MIT Washington Office

The Washington, DC, Office of the Massachusetts Institute of Technology was established within the Office of the President in 1991. The office reports to MIT's president and works closely with the vice president for research and other senior administrators. The staff of the office during FY2015 included William Bonvillian, director; Philip Lippel, assistant director; Kate Stoll, senior policy advisor; Helen Haislmaier, program coordinator; and Lisa Miller, office representative.

The mission of the MIT Washington Office is to support the science and technology advocacy activities of MIT's president, other senior officials, and faculty in Washington, DC, and to extend MIT's historic role as one of the nation's premier research universities in providing leadership on national science and technology issues. The Washington Office facilitates a two-way exchange of information and ideas between MIT and Washington institutions, including executive branch agencies, offices, and departments; Congress; and university, industry, and science organizations.

Connecting the Institute with the Policy Agenda in Washington, DC

MIT helped design the model of the federally backed research university and continues to support a strong federal role in science and technology research and development. Washington Office staff members engage with key officials from the legislative and executive branches of the federal government and with other national figures on federal policy issues regarding science and technology, education, and other core Institute concerns. They also help identify and work with appropriate campus experts to inform specific policy discussions.

With congressionally mandated budget limitations restricting all federal discretionary spending for the current federal fiscal year and appropriations proposals for the upcoming year, research and development (R&D) funding levels remained a core concern for the Washington Office. The office supported MIT's major national policy initiatives on energy, online education, advanced manufacturing, and the convergence of the life, engineering, and physical sciences. These policy initiatives, important in themselves, also help federal decision makers envision how science and technology investments could help resolve the great challenges we face nationally and internationally. The office also assisted in laying the groundwork for federal interactions regarding the recently announced campus initiatives on the environment and on innovation, each of which address broad societal challenges.

The sections below review the overall funding situation for federal research, with brief funding summaries for each of the five major research agencies that support most of MIT's research. Individual policy initiatives are then reviewed, followed by a discussion of the office's work with MIT students interested in science and technology policy issues. The appendix to this report lists key meetings and other interactions between Washington, DC, officials and MIT administrators, faculty members, and staff.

Science Research and Development Support

The Sequestration Challenge to Federal Research Budgets

The Budget Control Act (BCA), passed by Congress in 2011, imposed strict limits on the discretionary portion of the federal budget for fiscal years 2012 through 2021, forcing spending to be reduced by $917 billion below previous official projections. When the Joint Select Committee on Deficit Reduction, established under the act, failed to identify an additional $1.5 trillion in savings over that period as mandated by the BCA, automatic cuts were triggered in a decade-long process termed "sequestration," starting with a $105 billion cut in federal FY2013. A compromise agreement, finalized in January 2014, modified the overall levels of the FY2014 and FY2015 federal discretionary budgets (covering the period from October 2013 to September 2015). The agreement provided a partial rollback of the sequestration cuts for those two years but extended the overall BCA through FY2023. As of the end of MIT's fiscal year, no similar agreement was in sight for federal FY2016 or beyond, so federal budgets are scheduled to revert back to full sequestration levels as of October 1, 2015.

Federal research and development support is part of the discretionary budget and thus subject to sequestration. The initial cuts in 2012 and 2013, followed by stagnant budgets during 2014 and 2015, make it challenging for the federal government to maintain its historic role as the predominant supporter of university-based R&D. Restoration of adequate funding levels for federal R&D agencies and preservation of their broad funding authorities have been major efforts of the MIT Washington Office.

However, R&D support in Washington, whether in Congress or the executive branch, is not served particularly well by only making what could be called the "dial-able" argument: dialing up increases in R&D funding solves all science and technology challenges. The Washington Office, working with MIT leaders, has focused on providing arguments about problems that can be solved and challenges that can be addressed through science.

By the end of MIT's fiscal year, there was only limited progress with respect to the argument that federal support for research should be treated more like an investment than a simple expenditure. This was largely because the Budget Control Act protected certain core political positions for each major party from sequestration. Entitlement programs supported by the Democratic party are largely immune, and in the case of the Republican party no tax increases would be required. Instead, the entire 10-year sequestration cut is equally divided between federal defense discretionary programs and non-defense discretionary programs. These programs account for less than 40% of the total federal budget but include nearly all federally funded research and development activities.

R&D Funding by Agency

Although FY2016 remains highly uncertain, consolidated appropriations bills for the end of federal fiscal years 2014 and all of 2015 restored well over half of the R&D funding initially cut by sequestration, with most R&D agencies ending up above FY2012 pre-sequestration funding levels. Preparation of FY2016 appropriations bills conforming to full sequestration levels has been the major focus of Congress throughout the year.

For the first time in six years, members of both the House and Senate appropriations committees have completed work on all their FY2016 bills. The full House passed measures that would provide funding for Department of Defense (DOD) science and technology (S&T) programs, Department of Energy (DOE) R&D programs, the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA), the National Science Foundation (NSF), the National Institute of Standards and Technology (NIST), and the National Institutes of Health (NIH). But Senate work on the appropriations bills has stalled because of partisan disagreements about overall spending limits. Congressional Republicans are working toward the overall FY2016 sequestration limit set by the BCA but want to raise defense limits while further reducing non-defense discretionary spending. Congressional Democrats support the president's position that the sequestration limits for both defense and domestic spending must be raised. In general, R&D appropriations in both chambers are below the administration's FY2016 request but at or above FY2015 levels.

Republican congressional leaders have made it clear they do not want to shut down the government and want to forge a new two-year agreement on overall budget levels so that Congress does not have to face a shutdown during a presidential (and congressional) election year. But with significant political barriers to negotiations with their Democratic counterparts remaining as the year drew to a close, it seemed increasingly likely that a continuing resolution, extending 2015 budget levels for at least a few months and perhaps the full year, was the only option available to avoid a shutdown.

The chart below, prepared by the American Association for the Advancement of Science (AAAS), compares funding provided by the FY2015 appropriations legislation to major R&D agencies with the prior year's funding, the presidential budget request, and the levels proposed by the House and Senate for FY2016, which are still pending. It is followed by a discussion of funding at the five major federal R&D agencies that MIT engages with.

