Massachusetts Institute of Technology

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MIT Faculty Newsletter

http://web.mit.edu/fnl

in this issue we continue the discussion of climate change and whether MIT should divest from fossil fuel companies (below); offer commentary on the recent ICEO report, "Advancing a Respectful and Caring Community: Learning by Doing at MIT" (beginning on page 14); and report on the Institute's plans to integrate ORCID into MIT systems (page 23).

AN-11 Nuclear Bomb

Review Conference on Non-Proliferation of Nuclear Weapons to take Center Stage

Aron Bernstein

NUCLEAR WEAPONS ARE BACK in the news with the negotiations with Iran. If an agreement is reached we anticipate some strong opposition in Congress. The 2015 Review Conference on the Non-Proliferation of Nuclear Weapons (NPT) will be held from 27 April to 22 May 2015 at U.N. headquarters in New York. Stormy weather is anticipated which is likely to lead to a great deal of press coverage. The large costs of modernizing the nuclear weapons complex will be a continuing issue, even if this does not generate as much news coverage, as well as continuing problems with North Korea developing nuclear weapons and launchers.

The past few years have seen a resurgence of scholarly activity in the study of nuclear weapons and non-proliferation issues at MIT. In the Nuclear Science and

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Campus Conversation on Climate Change

Maria T. Zuber

WHEN PRESIDENT REIF ANNOUNCED *the MIT Environmental Solutions Initiative (ESI) last spring, he called for a campus conversation on climate change to gain input as to what our community thinks MIT should do to address the risk of climate change. This spring, as the MIT Climate Change Conversation unfolds, I take this opportunity to outline the facts that form a starting point for the Conversation, to explain the process so far, and to challenge you, my faculty colleagues, to engage and express your views, so that MIT can choose a path to combat climate change that reflects your wisdom, ideas, and values. We need every segment of the MIT community to participate in the Conversation, and that is why I am personally reaching out to you.*

Let's begin with science. I will provide a very brief summary of the scientific case

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Editorial
Global Issues Confront Us All

OUR LEAD ARTICLES IN this *Newsletter* tackle squarely issues of enormous global concern – the threat from global climate change, and the threat of the use of nuclear weapons. The articles by both Maria Zuber and Aron Bernstein (page 1) tackle the issues head-on.

MIT, with its national and global cachet, is uniquely positioned to play a leadership role in these debates. It is absolutely critical that the analyses not be softened, defused, or obscured in order to avoid the inevitable controversy and confrontation that may be involved. We should tackle and not put aside the debate over divestment of fossil fuels investment as Professor Zuber reports. We recommend that faculty read the letter in this issue in opposition and the response (page 10).

Similarly, we should be explicit over the increasing danger from the continu-

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The MIT Faculty Newsletter
Editorial Board

Vol. XXVII No. 4 **March/April 2015**

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Global Issues Confront Us All
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ing deployment of thousands of nuclear weapons, with hundreds on hair trigger alert. We should make clear that the actual federal budget mechanism which allows our nation to plan to spend a trillion dollars on modernizing our nuclear weapons and delivery systems depends upon cutting investment in domestic programs – including housing, public transit, higher education, health care, NIH and NSF funded research, food stamps, environmental protection, and infrastructure repair.

We hope these articles, as well as the ones described below on MIT's internal culture, will pave the way for continued critical discussion and analysis within MIT of issues upon which our futures depend.

* * * * *

The ICEO Report

Professor Edmund Bertschinger, who was appointed head of the Institute Community and Equity Office in 2013, released his report, "Advancing a Respectful and Caring Community: Learning by Doing at MIT," in February of this year. The report focuses on MIT's "community and culture," and includes a wealth of insights about the current MIT environment, and a range of recommendations on how to change it.

The report states three specific goals. The first is to develop a plan for the MIT community to deepen the sense of inclusion based on shared values and to help community members benefit from diversity. The second is to present specific achievable goals for advancing community and equity along with means for assessing progress toward these goals. The third is to define the role of the ICEO. The report presents a specific plan for fostering change in community, equity, and structural areas (***iceoreport.mit.edu***).

Professor Bertschinger writes in this issue to summarize the research, findings, and recommendations of the report (page 14). Also included are letters from faculty strongly supporting the report, as well as comments by student leaders (beginning page 16).

Bertschinger's bold and thoughtful endeavor can play a transformative role in shaping MIT's culture. A clear strength of the report is its comprehensive approach. It reflects the understanding that the entire community: faculty, staff, administration, and students, must be engaged, and that change must be fostered in the various realms of Institute life. However, he has been charged with examining and proposing solutions to quite a range of tough problems. Section 7 of the report, for example, lists five challenges of the ICEO's mission and vision: unconscious bias and micro-inequities; discrimination and harassment based on race, gender, sexual orientation, etc.; abrasive conduct; sexual assault; and excessive stress. Each one of these challenges is informed by a distinct and complex history, and by a web of root causes, incentives, and cultural dynamics. Each one requires a unique approach.

