

# MIT Faculty Newsletter

<http://web.mit.edu/fnl>

**in this issue** we continue the discussion on climate change (below, pages 6 and 7); highlight MIT 2016: “A Century in Cambridge” (page 8); ask “Does MIT Really Need a Faculty Senate?” (page 11); and offer a eulogy to the MIT Engineering Systems Division (page 12).



Constructing the Dome (see p. 8)

## Nuclear Weapons Divestment Announced at MIT Conference

Max Tegmark

**CAMBRIDGE MAYOR DENISE SIMMONS** announced on April 2 at MIT that the Cambridge City Council has unanimously voted to recommend divesting their \$1 billion city pension fund from nuclear weapons production. “*It’s my hope that this will inspire other municipalities, companies and individuals to look at their investments and make similar moves,*” Simmons said.

The announcement was made at an MIT conference on reducing the dangers of nuclear war ([futureoflife.org/reducing-the-dangers-of-nuclear-war](http://futureoflife.org/reducing-the-dangers-of-nuclear-war)). The conference built on the long tradition of MIT Physics faculty pressing for nuclear disarmament, including Philip Morrison, Vicki Weisskopf, Herman Feshbach, Bernard Feld, and Henry Kendall. The hundreds of participants were welcomed by MIT Vice President for

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## An Update on Climate Action

Maria T. Zuber

**LAST DECEMBER, I HAD THE** privilege of traveling to the Paris climate talks and being a witness to history: Nearly 200 countries, representing as grand a consensus as the world likely has ever seen, reached an agreement to limit the increase in global average temperature to 2°C over pre-industrial levels – and even more ambitiously, to “pursue efforts” to limit this increase to 1.5°C. Accomplishing this 2°C goal, seen as essential to preventing the most serious impacts of climate change, will require rapid and significant reductions in global carbon emissions on the way to building a zero-carbon energy system.

If I needed reminding of the urgency of the climate threat, I got it a month after Paris, on a trip to visit a Lincoln Laboratory field site on the Kwajalein Atoll in the Republic of the Marshall

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Editorial

## Some Steps Forward on Climate Action, More Needed

**THE 116-DAY SIT-IN** by members of Fossil Free MIT Coalition (FFMIT), directed against the MIT administration’s climate action and investment policies, ended on March 1 with issuance of a joint statement. We applaud the persistence and civility of the protestors and the willingness of the administration to engage with them.

The administration did not agree to the FFMIT call to divest the endowment of stocks in the coal and tar sands industries. However, four areas of agreement were reached: “Moving toward campus carbon neutrality as soon as possible; establishing a climate action advisory committee to consult on the implementation of the Plan for Action; developing a set of strategies and benchmarks for MIT’s engagement with industry, government, and other institutions; and convening a forum on the

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Vol. XXVIII No. 4 March/April 2016

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**Photo credits:** Pages 1, 8-10: Courtesy the MIT Museum

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## Subscriptions

\$15/year on campus

\$25/year off campus

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**Some Steps Forward on Climate Action**  
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ethics of the climate issue.” (David Chandler, *MIT News*, March 3, 2016.)

In the September/October issue the *Faculty Newsletter* published an open letter to President Reif from 83 faculty calling for divestment from coal and tar sands investments ([web.mit.edu/fnl/volume/281/divestment.html](http://web.mit.edu/fnl/volume/281/divestment.html)). The November/December issue carried a letter from 93 faculty raising issues with MIT’s Plan for Action on Climate Change ([web.mit.edu/fnl/volume/282/climate.html](http://web.mit.edu/fnl/volume/282/climate.html)). In the current issue, the climate change discussion continues. Vice President for Research Maria Zuber, who has played a leading role in the administration’s team on the MIT Climate Change conversation, describes MIT’s continuing efforts (page 1). Her support for proposals to establish benchmarks for the effectiveness of efforts toward sustainability is welcome.

We also print a letter from members of the Climate Change Conversation Committee (page 6) identifying areas that still need attention. One of these is the issue of decisions on the investments held by the MIT endowment. During the Faculty Forum on the matter, a number of faculty called on the administration to adopt the unanimous recommendation of its own Climate Change Conversation Committee to establish an ethics advisory committee to advise MIT on its investment decisions for its portfolio. The response was that such a committee was unnecessary and that the MIT Investment Management Corporation (MITIMCo), which manages the endowment, had its own ethics advisory committee and didn’t

need additional input. In the last issue of the *Faculty Newsletter*, Prof. Sally Haslanger expressed concerns that the administration’s response to addressing ethical and humanitarian concerns was inadequate ([web.mit.edu/fnl/volume/283/haslanger.html](http://web.mit.edu/fnl/volume/283/haslanger.html)).

We share this concern. Over the past half dozen years, the *Faculty Newsletter* has carried a series of articles that indicate that the MITIMCo mission of maximizing return on investment was often counter to MIT’s interest in providing the best in education and research. Thus we continue to oppose the MITIMCo plan that uses the East Campus of MIT to develop commercial office buildings, while leaving graduate students to fend for themselves in an increasingly restrictive off-campus rental market (see article by Fred Salvucci [January/February 2015] and more recently Bob Simha’s critique of the East Campus plans in the last issue [[web.mit.edu/fnl/volume/283simha.html](http://web.mit.edu/fnl/volume/283simha.html)]).

MIT’s students, staff, and faculty deserve a public and legitimate Advisory Committee on Socially Responsible Investments that is responsive to and representative of campus concerns. American colleges and universities that have established campus-based committees on socially responsible investing include Brandeis, Brown, Columbia, Dartmouth, Georgetown, Princeton, Stanford, Penn, and Yale ([www.endowmentethics.org/committees\\_resources](http://www.endowmentethics.org/committees_resources)). The authority of the committees varies, but establishing such a committee would be a major step forward from a private committee at MITIMCo. Hopefully, the MIT committee to be established under the agreement that ended the sit-in will come to a similar conclusion.

**Cambridge City Council Calls for Divestment from Nuclear Weapons Industries**

We note that the Cambridge City Council has unanimously passed a Policy Order calling on the City’s pension fund to divest from stocks in corporations tied to the manufacture or upgrade of nuclear weapons. This was publicly announced at MIT at the Conference on “Reducing the Danger of Nuclear War,” described by Prof. Max Tegmark in the article on page 1. That effort was a U.S. offshoot of the European-based Don’t Bank on the Bomb Campaign, which also calls for the establishment of Committees on Socially Responsible Investments, in all institutions that make decisions on financial investments.

**Governance and the Climate Change Debate**

Inside this issue (page 11) Prof. Patrick Winston continues the discussion of MIT Governance from the Editorial and the From the Faculty Chair column of the last issue. A fulcrum of that debate has been whether small, essentially appointed committees can deal with questions that have broad impact on faculty and students. The “Shared Statement on Climate Action” says that Prof. Zuber will convene a forum to explore ethical dimensions of the climate issue. Typically, such forums lead to a further committee that has some power to recommend action. Many faculty and students will be paying close attention to the efficacy of such efforts to make progress on the questions raised. ■

Editorial Subcommittee

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## An Update on Climate Action

Zuber, from page 1

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Islands. Low-lying atoll island nations are particularly vulnerable to the rising sea levels produced by climate change; it was at the behest of small island nations that negotiators added the aspirational goal of 1.5°C to the Paris agreement.

In Kwajalein, I met with members of a U.S. Geological Survey (USGS) research team that has been studying climate impacts on Pacific atolls. The team's research ([www.nature.com/articles/srep14546](http://www.nature.com/articles/srep14546)) shows that annual flooding will affect low-lying atoll islands sooner than previous models had predicted. Among other things, these annual floods will wash over wells – during my trip, the USGS showed me wells that it was monitoring for seawater infiltration – salinizing scarce water resources and rendering the islands uninhabitable not in a matter of centuries, but of decades. With this existential threat looming, it's no wonder that island nations have pressed for more aggressive action from the world community.

For me, these two trips starkly represent the Paris paradox: On the one hand, we have an historic agreement that should fill us with hope that the world is finally serious about tackling climate change. On the other hand, we know that the Paris commitments are insufficient – countries' individual emissions reduction goals, if successfully implemented, will get us less than halfway to the 2°C goal (<https://www.climateinteractive.org/tools/scoreboard>) – so the world community has a lot of hard work ahead of it.

With so much at stake, the MIT community has made clear its determination to do its part to help the world address climate change. In October, MIT's senior officers published the Institute's Plan for Action on Climate Change ([climateaction.mit.edu](http://climateaction.mit.edu)). I'd like to take this opportunity to update all of you on our progress in implementing the plan.

First, I am in the process of establishing a Climate Action Advisory

Committee, comprising faculty, postdocs, students, staff, alumni, and Corporation members, to provide advice on the ongoing implementation and assessment of the plan, including the strategy of engagement with industries, governments, and other institutions at the heart of the plan. Through the Committee, I will ensure that all constituencies at MIT

You may have read about the Committee in the text of the agreement that I reached in March with the members of Fossil Free MIT (FFMIT). This agreement will help to enhance the Plan for Action in other ways as well. Importantly, it calls for establishing benchmarks that will enable us to assess the effectiveness of our engagement efforts.

are represented in our climate action efforts.