Estimates of Congressional Action on FY2016 R&D Budgets by Agency

	FY2014 Actual	FY2015 Estimate	FY2016 Budget	FY2016 House*	Percent Change Request	Percent Change FY2015	FY2016 Senate*	Percent Change Request	Percent Change FY2015
Research and Development Estimates									
Defense (military)**	66,505	66,629	72,165	70,667	–2.1	6.1	73,518	1.9	10.3
(6.1–6.3 + medical)	13,431	13,982	13,246	14,268	7.7	2.0	14,622	10.4	4.6
All other	53,074	52,647	58,919	56,399	–4.3	7.1	58,895	0.0	11.9
Health and Human Services (HHS)	30,669	30,934	31,871	31,393	–1.5	1.5	32,648	2.4	5.5
National Institutes of Health	29,251	29,488	30,476	30,556	0.3	3.6	31,434	3.1	6.6
All other HHS	1,418	1,446	1,395	837	–40.0	–42.1	1,215	–12.9	–16.0
Energy	11,994	11,751	12,462	11,853	–4.9	0.9	11,992	–3.8	2.0
Atomic Energy Defense	4,964	4,750	4,674	4,768	2.0	0.4	4,729	1.2	–0.4
Office of Science	4,724	4,680	4,900	4,680	–4.5	0.0	4,720	–3.7	0.9
Energy Programs	2,306	2,321	2,889	2,406	–16.7	3.7	2,543	–12.0	9.6
NASA	11,754	12,145	12,329	12,406	0.6	2.2	12,318	–0.1	1.4
National Science Foundation	5,800	5,999	6,309	6,077	–3.7	1.3	6,031	–4.4	0.5
Agriculture	2,380	2,446	2,884	2,411	–16.4	–1.4	2,408	–16.5	–1.6
Commerce	1,552	1,507	2,115	1,615	–23.6	7.2	1,684	–20.4	11.7
NOAA	629	682	912	747	-18.1	9.5	762	-16.5	11.7
NIST	655	668	888	689	–22.3	3.2	715	–19.4	7.1
Transportation	797	796	1,048	860	–17.9	8.1	865	–17.5	8.7
Homeland Security	1,032	905	569	577	1.4	–36.3	558	–2.0	–38.4
Veterans Affairs	1,101	1,059	1,114	1,114	0.0	5.2	1,114	0.0	5.2
Interior	840	905	985	845	–14.2	–6.6	838	–14.9	–7.4
US Geological Survey	649	665	761	659	–13.4	–0.9	671	–11.9	0.8
Environmental Protection Agency	538	521	528	492	–6.7	–5.5	492	–6.8	–5.5

Note. Includes R&D and R&D facilities. All figures rounded to the nearest million. Changes calculated from unrounded figures. The project gross domestic product inflation rate between FY2015 and FY2016 is 1.6%.

*As of July 28, all Senate figures and some House figures are appropriations committee or subcommittee marks only.

**Includes overseas contingency operation funding.

Source: Office of Management and Budget R&D data, agency budget documents, and appropriations bills and reports

National Institutes of Health

In FY2015, the NIH budget remained below pre-sequester levels despite a $150 million (or 0.5%) increase over FY2014, for a total budget of $30.1 billion. Most NIH institutes saw a mere 0.3% increase in their budgets, well below the rate of inflation.

The National Institute on Aging received a 2.4% increase, and Congress provided a 1.1% increase to the National Institute for Neurological Disorders and Stroke, primarily for Alzheimer's research. The National Cancer Institute, NIH's largest institute, received a 0.55% increase. The NIH component of the president's BRAIN (Brain Research through Advancing Innovative Neurotechnologies) Initiative received a $25 million boost, to $65 million. House and Senate appropriations bills pending as the year ends would provide significant 3% and 6% increases, respectively.

National Aeronautics and Space Administration

The FY2015 omnibus bill provided $18 billion for NASA, an increase of $364 million (or 2.1%) over FY2014 levels. This exceeded the president's budget and the recommendations of the appropriators. The biggest winner was aeronautics research, with a 15% increase. The Science Mission Directorate received a nearly 2% increase, including a $160 million boost over the president's request for planetary sciences to a total of $1.44 billion. At least $100 million of this budget must be spent on the mission to Jupiter's icy moon Europa. Space technology received a $20 million (3.5%) boost. Education received a 2.1% boost to $119 billion and maintained $40 million for the Space Grant program. The provision prohibiting NASA from participating in bilateral activities with China remained in place. NASA would receive 0.6% and 1.6% increases, respectively, in the pending House and Senate appropriations bills for FY2016.

Department of Energy

Department of Energy technology programs in efficiency, renewables, fossil energy, and nuclear energy all saw FY2015 increases in new budget authority, although the increases for efficiency and renewables were smaller than those requested in the president's budget. The Office of Science (OS) and the Advanced Research Projects Agency-Energy (ARPA-E) were flat funded at $5 billion and $280 million respectively.

In the OS Office of Fusion Energy Sciences, appropriators trimmed US cash and hardware contributions to the ITER (International Thermonuclear Experimental Reactor) project by $49.5 million but rejected the administration's proposed cuts to the domestic fusion program. Instead, the office gave domestic researchers a slight increase, including approximately $22 million for research and operations at MIT's Alcator C-Mod tokamak in FY2015. The funding bill specified that C-Mod should remain in operation through FY2016 while planning commences for its "orderly shutdown" thereafter.

Under appropriations bills pending at year end, DOE's Office of Science would receive a 0.7% (House) or 1.5% (Senate) increase, far short of the administration's requested 5.4%. The president's budget requested increases for most offices within OS, varying from 2.9% for High Energy Physics to 14.8% for Advanced Scientific Computing Resources. But the request for Fusion Energy Sciences would maintain level contributions to the

international ITER construction project at $150 million while reducing ongoing plasma science research activities by $47.5 million (13%). Funding for C-Mod would be reduced by $4.3 million, allowing five weeks of experimentation in the tokamak's final year of operation. The pending House appropriations bill would flat fund Fusion Energy Sciences, while the Senate proposal would reduce its budget by $198 million or 43% relative to FY2015. The Senate would cut the budget for current fusion research as well as defunding ITER construction.

The president requested a 16.1% increase for ARPA-E, but pending legislation would keep the agency's budget flat at $280 million (House) or would provide a 3.9% increase (Senate).

National Science Foundation

With a 2.4% increase in FY2015 over FY2014, to $7.344 billion, the National Science Foundation fared better than most agencies. The total is $89 million above the president's request and includes a $125 million increase for NSF's research accounts. The administration had recommended flat research funding but had requested a $43 million increase for educational activities. Congressional funding for priority agency-wide programs in materials and smart manufacturing, cyber-enabled education, and secure computing remained essentially flat, while sustainability research decreased by $35 million. Cognitive Science and Neuroscience—NSF's contribution to the interagency BRAIN Initiative—more than doubled to $29 million as the program continued to ramp up rapidly.

The National Science Foundation's six research directorates grew in FY2015 by $125 million, or 2.8%, to $5.93 billion. In contrast, the Obama administration had proposed no boost for research. The increase will allow the agency to double, to $29 million, its spending on cognitive science and neuroscience in light of the administration's ambitious BRAIN Initiative plan to develop neurotechnologies to better explore brain functioning. NSF had requested a 6.3% boost for its education directorate, to $890 million; Congress provided a 2.4% increase, to $866 million.