Shifting the culture of stress at MIT may be difficult, but it is certainly more straightforward than transforming the forces that lead to discrimination and sexual assault. Humanity and kindness are critical values that should be embodied in our community, but the problems of unconscious bias, and of disparate opportunity, access, representation, and resources, will require different and more complicated policies and practices. Clearly, there is much work to be done in the area of equity. Too often we still hear the issue of diversity framed in terms of a choice between excellence and inclusion. Too often we fail to question the myth that our society and our Institute operate as meritocracies, despite clear evidence of disparate advantages, opportunities, and resources, and despite demonstrations to the contrary by studies on the workings of bias, both conscious and unconscious. And MIT's survey of students on sexual assault was dismaying in its revelation of the prevalence of violence towards women and the persistence of ignorance and misunderstanding. Inequality and sexual violence cannot be tackled without addressing issues of privilege and power.

The ICEO's support of the Black Lives Matter forum and silent protest were important steps in demonstrating an institutional commitment to student activism and racial justice. These events, in concert with a burgeoning and largely youth-led protest movement that has taken shape across the country, have provoked attention to and discussions about race at MIT. Often missing from these conversations, however, has been an analytical framework regarding the historical, political, social, and economic contexts that produce and sustain inequity and injustice. While interacting in caring and respectful ways is integral to the process of change, much of the work involved in dismantling discrimination, bias, sexual assault, intimidation, and harassment involves the discomfort of and pain of self-interrogation, of wrestling with inheritance and privilege, of confronting institutional and structural obstacles to access and justice. The most challenging work before us is to convey to those who are not troubled by the realities presented in the report why it is in their interest, indeed, in our common interest, to shift the social order of our academic community and our society.

The ICEO report is an important step in naming the problems before us, and in beginning to foster meaningful change on our campus. We should also be committed to preparing and inspiring our students to take their expanded understanding and commitment regarding equity, respect, and caring into their work, community, and family lives once they leave MIT, and to engage with the issues raised in the ICEO report as socially involved citizens. The report states: "Most MIT reports present ideas to change the world. This one presents ideas to change MIT." This is a worthy goal. Ultimately, though, we must deliver the message that changing the world is also the responsibility of our MIT community, and that this mantle pertains not only to creating scientific and technical innovation, but to enacting social change.

Editorial Subcommittee

From The Faculty Chair

A Guide to Proposing, Revising, and Terminating Curricula

Steven Hall

AT MIT, OUR SHARED governance system means that the faculty play an important role in setting educational policy. Overall, the role of the Institute-wide standing faculty committees is to work with proposers and the administration to ensure the continued strength of our educational programs. The role of the Faculty Chair is to facilitate collaboration and dialogue, particularly at the level of degree programs.

The committees usually see multiple proposals for major curricular changes each year, and try to ensure such proposals reflect common standards. While committees attempt to expedite the process as much as possible, the common experience is that significant curricular changes, such as a new degree program or minor, can take several months to move through the system. Thus, as part of normal planning for a new academic year, the committees request that proposals for new programs or for significant changes to existing programs be submitted for review as soon as possible during the fall term. (The committees will start working on proposals for 2016–17 during the Fall 2015 term.)

As former chair of the Committee on the Undergraduate Program and now Faculty Chair, I have seen the ways that this impedance mismatch (to borrow an engineering term) between proposers and the governance system can be surprising and frustrating to proposers. One aspect that can surprise proposers who are engaging in the process for the first time is its iterative nature. There is a natural tension between the role of governance to apply past experience as part of a careful vetting, and the forward-looking evolution of our curriculum.

Because our system brings together faculty from different parts of the Institute and sees proposals from all units, committee review is intended to provide a broad, Institute-wide perspective. In many cases, committees will raise questions based on comparative experience, and in fact, it is unusual for committees to approve a proposal at the meeting in which it is first presented. For proposals that must be voted on at a faculty meeting, committees also want to help proposers resolve issues that might otherwise put the proposal at risk of a negative vote.

Below, I briefly describe the processes for the approval of curricular changes. All of the processes have defined timelines to help ensure that proposals can be fully vetted and made effective at the requested time. Except for individual subjects, it is difficult to approve proposals initiated in the spring in time for the following academic year.

In reviewing proposals, committees look for several core elements, such as educational rationale and student demand. In the case of minors and degree programs, sustainability, oversight, and resources are equally important considerations. In all cases, the committees expect that proposals have been discussed with and approved by both the sponsoring departmental and School bodies, as well as any department or School on which the program will depend for continuing support.

Subjects

Subjects are the building blocks of the curriculum, and any significant proposal will require approval of any new subjects required for the program.

The faculty has authorized the Committee on Curricula (CoC) to act with power on proposals to create, revise, and eliminate undergraduate subjects, including freshman advising seminars, ROTC subjects, and for-credit IAP offerings. The Committee also reviews proposals for subjects that may be used to satisfy General Institute Requirements (GIRs), and acts with power concerning subjects that satisfy the Restricted Electives in Science and Technology Requirement (REST) and the Laboratory Requirement within the General Institute Requirements.