You may have read about the Committee in the text of the agreement that I reached in March with the members of Fossil Free MIT (FFMIT). This agreement will help to enhance the Plan for Action in other ways as well. Importantly, it calls for establishing benchmarks that will enable us to assess the effectiveness of our engagement efforts. We are interested in working with industries to adopt business strategies that are compatible with a 2°C future and to support a 2°C public policy framework. Student members of FFMIT have rightly pressed for the development of metrics to show that we're having an impact.

We will have to think carefully about these benchmarks: We cannot, for example, simply take credit for actions by industry that would have happened with or without our involvement. Providing advice on valid ways to develop benchmarks will be an early priority for the Climate Action Advisory Committee. Benchmarks will surely include the quantity and quality of our external interactions. We are both reaching out to and responding to inquiries from academia,

industry, government, and the public regarding how we might team up to mitigate climate risk.

Our biggest impact will come from doing what we do best: teaching and research. I am pleased to report considerable progress on these fronts as well. Professor John Fernandez, who became Director of the Environmental Solutions

Initiative (ESI) last fall, and ESI Executive Director Amanda Graham have done an extensive campus listening tour and have been working with faculty from all five Schools to define ESI's research priorities; they expect to share details of their strategy at an ESI event on Earth Day, April 22.

Work is actively underway to develop an environment and sustainability minor. The minor is being designed to have a flexible interdisciplinary architecture in which students will be able to build both breadth and depth to complement their major academic focus.

The MIT Energy Initiative (MITEI), the hub of MIT's clean energy research efforts, has identified faculty co-directors for four of its eight Low Carbon Energy Centers (LCECs). Exelon, an energy provider operating in 48 states, recently became a MITEI member in order to support the work of the LCECs. Exelon brings knowledge of the energy generation, transmission and distribution businesses that will help MIT researchers who are taking on major challenges like grid-scale storage.

Through research, convening, and partnerships, MIT will work to advance public policies that accelerate the trans-

formation of our energy system. Professor Chris Knittel, Director of the Center for Energy and Environmental Policy Research, and colleagues at the University of Chicago published a sobering study (<https://dspace.mit.edu/handle/1721.1/101435>) in February that concluded that, absent “aggressive policy choices,” the U.S. and world economies are “unlikely to stop relying on fossil fuels as the primary source of energy” on any timescale relevant to the climate threat.

To remedy this, as the study highlights, we must put a price on carbon emissions that is large enough to effect a massive shift to low-carbon technologies, and we must significantly increase funding for clean energy R&D. Carbon pricing and R&D funding will be foci of our policy-related efforts. The message is clear: While technology innovation will be necessary to solve the climate problem, relying on technology alone reflects, to paraphrase Professor Knittel and his colleagues, the triumph of hope over strategy.

We are also working to make sure that MIT can lead by example. For the campus, the Plan for Action on Climate Change articulated a goal of reducing carbon emissions by at least 32% by 2030 compared with a 2014 baseline. This goal was based on the target contained in the Obama administration’s Clean Power Plan, not on an analysis of the MIT

campus. As a result, students and others challenged MIT to aim higher, and the senior officers agree that we must. We have clarified the 32% reduction to be a floor, not a ceiling.

To know if we are on track to meet and exceed our campus emissions goal, we need good data. Under the leadership of Julie Newman, the Office of Sustainability recently issued the Institute’s first comprehensive greenhouse gas inventory

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(<https://sustainability.mit.edu/ghginventory>). Working with the Department of Facilities and members of the faculty, the Office of Sustainability will continue to expand and improve this essential tool.

The Office of Sustainability has also been working hard to solicit input from across the MIT community on promising strategies to decarbonize the campus; most recently, the Office and the Climate CoLab launched a contest to crowdsource ideas. I ask all of you to encourage your

students and staff to participate: given the significant challenge of sustainably powering a campus that turns 100 years old this year, we’ll need as many good ideas as our community can muster.

Finally, as I wrote in my last contribution for these pages, how we respond to climate change will depend upon our view of the risks it poses. While science informs that view, it is ultimately a question of values. With this in mind, my

office will sponsor a forum on the ethical dimensions of the climate issue. I thank the members of Fossil Free MIT for proposing this forum.

We have made good progress since October, but we’re just getting started. I will continue to share updates with you as I have them, and I invite you to reach out to me with your thoughts, ideas, and questions. ■

**Maria T. Zuber** is Vice President for Research ([mtz@mit.edu](mailto:mtz@mit.edu)).

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## MIT and the Climate Challenge: The Need for More Than Technical Solutions

**IN SEPTEMBER 2014, MIT** established the Committee on the MIT Climate Change Conversation, with the mandate to “seek broad input from the Institute community on how the U.S. and the world can most effectively address global climate change.” During the ensuing academic year, the committee sponsored a number of educational events and a campus-wide debate on fossil fuel divestment, and surveyed the MIT community on a broad range of climate issues. In June 2015, it submitted an extensive report containing recommendations based on input from the MIT community. In October 2015, the Institute responded to that report by issuing “A Plan for Action on Climate Change” that outlines a number of concrete steps to address climate change.

We praise the Institute’s explicit and forceful assertion in that document of the seriousness of the risks and challenges of climate change. MIT’s acknowledgement was followed two months later by the explicit recognition of the urgency of climate change issued unanimously by world leaders at the United Nations climate change negotiations (UNFCCC COP21 meeting) in Paris in December 2015. As with the Paris agreement, it is imperative that plans be followed by action. Thus we advocate that MIT’s plan for action be rapidly followed by an aggressive implementation plan that establishes clear management responsibilities and organizational frameworks, so that the steps identified in “A Plan for Action on Climate Change” can be realized, and that goals be made continuously more ambitious to align with the seriousness of the problem.

As with the Paris accord, it is paramount that our money and energy be put

where our mouth is. In this respect, we found the Institute’s funding commitment of \$5 million for the Environmental Solutions Initiative (ESI) to be grossly inadequate for the scale and multidisciplinary scope of the climate challenge. While the Institute’s plan addresses the technical dimension – in the form of eight new low-carbon energy centers that will reaffirm MIT’s leadership in developing technologies to advance carbon-free energy – the economic, policy, and societal dimensions are largely unaddressed. Focusing on engineering a solution belies an integral component: without societal recognition of the risks and challenges of climate change, many low-carbon technologies may never be implemented – they will stand little chance as long as fossil fuels remain the cheapest option and without government-mandated incentives to change.

If the Institute were to allocate significant resources toward bolstering such a multi-faceted approach, it could exercise intellectual leadership toward engendering strong societal support for a transition to new sources of energy. In tandem with a focus on technology, advancing the policy steps, the societal dimension, and the understanding of the science of those problems at the same time, MIT can build on existing entities such as the Joint Program on the Science and Policy of Global Change. “Manus” alone cannot succeed without “mens.” In this regard, endeavoring to administer an internal carbon tax could harness the broad potential for education and participation as the Institute tackles the changes necessary to mitigate and adapt to the impacts of climate change.

Universities are at their best when they undertake unfettered search for truth.

Such a pursuit is weakened and tarnished when it is associated with organizations and individuals that support campaigns of deception for financial gain; these are clearly distinguished from mere differences of opinion, which are an essential element in the quest for knowledge. In recommending the establishment of an Ethics Advisory Council, we sought to emphasize that investment ethics – particularly on assets that can negatively impact climate change – should derive from an open process that incorporates the sentiments and values of the larger MIT community. Many of our peers, including Harvard, Princeton, Yale, Columbia, and Stanford, already have such entities to ensure that critical decisions involving institutional investments are made in ways that respect the university’s greater commitment to scientific truth. We are not suggesting that MIT’s current system ignores the ethics of investing, but rather that decisions around some issues – climate change among them – are too big and too important to leave to a select few to make. We advocate for a reconsideration of the decision not to establish an Ethics Advisory Council. We agree wholeheartedly on the importance of constructively working with industry on solutions to climate change, but also emphasize that there are higher standards to which MIT must be held, particularly in the face of such large-scale societal challenges as climate change.

With its “Plan for Action on Climate Change,” MIT recognized the gravity of the challenge ahead. As the Paris accord is for the world, a plan for action is for MIT an essential, early step. Following up now with concrete action, and ramping up commitments as opposed to letting them dwindle,

will be a momentous task, and one that we urge the Institute to accomplish. ■

Signed,

**Kerry Emanuel**, Cecil and Ida Green Professor of Atmospheric Science, Department of Earth, Atmospheric and Planetary Sciences;

**Bernadette Johnson**, Chief Technology Officer, Lincoln Laboratory;

**Jacqueline Kuo**, Undergraduate Student, Department of Mechanical Engineering;

**Christoph Reinhart**, Associate Professor in Building Technology, Department of Architecture;

**Anne Slinn**, Executive Director, Center for Global Change Science;

**Roman Stocker**, Associate Professor, Department of Civil and Environmental Engineering;

**Geoffrey Supran**, PhD candidate, Department of Material Science and Engineering.

*The above signatories were members of MIT'S Climate Change Conversation Committee.*

## letters

### An Updated Suggestion Regarding Climate Change

To The Faculty Newsletter:

**INDIVIDUALLY, WE MIT FACULTY** tend to be a hyper creative lot, although collectively, we tend to be cautious and reserved, especially with regard to curricula and governing ourselves. We also tend to sometimes sigh when the rest of the world does not trust science and seems to act in a not-so-rational manner. Hence I think it's time we step back and look into the mirror so we can see that although we may have super brains, our feet are soon to be held to the fire.