Pending FY2016 appropriations bills would give NSF only small increases. Senate legislation would provide a 0.5% overall increase. The corresponding House bill offers a 1.3% increase and includes controversial guidance regarding the distribution of funds among NSF's research directorates. While the appropriators did not specify funding levels for each directorate (as the House Space, Science, and Technology Committee did in pending NSF reauthorization legislation), the guidance, if enacted, could force major cuts to two directorates, Geosciences and Social, Behavioral and Economic Sciences.

Department of Defense

While DOD's budget proposed a significant cut for FY2015 in basic research across the department's research agencies, Congress rejected that cut, increasing basic research by 5% over the prior year to $2.16 billion. Applied research was funded at $4.64 billion, 0.8% below the prior year. Final FY2015 funding for technology development was $5.3 billion, 6.4% above the prior year's funding. Overall, these three S&T funding categories were increased by 3.4%.

Although FY2016 appropriations outcomes are still pending and subject to budget negotiations, House and Senate bills propose 2.0% and 4.6% increases, respectively, in defense S&T programs.

MIT Policy Initiatives

MIT faculty and administrators remained deeply involved with national policymakers in a series of ongoing policy initiatives and studies. These initiatives have significant science and technology aspects, and provide concrete examples of the importance of federal research support.

Future Postponed Report

The Washington Office worked with Professor Marc Kastner and a committee of 30 MIT senior faculty members on a new initiative to highlight potentially transformative scientific opportunities that are not being adequately explored in the current federal funding environment. The first-year efforts under this initiative culminated with the April 27 release of the MIT report The Future Postponed: Why Declining Investment in Basic Research Threatens a US Innovation Deficit. The report lays out the critical importance of federal investment in science research to grow the US economy, develop better therapies and cures, stay competitive internationally, and solve global challenges.

The Future Postponed faculty committee, representing every school at the Institute and numerous disciplines, worked with a skilled science writer to develop the report. Upon release of the report, select members of the community traveled to Washington, DC, in April to participate in a major forum hosted by AAAS as well as sessions with White House and congressional staff. At these events, they told stakeholders and policymakers why investment in basic research is critical for the future of the nation.

The report discusses 15 case studies of prospective science and engineering advances in areas ranging from infectious disease to batteries, Alzheimer's disease, and cybersecurity. The report attempts to make concrete how research investment can create new opportunities to improve society, as validated by a respected committee of scientists. This is a story the scientific community has not always told well. "The Future Postponed" gained attention in the national press, including the *Wall Street Journal*, the *New York Times*, Bloomberg, Reuters, and the *Los Angeles Times*, and was widely circulated on Capitol Hill.

Can this new way of telling science's story be broadened beyond MIT? Led by Professor Kastner, the Science Philanthropy Alliance, composed of six major foundations, is continuing to have outstanding scientists develop case studies, which can then be used to seek research support from philanthropists. The Association of Public and Land-grant Universities (APLU) is now considering a complementary effort to use these case studies with congressional leaders and other policymakers.

Convergence

The MIT Washington office continued to support the "convergence" research model across life, engineering, and physical sciences for biomedical research, drawing on the

2011 MIT white paper "The Third Revolution: The Convergence of the Life Sciences, Physical Sciences and Engineering." The Precision Medicine Initiative announced by President Obama in the State of the Union address utilizes this convergence model, as do research efforts at NIH, the Defense Advanced Research Projects Agency (DARPA), and NSF in support of the president's BRAIN Initiative. DARPA's new Biological Technologies Office also now uses a convergence model to support breakthrough research.

To further advance this research model, the Washington Office conducted interviews with convergence leaders in the policy sphere to gather information on best practices and began planning a follow-up report, expected to be developed in 2016. A new committee of convergence researchers at MIT led by Professor Philip Sharp, Professor Tyler Jacks, and former MIT president Susan Hockfield formed to discuss the goals and vision of this next report. The group focused on the need to examine the most promising opportunities that could derive from convergence research in the health sciences. The team plans to host two major workshops with convergence experts around the country, culminating in a major white paper that will provide a roadmap for the future of convergence research and its potential to positively impact health care in the United States and more broadly.

Advanced Manufacturing

MIT's active engagement in the nation's manufacturing policy continued this year, with Washington Office staff working together with campus experts to support President Rafael Reif in his role as steering committee co-chair for the federal Advanced Manufacturing Partnership (AMP) 2.0. Reif delivered key AMP 2.0 recommendations to President Obama at the White House on October 26, 2014, sharing the stage with co-chair Andrew Liveris, the president and CEO of Dow Chemical Co.; Secretary of Commerce Penny Pritzker; presidential science advisor John Holdren; and National Economic Council director Jeff Zients, who also participated in the committee's final meeting and White House briefing. They were joined by 16 other AMP leaders, including industry CEOs and university presidents. The President's Council of Advisors on Science and Technology (PCAST) approved and published the committee's AMP 2.0 report, which outlined a series of recommendations for renewing advanced industrial production in the United States in an effort to address the loss of manufacturing production and jobs that has occurred over the last three decades.

"To reverse that trend, and to compete in an intensely globalized world, we need to take a big leap forward, fueled by innovation—and we need an innovation system that can deliver new manufacturing technologies and processes to get us there," Reif said in remarks to the president. He reiterated the point later that day in a public forum on the report held at the National Academies. Professor Krystyn Van Vliet of MIT, who was co-chair of the technology analysis group for the AMP 2.0 report effort, also presented at the National Academies forum.

The AMP 2.0 report recommends new ways of enabling innovation, training workers, and aiding the US business climate, extending these three "pillars" for bolstering industrial growth that were established by the original AMP committee in 2012 under the leadership of Liveris and then-president Susan Hockfield.

To enable innovation, the report calls for prioritizing advanced manufacturing technologies, developing advanced manufacturing technology strategies and cross-agency R&D coordination, creating a standing university-industry consortium to guide federal actions, developing better standards and information-sharing mechanisms in manufacturing, and establishing a strong governance structure for the National Network for Manufacturing Innovation (NNMI).

To build a skilled workforce for advanced manufacturing, the report outlines measures ranging from new programs in skill certification and job training to a campaign portraying the image of contemporary manufacturing. Specific programs and strategies addressing workers from diverse backgrounds are discussed, including how to utilize the skills of returning veterans, encourage apprenticeship programs for middle-skills workers, and retrain experienced workers from declining industries.

To improve business conditions for US manufacturers, especially small and midsized firms, the report proposes providing tax incentives and better access to capital to companies seeking to scale up advanced manufacturing operations and improving the flow of information about technologies, markets, and supply chains among all US stakeholders.

The White House subsequently announced new measures responding to most of the concepts outlined in the AMP 2.0 report. MIT continued to engage with the White House, federal agencies, and its AMP 2.0 partners to assist in the implementation of these measures.