Depending on the type of subject, proposals may be reviewed by other committees. Any proposals that involve significant changes to undergraduate educational policy, particularly related to the GIRs, will be referred to the Committee on the Undergraduate Program (CUP). Proposals to add or delete Science Core subjects require approval of the full faculty. Prior to final review by the CoC, the standing subcommittees on the HASS Requirement and Communication Requirement review proposals for subjects that will satisfy the HASS Requirement, or that will receive a Communication Intensive (CI-M, CI-H, or CI-HW) designation.

Jurisdiction for proposals to create, revise, or eliminate graduate subjects sits with the Committee on Graduate Programs (CGP). The Committee works with CoC to review proposals for undergraduate subjects that meet with graduate versions.

Two points of clarification are noteworthy. First, departments may develop and offer special subjects at any time without CoC or CGP review; however, the

CoC must approve any such proposals for which either GIR or degree credit is to be awarded. Second, in terms of changes to existing subjects, either CoC or CGP must approve changes to units, title, description, status, enrollment limitations, equivalency relationships (including joint and meets-with subjects), and special grading policies.

Additional information about the subject review process, including the general timeframe for review and how the committees are addressing the use of digital content, is available on the Registrar's Website (***web.mit.edu/registrar/general/instructors/subjectproposals.html***).

Departmental Exchanges

Currently, departmental exchanges for undergraduate students are routed through CoC. Depending on curricular content and impact on the general educational program, CUP and the standing subcommittees may also be involved. The Office of the Provost should be consulted early in the process and plays a role in final review. While such proposals are relatively rare even within the committee system, they tend to raise unique, cross-cutting considerations. The normal deadline for submitting such proposals is the first week in December.

Minors

Minors were first established in HASS areas in 1987 and expanded to other areas in 1992. There are now three types: departmental minors (reviewed by CoC), HASS minors (reviewed by CoC and SHASS), and interdisciplinary minors (reviewed by CoC and CUP). All consist of 5–7 subjects, with the objective of providing a depth of understanding in an area outside of a student's major.

In reviewing minors, the committees look for cohesiveness, solid governance and advising, and evidence of interdisciplinarity (where appropriate). They will consider dependencies or overlap with other programs, with the expectation that appropriate consultations have taken place. Committees will look at compliance with existing policy and rules and, of course, focus extensively on curriculum. In most cases, committees will prefer to see that a good portion of subjects have been offered successfully in the past.

Again, the typical starting point for review of minors is CoC. A proposal template and full guidelines are available through the CoC Website (***web.mit.edu/registrar/subjects/cmtes/coc/proposals.html***).

Degree Programs

Changes to undergraduate majors may be proposed to, and authorized by, CoC; graduate proposals go through CGP. Depending on the scope of changes, committees may request that the procedures for new degrees be followed.

The same paths apply to proposals to terminate existing curricula. In this case, the committees look to ensure that currently enrolled students can complete their requirements and that reasonable notice is given to other departments whose curriculum may be impacted.

By far the most comprehensive review processes are reserved for new degree programs. The mechanisms for reviewing new programs are based on guidelines for the approval of undergraduate degree programs, which were presented to the faculty in May 2003.

The typical path for undergraduate proposals begins with a review of the communication component of the proposed program, after which it runs through the Committee on Curricula, the Committee on the Undergraduate Program, and the Faculty Policy Committee. Graduate proposals begin in CGP, then move to the Faculty Policy Committee. Templates are available through CoC and CGP; the undergraduate template and instructions are also available on the Faculty Resources Website (***web.mit.edu/faculty/governance/degree.html***).

All proposals are reported to the Provost and Academic Council. The final step is to seek the approval of the faculty. This typically involves presentations at two consecutive Institute faculty meetings, the first to introduce a motion to create the program, and the second to vote on the issue.

Both undergraduate and graduate programs require an outline of the curriculum, including required and optional subjects. Undergraduate degree proposals require thoughtful roadmaps for how students might enter the curriculum at different points in their educational careers.

Degree proposals can also raise bigger questions. For undergraduate proposals, it is important to consider how a new program will fit in the overall array of degree programs. Given the essentially fixed size of the undergraduate body, the creation of a new program may draw students away from other programs. In some cases, new programs may have embedded resource requirements, such as special classroom facilities or additional Communication instruction. A new graduate program, on the other hand, has the potential to add to the overall campus population, impacting areas such as housing, student services, and funding for stipends.

Because new degree programs (especially graduate programs) can have significant impact on resources, whether a program is viable or not depends on resources available, and commitments made by the administration at the department, School, and Provost level. While faculty committees cannot make decisions about resource allocation, they are sensitive to the fact that the success of a new program depends on adequate resources, and therefore ask proposers to obtain letters from the appropriate administrators that delineate the resources that will be available.

The goal of the faculty committees is to help departments maintain and initiate strong academic programs for our students. My hope is that this brief guide will be helpful to units contemplating new proposals. As always, please feel free to contact me or the other faculty officers with questions.