Specifically, you may have noticed, if you have gone outside much in the last few years, the weather is on average a bit on the warm side of odd. And recently it's been downright whacky all over. An anomaly? If we believe ourselves and extrapolate, global warming is probably going to wipe us out, and low-lying MIT will be in the first wave. It may be from extreme temperatures or something far more sinister such as the inability to effectively perpetuate our species due to something like the Zika virus. Maybe rising waters will force us to move to Montana or Manitoba so we can continue to use the letters MIT!

Meanwhile, the world looks to MIT for guidance, and thus when it comes to global warming, if it sees us going about business as usual with a few lukewarm efforts on energy and the environment but overall no major institution-wide change in approach or habits, it shall do the same. We are thus probably all doomed, because Nature does not give a damn what happens to humans. Something will evolve to take our place and the planet will keep surfing through space on the gravity waves of time.

Let's simply start with the observation that perhaps nowhere but in academia are there so many smart people all toiling to solve the same old problems with known solutions! Then let us realize that we are human and often respond in an all too human way to challenges, such as students maximizing energy use on one day and then minimizing it on the next to win an award for the biggest change. Or, just as curious, we base our promotion heavily on how much we all like each other's work, so publishing in a journal appears to be far more important than actually applying results in the real world. So what's a geeky institution like us to do? It's time for a FUNdaMENTAL change – Fun? Yes! Mental? Absolutely!

I believe the key lies in a symbiotic approach: we need to infuse our tenure and promotion process with a weighty consideration for how well energy and environment issues are woven into the fabric of our teaching, research, and outreach application with industry. Just about every topic in at least the GIRs can have energy and environment examples and homework problems. It does not all have to be about energy and environment, but if every topic had at least a few such questions, it would go a long way to sensitizing our students and the rest of the world to the fundamental nature of the problems we face, and get more people thinking about solutions.

We must not be smug in our self assurance that we often already put out calls for curriculum development proposals. We assume that honey is the best way to attract bees, BUT it takes bees to make honey and it's easy to get stung and discouraged. We must be sure to cultivate the soil and plant the seeds of the future such that they perennially bloom for the good of us all. ■

**Alexander Slocum**  
Pappalardo Professor of Mechanical Engineering

## A Century in Cambridge

John Ochsendorf

### THIS SPRING, MIT COMMEMORATES

its historic 1916 move from Boston to Cambridge with a series of academic and social events. *MIT2016: Celebrating a Century in Cambridge* invites members of our community to reflect on our past and to examine the greater impact of the decision to relocate across the Charles River. We are exploring the visionary design of the Main Group, and how MIT has shaped – and been shaped by – the city it has called home for one hundred years. As chair of the MIT2016 Steering Committee, I had the privilege to work with colleagues and students from across the Institute to envision a series of centennial activities for this spring, which are summarized below.

For an overview, we invite you to visit [mit2016.mit.edu](http://mit2016.mit.edu), the Century in Cambridge Website, for event information and historical and multimedia content – with fresh video arriving weekly in the form of elucidating vignettes, in addition to a four-part, longer-format documentary series. The series began with *A Bold Move*, which tells the inside story of MIT's move from Boston to Cambridge, from the design and construction of an innovative new campus to the exuberant opening celebration in 1916. Next, *Function Follows Form* looked at the connection between the Main Group's architecture and MIT's now well known interdisciplinary approach to research. Two more documentary installments will follow.

### Exhibitions: MIT Museum and MIT Libraries

The MIT Museum has explored the impact of the Institute's design on the physical, economic, and social develop-



Dedication Procession Led by Dr. Maclaurin, C. duPont, Governor McCall, and Senator Lodge

ment of the City of Cambridge through photos and artifacts in the new exhibition, *Imagining New Technology: Building MIT in Cambridge*. Of particular note is the unique opportunity for visitors to contribute to a crowd-sourced 3D-printed model of the MIT campus and surrounding neighborhoods as part of their visit.

Across campus in the Maihaugen Gallery, *The Great Stride: MIT Moves to Cambridge* – an MIT Libraries exhibition – focuses on the people who made the new campus a reality and celebrates the Alumni Reunion Dedication events that took place June 12-14, 1916.

### Symposia

Two symposia during the Century in Cambridge celebration spanned topics covering the Institute's architecture, research, and educational influence.

On March 30 and 31, *Designing Places for Inventing the Future: The Campus – Then, Now, Next*, brought more than 20 leaders in campus design and innovation to Kresge Auditorium to share ideas and to celebrate the Institute's role as an innovative campus. The four moderated panels comprising the symposium spanned two half-day sessions on architectural design, economic incubation, and educational experiments.

On the afternoon of April 12, symposium attendees embarked on an immersive adventure across campus during *Beyond 2016: MIT's Frontiers of the Future*. MIT faculty explored the frontiers of their work with the audience in a fast-paced series of short, exciting talks that celebrated our intellectual and geographic connectivity. Multimedia transitions between each talk explored the physical campus in provocative and imaginative ways.

### Service Day

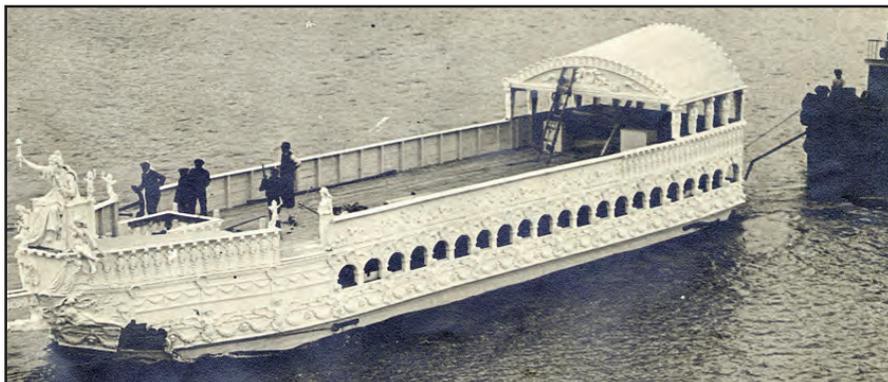
As MIT works globally for the betterment of humankind, we remain committed to our neighbors in Cambridge, with whom we joined for a day of service on Tuesday, April 19. Part of the larger Together in Service program, which unites MIT students, staff, faculty, and alumni to strengthen our relationships with the local community, the Day of Service took members of the MIT community into Cambridge to give back through volunteer service opportunities. Also on April 19, the Graduate Student Council held an all-day service event in collaboration with the City of Cambridge. Conducted in hackathon style, teams comprising graduate students, Cambridge high school students, city officials, and community members worked together to find solutions to pressing civic needs.

### Open House

We opened our doors again this spring to visitors of all ages for *Under the Dome: Come Explore MIT*, a day-long, campus-wide Open House on April 23, in collaboration with the 10th Annual Cambridge Science Festival. At the 2011 sesquicentennial Open House, at least 20,000 visitors spent the day discovering the innovative research, projects, and activities that take

place on campus and beyond – and we looked forward to an even larger crowd this year. Coordinated by DLCs and student groups, the Open House schedule included nearly 350 activities, activities to spark the

pageantry, and the Bucentaur, a Venetian-inspired barge that transported the MIT charter from Boston to Cambridge. In the same spirit, the May 7 events will be full of “only at MIT” moments.



**Bucentaur, 1916 Dedication**

excitement of discovery in our visitors. The attendance count for this year’s open house was not in at press time, but we hope that you were able to attend and share the day with your family and friends.

### Moving Day

To commemorate MIT’s ceremonious move across the Charles in June 1916, we will recreate that historic crossing on May 7 during *Moving Day* at MIT. The original 1916 river crossing was a spectacle of quirky grandeur, complete with costumes,

The day begins with the recreation of MIT’s river crossing, with the procession from Back Bay led by Grand Marshal Oliver Smoot ’62. The first part of the day includes a community competition (2:00 pm) over land and water, where participants will show their interpretations of how MIT moves. Join us to cheer on some wonderfully imaginative entries! The whole community is invited to be part of the parade across the bridge and to arrive together in Cambridge.

Later in the evening, the MIT community is invited to *Mind and Hand: A Pageant!*, an unprecedented multimedia experience in Killian Court that will combine technology and the arts to celebrate MIT’s history and future. Spectators will be enthralled by pyrotechnic displays, multimedia soundscapes on the facade of Building 10, student performers, and a joyful blend of art and science by the renowned dance troupe, Pilobolus. The spirits of Mens and Manus will come to life to debate the true essence of MIT during what we expect to be the largest on-campus community gathering since 1916.