Expansion of the National Network for Manufacturing Innovation was a central activity for the advanced manufacturing community. Congress showed bipartisan approval for this new administration initiative when it included the Revitalize American Manufacturing and Innovation Act (RAMI) in a year-end budget deal passed in December. While RAMI formalized NNMI and gave the Department of Commerce some coordination authority, Congress has not yet appropriated dedicated funding for manufacturing innovation institutes (MIIs), which are the major nodes in the network. However, federal agencies continued to fund MIIs aligned with their missions. The Department of Defense, the lead sponsor of three MIIs as the year began, announced three new MII competitions this year. MIT faculty and staff assumed significant roles on teams participating in each of them. The Department of Energy also announced its intent to lead its third institute. The DOE competition had not formally begun at year end, but MIT was in preliminary discussions with potential teammates. The president's FY2016 budget, released in February, proposed enlarging the NNMI once again, with eight additional institutes. This would bring the federal investment to $500 million a year in funding, with industry and state cost sharing more than doubling the total NNMI budget.

Innovation Initiative

In December, an advisory committee chaired by Professors Vladimir Bulović and Fiona Murray released a preliminary outline for the MIT Innovation Initiative. The committee's report, responding to a call from President Reif in October 2013, is largely focused on education, entrepreneurship, and applied research at MIT.

In May, Reif unveiled a new dimension of the initiative in a *Washington Post* op ed. Calling for a new kind of "innovation orchard," he emphasized the need for regional and national policy elements to fill a gap he identified in the national innovation system. He noted that start-ups in non-information-technology fields face major challenges in scaling up to a point where their technologies are prototyped, demonstrated, tested, accelerated and de-risked, and placed in range of follow-on financing mechanisms. Subsequently, the Washington Office began preparing a detailed evaluation of federal and regional programs supporting early-stage technology innovation and working with a team at MIT exploring potential models for "orchard" and "accelerator" spaces. This group is considering new innovation institutions that could be supported by MIT and its partners to fill this gap in Massachusetts and the surrounding region.

Online Education Initiative

With massive open online courses (MOOCs) drawing attention from education policymakers, MIT's senior leaders continued to take a national role in discussions of the function of MOOCS and other online tools in higher education.

Dean of Digital Learning Sanjay Sarma and Professor Karen Willcox initiated the Online Education Policy Initiative, a major study of the national learning science aspects and implications of online education, in August with support from the Carnegie Foundation and NSF.

Chancellor Cynthia Barnhart represented the Institute at the December 2014 White House College Opportunity Summit, announcing a commitment to expand the use of MITx courses to help develop a cadre of high school science, technology, engineering, and mathematics (STEM) teachers skilled in the use of educational technologies. These teachers can then in turn better prepare their own students to transition into college and succeed academically along the path to STEM careers.

In April 2014, President Reif and Harvard president Drew Faust hosted an online education summit in Cambridge with guests including senior officers from colleges and universities across the country and leading academics in the field. Under-Secretary of Education Ted Mitchell and other federal education officials joined Presidents Reif and Faust in discussions of online learning on and off campus, including a discussion moderated by John Hockenberry that was later broadcast nationally on Public Radio International's *The Takeaway*.

The Online Education Policy Initiative extends the work of the Institute-wide Task Force on the Future of MIT Education, which President Reif had charged with capturing an integrated understanding of how online access is changing teaching and learning on campus, to the national community. Washington Office staff worked with Professors Sarma and Willcox and other participating faculty to structure this exploration of teaching pedagogy and efficacy, institutional business models, and global educational engagement strategies and to involve federal education leaders in the study, which is scheduled to conclude with a final report in early 2016.

Important input to the Online Education Policy Initiative was obtained through a May 2015 workshop, sponsored by the National Science Foundation, that brought 50 practitioners from the learning science and online learning technology communities together to discuss emerging ideas about online pedagogy. A forthcoming report from that workshop aims to answer a critical question about online education: what are the learning designs and models that can optimize online education and blended education that incorporate both face-to-face and online features?

MIT Energy Initiative

Members of the MIT Energy Initiative (MITEI), widely recognized as the first and the foremost campus-wide energy program at a US academic institution, returned to Washington in May to present "The Future of Solar Energy," the seventh multidisciplinary "Future of" study released since the initiative was launched in 2006. The study was released at the National Press Club, with in-depth follow-on discussions at the Center for Strategic and International Studies and the Department of Energy and an alumni release event co-hosted by the MIT Club of Washington. Key recommendations and analyses included a renewed focus within DOE's solar research portfolio on new photovoltaic technologies utilizing abundant materials, the necessity of continued cost reduction in photovoltaics as market penetration increases (since the marginal value of non-dispatchable electricity will decrease), and the suggestion that tax credits for solar deployment should be based on the desired outcome (the production of electricity) rather than the input (the cost of purchasing and installing solar systems).

The Washington Office also assisted MITEI in coordinating its future activities with the Washington energy community. A study titled "The Utility of the Future: Preparing for a Changing Energy Sector" is now under way, and additional studies are under consideration.

Agency Activities

National Institutes of Health

In July, the House of Representatives passed the 21st Century Cures bill, which would boost NIH funding by $8.75 billion over five years and epitomizes the surge in support for biomedical innovation. However, finding acceptable funding offsets for this boost remains a challenge, and the bill has not yet been approved in the Senate.

The President's Precision Medicine Initiative, announced at the State of the Union address in January 2015 and featuring a convergence research model, has generated excitement in the biomedical community. It proposes $130 million in funding to NIH for the development of a voluntary national research cohort of a million people. The President's BRAIN Initiative continued to be a point of pride for both NIH and Congress. In the first round of NIH BRAIN awards, MIT researchers received more awards than researchers at any other university.

The Washington Office worked closely with biomedical science coalitions and university associations such as United for Medical Research, the Association of American Universities (AAU), and APLU to advocate for strong NIH funding on Capitol Hill, including the provisions for increased funding in the 21st Century Cures Act.

National Aeronautics and Space Administration

Professor Dava Newman of MIT was confirmed as the deputy administrator of NASA in April. Support for the Commercial Crew program and regulation of commercial space flights was a topic of great debate in Congress, which proposed cuts to the program in favor of other priorities. NASA also had to work around three failed private-sector launches to supply the International Space Station.

The Washington Office worked with the newly created Coalition for Aerospace and Science to advocate for strong NASA funding. Additionally, the scientific community responded to congressional pressure to boost planetary sciences and exploration funding at the expense of earth sciences at NASA. The Washington Office met with several Massachusetts congressional offices to advocate for Space Grant, an education and outreach program funded by NASA.