Steven Hall is a Professor in the Department of Aeronautics and Astronautics and Faculty Chair *(srhall@mit.edu).*

Campus Conversation on Climate Change
Zuber, from page 1

for global warming. This is meant to inform subsequent discussion and not to be an exhaustive justification. For the latter you should read the scientific literature, various climate reports [see, for example, *ipcc.ch and www.globalchange.gov/what-we-do/assessment*], or talk to climate scientists at MIT or elsewhere.

The science, briefly

The world has warmed at various times throughout its history and it is warming now. Recent warming (Figure 1) is a matter of concern. The last 10 years represent the warmest decade since at least the 1880s, when global temperature measurements became available. On a global average, the planet is about 0.8°C warmer than it was in 1880 based upon dozens of high quality, long records using thermometers worldwide, on land and sea (IPCC WG1, 2013).

The amount of CO_2 in the atmosphere has also varied over geological time. A particularly long, high-quality record from an ice core from Antarctica (Figure 2) demonstrates the variability. The CO_2 content of the atmosphere has been increasing since the last ice age, but has accelerated since the dawn of the industrial revolution. The amount of CO_2 in the atmosphere now (400.26 ppm in February 2015; see Figure 3) is greater than at any point in the last 800,000 years, the length of the measured record. (There are geologic and sediment records that place some constraint on CO_2 farther back than 800,000 years, but these records are considerably less accurate than the ice core data.) Virtually all scientists accept these observations as accurate.

The substantial increase in CO_2 during the industrial age is believed by the overwhelming majority of scientists to be primarily due to the burning of fossil fuels, and to be the cause of most of the current warming of the Earth. Global warming is not a debate. What is legitimately debatable is the fraction of the increase that is human induced. Equally

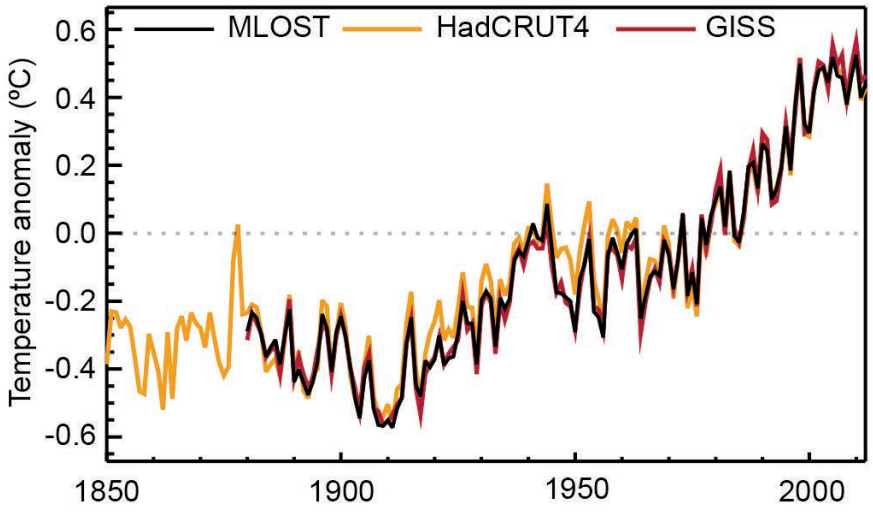


Figure 1. Annual global mean surface temperature anomalies relative to 1961–1990 from three combined land-surface air temperature and sea surface temperature data sets (HadCRUT4, GISS and MLOST). (From IPCC, WG1, 2013).

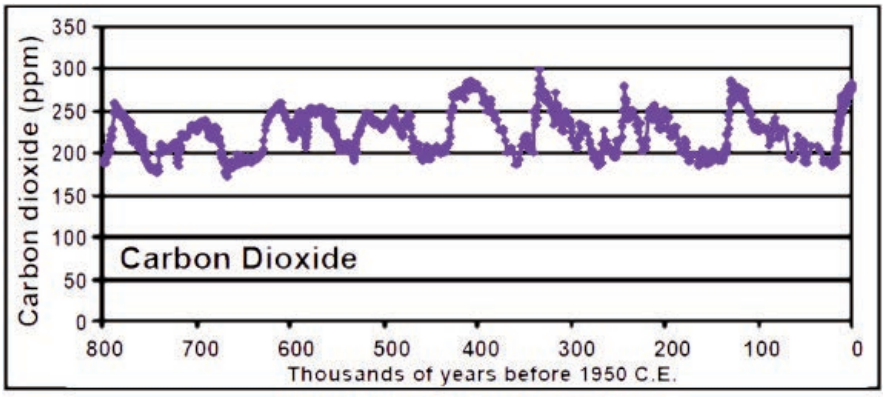


Figure 2. Atmospheric carbon dioxide measured in air bubbles trapped in an ice core from Dome C, Antarctica collected by the European Project for Ice Coring in Antarctica (EPICA). Units are parts per million (ppm). Year zero is 1950 of the Christian Era (C.E.). (From: ***cdiac.ornl.gov/trends/co2/ice_core_co2.html#***).