We will adjourn from Killian Court to dance parties whose themes trace 100 years of music and culture across four different campus venues. Our community and friends will enjoy performances,

continued on next page



**The Crowd at the Dedication Exercises**

**A Century in Cambridge**

Ochsendorf, from preceding page

refreshments, games, and music from 9:30 to midnight. Moving Day will be great fun for all and we hope to see many of you there with your families and friends.

**Closing Ceremonies**

The Century in Cambridge celebration closes on Saturday, June 4 with Toast to Tech. Please join us again in Killian Court to raise a glass to MIT's first century in Cambridge – and to the century ahead.

**1916 to 2016 and Beyond**

In 1916, the opening of the new Cambridge campus created an unparalleled environment for problem-solving across disciplines. In particular, the interconnected buildings of the Main Group have allowed for porous boundaries, which has opened up new frontiers in research and innovation for the last century. In 2016, the centennial celebration is a unique moment to reflect on the culture of the campus and to expand upon MIT's success in the future. Please join us to celebrate the past century and to embark upon our second century in Cambridge! ■

**John Ochsendorf** is Class of 1942 Professor of Architecture and Civil and Environmental Engineering and Chair of the MIT2016 Steering Committee ([jao@mit.edu](mailto:jao@mit.edu)).



Assistant Secretary of the Navy F. D. Roosevelt and E. S. Webster class of 1888  
Dedication June 12, 1916



Mass. Ave. Crosses the Charles River



"Pyrrhic Dance of Gladiators" During the 1916 Tech Pageant



Charles Hayden Entertaining Classmates On Board his Yacht  
During the 1916 Technology Reunion

## Does MIT Really Need a Faculty Senate?

Patrick Henry Winston

**IN THE JANUARY/FEBRUARY 2016** issue of the *Faculty Newsletter* (Vol. XXVIII No. 3), the Editorial Board Editorial Subcommittee, noting low turnout at faculty meetings and other problems, called for an elected body – some sort of faculty senate perhaps.

I write in opposition. I believe we should ask not only where we are but also what we aspire to be. I believe at MIT we aspire to be a community in which the administration and the faculty are in harness together. An elected faculty senate would move us in the opposite direction. By its nature a faculty senate suggests there is an *us* and a *them*.

This is not to say we shouldn't argue. Any organization benefits from a family squabble now and then. Squabbles challenge sleepy thinking. Questioning everything is what we do at MIT. So when something big comes up, let us have arguments, let all sides be heard as much as they want to be, let us get angry, let decisions be made, let us then get over it and move on.

Wouldn't a faculty organization, with members duty-bound to show up at meetings, promote being heard, increase transparency, and lead to better decisions? I think not, because a faculty senate would end up being a big committee. I've been on many committees, small and large, unnoticed and prestigious, local and national, and all have been capable of hasty reviews that endorse bad ideas. If we have a problem, it is more likely to be noted and brought to light by passionate individuals, not by a faculty senate, and when I am one of the passionate individuals, I don't want a faculty senate sitting between me and the administration. I want to be heard directly. I don't want a

layer of campus politicians misunderstanding or averaging my thoughts.

Instead of creating a faculty senate, full of opportunity for unintended consequences, I suggest we fix our faculty meetings and see what happens. Here are obvious improvements:

- There should be no faculty forums. Their content should be moved to faculty meetings. The parliamentarian, equipped

Wouldn't a faculty organization, with members duty-bound to show up at meetings, promote being heard, increase transparency, and lead to better decisions? I think not, because a faculty senate would end up being a big committee.

with a copy of *Robert's Rules of Order*, can figure out how to get us into a Committee of the Whole and back out again when someone wants to offer a motion.

- No final report, with everything already decided, should be presented at a faculty meeting. That's what email is for.

- Ad hoc committees should describe how their recommendations are trending in faculty meetings while debate can still matter. Hard work should not insulate the committee members from aggressive questioning.

- We should restore question time. Without an easy means of asking for explanations, explanations tend to be hallucinated, and hallucinated explanations tend to be worse than real reasons.

- The time appointed for our monthly faculty meetings should be sacrosanct, just like the 5-7 pm period set aside for

athletics. Faculty meetings should not be competing with personnel committee meetings and job talks.

- Faculty meetings should be at the beginning of the month not the end. It takes a pretty big issue to turn faculty out near Thanksgiving or right before the winter break. There is no faculty meeting during IAP. All this means there is no faculty meeting or not much of a faculty

meeting in the four months between the end of October and the end of February.

And of course if we want faculty to show up, there should be a tradition that the agenda will include a presentation of sure and certain interest. Why not devote some time to the way admissions is done these days and how it has changed in the past decade, or to mental health trends and addiction problems, or to what alums are telling us as we pitch the campaign, or to where the administration hopes to go with professional programs and degrees, or to lessons learned from the Skolkovo enterprise, or to the concerns of the Corporation during the past year, or to new initiatives under consideration, or to whatever problems MIT's President is currently wrestling with. Surely in any given year there are eight such topics. ■

**Patrick Henry Winston** is Ford Professor of Computer Science and a MacVicar Faculty Fellow ([phw@mit.edu](mailto:phw@mit.edu)).

## MIT Engineering Systems Division R.I.P. Eulogy for a successful experiment 1998-2015

Olivier de Weck

**ON JULY 1, 2015, THE** Engineering Systems Division (ESD) ceased to exist as a recognized organizational unit at MIT. This event went unnoticed perhaps by a majority of the MIT community, but for those of us who were an integral part of the life of the Division it was a major event. Not much has been said or written by either the administration or former members of ESD since then, and so I felt compelled to write this article. This piece is not an official history of ESD, but simply a personal reflection, since the Division has played a major role in my own career and also in that of several of my colleagues here at MIT. I will first review the creation of ESD and its early trajectory (1998-2004), followed by its most active period (2004-2011) and its ultimate decline and discontinuation (2012-2015). I will also attempt to extract some lessons learned from this experiment, both for me personally, and for MIT as an institution.

### Creation of ESD – Need for “Big E” Engineering (1998-2004)

The MIT Engineering Systems Division was founded on December 1, 1998 under then Dean of Engineering Bob Brown. This event followed on the heels of a multi-decadal effort to create a new unit at MIT that would focus on the science and engineering of large and complex socio-technical systems. Examples of such systems include global manufacturing and supply chains, multi-modal transportation systems, electrical power generation and distribution networks, and health care systems. The particular impetus for the creation of ESD came from a report of the Eager Committee, named for Prof. Tom Eager who was then Department Head of Materials Science and Engineering, and

who chaired this visionary committee that included, among others, Institute Professor and later Dean of Engineering Thomas Magnanti. The group issued its recommendations in 1996 [T.W. Eager (chair), D.A. Lauffenburger, T.L. Magnanti, E.M. Murman, D. Roos, “Final Report of the Committee on Hiring and Promotion of Faculty interested in Big E Engineering,” *MIT School of Engineering*, September 15, 1996] and included the following statement:

*“In order to expand MIT’s activities in engineering systems and engineering integration, we propose that the School of Engineering create a Division of Engineering Systems that cuts across the eight Engineering Departments. This Division would report to an Associate Dean, would have a faculty rank list and budget, with the authority to develop curricula, admit students and hire and promote faculty.”*

Prof. Dan Roos became ESD’s founding director and Associate Dean of Engineering Systems in 1998 [[esd.mit.edu/Headline/esd-founded.htm](http://esd.mit.edu/Headline/esd-founded.htm)] and served in that role until 2003. He was followed by Prof. Daniel Hastings (2003-2005), Institute Prof. Joel Moses (acting, 2005-2007), Prof. Yossi Sheffi (2008-2011), Prof. Joseph Sussman (interim, 2011-2012), Prof. Steve Graves (interim, 2012-2013) and Prof. Munther Dahleh (2013-2015). The evolution of ESD during its first decade was characterized by a pioneering spirit that included the creation of a new PhD program in Engineering Systems, the placement within ESD of several pre-existing Masters programs including TPP, LGO (formerly LFM), SDM, and SCM (for-

merly MLOG) and the organization of several workshops that led to some seminal intellectual cross-pollination amongst the roughly 50 faculty members associated with ESD. Several inset graphics accompanying this article show the evolution of ESD over time, for example in terms of the number of credit units taken by MIT students in ESD subjects, indicating a growing interest in this area.

With the formation of ESD came a commitment to hire eight new junior faculty members as so-called “duals” between ESD and a department in the School of Engineering. The idea that an interdisciplinary unit like ESD would have half-faculty slots – to be used in conjunction with half-slots from the departments – was unique. Faculty from other departments and programs at MIT joined ESD, including those from the Sloan School of Management, the program for Science, Technology and Society (STS), and others. Some were duals and others were the more traditional joint faculty. I was fortunate enough to be offered one of the first “dual” slots between ESD and the Department of Aeronautics and Astronautics in 2001, a perfect fit for my research interests at the intersection of aerospace systems, engineering design, and strategy.