Department of Defense

On November 15, Secretary of Defense Chuck Hagel announced that DOD would undertake the Defense Innovation Initiative, a major new effort to address a worsening threat environment. Hagel stated that America's potential antagonists are continuing to update their militaries and push their tactical capabilities, requiring a major United States response. Hagel later resigned, and soon after President Obama announced that Ash Carter would replace him. Carter, who was a research fellow at MIT from 1982 to 1984, was confirmed by the Senate in February and strongly endorsed the new emphasis on innovation.

At the center of this effort is the Long Range Research and Development Plan, announced by Undersecretary Frank Kendall in October. This plan is focused on technology investments that can provide an opportunity to shape key future US materiel investments and the trajectory of future competition for technical superiority. Working groups are tasked with identifying key technology opportunities in five specific areas: space technology, undersea technology, air dominance and strike technology, air and missile defense, and other technology-driven concepts. The working groups aim to establish technology development programs based on these opportunities within five years.

Ideally, DOD hopes that Defense Innovation Initiative R&D will respond to the 21st-century threat environment by pushing defense technologies into the future, with a new generation of "technology offsets" replacing the precision, stealth, and unmanned aerial vehicle offsets the department has relied on for defense superiority in recent decades.

The Washington Office arranged extended meetings and technology briefings on campus for leaders of the Defense Innovation Initiative. MIT researchers met with Steve Welby, DOD acting assistant secretary, on January 22 and were preparing for a July 2015 visit

by Undersecretary Frank Kendall and his senior staff. In addition, the office developed a background paper on the initiative to assist MIT faculty. Lincoln Laboratory has also been deeply involved in this DOD project.

Department of Energy

MIT engaged deeply with DOE this year as the agency emphasized new approaches to counter global climate change and move toward a low carbon energy future. In addition to its role in the MITEI activities described above, the Washington Office worked with faculty and staff in consulting roles as DOE reorganized its technology efforts. We consulted with the Clean Manufacturing Office of the DOE Office of Energy Efficiency and Renewable Energy (EERE) on programs using advanced manufacturing technology to drive down the cost and increase the performance of new energy technologies. In February, the department established the new Technology Transition Office to better use DOE assets, including the National Laboratories, to help commercialize these technologies. MIT engaged with the Technology Transition Office and DOE's new "Cyclotron Road" technology transition pilot program at the Lawrence Berkeley National Laboratory.

MIT nuclear fusion experts advised Undersecretary for Science and Energy Lynn Orr and other senior DOE leaders on new technology advances that could dramatically accelerate the time scale and reduce the cost for the development of fusion as a practical energy source. Washington Office staff also served as advisors for DOE's Quadrennial Technology Review process.

National Science Foundation

The National Science Foundation continued to face unusual pressure from its authorizers in the US House of Representatives, with little sign that the rift between majority and minority leaders on the Committee on Science, Space, and Technology might close. Committee chairman Lamar Smith (R-TX) continued to seek more direct congressional oversight of the foundation's budget and proposal review procedures, while ranking member Eddie Bernice Johnson (D-TX) defended NSF's independence and the integrity of its current peer review process. Smith also continued his inquiry into selected individual NSF grants, bringing to more than 60 his requests for staff access to detailed proposals and review information. In February, Smith attacked 13 NSF awards that he viewed as questionable.

The America COMPETES Reauthorization Act of 2015, which Smith introduced in April, incorporated most of the contentious provisions of the 2014 Frontiers in Innovation, Research, Science, and Technology (FIRST) Act. In a repeat of the committee action on the earlier bill, COMPETES was approved in May on a 20-16 party-line vote after an angry, partisan six-hour committee markup session the previous week. MIT and most other research universities, along with the major university associations and scientific societies, found themselves in the uncomfortable position of opposing a bill that would reauthorize funding for several major research agencies as well as the White House Office of Science and Technology Policy (OSTP). The Obama administration also objected strongly to the bill. Troubling provisions included modifications of NSF's highly respected peer review system to require the NSF director's approval of each

research award, a new "national interest" review standard, individual authorization levels for each directorate rather than the traditional two allocations for educational activities and research activities, and low authorization levels for NSF's directorates for geosciences and for social, behavioral, and economic sciences, which would sharply curtail research awards in those areas. The full House, which had failed to act on FIRST earlier in the year, narrowly passed COMPETES in May. The Senate Commerce, Justice, and Science Committee showed little interest in the measure, instead holding preliminary hearings in preparation for its own attempt to reauthorize COMPETES.

In an attempt to build bridges, President Reif met with Smith on February 26, 2015, and invited the chairman to visit Cambridge. At MIT fiscal year end, the Washington Office was working to set up late summer meetings with campus researchers in fields of personal interest to Smith.

In January, NSF introduced new transparency and accountability guidelines intended to address some of the Science Committee's concerns regarding oversight. The guidelines emphasized NSF program managers' responsibility for ensuring that award abstracts include a clear description of the research to be performed, its significance, and how it "serves the national interest, as stated by NSF's mission: to promote the progress of science; to advance the national health, prosperity and welfare; or to secure the national defense."

In one particularly notable MIT-related development, NSF director France Cordoba headlined a dedication ceremony in May for the Advanced LIGO project, a $205 million upgrade of the LIGO gravity wave detectors in Hanford, WA, and Livingston, LA, funded through NSF's Major Research Equipment and Facilities Program. The seven-year upgrade, completed on schedule in September under the leadership of Senior Research Scientist David Shoemaker of the MIT Kavli Institute for Astrophysics and Space Research, is widely expected to lead to the first direct detection of gravitation waves and initiate a new realm of astronomical observations.

Cross-Agency Issues: Intellectual Property

As the US Patent and Trademark Office, patent holders, and litigators continued to adjust to major patent reforms introduced via the America Invents Act of 2011 and now being implemented, judiciary committee members in both houses of the US Congress pressed for further changes to the patent system. Curbing abusive patent demand letters, a practice known as "patent trolling," has been a particular topic of continuing legislative efforts.

In February, the chairman of the House Judiciary Committee introduced the Innovation Act. The bill was nearly identical to a measure passed by the House in the previous Congress that was opposed by a number of universities, including MIT, along with much of the biotech, pharmaceutical, entrepreneur, and venture capital community. Opponents argued that both versions of the Innovation Act, in their zeal to eliminate patent trolls, did not protect legitimate inventor interests and thus threatened to weaken the entire patent system. University organizations led by AAU and APLU sought changes in provisions on fee shifting and joinder, which they argued could reduce the

ability of universities to develop their intellectual property through licensees and leave them vulnerable to extended lawsuits regarding activities over which they have little control.

The Senate Judiciary Committee drafted its own reform bill, the PATENT Act, which was introduced in April, after consulting with numerous stakeholders including university experts. The university groups concluded that the PATENT Act offered a more balanced approach to addressing patent trolling abuses than the House's Innovation Act and would be less harmful to the rights of legitimate patent holders. Both bills were passed out of their respective committees, but at year end neither had been brought up for a floor vote.