debatable are the environmental consequences of the continued increase of CO_2 and other greenhouse gases in the atmosphere because not all climate forcings are well understood. Some climate feedbacks such as cloud changes in a warming world are subject to uncertainty, as are scenarios for future emissions. Climate models that contain different physical parameterizations and make different assumptions forecast outcomes ranging from grim to somewhat troubling. [Check out the "Greenhouse Gamble Wheel" (***globalchange.mit.edu/focus-areas/uncertainty/gamble***) developed by the MIT Joint Program on the Science and Policy of Global Change.] The latest National Climate Assessment declared that effects of global warming are already being observed. Like many of you, I travel around the world, and I am struck that the United States is nearly unique in not readily accepting the threat of global warming.

That said, given the uncertainties, what, if anything, do we do about it? It's really all about risk. The overwhelming majority of scientists regard global warming as presenting serious risks. It is certainly possible that most scientists are wrong, but are we willing to bet the future that this is the case? In other aspects of our lives when we

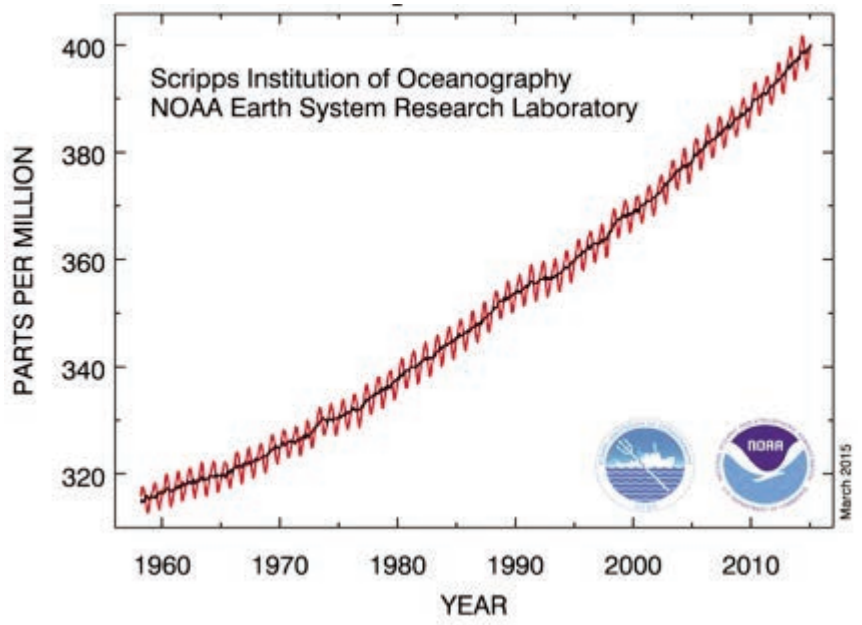


Figure 3. Monthly mean atmospheric carbon dioxide at Mauna Loa Observatory, Hawaii. The observations, shown by the red curve, constitute the longest record of direct measurements of CO_2 in the atmosphere. (Credit: P. Tans, NOAA/ESRL and R. Keeling, Scripps Inst. of Oceanography). Compare the concentration in this modern record to the historical time series in Figure 2.

face risk we think carefully about the consequences of action and inaction and proceed accordingly. What would happen if we stopped pumping CO_2 into the atmosphere right now? It would take more than a thousand years to remove from the system the CO_2 that we have added and for surface warming to dissipate (Solomon et al., PNAS, 2009; 2010). If we wait until we understand all of the uncertainties while continuing on a path of unabated CO_2 increase, we could be setting up future generations to deal with a global calamity. This is where science ends and values begin, because how we deal with risks, particularly risks we may be causing now that affect other people (in other parts of the world, or future generations), is a question of values.

What are the attitudes in our community?

Now let's take the temperature of members of the MIT community. This is my assessment based on numerous meetings, discussions, and e-mail exchanges on the topic of global warming. There are many students, postdocs, and young alumni who are worried that we adults are ruining their planet. There are faculty members who study climate change whose research has been vilified and politicized by individuals and organizations, most of whom have not attempted to grasp the complexity of the science. There are young people who are embarking on careers to study the Earth's climate who must face the concern that they will be judged on their alignment with political ideology rather than on the scientific merit of their work. There are alumni who are expecting MIT to stand up and take a leadership position on this matter of global importance. There is a small fraction of our community who don't believe that global warming is a problem.

The campaign for divestment

Enter Fossil Free MIT (FFMIT), a campus organization that has joined a national movement on college campuses whose objective is divestment from fossil fuel stocks to highlight the threat of climate change. FFMIT consists primarily of students, and their leadership has met with many members of the senior administration and other campus leaders.