The year 2004 essentially completed the startup phase of the Division with an international Engineering Systems Symposium held at MIT, a report issued by the National Academy of Engineering (NAE) regarding the envisioned characteristics of Engineers in 2020 [The Engineer of 2020: Visions of Engineering in the New Century, *National Academy of Engineering*, ISBN: 0-309-53065-2, 118 pages, 6 x 9, (2004)], as well as the completion of an initial five-year review –

required by MIT for any newly-formed unit – by an independent faculty committee led by Prof. Ahmed Ghoniem [A. Ghoniem (chair), H.F. Hemond, G. McRae, S. Silbey, T. Stoker, N.E. Todreas, ESD Five Year Review Committee, *Final Report*, September 2005]. Even though ESD passed this initial review, there were several recommendations and some criticisms expressed in the report that would never completely vanish in the following decade, despite ESD’s efforts to address the recommendations and its manifest growth and intellectual progress. At the time some of the criticisms seemed to me to be legitimate and not unusual for a relatively young academic unit. While this led to some consternation within ESD, the above mentioned NAE report provided confirmation that ESD was indeed on the right path.

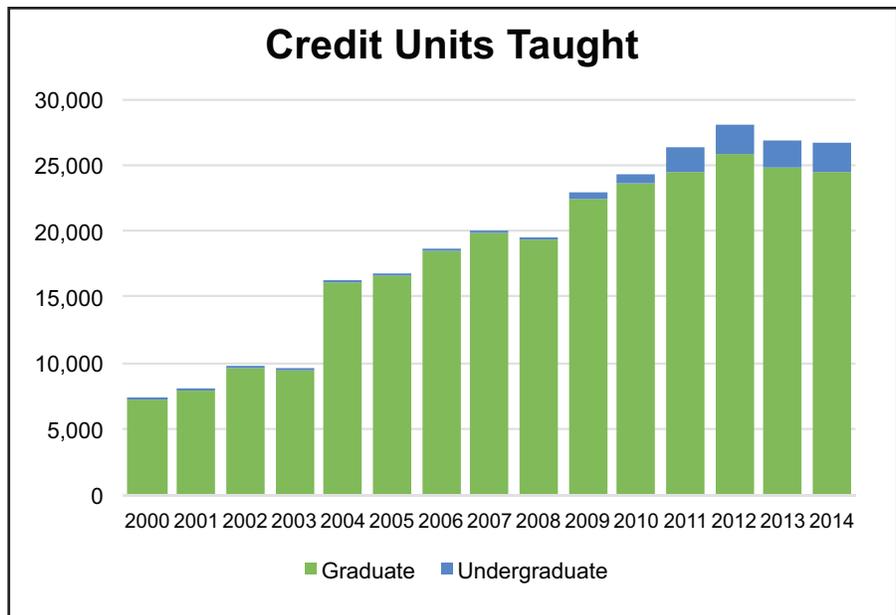
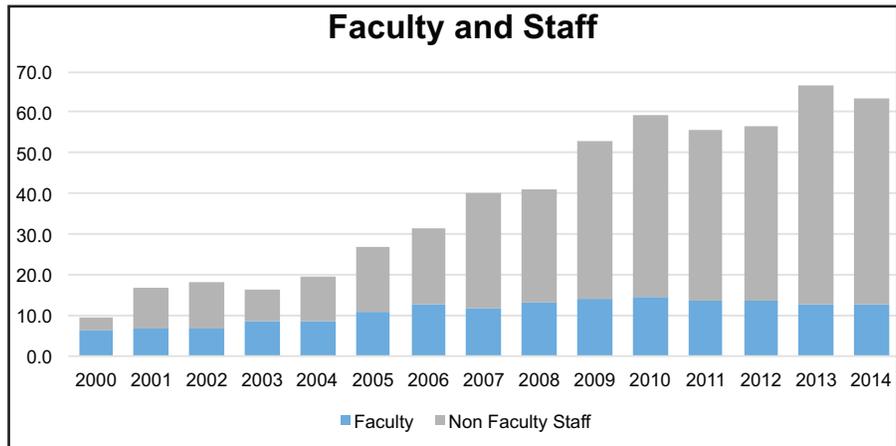
**The “Golden Age” of ESD (2005-2011)**

During the period between roughly 2005-2011 ESD continued to grow and gain increasing traction in fulfilling its mission. This seems to me to have been the “Golden Age” of ESD and some of the accomplishments during this time are summarized here:

1. Pre-existing programs such as TPP, TMP, SDM, LGO (LFM) and SCM (MLOG) were managed under a more integrated and joint umbrella, with each retaining a relative degree of autonomy. This gave a general sense that these interdisciplinary programs had a common home at MIT.

2. Following a retreat in 2001, the ESD faculty voted to initiate a new PhD program in Engineering Systems, incorporating the prior Technology, Management and Policy (TMP) program. The first cohort graduated in 2005.

3. A number of junior faculty were hired and promoted over these years, with mixed results. While some junior faculty, including myself, felt very much at home in the Division, others decided to change their appointments from dual to joint or



leave the Division altogether because they felt that working in a more department-centric structure would work better for them. The promotion and tenure process for dual junior faculty was also challenging since they had to effectively convince both ESD and their other department that they satisfied the criteria for tenure at MIT.

4. As ESD’s intellectual agenda matured and scholarship in Engineering Systems progressed, the MIT Press decided to create a new book series in the field [MIT Press Engineering Systems Series: <https://mitpress.mit.edu/books/series/engineering-systems>]. This series was successfully launched in 2010 and has since published five titles, including an

overview about Engineering Systems as well as books on methods (e.g., the Design Structure Matrix) as well as on designing systems for lifecycle properties such as flexibility and safety. A more recent book looks at complexity in health care systems.

5. MIT’s activities in the area of Engineering Systems did not go unnoticed at other universities. In 2004, the Council of Engineering Systems Universities (CESUN) [Council of Engineering Systems Universities: <https://cesun.mit.edu>] was created with like-minded programs around the world. It is fair to say that ESD served as the cata-

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**Engineering Systems Division R.I.P.**  
de Weck, from preceding page

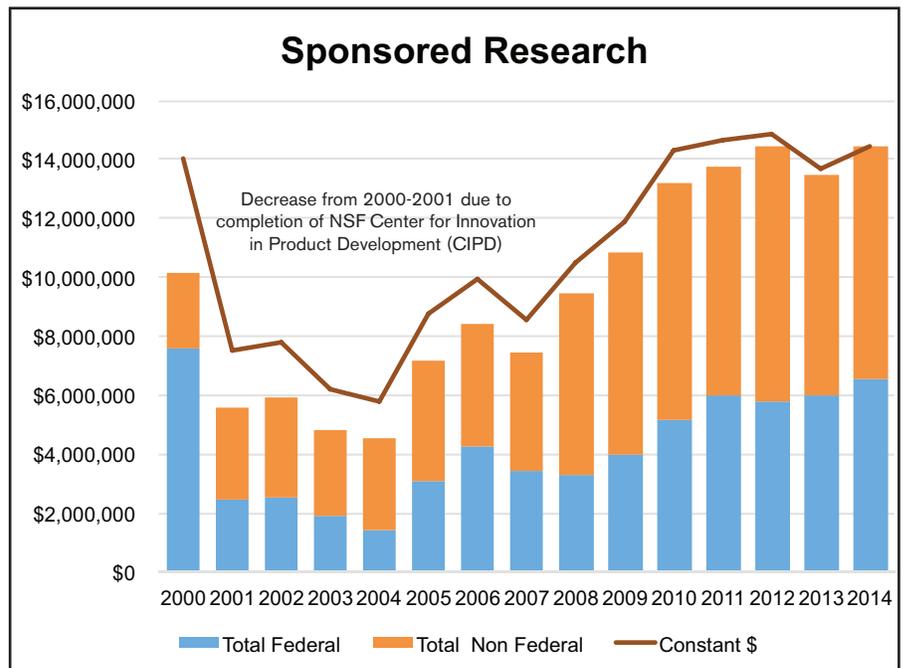
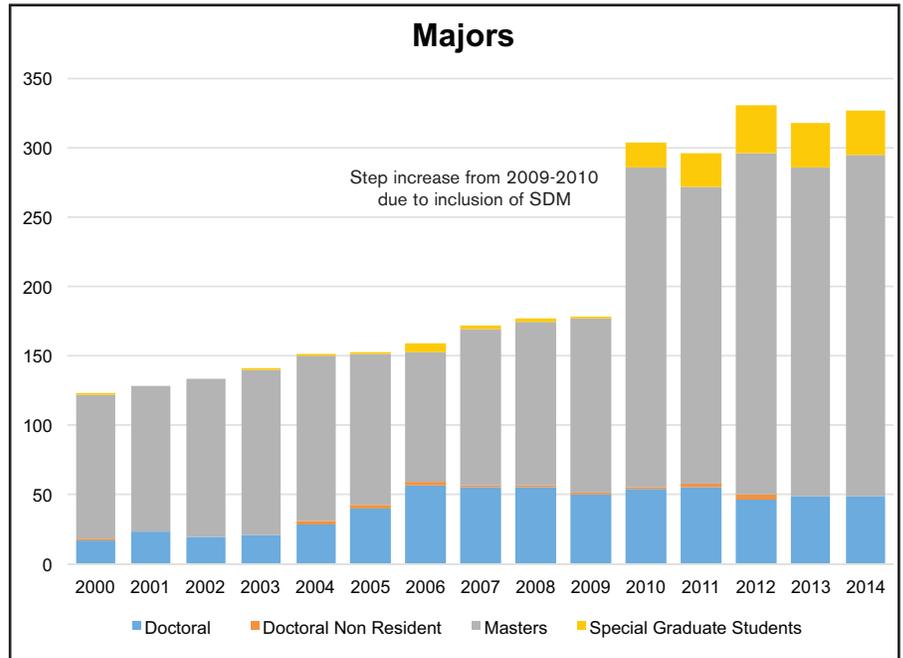
lyst for the formation of CESUN. This organization continues to this day with about 60 university members and bi-annual conferences and annual meetings. The 2016 meeting will be hosted by George Washington University (GWU) in June. A number of programs were created in direct response to MIT's foray into this new area.