Developing MIT Citizen Scientists

The Washington Office continued to provide opportunities for MIT faculty and students to engage in the policy process and develop as citizen scientists, long a part of the office's mission. As noted above, the appendix lists MIT faculty visits to Congress and federal agencies as well as federal officials' visits to MIT.

Support for MIT Student Groups

The MIT Washington Office supports MIT students seeking opportunities and insights in science policy in several ways. The Science Policy Initiative (SPI), a primarily graduate student group, continues to be a strong collaborator with the Washington Office. We also engage with the Graduate Student Council, specifically its Legislative Action Subcommittee, and the Undergraduate Student Council on issues related to federal policy.

Science Policy Weekly News Update

When Congress is in session, the Washington Office sends weekly science policy news updates through the MIT Alumni Office Legislative Advocacy Network. Updates are also sent to interested MIT students in SPI and the Graduate Student Council's Legislative Action Subcommittee to keep them abreast of current events in Washington. The updates cover such issues as federal R&D policy, STEM education, and appropriations. MIT senior faculty and administrators receive a more detailed weekly "federal update" on federal R&D support and education developments.

Science and Technology Public Policy "Boot Camp"

Washington Office director William Bonvillian and a committee of graduate students elected by SPI taught a four-day intensive course on federal science and innovation policy during Independent Activities Period in January. The course, begun in 2007, was oversubscribed, with over 30 students competitively selected to participate. Students actively engage in the discussion-based course, and more than half complete course papers for credit toward MIT's science and technology policy certificate program.

Internships in Washington, DC

The Washington Office Hosted four interns throughout the year, including one MIT undergraduate during the summer. Intern projects included an analysis of the House Energy and Commerce Committee 21st Century Cures Act roundtables and hearings, interviews of Convergence stakeholders, a report on the new DOD Defense Innovation Initiative, and a survey and analysis of existing federal and regional innovation pipeline intermediaries and resources.

In coordination with the Department of Political Science and the Technology and Policy Program, 17 MIT students completed internships in Washington, DC, including one in the Washington Office. As part of this program, the Washington Office arranged for a series of meetings with Senator Edward Markey (D-MA) and leaders at OSTP, DOE, NSF, DOD, NIH, the Central Intelligence Agency (CIA), the State Department, Georgetown Law School, and the Supreme Court.

Congressional Visits and Executive Agency Visits

The Washington Office collaborated with SPI to plan two trips to Washington, DC. On Congressional Visits Day in March, 23 MIT students met with representatives from 51 congressional offices, including seven members of Congress. In these meetings, students spoke about the importance of robust and sustained federal investment in R&D, high-skilled work visas, and policy issues relating to their individual research. Several staffers followed up with the students to gather more information on specific issues such as Superfund sites, climate change, and undergraduate research.

More than 20 students visited federal agencies and nongovernmental organizations in October during the Executive Visits Days. Students met with staff at OSTP, the Department of State, NSF, DOE, the Environmental Protection Agency (EPA), ARPA-E, the US Agency for International Development (USAID), and other agencies to learn about federal policy and explore career options.

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, and working groups 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 Aerospace and Science
- 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

Meetings in Washington, DC

MIT Faculty/Staff/Students	Date	Topic	Meeting
Miklos Porkolab and Earl Marmar	7/9/14–7/10/14	MIT fusion research and overall US fusion program	House Committee on Science, Space, and Technology: Hans Hoeg, chief of staff for Representative Thomas Massie (R-KY); Geoff Browning, legislative assistant for Representative Katherine Clark (D-MA); Eric Fins, legislative assistant for Representative Joe Kennedy (D-MA); Aaron Weston, majority staff counsel; and Adam Rosenberg, minority staff director
Krystyn Van Vliet	7/16/14	AMP 2.0	DOE EERE Assistant Secretary David Danielson and EERE advanced manufacturing leaders Libby Wayman and Mark Johnson; interagency meeting at the White House including Jason Miller and JJ Raynor from the National Economic Council and NIST deputy director Phil Singerman 20 NSF office directors and program managers
Feng Zhang	7/30/14	CRISPR technique for gene modification	Congressional Biomedical Research Caucus members and their staffs
James Poterba	7/30/14	Retirement security: what's working and what's not?	Bipartisan Policy Center meeting with Andrew Biggs of the American Enterprise Institute, Lynn Dudley of the American Benefits Council, Ben Harris of the Brookings Institution, and Kristi Mitchem of State Street Global Advisors
Stuart Schmill, Lee Rubenstein, and Teppo Jouttenus	9/16/14	Building on STEM-oriented commitments to expand access to college	White House College Opportunities Workshop at the University of Maryland, Baltimore County

MIT Faculty/Staff/Students	Date	Topic	Meeting
Krystyn van Vliet and Neil Gershenfeld	9/18/14–9/19/14	AMP 2.0 "Alternative Visions of Where Science and Technology May Take Us"	Presentation and discussion of AMP 2.0 recommendations (along with Ravi Shanker from Dow) at PCAST closed meeting Presentation at PCAST public session
Rafael Reif	10/27/14	AMP 2.0 "Accelerating Advanced U.S. Manufacturing" report	Final AMP 2.0 steering committee meeting at the White House. President Reif and Andrew Liveris, CEO of Dow Chemical, gave an overview of and recommendations for the findings and Secretary of Commerce Penny Pritzker; Jeffrey Zients, director of the National Economic Council; and John Holdren, director of OSTP, discussed steps for implementing the AMP report's proposals with the steering committee and with President Obama. Reif also made a presentation to the National Academies with OSTP deputy director Tom Kalil, NIST associate director Phillip Singerman, and Jason Miller, deputy director of the National Economic Council.
Mildred Dresselhaus and Robert Solow	11/24/14	Presidential Medal of Freedom	Medal presentation at the White House by President Obama
Cindy Barnhart	12/4/14	2nd White House College Opportunity Summit EdTechX expansion commitment	President Obama, Michelle Obama, Vice President Joe Biden, Secretary of Education Arne Duncan, and a select group of university leaders
Krystyn Van Vliet	12/4/14	AMP 2.0 project and findings	Information Technology & Innovation Foundation panel discussion with Ravi Shanker from Dow Briefing for congressional staff co-hosted with the American Society of Mechanical Engineers, Dow Chemical, GLOBALFOUNDRIES, Georgia Tech, and the University of California, Berkeley

MIT Faculty/Staff/Students	Date	Topic	Meeting
Maria Zuber	12/12/14	Basic Energy Sciences research folio and balance of support for individual research grants, university-based centers, and national user facilities New DOD R&D initiative focusing on advanced defense technologies BRAIN Initiative MIT's pending study to draw attention to opportunities for driving innovation that are being lost due to underinvestment in R&D, as well as next steps in policies to stimulate advanced manufacturing in the United States Science education and R&D issues in the OSTP science portfolio, including MIT's current major study on online and blended learning supported by the Carnegie Foundation and NSF	Harriett Kung, DOE associate director for science Pat Falcone, OSTP associate director for national security, and national security staffers Reed Skaggs and Christopher Fall OSTP's Robbie Barber OSTP deputy director Kalil Jo Handelsman, OSTP associate director for science
Dennis Whyte	1/15/15–1/16/15	Fusion	Lecture at NSF sponsored by the Engineering Directorate, followed by meetings about fusion with program managers from divisions within the Engineering and Mathematical and Physical Sciences Directorates. Also, meetings with staff from six Massachusetts delegation offices (Senators Elizabeth Warren and Edward Markey and Representatives Michael Capuano, Joe Kennedy, Niki Tsongas, and Katherine Clark) as well as staff from the House and Senate Energy and Water Appropriations Subcommittees and the House Science Committee's Energy and Environment Subcommittee.

