFC director Miklos Porkolab, and Alcator project director Earl Marmor to ensure that congressional leaders understood the unique capabilities C-Mod brings to the fusion science community and appreciated the importance of MIT's fusion graduate program (the largest in the United States) to future domestic leadership in fusion research. We coordinated closely with representatives of other US fusion research programs to advocate for strategic planning for all DOE-sponsored research in magnetically confined fusion, encompassing both domestic and international efforts, and for a balanced funding approach to ensure that domestic research capabilities will remain the best in the world as global efforts to develop clean, abundant electricity generation via nuclear fusion move forward.

As the MIT fiscal year drew to a close, the Department of Energy agreed to provide sufficient funding to maintain current staffing levels at C-Mod through September, the end of the federal fiscal year. But the future of the program remains unclear, with DOE

once again proposing to shut C-Mod down in FY2014. In congressional action so far, the House would provide funding for continued C-Mod operations, while the Senate has supported the president's shutdown request. With a continuing resolution all but certain for at least part of FY2014, further negotiations are under way.

The office worked closely with MIT researchers and research partners on major proposals for two Energy Innovation Hubs. Both teams—the Battery Hub team led by professor Donald Sadoway and the Critical Materials Hub team led by professor Joel Clark—were finalists for five-year awards of \$100 million or more, but ultimately neither was successful.

The Washington Office assisted in key MIT Energy Initiative activities during the year. In October, MITEI and the student Energy Club hosted a pre-election debate on national energy policy, with Harvard professor Joseph Aldy representing the Obama campaign and domestic policy director Oren Cass representing the Romney campaign. In March, MITEI and the Hoover Institute at Stanford co-sponsored a workshop on game-changing energy technologies at the Woodrow Wilson Center. President Reif and professor Robert Armstrong led the MIT delegation to the workshop and related Capitol Hill and White House meetings, and former secretary of state George Shultz led the Stanford group. In May, MITEI co-hosted a Washington workshop on energy, water, and land use policies with the Center for Strategic and International Studies.

## Emerging Initiatives

### Online Education

With President Reif's inaugural address signaling a strong interest in shaping the future of higher education, the Washington Office took on an expanded role in representing MIT's educational activities and research into new educational technologies. The popular attention to new online educational tools, including edX/MITx and other massive open online course platforms, made these efforts highly visible to federal officials and university associations. The office worked with edX and the newly created Office of Digital Learning to help promote MIT's leadership in the application of new technologies to postsecondary education and to ensure that federal officials ranging from regulators to research program directors are familiar with emerging opportunities and ready to encourage their exploration.

In January, the office arranged for edX CEO Anant Agarwal to address the American Association of Universities Council on Federal Relations (CFR) and meet with AAU president Hunter Rawlings in New Orleans, at CFR's annual strategic planning retreat. The office participated in the planning of the Harvard-MIT Online Learning Summit in March, including the identification of appropriate government speakers and attendees, and led a series of associated on-campus meetings with officials from the Department of Education, the Office of Science and Technology Policy, and NSF. We organized meetings for President Reif and ODL director Sanjay Sarma with undersecretary of education Martha Kanter, NSF director Subra Suresh, and presidential science advisor John Holdren, as well as their senior advisors, to discuss the role nonprofit organizations such as edX—and MITx as a component of a research university—are

playing in improving access to and the efficacy of teaching materials and methods, both in the United States and globally. Potential impacts on college access and affordability, including new models for certification and credit, were also discussed. Several opportunities for federal support of these activities were identified, and the Washington Office worked with campus researchers to develop proposal concepts combining online delivery and assessment tools with educational techniques derived from learning science.

The office worked with the Office of the General Counsel and Vice President for Research Canizares to ensure that MIT's online educational materials were available to the widest possible international audience, consistent with US regulations. This included meetings with science and technology advisor to the secretary of state William Colglazier, former advisor Norman Neureiter, and staff at the National Academies. A new partnership to sponsor translation of MIT OpenCourseWare materials and their distribution in Arabic-speaking countries was announced by secretary of state Hillary Clinton in January.

### **Health**

With leadership from Associate Provost Schmidt, MIT began to consider a possible policy initiative on health, likely including health innovation, care delivery, and cost issues, and the Washington Office assisted in that process. Such an initiative would include further work on the convergence efforts discussed above. Concrete developments at MIT this year in two aspects of health policy are noted below.

#### *Big Data Research and Development*

The Washington Office has been working with faculty and staff from the Computer Science and Artificial Intelligence Laboratory (CSAIL), the Sloan School of Management, the Koch Institute, and the Center for Biomedical Innovation (CBI) to identify new NIH and Food and Drug Administration (FDA) program opportunities for the use of large data sets in health-related fields. The federal Big Data Research and Development Initiative announced last year aims to advance the state of the art in technologies for collecting, restoring, preserving, managing, analyzing, and sharing massive data sets and to address workforce needs in data science. The Washington Office completed the "Survey of Federal Big Data Efforts" in August to help campus researchers as well as officials at NIH and other agencies understand existing programs and identify new opportunities. NIH solicited proposals for a total of \$40 million in research awards in its Big Data to Knowledge program, one of the key new investments in the Big Data Research and Development Initiative, in April 2013.