6. *U.S. News and World Report* expanded its graduate rankings of engineering programs in 2013 to broaden the existing category of Industrial and Manufacturing Engineering to include Systems. The ESD program was ranked third nationally in 2013, the first time it was included in this category. I viewed this as a significant success, but it went almost unnoticed by MIT's administration.

**Decline and Discontinuation (2012-2015)**

Starting in 2011, it became clear that ESD, although the third largest graduate program in the School of Engineering with about 300 students, and having also gained the right to hire "ESD only" faculty – rather than duals – under then Dean of Engineering Subra Suresh, was at a crossroads. In a number of dimensions, such as the faculty/student ratio, ESD was understaffed and under-resourced. At the same time, ESD's graduates were increasingly in demand by systems-oriented programs around the world. To most of us in ESD it seemed that the Division was doing well, especially as we saw our program emulated elsewhere around the world, particularly in those universities participating in CESUN.

At this point a change in the leadership of the MIT School of Engineering took place. Dean Suresh, who had been generally supportive of ESD, left MIT to become the director of NSF and was succeeded in February 2011 by Dean Ian Waitz. One of Dean Waitz's first orders of business was to examine more deeply the future of ESD. A series of committees and long consultations ensued, which eventually led to the recommendation to



disband ESD in its current form and create in its stead a "new entity" following the model of the Institute for Medical Engineering and Science (IMES). During this difficult period that lasted about four years, the Division was unable to hire new faculty or to continue on its planned growth trajectory. The ESD Visiting Committee met several times during this same period, and was supportive of ESD

in its written reports to the Corporation, although this seemed to have little impact. While I feel that a "proper" process was followed in the sense of the recommendations of the Widnall Committee, I could never shake the impression that, beginning in 2011, the discontinuation of ESD was a foregone conclusion.

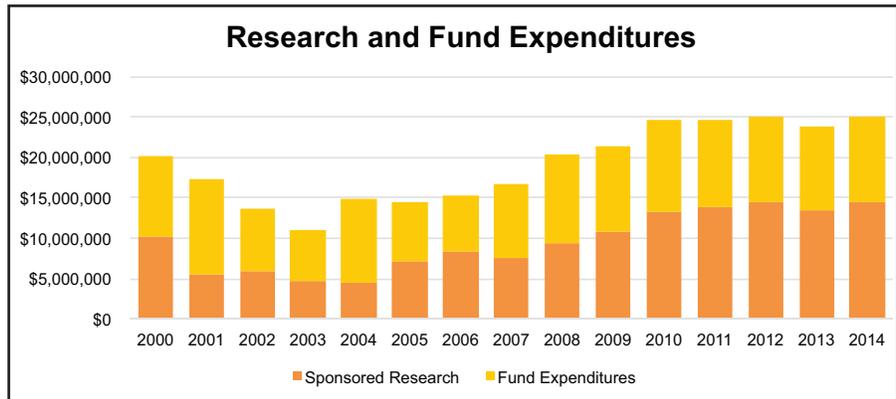
The main reason stated or implied for ESD's discontinuation as a unit were

alleged “quality issues” in its programs, as well as an unwillingness by the School of Engineering to further support it. I have to this day not seen any concrete evidence or data that supports the allegations of “quality issues” associated with ESD. As is so often true in life, perception is reality. However, this perception seemed to have been mainly an internal MIT issue, since as stated earlier the ESD model was being copied or emulated at other universities. My own hypothesis is that the main reason for ESD’s discontinuation was that its ambition to conduct “unified” research that would meld together engineering, management, and the social sciences in a way that would make the disciplinary boundaries between these fields nearly indistinguishable, caused a counter-reaction by more disciplinary-oriented faculty and some administrators. Similar tensions are often observed in the painful birth of new research fields and disciplines, as they are in the study of socio-technical systems.

**Lessons and Takeaways**

As a result of ESD’s discontinuation, MIT launched a new unit as of July 1, 2015 – the Institute for Data, Systems and Society (IDSS) – under the able leadership of Prof. Munther Dahleh. The mission of IDSS is quite similar and yet somewhat different from the earlier conception of ESD. IDSS is focused on the increasingly large amounts of data that are generated by today’s complex systems and how these data can be statistically analyzed and ultimately lead to better models and decisions. The core faculty in IDSS is centered around the Laboratory for Information and Decision Systems (LIDS), some remnants of ESD, and other faculty at MIT across all five Schools. The research in IDSS has a distinctly more mathematical, almost “algorithmic” flavor, and I have to admit that I do not yet feel the same intellectual resonance in IDSS as I felt in ESD. Nevertheless, I am willing to give it a try and be a positive contributor to the future of IDSS, even though the loss of ESD is still painful to me.

As we look back at the 17-year history of ESD at MIT there are several lessons learned that stand out for me:



1. *Initial conditions matter.* While ESD was created in 1998 under then Dean Bob Brown, the level of enthusiasm for the new unit was only moderate and the migration of faculty into the new unit from CEE, Aero Astro, and other units ruffled some feathers. A potential contributor to this was the lack of explicit backfill for the dozen or so faculty members who moved their full or half appointments to ESD. To be successful, a new interdisciplinary unit should have more universal support at all levels and receive a strong initial commitment and endowment. In that respect, it is probably true that IDSS’s initial conditions in 2015 were stronger than those of ESD in 1998.

2. *Continuity of leadership.* ESD has had a number of very capable and respected directors (mentioned above) during its existence. However, many of these were only “acting” or “interim” and every leadership change created a discontinuity. In sharp contrast stands the Biological Engineering Division (BED) that became the successful Department of Biological Engineering under the sustained and strong leadership of Prof. Doug Lauffenburger. In order to reach its full potential a new academic unit should be led by the same person for at least the first decade of its existence.

3. *Clarity of mission.* The mission of ESD was a bit fuzzy from the start. For some the ambition was to “broaden engineering” by simply supporting the departments and by creating a common home for the various systems-oriented pro-

grams at MIT [[esd.mit.edu/Headline/esd-founded.htm](http://esd.mit.edu/Headline/esd-founded.htm)]. For others it was a more ambitious quest for a unifying theory underlying all socio-technical systems, an attempt not dissimilar to the General Systems Theory of the 1950s and ’60s [Von Bertalanffy, Ludwig, and Anatol Rapoport, eds. *General Systems*. Society for general systems research, 1963]. Over time ESD’s agenda became more ambitious, swinging towards the latter view, as did the amount of resistance by some at MIT. It is also true that as ESD’s activities expanded, the needed resources in terms of faculty, space, and budget did not.

4. *Unified versus federated approach to socio-technical systems research.* A unified approach aims to not only bridge established disciplines but to formulate a new ontology that incorporates and harmonizes research in previously separate disciplines or fields. This was more or less ESD’s approach. A federated approach is where recognized experts in different disciplines (e.g., engineering science, policy, economics . . .) get together to tackle a specific problem or question using the theories, methods, and tools that are well accepted in their home disciplines. After their joint effort is done, they disband again to retreat to their home turf. This is how many policy studies on key societal topics such as energy, manufacturing, the environment, and innovation are done. In my view, there is a need for both approaches. The risk of the first is that the research is, or is perceived as, shallow if

continued on next page

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**Engineering Systems Division R.I.P.**  
de Weck, from preceding page

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the unified approach is reduced to the least common denominator of the participating disciplines. The danger of the second approach is that a common approach and lasting scientific advancements are never achieved due to the more ephemeral nature of the collaboration.