FFMIT has a petition that reads:

In order to limit global temperature rise to less than 2 degrees C, no more than 1/3 of global carbon reserves owned by fossil fuel companies and governments can be burned prior to 2050. Because it is unconscionable to finance our Institute with investments that will lock us in to catastrophic climate change, we call on MIT to:
1. Immediately freeze any new investment in fossil fuel companies, and
2. Divest within five years from current holdings in these companies.

Their petition contains more than 3000 signatures. From what I can surmise, some of the signees have thought very deeply about climate change and signed the petition with an understanding of many of the issues relating to divestment. Others signed with what might be a less thorough appreciation of the pros and cons of divestment, often on their way down the Infinite Corridor where FFMIT periodically has a presence. Finally, some signees have told me that they don't think that MIT should necessarily divest, but they are deeply troubled about the lack of action on climate change at any level (MIT, the U.S., the world) and thought that they should do something to express their concern. We do not know the relative contributions of signers from the various categories. However, the sheer quantity of signatures tells us that this issue merits thoughtful discussion.

What have other universities done regarding fossil fuel divestment? Most that have divested do not have substantial endowments, with the exception of Stanford, which decided to divest only from coal and only from coal investments that Stanford makes directly (as opposed to investments made by outside investment managers who invest for Stanford). None of the Ivies have divested, but Yale communicated to its outside investment managers the importance of accounting for "the risks of climate change in investment analysis."

continued on next page

Campus Conversation on Climate Change
Zuber, from preceding page

Table 1. Committee on the MIT Climate Change Conversation

Roman Stocker (Committee Chair)
Associate Professor in Civil and Environmental Engineering
Dept. of Civil and Environmental Engineering
Sarah Brylinsky (Committee Staff)
Sustainability Project Manager
Office of Sustainability
Adam Berinsky
Professor of Political Science
Dept. of Political Science
Kerry Emanuel
Cecil and Ida Green Professor of Atmospheric Science
Dept. of Earth, Atmospheric and Planetary Sciences
Henry "Jake" Jacoby
William F. Pounds Professor of Management Emeritus
Sloan School of Management
Bernadette Johnson
Chief Technology Officer
MIT Lincoln Laboratory
Jacqueline Kuo
Undergraduate
Dept. of Mechanical Engineering
Christoph Reinhart
Associate Professor in Building Technology
Dept. of Architecture
Anne Slinn
Executive Director for Research
Center for Global Change Science
Tavneet Suri
Maurice J. Strong Career Development Associate Professor
Sloan School of Management
Geoffrey Supran
Graduate Student
Dept. of Materials Science and Engineering
Stian Ueland
Postdoctoral Associate
Dept. of Materials Science and Engineering

What does our community think MIT should do about climate change?

The question we all care about is, "*What does our community think MIT should do about climate change?*" Should we accept FFMIT's call to divest? Should we do something else instead, possibly a proactive response that contributes to reducing the Institute's carbon footprint? Should we do something far more ambitious, and if so, what? Should we do nothing until we are more confident about the magnitude of the risks?

Last spring, when President Reif called for the campus conversation on climate change, he asked Provost Marty Schmidt, ESI Director Susan Solomon, MITEI Director Bob Armstrong, and me (collectively forming the "Conversation Leadership") to lead this activity. Because much of the best work at MIT is done through collaboration across the Institute, we decided to appoint a committee to implement the conversation. The Committee on the MIT Climate Change Conversation, listed in Table 1, is chaired by Professor Roman Stocker and contains faculty from all five Schools, a postdoctoral associate, a graduate student, an undergraduate student, a staff member, and a senior member of the technical staff of Lincoln Laboratory. [The Climate Change Conversation Committee has a Website that contains a lot of useful information: ***climatechange.mit.edu***.] Their charge is as follows:

The Committee will plan and implement the MIT Climate Change Conversation, reporting to the Conversation Leadership (Provost Marty Schmidt, Vice President for Research Maria Zuber, Environmental Solutions Initiative Director Susan Solomon and MITEI Director Bob Armstrong).

The Committee should seek broad input from the Institute community on how the US and the world can most effectively address global climate change. The Conversation should explore pathways to effective climate mitigation, including how the MIT community – through education, research and campus engagement – can constructively move the global and national agendas forward. Possible activities for the Campus Conversation could include a lecture series, panels and a survey in which all points of view of the MIT community are sought, presented and discussed.

The Committee should produce a final report to be delivered to the Conversation Leadership. The report should list, in unranked order, key suggestions with associated pros and cons that encompass the range of views of the community. The Committee should accomplish its work during the FY14-15 academic year and submit its report by Commencement 2015. The Conversation Leadership will solicit reactions to the report from the MIT community and, from the collective input, recommend to the President a path forward.

Last fall the Climate Change Conversation Committee launched an idea bank seeking input for the most effective ways to deal with climate change, as well as a survey to gain input as to how the community wanted to engage on the topic. The public part of the conversation is taking place this spring, with the schedule of events listed in Table 2.