#### *Cancer Megafund*

In September, Andrew Lo of Sloan's Laboratory for Financial Engineering introduced a new concept for applying financial engineering principles to encourage private investment in national R&D priority areas. He described possible new financial instruments that would spur innovation while spreading risk among multiple projects and investors. Lo proposed one such instrument, the Cancer Megafund, at the February AAAS panel on convergence noted above. Washington Office staff coordinated a series of meetings in May between Dr. Lo and federal officials to further explore this concept and invited representatives of interested White House and NIH offices to a campus workshop hosted by Lo in June 2013.

## Agency Activities

### Department of Defense

Secretary of defense Robert Gates and, from February, his successor Charles Hagel continued to advocate for basic research in support of DOD's mission. But with sequestration reducing the discretionary defense budget, cuts of 4.67% in the \$2.130 billion basic research budget (the 6.1 program) and in the \$4.7 billion applied research budget (6.2) interfered with the implementation of that vision. DARPA's \$2.817 billion budget was also proportionally reduced by the sequester.

As of the end of MIT's fiscal year, neither the House nor the Senate had passed defense appropriations bills. Sequestration cuts remain a continuing threat to DOD science and technology programs.

The Washington Office worked closely with MIT Lincoln Laboratory senior staff this year in seeking support for Lincoln's proposed \$400 million lab facility expansion and modernization. Strong congressional support from both the Massachusetts delegation and the House and Senate Armed Services Committees was obtained for these plans, including authorization of committee report language. However, because the construction would be on an established Air Force base, DOD approval under the complex Office of Management and Budget (OMB) guidelines for federal financing was still pending in June.

### Defense Advanced Research Projects Agency

This past year saw a continuation of outreach efforts with new DARPA leaders, who continued to signal a return to DARPA's historic model of support for breakthrough research with strengthened university ties. MIT was particularly engaged this year on advanced manufacturing, where DARPA has been building a major research effort and working closely with other agencies through the Advanced Manufacturing Partnership.

Arati Prabhakar, who became DARPA director in July 2012, toured MIT labs on May 9, 2013. She met with Vice President Canizares, MIT Executive Committee member Ray Stata, and nearly 30 researchers, including lab directors Yoel Fink (Research Laboratory of Electronics [RLE]), Vladimir Bulovic (Microsystems Technology Laboratories), and Daniela Rus (CSAIL) and professor Chris Voight from the MIT-Broad Foundry. In a lecture describing her framework for DARPA research, Dr. Prabhakar addressed a standing-room-only crowd of some 350 MIT faculty, students, and researchers.

### Homeland Security

The Washington Office helped organize meetings for Department of Homeland Security (DHS) undersecretary for science and technology Tara O'Toole at MIT and in Washington. Professor Neil Gershenfeld (Center for Bits and Atoms) hosted Dr. O'Toole on campus, and she met with Vice President for Research Zuber in Washington. The office participated in a celebration of the 10th anniversary of DHS's Science and Technology Directorate on April 11.

DHS support for R&D was one of the few positive funding stories for FY2013, with Congress reversing its FY2012 cuts to the agency's research budget. Legislators appropriated \$773 million for FY2013, short of the administration's \$857 million request but well above the \$617 million provided the previous year, even after an expected sequester of approximately 5%. The FY2014 appropriations bill had not passed Congress by the end of MIT's fiscal year, and a continuation of sequestration threatened to interfere with plans to grow DHS research capacity.

### **National Institutes of Health**

The Washington Office worked throughout the year to highlight the importance of NIH-funded research (which faced a 5.2% sequestration cut) in improving health outcomes while supporting economic growth. Office staff worked with the group United for Medical Research (UMR) to increase public understanding of NIH's role. The booklet *Leadership in Decline: Assessing U.S. International Competitiveness in Biomedical Research*, one of several UMR documents to which the Washington Office contributed in 2013, was cited by NIH director Collins as particularly valuable.

### **Indirect Costs**

University research cost structures, particularly in the context of health research, came under increased scrutiny, with reimbursement rates for indirect costs now under investigation in two separate studies by the Government Accountability Office. Representative Tim Murphy (R-PA) has been a particularly vocal critic of university charges for facilities and administration of awards. The Washington Office worked with the Office of Sponsored Projects and AAU to better explain to officials from NIH and the Department of Health and Human Services (HHS) the often-misunderstood accounting principles involved, including assisting Vice President for Research Zuber with a letter to the editor of the *Boston Globe* responding to a misleading article about research costs at MIT and other Boston-area universities.

### **NIH Salary Cap**

Washington Office staff continued to engage NIH officials regarding the maximum salary level allowed for researchers on NIH awards, which was lowered in 2012. Together with other universities and associations including UMR, the Council on Governmental Relations, APLU, and AAU, we worked to ensure that no further reductions would be imposed and that NIH policies would not otherwise discourage full participation by world-class researchers. Vice President for Research Zuber met with HHS officials in June to discuss NIH's salary cap, indirect costs, and related research award management issues.

### **Biomedical Workforce**

The Washington Office is carefully following new NIH policies for workforce development, implemented in response to the [Biomedical Research Workforce Working Group Report](#) of the NIH Advisory Committee to the Director.

## Food and Drug Administration

The Washington Office staff worked to deepen MIT's engagement with the Food and Drug Administration under the authority of an MIT-FDA memorandum of understanding updated last year. Commissioner Margaret Hamburg led an FDA delegation visiting MIT in September, and senior FDA staff including Eric Perakslis and Michael Coene returned to campus in March for further planning. Washington Office staff worked with FDA and campus leadership to develop a potential proof of concept project to address challenges the FDA Inspectorate faces in tracking imported products subject to FDA jurisdiction. FDA Inspectorate director Deborah M. Autor detailed these challenges in a concept paper and visited the campus in May to discuss them with researchers from Sloan, CSAIL, and CBI. These activities led to the submission of a CBI-led proposal to FDA in May.