MIT Faculty/Staff/Students	Date	Topic	Meeting
Maria Zuber	1/23/15		Cathy Cahill, Senate Committee on Energy & Natural Resources Bruno Freitas, office of Senator Warren Richard Duane-Chambers, Suzanne Gillen, Bailey Edwards, and Missye Brickell from the Senate Commerce Committee Ana Unruh Cohen from Senator Markey's office Cliff Shannon from the Research and Technology Subcommittee of the House Committee on Science, Space, and Technology Richard Obermann and Dahlia Sokolov from the House Committee on Science, Space, and Technology Arun Seraphin from the Senate Armed Services Committee
Daniel Weitzner and Eric Lander	1/30/15	Precision Medicine Initiative	President Obama announced the initiative at a forum in the White House East Room
Rafael Reif	2/12/15	Release of US postage stamp honoring Robert Robinson Taylor, MIT's first black graduate	President Reif addressed a large crowd gathered at the Smithsonian's Postal Museum to celebrate the release of a Forever stamp commemorating Robert Robinson Taylor, the first black graduate of the Institute (Class of 1892). The dedication was led by Postmaster General Megan Brennan. Additional participants at the Smithsonian event included Taylor's great-granddaughter, White House senior advisor Valerie Jarrett, and Attorney General Eric Holder.

MIT Faculty/Staff/Students	Date	Topic	Meeting
Raji Patel	2/25/15	Space Grant	John Moreschi from Representative Clark's office, Louis Katz from Senator Warren's office, Eric Fins from Representative Kennedy's office, and Samuel Rodarte from Representative Capuano's office
Krystyn Van Vliet	2/25/15	AMP 2.0 report implementation update Opportunities for Massachusetts to compete for federally supported manufacturing innovation funding	NIST: Ajit Jillavenkatesa, senior standards policy advisor; Jason Boehm, office director; and Engineering Laboratory staffers Simon Frechette and Allison Feeney Libby Wayman and Megan Brewster of DOE's Office of Energy Efficiency and Renewable Energy discussed the department's Clean Energy Manufacturing Initiative and interactions with other federal agencies. JJ Raynor of the National Economic Council and Lloyd Whitman, OSTP assistant director for nanotechnology, updated Van Vliet on interagency coordination efforts. John Phillips, senior advisor to Senator Markey
Rafael Reif	2/26/15	MIT's research and education programs	Ellen Williams, head of DOE's ARPA-E, and NSF director France Cordova Representative Lamar Smith (R-TX), chair of the House Committee on Science, Space, and Technology, and Representative Seth Moulton, the newest member of the Massachusetts congressional delegation

MIT Faculty/Staff/Students	Date	Topic	Meeting
Dennis Whyte (along with representatives from the Oak Ridge National Laboratory, General Atomics, the Princeton Plasma Physics Laboratory, and University Fusion Associates)	2/27/15	US fusion research program	Brianne Miller (Senate Committee on Energy and Natural Resources); Tyler Owens (Senate Appropriations Subcommittee on Energy and Water Development); Donna Shahbaz, Perry Yates, and Taunja Berquam (House Appropriations Subcommittee on Energy and Water Development); and Aaron Weston and Adam Rosenberg (House Science Subcommittee on Energy) Anital Bar-Shalom of the Office of Management and Budget. Dr. Whyte also spoke with Bob Simon of OSTP on new fusion technology options.

MIT Faculty/Staff/Students	Date	Topic	Meeting
Sanjay Sarma, Eric Klopfer, and researcher Joseph Seering	3/6/15	Online Education Policy Initiative	Susan Singer, NSF division director for undergraduate education; Michael Feder, senior program officer, National Research Council; and Heidi Schweingruber (by call-in), director, Board on Science Education, National Academy of Sciences Tobin Smith, AAU vice president for policy; Emily Miller, AAU project director for undergraduate STEM education initiatives; Howard Gobstein, APLU executive vice president; R. Michael Tanner, APLU chief academic officer and vice president; Kacy Redd, APLU director for science and math education policy; and Meaghan Duff, APLU executive director, Personalized Learning Consortium. At the Department of Education, the group met with Jamienne Studley, deputy under secretary of education, and David Soo, senior policy advisor, Office of the Under Secretary. At the White House, they saw OSTP deputy director Kalil; Meridith Drosback, OSTP assistant director for education and physical sciences; Nancy Weiss, OSTP senior advisor to the chief technology officer; and Roberto Rodriguez, special assistant to the president for education at the White House Domestic Policy Council.
21 MIT Science Policy Initiative students	3/18/15	The value of federally funded scientific research. The students shared stories of successful research and inventions that depend on federal funding.	51 US senators and representatives from 19 states during Congressional Visits Day

MIT Faculty/Staff/Students	Date	Topic	Meeting
Dennis Whyte, Earl Marmar, Joe Minervini, and Brandon Sorbon of the Plasma Science and Fusion Center (PSFC)	3/25/15–3/27/15	Fusion during Fusion Day	Representative Bill Foster of Illinois and energy staffers John Moreschi (Representative Clark) and Eric Fins (Representative Kennedy) DOE senior advisor Henry Kelly Anital Bar-Shalom, Office of Management and Budget (OMB) energy examiner; Saul Gonzales, OSTP assistant director for physical sciences; and Altaf Carim, OSTP assistant director for research infrastructure
Maria Zuber	3/27/15	Nanotechnology research The new technology strategy of the Office of Naval Research (ONR) and its international programs	Michael Meador, director of the National Nanotechnology Initiative Larry Schutte, director of the ONR Office of Research, and other ONR officials
Maria Zuber and Dennis Whyte	3/27/15	New technology options for fusion	DOE undersecretary Lynn Orr Dev Shennoy and Megan Brewster of EERE
Claude Canizares	4/15/15	MIT's ongoing collaborative role in the establishment of the Skolkovo Institute of Science and Technology in Skolkovo, Russia	Mahlet Mesfin, OSTP senior policy advisor for international science and technology; OSTP Russia expert Susan Monarez; and Rod Schoonover, science advisor for emerging issues in national security at the State Department
Amy Smith and Bish Sanyal (along with colleagues from the College of William and Mary, Michigan State University, Makerere University in Uganda, Texas A&M University, Duke University, and the University of California, Berkeley)	4/15/15	The Higher Education Solution Network program within USAID's Global Development Lab	Capitol Hill briefings in the House and Senate