To know what the community thinks, we need the community to speak

Up until now, there has been a dedicated and passionate group on campus and from the alumni ranks who have been calling on MIT to take action. *But we need all members of our community to get involved with this conversation.* To inspire you to start thinking, let me pose some challenging questions:

- How do we reconcile the social harm associated with burning fossil fuels with the social benefit of their current use, especially in developing economies?

Table 2. Campus Conversation on Climate Change Schedule of Events

Fall 2014: Idea bank launched (***climatechange.mit.edu/ideabank***)
Fall 2014: Survey on campus engagement
January 21: "One Man's Journey to Climate Activism" by alum Larry Linden
March 12: Public Forum on Reducing MIT's Carbon Footprint
March 31: Public Forum on Climate Change Communication, E51-115, 4:00 – 5:30 pm
April 9: Campus debate on divestment, Kresge Auditorium, 4:30 – 6:00 pm
April-May: Climate Change Conversation Committee Listening Tour
April 13, 12-1 pm, 4-237
April 22, 6-7 pm, 37-212
April 27, TBD @ Lincoln Laboratory
April 28, 12-1 pm, E25-111
May 7, 5-6 pm, 32-155
May 12, 6-7 pm, 3-270
May 11: Compton Lecture by Mario Molina, TBD
June 5 (approx.): Report due to Conversation Leadership, followed by release to community for comment

- Everything we do has a cost. What's the appropriate balance of MIT investment to respond to climate change with investment in other Institute needs?

- What kinds of action can we take that are commensurate with the global nature of climate change?

- Would it be appropriate to call out fossil fuel companies while continuing to use their products and to partner with them on clean energy solutions and fossil fuel studies that mitigate environmental harm?

- Is the threat of climate change such that we should diverge from our *modus operandi* of objective, data-driven analysis and problem solving to take a social activism role in combating it?

- Where's the shared sacrifice? How do we insist that MIT as an institution take action without each of us changing our own behavior?

- How can MIT best exhibit leadership on the issue of climate change?

We need to be discussing these and many other questions about what MIT should do, or, if you wish, not do. We can fully expect our students to come out in force and let us know what they think. Good for them! But on this issue, we have heard from a small fraction of MIT's 1,000-plus faculty so far. We can't develop a strategy that considers the wishes of the community if we don't know what all community members think. There should be no expectation on your part that an outcome that is acceptable to you will emerge in the absence of your input. Please make your opinion known by participating in the public events (Table 2) or contacting anyone on the Climate Change Conversation Committee (Table 1) or the Conversation Leadership.

Maria T. Zuber is Vice President for Research and E. A. Griswold Professor of Geophysics *(mtz@mit.edu).*

letters

Why MIT Faculty Should NOT Sign the Petition to Divest from Fossil Fuels

Dear Faculty Friends,

UNTIL MIT ITSELF DIVESTS FROM using fossil fuels, it would be hypocritical for us to sign a petition to divest from fossil fuel companies. Indeed, given that many fossil fuel companies have invested in MITei to help us find ways to address our world's energy problems (supply and environmental issues), divestiture would be an act of ballistic podiatry followed by a round of Abbe Roulette. If we really want to "punish" fossil fuel companies, replace the "FFincome" from investment in fossil fuel companies with endowment funds and spend the "FFincome" on solar panels for all MIT roofs, energy saving windows…. First put our own money where our mouth is, then we will be free to preach to others. ☺.

There will of course be accusations that we are being "bought off" by fossil fuel company members of MITei. On the contrary, I believe MITei fossil fuel company members are genuinely also interested in renewables and low carbon energy sources. Personally, as a recipient of funds from MITei, my research into renewables has been able to flourish before it became fashionable to work in renewables. Indeed, MITei funded my wild renewable ideas at a time when DoE and NSF would not. The result? Things like "Symbiotic offshore energy harvesting and storage systems," *Journal Sustainable Energy Technologies and Assessments*, 1-7 and "Concentrated Solar Power on Demand," *Solar Energy 85* (2011) 1519-1529 (e-mail me and I will be happy to send you a copy).

Read the CSPonD paper where in the end we show how the U.S. government could easily attain 50 GW of 24/7 solar power, which could power L.A., on a small part of its large military bases at China Lake and White Sands. I agree it's easy to join a loud protesting mob: REAL leadership would be for MIT to even more strongly engage the "problems" and work with all involved to achieve long-term sustainable goals.

Sincerely,
Alexander H. Slocum
Pappalardo Professor of Mechanical Engineering
MacVicar Faculty Fellow

Professor Harvey Responds

Editor's Note: *Prof. Slocum's letter (above) is in reply to the article, "Why MIT Faculty Should Sign the Petition to Divest from Fossil Fuels," by Charles F. Harvey (*MIT Faculty Newsletter*, Vol. XXVII No. 3, January/February 2015.)*

Following is Prof. Harvey's response to Prof. Slocum's reply.