## National Aeronautics and Space Administration

The Washington Office worked closely with campus leadership to understand the new vision for NASA that is emerging in the era of sequestration (which led to a 6.6% funding cut to the agency for FY2013). Two new administration proposals were generating considerable controversy as the MIT fiscal year ended. The president's 2014 budget request included a proposal for a new asteroid retrieval initiative, with first-year funding of \$105 million. The mission would dispatch a robotic probe to capture a 500-ton asteroid and move it into the Earth-Moon system, where astronauts could explore it (perhaps by 2021). The presidential request would also eliminate much of NASA's funding for education and public outreach as part of the proposed reorganization of STEM education efforts across federal agencies (discussed below). Congress showed little enthusiasm for either proposal, with multiple committee hearings subjecting agency officials to tough questioning. In coordination with involved MIT faculty, the Washington Office staff worked with AAU and APLU to ensure that the expertise NASA-funded researchers share with the public is maintained in any education reorganization and to oppose curtailment of current NASA educational activities, including the waiver process instituted with regard to continuation of ongoing education and public outreach programs under sequestration.

## National Science Foundation

The National Science Foundation is a major funder of MIT research across the physical, biological, and social sciences and various fields of engineering. The agency's primary response to budgetary pressures was to reduce the number of new awards while preserving funding for the remaining years of most existing grants. The final 2013 appropriations bill provided some additional funds for the agency above the FY2012 baseline, but post-sequestration the FY2013 budget was reduced by 3.1%. The agency's support for social sciences came under attack, as it has for several years. The final funding bill placed unprecedented restrictions on funding for political science, requiring certification by the NSF director that each award would support the national security or economic well-being of the United States. An early draft of an NSF reauthorization bill, authored by the Republican staff of the House Science Committee (HSC) and widely circulated in May, proposed similarly restrictive certification requirements for all NSF awards. It was widely criticized as an attempt to interfere with NSF's internationally

renowned peer review system and deepened a growing divide between majority and minority members on the traditionally bipartisan Science Committee. The bill has not yet been introduced.

In February, NSF director and former MIT dean of engineering Subra Suresh announced that he had accepted an offer to become president of Carnegie-Mellon University and would leave the agency in March. Deputy director Cora Marrett assumed leadership of the agency in an acting capacity. A successor, France Cordova, former president of Purdue University, was subsequently nominated.

## **Cross-Agency Activities**

### **Intellectual Property**

#### ***Patents***

The Washington Office worked with the vice president for research, with technology licensing office staff, and with AAU to monitor changes impacting patenting practices as the United States Patent and Trademark Office began to implement major changes to patent law codified in the 2011 America Invents Act. Issues arising in the implementation, some of which were addressed in a technical amendment bill adopted in January, include modifications to the one-year grace period for patent filing following public disclosure and new dispute procedures for issued patents, which are seen as disadvantaging small businesses and start-ups. Potential legislation to limit the power of so-called “patent trolls,” which acquire patents to enable future litigation challenges with no intention of utilizing them in production, was also monitored.

#### ***Public Access to Results of Federally Funded Research***

The White House moved forward with efforts to provide increased public access to the fruits of publicly funded research. In February, OSTP gave extramural research agencies six months to develop plans to support increased access. OSTP also directed agencies with intramural research programs to maximize the availability of publications and access to data from those efforts, and, in May, President Obama signed an executive order creating an “open data policy” for data generated by federal researchers. The order builds on previous efforts such as the [Health Data Initiative](#) (which expanded access to government-held data on hospitals, drugs, insurance products, and health care costs) by applying an open approach to geographic data, weather data, and other federally owned data sets.

Also in May, OMB solicited public input on access policies for scholarly publications and, separately, on policies for access to digital data. MIT responded to both calls for comments, stating that use of research results for public benefit is an essential component of the mission of the Institute and proposing principles for facilitating beneficial use.

#### ***Access to Publications***

MIT’s own open access policy, unanimously adopted by the faculty in 2009, endorses the concept of making scholarly publications available as widely as possible. In

comments to OMB, MIT recommended that federal policies regarding access to scholarly publications originating from federally funded research be built around this principle; in addition, the Institute recommended that policies be consistent across all funding agencies, promote archival preservation, and encourage future scholarship via reuse, derivative works, and text mining. With several consortia emerging to support agencies' plans for increasing access, the MIT Libraries decided to join in the SHARE proposal, which would build a network of digital repositories for scholarly articles at research universities. The SHARE concept, supported by AAU, APLU, and the Association of Research Libraries, builds on the expertise nonprofit research institutions have developed in establishing and governing shared resources, as exemplified by Internet2, HathiTrust, edX, and the Digital Preservation Network.

### *Access to Data*

MIT also supported expanded public access to research data, including the development of metadata standards and identification of repositories to promote long-term stewardship, preservation, and productive reuse of data generated through federally funded investigations. Agencies should adopt common procedures and regulations while recognizing that specific data standards and repository needs may be discipline specific. The Institute's comments, submitted by director of MIT Libraries Ann Wolpert, noted that research data, unlike publications, are not usually subject to copyright. Absent a specific need to protect privacy or confidentiality, the comments suggest that data generated with federal funding should be available for open reuse as a default.