In summary, it is my view that ESD, in the period from 1998 to 2015, has in many

ways been a successful experiment. It significantly advanced research in socio-technical systems at MIT and beyond. It strengthened a number of educational programs; and it created an open and inviting research environment. Others may argue that ESD failed because it did not permanently inscribe itself as an organizational unit at MIT. While the memory of ESD will likely fade over time, the intellectual contributions, exceptional graduates, and worldwide community interested in tackling socio-technical

problems in a unified way will live on. For MIT, the ESD experience should serve as an opportunity to learn and become more reflective in terms of the drivers of its own organizational transformation. But that is a topic for another day. ■

**Editor's Note:** All figures courtesy of: Office of the Provost/Institutional Research

**Olivier de Weck** is a Professor of Aeronautics and Astronautics and Engineering Systems. He was Associate Director of ESD from 2008-2011 ([deweck@mit.edu](mailto:deweck@mit.edu)).

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**Nuclear Weapons Divestment Announced**  
Tegmark, from page 1

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Research Maria Zuber, who was followed by a roster of speakers including MIT faculty Aron Bernstein, Frank Wilczek, Jonathan King, and myself, as well as Harvard Prof. Elaine Scarry. Many emphasized that 1,000 nuclear weapons are plenty enough to deter any nation from nuking the U.S., yet we are hoarding over 7,000 [see Numbers, back page], and a long string of near-misses ([future-of-life.org/background/nuclear-close-calls-a-timeline](http://future-of-life.org/background/nuclear-close-calls-a-timeline)) have highlighted the continuing risk of an accidental nuclear war which could trigger a nuclear winter, potentially killing most people on Earth. Rutgers climate scientist Prof. Alan Robock presented supercomputer simulations suggesting that nuclear winter will be even more severe than initially forecast, with even a limited India-Pakistan nuclear war starving billions to death, and an all-out U.S.-Russia exchange triggering a decade-long mini ice age.

Yet rather than trimming our excess nukes, we Americans are planning to spend \$4 million per hour for the next 30 years making them more lethal. Former Secretary of Defense William Perry argued that this spending will make us less safe, and that souring U.S.-Russian relations have made the risk of nuclear war (resulting from terror or error) greater

today than during most of the Cold War. "Not in our name!" Mayor Simmons exclaimed and drew a standing ovation after her divestment announcement. Physicist Stephen Hawking sent a personal message of support: "*If you want to slow the nuclear arms race, then put your money where your mouth is and don't bank on the bomb!*"

Personally, I see intellectual links between this issue and the spirited MIT debate about fossil fuel divestment. Nuclear winter would be the ultimate climate change: not 2°C heating but 20°C cooling. Moreover, like climate change, the restarting nuclear arms race is driven in no small part by money, with behind-the-scenes lobbying for the new trillion-dollar triad by the very companies who want to build it. Just as there's climate change denial, there's nuclear winter denial and other claims from industry-funded think tanks that don't hold up to scientific scrutiny.

The MIT administration has correctly pointed out that there are multiple ways of influencing the private sector, ranging from engagement and shareholder activism to divestment. Divestment helped stigmatize the production of land mines and cluster munitions, which have now nearly ground to a halt. I believe that it can similarly help stigmatize the nuclear weapons production that even a former secretary of defense opposes, in which case

it will strengthen the bargaining power of those pushing to instead spend that trillion dollars on what our armed forces truly require and on education, research, infrastructure, and other urgent needs.

I was shocked to realize that I myself was exacerbating the problem: my wife and I had been unwittingly investing in nuclear weapons production through my MIT IRA. This inspired me to work with colleagues at the Future of Life Institute to make an easy-to-use app for people and organizations to put their money where their mouth is, and I encourage you to check the status of your own investments at [responsibleinvest.org](http://responsibleinvest.org). In practice, it is quite easy to divest, since many financial institutions now offer mutual funds catering to the growing market for socially responsible investing, including Ariel, Calvert, Domini, Neuberger, Parnassus, Pax World, and TIAA-CREF. "*We appreciate and share Cambridge's desire to exclude nuclear weapons production from its pension fund. Pension funds are meant to serve the long-term needs of retirees, a service that nuclear weapons do not offer,*" said Julie Fox Gorte, Senior Vice President for Sustainable Investing at Pax World.

The Conference was co-sponsored by MIT Radius, Mass Peace Action, the Future of Life Institute, and the American friends Service Committee. ■

**Max Tegmark** is a Professor of Physics ([tegmark@mit.edu](mailto:tegmark@mit.edu)).

## LabArchives: Store and Organize Your Research Data Online

Garry Zacheiss  
Katherine McNeill

**RESEARCHERS HAVE BECOME** increasingly interested in the benefits of Electronic Lab Notebooks (ELNs). ELNs enable researchers to organize and store experimental procedures, protocols, and data; information is searchable within and across notebooks. Additional advantages include security and 24x7 availability.

An ELN or portions of an ELN can be shared with colleagues at MIT and beyond, fostering collaborative research.

### Introducing LabArchives

Information Systems and Technology (IS&T) and the MIT Libraries have received inquiries about ELN options at the Institute. In response, MIT recently purchased a three-year enterprise license for LabArchives. This cloud-based product is available at no cost to MIT faculty, staff, students, and affiliates. LabArchives is an approved ELN Service Provider for Internet2 ([internet2.edu](http://internet2.edu)) member universities.

LabArchives can be used for a range of projects and is not restricted to those in a laboratory research environment. That said, LabArchives is optimal for those wanting to document research procedures/protocols or store research data during the active phase of research. Need to outline next steps for your team or refer to a procedure for setting up equipment? LabArchives can be a central, accessible platform.

Key features include:

- Ability to upload and store files – including text, tables, images, spreadsheets, and attachments – in their original format
- Ability to create standard ELN formats and templates for your research group
- Compatibility across multiple platforms, including mobile devices
- Secure storage of data on LabArchives servers: multiple redundancy ensures 24x7 data availability

- Ability to share information within your lab and invite collaborators from outside of MIT to join your ELN

### LabArchives and the Research Workflow

For those needing to meet federal agencies' requirements for data management plans, LabArchives can facilitate compliance. Data entered in a LabArchives notebook is automatically date- and time-stamped, preserving every version of a lab's data entries, showing who completed the work and when it was done. Access rights are controlled by your group administrator and can be modified to suit the needs of individual researchers or contributors.

LabArchives is also compliant with the Health Insurance Portability and Accountability Act (HIPAA). For guidance on HIPAA, see <https://couhes.mit.edu/hippa/hipaa-guidance-document>.

LabArchives provides many other built-in features. An advanced search lets you search selected notebooks or across all of your notebooks, enhancing how you can interact with your data. LabArchives' Widgets – interactive HTML forms or applications – can be tailored for your specific experiment. The Database Widget ([labarchives.kayako.com/Knowledgebase/Article/View/64/259/58-database-widget](http://labarchives.kayako.com/Knowledgebase/Article/View/64/259/58-database-widget)), for example, can be customized for a lab inventory or a table of experimental results data.

The sketch and annotation tool lets you draw sketches and annotate images you've added to your notebook. LabArchives lets you create or edit Microsoft Office documents within your notebook and is fully integrated with Google Docs and Sheets. Integration with Dropbox is on LabArchives' roadmap; for now, Dropbox users can add links to items in Dropbox.

### Signing Up and Support

To use MIT's enterprise LabArchives license, go to [labarchives.mit.edu](http://labarchives.mit.edu), authenticate via Touchstone, and then activate an enterprise account.

IS&T can provide support in customizing lab notebooks for early adopters at MIT. To set up a consultation, ask questions or provide feedback, send a message to [labarchives-support@mit.edu](mailto:labarchives-support@mit.edu). As a partner, Data Management Services in the MIT Libraries (see [libraries.mit.edu/data-management](http://libraries.mit.edu/data-management)), can point you to resources for managing your data throughout the research life cycle. In particular, Libraries' staff can advise you on options for storing and sharing your data once you've completed your project, such as moving data from LabArchives to a long-term repository.

There are also several online resources to help you get started:

- The LabArchives Knowledgebase at [labarchives.kayako.com/Knowledgebase/List](http://labarchives.kayako.com/Knowledgebase/List) includes quick start guides; information about entry types, tools and widgets; and video tutorials.

- A LabArchives FAQ in the MIT Knowledge Base at [kb.mit.edu/confluence/x/HcEwCQ](http://kb.mit.edu/confluence/x/HcEwCQ) links to overview documents and "how-to" instructions, from sharing your ELN to creating an offline notebook.

- LabArchives offers personalized 30-minute training webinars at [www.labarchives.com/training-webinars](http://www.labarchives.com/training-webinars). ■

**Garry Zacheiss** is Director, Platform & Systems Integration, IS&T ([zacheiss@mit.edu](mailto:zacheiss@mit.edu)); **Katherine McNeill** is Program Head, Data Management Services, MIT Libraries ([mcneillh@mit.edu](mailto:mcneillh@mit.edu)).

## letters

### Asking the Important Questions

To The Faculty Newsletter:

**HOW LUCKY MIT IS** to have the measured, informed, and powerful intellectual reasoning of Prof. Sally Haslanger [“Is This Really Who We Are?”, *MIT Faculty Newsletter*, January/February 2016]. In our community, where the humanities

and social sciences are not well-represented we have in Prof. Haslanger a leader who asks the important questions and steers us towards a place of greater transparency and firmer moral ground.