MIT Faculty/Staff/Students	Date	Topic	Meeting
Rafael Reif	4/19/15	Innovation system issues and online education	US chief technology officer Megan Smith, OSTP deputy director Kalil, and a group of OSTP staff
		Innovation questions and the new Defense Innovation Initiative	Arati Prabhakar, director of DARPA
		The Defense Innovation Initiative and related technology challenges	Frank Kendall, undersecretary of defense for acquisition, technology, and logistics
Michael Hecht and Olivier de Weck	5/4/15–5/8/15	Current state of human space flight and a roadmap to a human landing on Mars	Humans 2 Mars Summit, hosted at George Washington University with NASA administrator Charles Bolden
Robert Armstrong, Richard Schmalensee, Vladimir Bulović, Frank O'Sullivan, Robert Stoner, Ignacio Perez-Arriaga, Robert Jaffe, Henry Jacoby, Raanan Miller, and graduate students Patrick Brown and Joel Jean	5/5/15–5/6/15	"The Future of Solar Energy"	Report rollout at the National Press Club; discussion at the Center for Strategic and International Studies; dinner hosted by the MIT Club of Washington
			Meetings with Richard O'Neill and other economists at the Federal Energy Regulatory Commission office; staff of the Senate Energy and Natural Resources Committee; DOE undersecretary Franklyn Orr and deputy undersecretary Mike Knotek; Peter Davidson, executive director of the Loan Program Office; Dave Danielson, assistant secretary for energy efficiency and renewable energy; and other officials
			Energy advisor Robert Simon hosted the group and 10 OSTP staff at the White House Office of Science and Technology Policy. The group also briefed Senator Markey.
Rafael Reif	5/14/15	Online education and other education issues	*Washington Post* higher education reporters Nick Anderson and Valerie Strauss
		Basic research funding	National Academies president Ralph Cicerone
		Ongoing adverse effects of sequestration cuts on basic research	Congressman Tom Price (R-GA)
		Defense R&D issues and *The Future Postponed*	Congresswoman Tsongas

MIT Faculty/Staff/Students	Date	Topic	Meeting
Maria Zuber	6/3/15	"Human Space Exploration: Looking Back 50 Years, Getting Ready for the Next 50"	Secretary of the Air Force Deborah Lee James and Northrup Grumman CEO Wes Bush
Ed Boyden	6/9/15	Optogenetics and the president's BRAIN Initiative	
Maria Zuber	6/25/15	International research and policy cooperation on climate and energy issues Mechanisms for bringing new technologies to market Precision Medicine Initiative Federal budget and funding for R&D	David Turk, deputy assistant secretary for international climate and technology, and Robert Marlay, director of the DOE Office of International Science and Technology Collaboration Jetta Wong, acting director of the new DOE Office of Technology Transitions, and senior advisor Teryn Norris Key players at OSTP, including US chief data scientist DJ Patil Government affairs leaders from AAU and APLU

Federal Officials – Visits to MIT

Government Official	Date	Topic	Meeting
Geoff Browning, senior legislative staffer for Representative Katherine Clark covering R&D issues	8/25/14	Fusion energy	Browning toured the Alcator C-Mod Tokamak with PSFC outreach coordinator Paul Rivenberg, Professors Anne White and Dennis Whyte from Nuclear Science and Engineering (NSE), and Alcator senior research scientist Brian LaBombard.
Francis S. Collins, NIH director	10/28/14	"Exceptional Opportunities in Biomedical Research"	Collins met with Rafael Reif, Martin Schmidt, and groups of life science faculty and students and gave the 2014 Compton Lecture.
Anthony Foxx, US secretary of transportation	1/5/15	The need for investment and planning in new technologies	Meeting at MIT's Center for Transportation and Logistics. Foxx was introduced by President Reif.
Stephen Welby, deputy assistant secretary of defense for systems engineering	1/21/15–1/22/15	DOD's new Defense Technology Initiative Advanced manufacturing issues Digital fabrication and energy technologies Biofabrication Cybersecurity and robotics Institute for Soldier Nanotechnologies	MIT vice president Maria Zuber, Lincoln Laboratory director Eric Evans, and Lincoln CTO Bernadette Johnson Suzanne Berger and Krystyn Van Vliet Neil Gershenfeld, Alex Slocum, Yet-Ming Chiang, and Tomas Palacios Angela Belcher, Douglas Lauffenburger, and Ben Gordon Daniela Rus, Polina Golland, Daniel Jackson, John Leonard, Armando Solar-Lezuma, Howard Shrobe, and Nockolai Zelovich John Joannopoulos, Yoel Fink, Moungi Bawendi, Bill Peters, Jeff Grossman, Paul Radovitzky, and Ron Weiss

Government Official	Date	Topic	Meeting
34 senior staff from the Senate, the House of Representatives, OSTP, OMB, DOD, and the State Department	4/8/15–4/10/15	"Renewal or Retrenchment: US Grand Strategy in a Volatile World"	Hosted by the Security Studies Program. Keynote by Karl Eikenberry, former US ambassador to Afghanistan and the William J. Perry Fellow in International Security at Stanford University's Center for International Security & Cooperation. Topics discussed included grand strategy and international security in Asia, Europe and the renaissance of Russian power, new technology and changing dimensions of military power, and the Middle East.
Representative Seth Moulton	4/24/15	The role of NSE in MIT's broad range of energy-related activities. Overview of the prospects and needs for advanced nuclear technologies and MIT's research and educational activities Tour of nuclear research labs and the Alcator C-Mod	Martin Schmidt Richard Lester and NSE graduate students, faculty, and staff, including Martin Greenwald, Michael Short, and Anne White
Susan Singer, NSF division director for undergraduate education	5/21/15	Learning Sciences and Online Learning Symposium	

Faculty Testimony in Washington, DC

MIT Faculty/Staff	Date	Topic	Committee
Simon Johnson	1/13/15	State of the US economy and policies needed to promote economic growth	House Ways and Means Committee
John Hansman	1/21/15	Unmanned aircraft systems and critical research to enhance their capabilities	House Committee on Science, Space, and Technology
John Hansman	6/11/15	The efforts of NASA and the Federal Aviation Administration to maintain a safe national airspace and introduce new technologies	House Committee on Science, Space Subcommittee