## **Education Policy**

### ***Reorganization of STEM Education Programs***

The Washington Office remained involved with policy efforts focusing on the quality of STEM education and has been closely following the administration's proposal to reorganize federal programs supporting such education. While the efforts to better coordinate these programs and share expertise across federal agencies were well intentioned, most observers—including six separate congressional committees—concurred that the plan presented in the FY2014 presidential budget is not sufficiently complete. For example, it does not adequately preserve deep disciplinary expertise essential to the continued success of existing education programs at NASA, the National Oceanographic and Atmospheric Administration, the Department of Energy, and several other agencies. MIT shared these concerns with congressional committee staff in meetings with Vice President for Research Zuber. The Washington Office worked closely with AAU, APLU, and other STEM education stakeholders to ensure that existing programs continue in federal fiscal years 2013 and 2014 and to urge the administration to establish a public process to gather input prior to implementing a future, more fully developed reorganization plan. Such a plan should take into account the five-year strategic plan of the National Science and Technology Council's Committee on STEM Education, released in June, as well as other available information on the effectiveness and accessibility of STEM education programs for learners of all ages.

### **Student Loans**

A one-year extension of the 3.4% interest rate on subsidized Stafford loans, a bellwether of support for postsecondary education, expired as the MIT fiscal year ended. While the immediate effect was to double the interest rate on newly issued loans, new legislation was eventually enacted this past summer before most students took out loans for the fall 2013 semester. Proposals from the administration and from both Democrats and Republicans in Congress would allow future loan rates to vary but would reduce current rates to a level similar to 2012. (Note that compromise legislation was signed in August 2013 setting a variable rate with a current value of 3.86%.)

### **Regulation of Higher Education**

With the Higher Education Act due for reauthorization in 2014 and an overhaul of the tax code on the horizon, the Washington Office prepared for upcoming hearings and rule-making sessions addressing numerous challenges facing the college and university community. With AAU, APLU, and the Ad Hoc Tax Group, we began to develop positions on charitable donations, student loan programs and rates, authorization and accreditation, veterans' programs, and access and affordability.

### **Developing MIT Citizen Scientists**

The MIT Washington Office continued to provide opportunities for graduate and undergraduate students, as well as experienced scientists and engineers from the MIT alumni community, to use their technical expertise in policy activities and develop a role as citizen scientists. The office also worked to bring MIT faculty and administrators to Washington and federal officials to MIT (see the appendix).

### **Support for MIT Student Groups**

The office provided advice and assistance to the Science Policy Initiative (SPI) MIT graduate student group in its efforts around science policy this year. It worked with students from Stand With Science (SWS), which began as a project of SPI, on a working agenda and a collaborative relationship between these two groups. An advisory board was formed for SWS, which decided to formalize its role as the advocacy arm of SPI and began issuing monthly "calls to action." SWS produced the winning entry in the Innovation Prize contest sponsored by the Federation of American Societies for Experimental Biology, earning a \$10,000 prize that is being used to further its efforts to help end sequestration and restore healthy R&D funding levels. The group's efforts gained the attention of the White House Office of Public Engagement and were included in a White House list of science community efforts opposing the sequester.

### **Science and Technology Public Policy "Boot Camp"**

Washington Office director William Bonvillian, working with a committee of graduate students affiliated with SPI, again conducted an intensive "boot camp" course in public policy, with 18 class hours over four days during the January Independent Activities Period. A closing session on January 18 featured a panel of MIT researchers working on the PIE study, including Industrial Performance Center director Elizabeth Beck Reynolds and graduate students Jonas Nahm and Hiram Samel.

The program, the eighth Science and Technology Policy Boot Camp since 2007, was offered for credit for the first time this year as part of a new MIT science and technology policy certificate program. This program, developed by SPI students working with an interdisciplinary faculty committee led by MIT professors Susan Solomon and Charles Stewart, was supported by the MIT Washington Office.

### **Senior Congressional and Executive Branch Seminar**

After a two-year hiatus, the MIT Senior Congressional and Executive Branch Science and Technology Policy Seminar returned to campus for three days in April under new sponsorship. The 2013 seminar, “National Security Policy in a Time of Austerity,” was sponsored by MIT’s Security Studies Program with support from the Frankel Foundation. Professor Barry Posen chaired the seminar with administrative support and program guidance provided by the Washington Office. Thirty-one federal staff members, representing committee and member offices from the US Senate and House of Representatives as well as executive branch agencies, attended the three-day program. Admiral Gary Roughead (US Navy, retired), former chief of naval operations, gave the opening luncheon address and remained to participate each day. Other speakers included Dr. David Chu, former undersecretary of defense and president of the Institute for Defense Analyses, and faculty from MIT’s Department of Political Science. A highlight of this year’s program was a visit to Lincoln Laboratory hosted by the Laboratory’s Dr. Steven Bussolari.

### **Internships in Washington, DC**

The Washington Office hosts interns throughout the year. In 2013, three MIT undergraduate students, one recent graduate, and one postdoctoral intern worked in the office.

The office supports the MIT undergraduate summer intern programs run by the Department of Political Science and the Technology and Policy Program, which place students in various offices around the nation’s capital. Two students worked in the Washington Office in the summer of 2012 and one in 2013. In coordination with a similar program for University of Virginia students, office staff helped arrange visits to agencies including the World Bank, the State Department, NSF, NIH, and the Department of Energy, increasing the interns’ exposure to senior science policymakers.