Thank you, Prof. Haslanger!  
I hope everyone reads your article. ■

**Molly Ruggles**  
Senior Educational Technology  
Consultant, ODL

### Replanting Our Social and Emotional Landscape

To The Faculty Newsletter:

**PROFESSOR ELTAHIR’S WARNING** in the November/December 2015 *Faculty Newsletter* (“In Guarding the Well-Being of MIT Students We Should Emphasize Prevention”) is both compelling and deeply distressing. Noting his research in Civil and Environmental Engineering centers on deforestation, desertification, and climate change makes me think that perhaps the Institute community – along with our culture at large – suffers from emotional desertification.

Social-emotional learning is now a hot topic in elementary schools. In *The Boston Globe* (1/6/16 [bit.ly/1Z58BNy](http://bit.ly/1Z58BNy)), James Vaznis reported that “teaching students at every grade to manage their emotions can help them deal with a multitude of serious issues, including bullying, mental illness, substance abuse, or trauma.”

A comment on that article echoes Professor Eltahir’s sad conclusions about MIT. According to Jerome J. Schultz, a clinical neuropsychologist and lecturer on psychology at Harvard Medical School, the “learning environment itself is a major source of stress [and] an under-recog-

nized cause of the epidemic increase of childhood anxiety and depression. Kids are the canaries in a coalmine that we’ve dug for them.”

Can we replant our social and emotional landscape? Can we more explicitly recognize that work is hardly the only dimension of our lives nor is it the sole measure of success in life. I believe that we need nothing less than a fundamental, community-wide broadening of both dialogue and behavior to re-prioritize life balance in all segments of the Institute family. Certainly the Institute Community and Equity Office and MIT Medical can both serve as cornerstones of this effort, but they cannot do the whole job.

Another laudable effort addressing the Institute’s role in both causing and countering the pervasive and deep-rooted malaise in community members is Portraits of Resilience, a series published by *The Tech* with support from the UA’s Committee on Student Support and Wellness. Prof. Daniel Jackson created the Resilience Project (<https://soulstrong-blog.wordpress.com>) in response to MIT’s recent tragic suicide cluster, including the suicide of a long-time colleague. The

project recognizes that “the pressures and frustrations of the MIT experience are severe” but through it Prof. Jackson has found “extraordinary insights and thoughtfulness among students” and he wants to see these strengths shared.

How can MIT integrate the various efforts in this domain? In his column on Faculty Committees in the January/February 2016 *Faculty Newsletter* (“The Roles of the Standing Committees of the Faculty in the Governance of MIT”) Faculty Chair Krishna Rajagopal mentions the Committee on Student Life, saying that “the best time to discuss it will be after it has begun working with our future Vice President for Student Life.” I very much hope that this administrator, with new energy and focus, will be equal to the task.

We owe our students not only rigorous and rewarding academic challenges. We must help them prepare for full and rewarding lives. ■

**Eve Odiorne Sullivan**  
Retired Senior Editorial Assistant,  
Laboratory for Nuclear Science

## letters

### Defects in the MITIMCo Proposals

To The Faculty Newsletter:

Re: “A Critical Look at the Plan for MIT’s East Campus” (O. R. Simha, *MIT Faculty Newsletter*, Vol. XXVIII No. 3)

Dear Bob,

**YOUR DECONSTRUCTION OF THE** current MITIMCo plan is required reading for MIT’s “Top Brass.”

In particular, the proposal that several commercial buildings be built so that at

some future date they can be converted to alternative uses is outstanding. Future flexibility can be worth its weight in gold.

Much of what you and others see as defects in the MITIMCo proposal(s) is traceable to a failure to align the longer-term interests of some MIT principals (stakeholders other than top administrators) with its agent (MITIMCo).

Many of us would love to see the particulars of the contract. (Is it available?)

I conjecture that the principal driver is cash flow. (Am I correct?) Rewarding MITIMCo mostly for cash flow generated to MIT skews MITIMCo incentives. ■

Best Ever,

**Gordon Kaufman**  
Morris A. Adelman Professor of  
Management Emeritus

### Questioning Construction Plans for Kendall Square

To The Faculty Newsletter:

Re: “A Critical Look at the Plan for MIT’s East Campus” (O. R. Simha, *MIT Faculty Newsletter*, Vol. XXVIII No. 3)

Dear Bob,

**I READ WITH INTEREST** your article in the current *Faculty Newsletter*, and wanted to applaud you for writing it. While I didn’t look at the plans in as much detail as you did, they seemed pretty mediocre, and largely driven by short-term commercial interests. The lack of attention to graduate student housing,

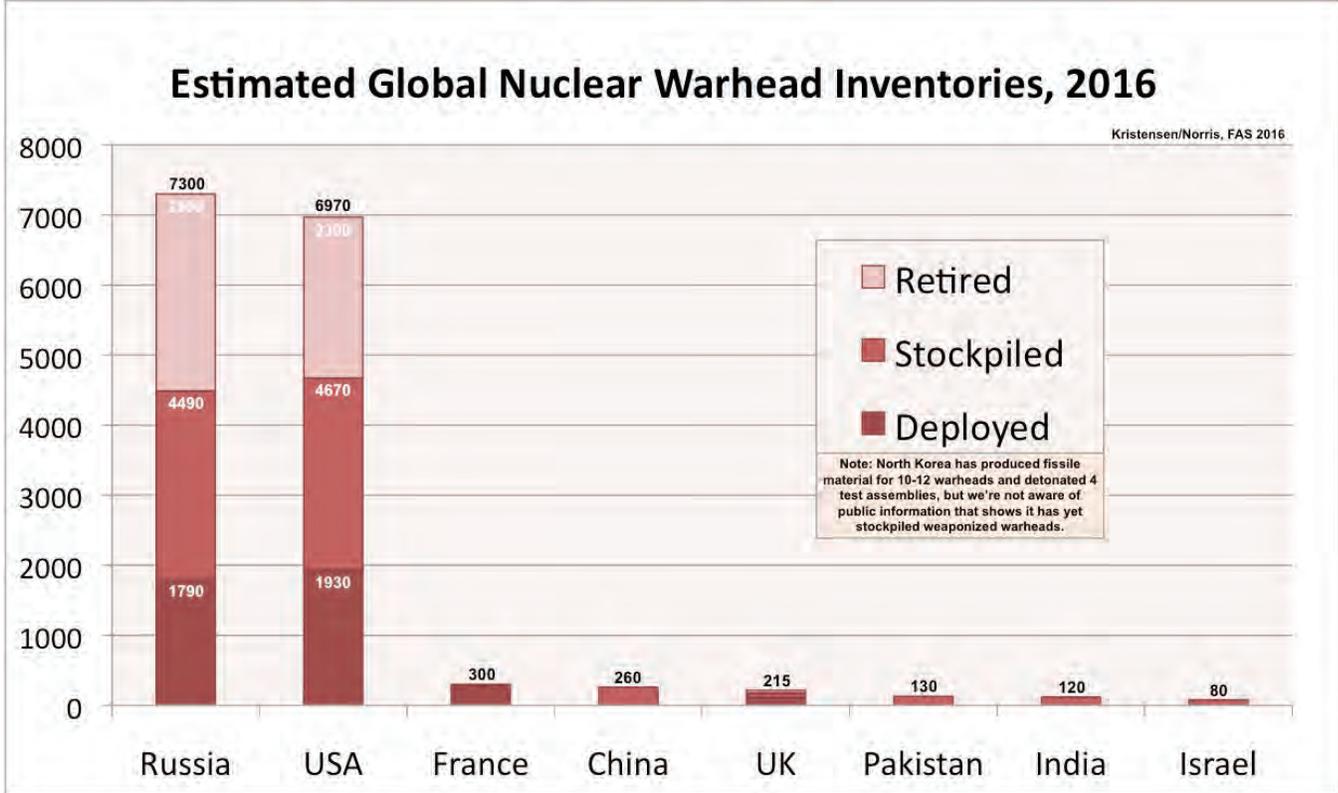
and the silence about it, seemed resounding. And as I read your article, the absence of direct connections to the Red Line station, absence of useable open spaces, ill-considered truck access and other things that have been neglected seem very surprising. Why the rush to fill out all these spaces? The returns don’t seem to square with the opportunity costs. And most of the designs are also not up to the standard I expect of MIT – although I make an exception for Marion Weiss’ building since she is a faculty member I nurtured at Penn.

In any case, I’m glad you are keeping your oar in the water on these matters.

I’m busily retired and living in New York these days, but think of the Institute often. As emeritus, I get the *Faculty Newsletter* and all the presidential emails (and campus alerts, and solicitations for funds) which keep me in touch. Perhaps our paths will cross one day. ■

Best,  
**Gary Hack**  
Professor Emeritus, Department of  
Urban Studies and Planning

# Numbers Status of World Nuclear Forces



**Note:**

- Nearly 1,800 U.S., Russian, British, and French warheads are on high alert, ready for use on short notice.
- The approximately seven (7) North Korean weapons are not shown in the above figure.

**Source:** Federation of American Scientists (FAS)