Three additional undergraduate students participating in American University’s Washington-based exchange program worked on Washington Office projects as interns in conjunction with their coursework.

### **Congressional Visits Day and Executive Agency Visits Day**

The Washington Office worked with SPI students to plan two trips to Washington. For Congressional Visits Day in April, 20 MIT students joined with representatives of other science and engineering groups to advocate broadly for congressional support for research funding. MIT students participated in 50 congressional office visits. In October, the Washington Office helped students organize visits to discuss policy issues

and policy-related career paths with staff from federal agencies and nongovernmental organizations.

### **Alumni Association Legislative Advocacy Network**

The Washington Office supported alumni advocacy on R&D budget and policy issues via the MIT Alumni Association Legislative Advocacy Network, chaired by John Gavenonis '98. Staff from the Washington Office and the MIT Alumni Office, along with Vice President Canizares, presented webinars for network members on the federal budget process and on the impact of sequestration on R&D investments. They also encouraged alumni to contact their legislators in support of robust federal funding for science and engineering.

### **Coalitions and Working Groups**

The Washington Office amplified its activities through cooperation with other universities and stakeholders in the R&D and innovation enterprise. Participation in the following associations, organizations, working groups, and events is an essential part of those efforts.

- Ad Hoc Group for Medical Research
- Ad Hoc Tax Group
- American Council on Education
- Association of American Universities, Council on Federal Relations
- Association of Public and Land-Grant Universities, Council on Governmental Affairs
- Coalition for National Science Funding
- Coalition for National Security Research
- Coalition for Plasma Science
- Council of Graduate Schools
- Council on Competitiveness
- Council on Governmental Relations
- Energy Sciences Coalition
- Fusion Energy Sciences Day
- National Association of Independent Colleges and Universities
- New England Council
- Personalized Medicine Coalition
- Research! America
- STEM Education Coalition
- Task Force on American Innovation
- The Science Coalition
- United for Medical Research

## APPENDIX

### Faculty Meetings in Washington, DC

MIT Faculty/ Staff	Date(s)	Topic	Meeting
Claude Canizares	7/19/12	Research agenda for DOE Office of Energy Efficiency and Renewable Energy (EERE); research agenda for ARPA-E; NASA strategic plan and new research efforts	DOE EERE assistant secretary David Danielson, ARPA-E acting director Eric Toone, NASA chief technologist Mason Peck
Ernest Moniz and Donald Sadoway	7/19/12	Briefing on MIT battery research and Synergy Energy Consortium for Energy Storage proposal for DOE Energy Innovation Hub	Staff from the office of Senator John Kerry (D-MA), including his legislative assistant for energy Clare Sierawski
Robert Redwine	7/30/12	Funding for nuclear physics	DOE Office of Science director William Brinkman, OSTP principal assistant director for science Philip Rubin, House and Senate energy appropriations and authorization staff
Melanie Kenderdine, Harvey Michaels, Tonio Buonassisi, Francis O'Sullivan, John Reilly, Henry Jacoby, and Sergey Paltsev	8/8/2012	MITEI projects to promote energy efficiency, the transition to a low-carbon economy, and the energy needs of the developing world	Clare Sierawski and Jamesine Rogers, energy and environmental staff members from the office of Senator Kerry
Claude Canizares	9/6/12	MIT collaboration with SkTech, new start-up research university in Skolkovo, Russia; SkTech progress and how SkTech fits into MIT's overall international engagement strategy	White House OSTP staff, including assistant director for international relations Joan Rolf, assistant director for nanotechnology Altaf Carim, and assistant director for physical sciences Gerald Blazey; science and technology advisor to the secretary of state William Colglazier, his staff, and representatives from the Russia Desk

Martin Schmidt	9/20/12	Advanced Manufacturing Partnership; advanced manufacturing issues	Briefings at the Woodrow Wilson Center and briefings for the Senate Commerce Committee and House Manufacturing Caucus (along with Dow Chemical vice president Theresa Kotanchek); officials from NIST and OSTP
Brian Anthony, Sanjay Sarma, Martin Schmidt, Julie Shah, Stephen Sofen, and Brian Wardle	10/19/12	Advanced manufacturing research and education; MIT and NIST advanced manufacturing research portfolios, including robotics, additive manufacturing, nanomanufacturing, and Advanced Manufacturing National Program Office (AMNPO) activities to design the National Network for Manufacturing Innovation	NSF Defense Sciences Office staff member Michael Maher, NSF civil, mechanical, and manufacturing innovation director Steve McKnight, and Bruce Kramer from the Manufacturing Innovation Division; OSTP principal assistant director for national security and international affairs Arun Seraphin, assistant director for advanced manufacturing Tom Kerfess, principal assistant director for environment and energy Henry Kelly, and assistant director for clean energy and materials R&D Cyrus Wadia; NIST AMNPO staff member Paul Brand, NIST program office staff member Heather Evans, and lab leaders Al Wavering, George Arnold, Alkan Donmez, Chris Greer, Jim St. Pierre, Alex Liddle, and Ed Garbozci
Martin Schmidt and Suzanne Berger	11/1/12	Production in the Innovation Economy	Secretary of commerce Rebecca Blank
Bish Sanyal, Amy Smith, Chris Kaiser, Dan Hastings, and MIT students and lab leaders	11/8/12–11/9/12	Announcement of MIT's selection as an inaugural partner in the United States Agency for International Development (USAID) Higher Education Solutions Network (HESN), aimed at increasing innovation capacity in developing nations	Secretary of state Hillary Clinton, USAID administrator Rajiv Shah, OSTP director John Holdren, and science advisor to the USAID administrator Alex Dehgan
Miklos Porkolab and Earl Marmor	12/4/12	FY2013 funding for domestic research in fusion energy science, including the budget for the MIT Plasma Science and Fusion Center	Representative Ed Markey (D-MA), legislative director Joseph Wender, and policy director Michal Freedhoff; senior legislative assistant to Representative Michael Capuano (D-MA) Christina Tsafoulis and chief of staff Robert Primus; John Philips, legislative director for Senator Kerry

Rafael Reif	12/14/12	Federal budget negotiations, future of charitable deductions; role of universities in stimulating the economy through R&D in advanced manufacturing; MITx, massive open online courses, and online education; pending sequestration cuts to the budget and potential opportunity areas for research efforts on health around the MIT campus	NEC director Gene Sperling, OSTP's John Holdren and Tom Kalil; NIH director Francis Collins, National Cancer Institute director Harold Varmus, and National Center for Biotechnology director David Lipman
Sallie Chisholm, Robert Langer, and Maria Zuber	2/1/13	National Medal of Science and National Medal of Technology and Innovation recipients	OSTP Director Holdren and other participating federal officials
Miklos Porkolab and Earl Marmor	2/1/13	New report by the Fusion Energy Sciences Advisory Committee (FESAC) on the direction of US fusion research	FESAC members, Senate energy staff members David Berrick and Victoria Gunderston
Rafael Reif and Sanjay Sarma	2/14/13	Online learning technology, open online courseware, and their potential impact on learning science; MIT's online learning efforts and their relation to national education and training policy; new models for delivering, accrediting, and financing higher education; online learning technologies and the impact of pending sequestration cuts on research and education	NSF director Subra Suresh, assistant director for computer science and engineering Farnam Jahanian, division director for undergraduate education Susan Singer, and senior education advisor Barbara Olds; OSTP's Holdren, Kalil, and Kelly; undersecretary of education Martha Kanter and senior staff Hal Plotkin, David Soo, and Julie Miceli; Representative Joseph Kennedy (D-MA); Representative Michael Capuano (D-MA)

Rafael Reif, Suzanne Berger, Martin Schmidt, Claude Canizares, Richard Lester, Olivier de Weck, Richard Locke, Paul Osterman, Elizabeth Reynolds, Maria Zuber, and graduate researchers Jesse Jenkins, Jonas Nahm, Andrew Weaver, and Rachel Wellhausen	2/21/13	Production in the Innovation Economy interim report launch	Commerce Secretary Blank, EERE Assistant Secretary Danielson, NIST director Patrick Gallagher, OSTP Director Holdren, APLU president Peter McPherson, NEC deputy director Jason Miller, Karen Mills of the Small Business Administration, DARPA director Arati Prabhakar, NEC Director Sperling, Semiconductor Industry Association president Brian Toohey, NAE president Charles Vest, and National Academy of Sciences director of technology, innovation, and entrepreneurship Charles Wessner
Rafael Reif, Suzanne Berger, Martin Schmidt,* Claude Canizares, Olivier de Weck,* Richard Lester,* Richard Locke, Paul Osterman,* Elizabeth Reynolds,* and Maria Zuber (an asterisk indicates the MIT presenters who attended the congressional lunch meeting)	2/22/13	Production in the Innovation Economy interim report launch	National Academy of Sciences public meeting chaired by Charles Wessner; congressional luncheon briefing hosted by the Congressional Research and Development Caucus; OSTP Director Holdren with assistant directors Arun Seraphin, Henry Kelly, Tom Kurfess, and Cyrus Wadia; Vijay Kumar; NEC's Miller
Rafael Reif, Susan Hockfield, Robert Armstrong, Melanie Kenderdine, and Vladimir Bulovic	3/7/13– 3/8/13	Energy Gamechangers Workshop, a discussion of “game- changing” energy technologies with the greatest potential to boost America’s long- term economic growth and address the most serious energy challenges	Senator Lamar Alexander (R-TN), speaker of the House John Boehner (R-OH), Representative Fred Upton (R-MI), Representative Ed Whitfield (R-KY), Representative Pete Olson (R-TX), Representative Greg Walden (R-OR), Representative Henry Waxman (D-CA), OSTP’s Holdren, Kelly, and Kalil, deputy chief of staff Ted Wackler, senior advisor Jeff Smith, OMB Energy Branch chief Kevin Carroll, and senior policy analyst Adam Cohn

MIT Energy Club team including Ryan Cook, Chris Jones, Ryan Sheinbein, Dania El Hassan, Kate Goldstein, Zak Accuardi, Carla Li, Mehmet Onbasli, Wardah Inam, and Defne Gurel	3/8/13	Energy efficiency strategy for the city of Fort Worth and a business plan to upgrade heating and cooling systems in a big box retail chain	OSTP and DOE staff of the Better Buildings Challenge
Miklos Porkolab, Earl Marmar, and Anne White	3/14/13	Funding balance in the Department of Energy's Office of Fusion Energy Sciences, including the prospects for continued operations of the Alcator C-Mod tokamak	House Committee on Science, Space, and Technology staff members Christopher King and Andrea Jones, Senate Committee on Appropriations (Energy and Water Development Subcommittee) staff member Leland Cogliani, legislative assistant Tsafoulas, policy director Freedhoff, Senator William Cowan (D-MA), legislative assistant to Representative Niki Tsongas (D-MA) Becky Cairns, and Representative Kennedy with legislative director Sarah Curtis and legislative assistant for energy and science Eric Fins
Claude Canizares and Greg Morgan	3/22/13	MIT's work with SkTech	OSTP Assistant Director for International Relations Rolf and special assistant to the president and senior director for Russia and Eurasia Alice Wells; Physical Science Officer, State Dept. Office of Space & Advanced Technology
Maria Zuber	4/25/13	NSF, advanced manufacturing, and computational research and education, including cross-disciplinary online opportunities; NASA's ongoing efforts to rejuvenate technology development at the agency along with the asteroid initiative as presented in the president's FY2014 budget request; Department of Energy attempts to better coordinate work on the connections between water and energy; energy research, especially the fate of the MIT Plasma Science and Fusion Center research program	NSF's McKnight and Jahanian; Michael Gazarik, associate administrator of the Space Technology Mission Directorate; senior advisor to the undersecretary Colin McCormick, senior policy advisor Craig Zamuda, and AAAS policy fellow Mark Philbrick; House Committee on Science, Space, and Technology's Richard Obermann and HSC's Adam Rosenberg

Erik Brynjolfsson	5/3/13	Impact of technology, productivity, and employment	President's Council of Advisors on Science and Technology
Miklos Porkolab	5/8/13	Critical state of fusion research and plasma science in the US, including the Department of Energy's plans for imminent shutdown of Alcator C-Mod	OMB Energy Branch Chief Carroll
Andrew Lo	5/13/13	Cancer Megafund proposal for shared risk financing of health care innovations; lunch seminar on megafund	NEC Deputy Director Miller; OSTP staff including Rolf, Rubin, Kei Koizumi, Jon Andrechik, Doug Rand, Tammy Dickinson, Reed Skaggs, George G. Cravaritis, Carlos Pena, Mark DeLoura, Katie Dowd; NIH National Center for Advancing Translational Sciences director Chris Austin; AAAS Fellow Jennifer C. Shieh
Rafael Reif	5/16/13	DHS research opportunities; importance of basic research and effects of sequestration on research funding; MIT efforts in online education	Senator Tom Carper (D-DE), chair, Senate Homeland Security and Government Affairs Committee; Representative Eric Cantor (R-VA), House majority leader; Robert Siegel, cohost of National Public Radio's evening news
Emery Brown	6/4/13	Role of anesthesia research in neuroscience as a potential area of interest for the president's BRAIN initiative	AAAS panel for Capitol Hill briefing
Maria Zuber	6/21/13–6/22/13	Sequestration and budget issues; administration's proposal to consolidate STEM education programs; indirect costs; NASA funding and STEM education consolidation funding for Alcator C-Mod; National Institute of Food and Agriculture (NIFA) research agenda and MIT's interest in issues including water and food safety	NASA director of astrophysics Paul Hertz and director of planetary sciences Jim Green; Senate appropriations senior staffers Gabrielle Batkin and Jean Toll Eisen; HHS chief financial officer Ellen Murray; HSC's Obermann and Senate commerce, science, and transportation professional staff member Ann Zulkosky; House Appropriations Energy Subcommittee professional staff member Ben Hammond; NIFA administrator Sonny Ramaswamy

Martin Schmidt	6/27/13	Advanced Manufacturing Partnership and NMMI; NIST programs supporting advanced manufacturing; advanced manufacturing initiatives and manufacturing education; manufacturing-related activities at EERE; follow-on activities to the Advanced Manufacturing Partnership	Director Mike Molnar and deputy director Frank Gayle, AMNPO; NIST coordinator for manufacturing research Roger Kilmer; NSF's McKnight and Maher; EERE special advisor for manufacturing Elizabeth Wayman; Department of Commerce manufacturing policy strategist Neal Orringer and NEC's Miller
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### Federal Officials—Visits to MIT

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Government Official	Date(s)	Topic	Meeting
FDA commissioner Peggy Hamburg, senior advisor Vicki Seyfert-Margolis, chief technology officer Eric Perakslis, and chief information officer Mike Coene	9/12/12	Expanded engagement in the application of “big data” to the development of new pharmaceuticals, medical devices, and treatment protocols	President Reif, Gigi Hirsch, Daniela Rus, and faculty from CSAIL
Gregory Tassej, NIST senior economist	9/12/12	Economics of the US manufacturing sector; innovation policies that can drive economic growth	Suzanne Berger, Mary Cunningham Boyce, Claude Canizares, Charles Cooney, Olivier de Weck, Jesse Jenkins, Joyce Marie Lawrence, Richard Lester, Paul Osterman, Michael Piore, Elizabeth Beck Reynolds, Donald Rosenfield, Hiram Samel, Phillip Sharp, Martin Arnold Schmidt, and Andrew Weaver  Talk to SPI & MIT community
House majority leader Eric Cantor (R-VA) and senior staff	10/12/12	Tour of Koch Institute; briefings on key research projects and their strong ties to the biological/pharmaceutical industry innovation system	Tyler Jacks, Claude Canizares; roundtable discussion with Philip Sharp, Robert Langer, Paula Hammond, and Angela Belcher, moderated by Tyler Jacks

House Science Committee minority staff members Dahlia Sokolov and Marcy Gallo	11/16/12	Advanced manufacturing; lab tours; tour of NSF Science and Technology Center; technological innovation; CSAIL projects	Martin Schmidt; Philip Sharp, Forest White, and Dane Wittrup; Roger Kamm; Leon Sandler; Russ Tedrake, Frans Kaashoek, Bill Freeman, Rob Miller, and Daniela Rus
Director of US citizenship and immigration services Alejandro Mayorkas	11/28/12	Martin Trust Center for Entrepreneurship	MIT community lecture
NASA chief technology officer Mason Peck	12/6/12	Strategic planning for the Department of Aeronautics and Astronautics; Kavli Institute for Astrophysics and Space Research, and Lincoln Laboratory; working lunch with MIT Space and Technology Fellows; Earth, Atmospheric and Planetary Sciences	John Hansman and Jaime Peraire; Dave Miller; Claude Canizares; Ian Waitz; Mark Bautz, Roy Bondurant, Greg Berthiaume, and Don Boroson; Chase Coffman, Brad Holschuh, Dustin Kendrick, Anne Marinan, Chris Masuru Pong, Louis Perna, and Matthew Smith; Sara Seager
Assistant secretary of treasury Janice Eberly	2/7/13	Economics of higher education	Symposium moderated by James Poterba with additional panelists David Autor, Israel Ruiz, and Claudia Goldin (Harvard)
Karen Mills, US Small Business Administration; also via videoconference: NEC deputy director Jason Miller and senior policy advisor Brayden McCarthy	2/8/13	PIE working session to discuss gaps in financing for companies developing advanced manufacturing technologies and processes	Susan Hockfield, Elizabeth Beck Reynolds, and Suzanne Berger, with Willy Shih (Harvard Business School), Nesbit Hagood (Qualcomm) and, via videoconference, David Hart (OSTP and George Mason University)

NEC director Gene Sperling and staff member Aviva Aron-Dine, NSF director for undergraduate education Susan Singer, OSTP assistant director Henry Kelly, and Department of Education senior advisor Hal Plotkin	3/4/13– 3/5/13	MIT-Harvard Online Education Summit; online education issues	President Reif, Harvard president Drew Faust, and faculty and staff from MIT, Harvard, and edX; meetings between Kelly, Plotkin, and Singer and Dan Hastings, Martin Schmidt and Sanjay Sarma, Eric Klopfer, Mitch Resnick, Ike Chuang, Vijay Kumar and Cecilia d’Oliveira, and Anant Agarwal
NASA associate administrator for space technology Michael Gazarik	3/7/13– 3/8/13	Workshop on Digital Fabrication; meetings on NASA technology issues: MIT Kavli Institute, Lincoln Laboratory	Meetings with Maria Zuber; David Miller and Jerome C. Hunsaker; Space Technology fellows Chase Coffman, Brad Holschuh, Sunny Wicks, Anne Marinan, Chris Masuru Pong, and Louis Perna; Paulo Lozano and Jaime Peraire; Mark Bautz, Robert Goeke, Herman Marshall, and Mark Schattenburg; and Greg Berthiaume, Don Boroson, and Jeffrey Mendenhall
Representative Bill Foster (D-IL)	3/8/13	Legislation to charter a nonprofit organization that will provide a seed funding source for “fab labs” across the country	Science of digital manufacturing meeting sponsored by OSTP and MIT’s Center for Bits and Atoms
DHS undersecretary for science and technology Tara O’Toole, DHS ARPA director Paul Benda, and DHS program directors Jose Vazquez and Michael Hopmeier	4/11/13	R&D challenges at DHS	Meetings with Maria Zuber, Claude Canizares, Neil Gershenfeld, Sandy Pentland, Joost Boosen, Daniela Rus, Sebastian Seung, and other faculty and research staff
FDA delegation led by Deb Autor, deputy commissioner for global regulatory operations and policy	5/2/13	How FDA deals with risk, possible research opportunities	Maria Zuber and other senior researchers

Department of Housing and Urban Development secretary Shaun Donovan	5/7/13	Need for creative urbanism in a time of economic strain, increasing importance of the urban planner	Xavier de Souza, President Reif, and MIT students; sponsored by the Department of Urban Studies and Planning
DARPA director Arati Prabhakar	5/9/13	DARPA research agenda	Talk on DARPA research directions; meetings with 27 faculty members including RLE researchers led by lab director Yoel Fink, MTL researchers led by Vladimir Bulovic, the MIT-Broad Foundry's Chris Voight, and CSAIL researchers led by Daniela Rus
Alex Dehgan, USAID science advisor to the administrator, and HESN staff Ticora Jones and Amit Mistry	5/13/13– 5/14/13	Comprehensive Initiative on Technology Evaluation (CITE) and International Development Innovation Network (IDIN), MIT's projects in USAID's newly formed Higher Education Solutions Network; building innovation capacity in the developing world; public lecture on HESN, USAID's innovation agenda, and engagement with universities	Bish Sanyal, Amy Smith, Derek Brine, Kofi Taha, and the CITE and IDIN teams; Rafael Reif; Chris Kaiser; Eric Grimson; Adèle Naudé Santos; Ian Waitz; approximately 175 MIT students, faculty, and staff

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Faculty Testimony in Washington, DC

MIT Faculty/ Staff	Date	Topic	Committee
Deborah Lucas	3/14/13	"Keeping College Within Reach: Examining Opportunities to strengthen federal student loan programs	House Committee on Education and the Workforce
Simon Johnson	6/4/13	Fiscal and economic effects of austerity	Senate Budget Committee