I HEARTILY AGREE THAT MIT should reduce its carbon dioxide emissions and am excited for the endeavor. I would like to see us do it "big," to go beyond what many other institutions are doing. The bar is already high. Apple and Google are offsetting their power consumption with large-scale solar projects. Other academic institutions have built innovative zero-emissions buildings. Alex Slocum's research stands out as an example of how the ingenuity concentrated at MIT can be focused to develop new ways to reduce fossil fuel consumption. I am pleased that oil companies are funding his research because I can think of no better use for their money. We should continue to welcome this funding. Let's hope MIT will make game-changing discoveries soon. Imagine if solar power and energy storage were improved to the point where together they outcompeted fossil fuels for most uses. When that day comes, we will all agree what to do with our fossil-fuel investments – sell them as fast as we can before they are worthless!

The serious and immediate concern about MIT's investment in the companies that extract coal, oil, and gas is the message it conveys to the world. What does it mean if we work during the day to reduce MIT's emissions, while our investments work at night to extract fossil fuels? Equity ownership of the fossil fuel industry is a bet on the future success of coal, oil, and gas – a bet with MIT's endowment against the success of competing non-fossil sources of energy, the renewables that Alex Slocum is working to develop. Proposing that technology will reduce fossil fuel consumption, while simultaneously betting that the coal, oil,

and gas industry will prosper, may seem strategic, or may seem cynical, but it certainly is not a style of real leadership that conveys a clear message about the threat of anthropogenic climate change to human welfare.

Yes, fossil fuel companies are funding alternative energy research at MIT in addition to funding MIT's research on oil and gas extraction. However, fossil fuel companies are almost exclusively in the business of extracting, refining, and distributing fossil fuels. They have not diversified into renewable energy and have a history, with an obvious motivation, of funding disinformation about climate change science – an activity that could hardly be more antithetical to MIT's mission. A careful shift of MIT's investment would have little effect on MIT's expected return on the endowment and would not punish the fossil fuel industry because MIT owns too small a portion of their stock to move the market. The reason to divest is to send a message beyond MIT that the coal, oil, and gas industries must leave most of their reserves, the assets that support their valuations, in the ground if we are to avoid the worst effects of climate change. With MIT's stature as one of the world's top scientific institutions, we have an opportunity to act responsibly and influence the world to follow a safer path.

The fact that we are working on one good thing (reducing MIT's emissions) does not preclude us from doing another good thing (divesting from fossil fuel companies). We can do better; we can do both. At MIT, we know that the scientific evidence is clear about the dangers of climate change. Let's make our actions equally clear and consistent.

Charles F. Harvey
Professor
Department of Civil and Environmental Engineering

letters

Humanities and The Future of MIT Education

To The Faculty Newsletter:

IN THE ARTICLE ON "The Future of MIT Education" (*MIT Faculty Newsletter*, Vol. XXVII No.2, November/December 2014) authors Sanjay Sarma, Karen Willcox, and Israel Ruiz state:

"Accordingly, the two central tensions that are clear in the Future of MIT Education report and in the summary on these pages are those between the direct encounter of students with dedicated teachers, and the deep value of direct hands-on engagement in the processes of science and engineering."

May I remind the authors and anyone else who might need reminding that there are five Schools at MIT, three of which are not engaged in science and engineering?

I have taught at MIT since 1972 and have experienced many examples of this kind of invisibilization of my scholarly and pedagogical identity and mission during that time. I know that many of my colleagues in SHASS have as well (and, probably, in the School of Architecture and Planning and Sloan School of Management).

In these three Schools we study and teach about politics, economics, linguistics, philosophy, literature in numerous languages, film and media studies, anthropology, history, urban studies, architecture, music, theater arts, and much, much more.

The material world is important, but it is not the only world we need to know about.

Jean E. Jackson
Professor Emeritus
Department of Anthropology

Review Conference to take Center Stage
Bernstein, from page 1

Engineering Department the Laboratory for Nuclear Security Policy has a vigorous program led by Scott Kemp and Richard Lanza. Francis Gavin, the Stanton Chair in Nuclear Security Policy, Vipin Narang, Barry Posen, Jim Walsh, and others are active members of the Security Studies Program in the Political Science Department, and I'm a member of the Physics Department. There is also a student Global Zero group led by Mareena Robinson, a Nuclear Science and Engineering graduate student, closely associated with the Technology and Culture Forum (Radius) who have been having programs of interest. Most prominent in the news is our Physics Department colleague, Ernie Moniz, the U.S. Secretary of Energy, who is participating in the Iran negotiations as a technical consultant to Secretary of State John Kerry [see *The New York Times*, 29 March 2015, p.1.]

Iran has ratified the NPT (Nuclear Non-Proliferation Treaty). However, for the past two decades, it appears likely to have been working towards the ability to either make nuclear weapons or become a nuclear weapons threshold state. Iran has had a long and troubled history with the IAEA (International Atomic Energy Agency) and the U.N., as can be seen by many Security Council Resolutions (for a summary see ***www.armscontrol.org/fact-sheet/Timeline-of-Nuclear-Diplomacy-With-Iran***).

In August 2013, three days after his inauguration, Iran's newly elected President Hasan Rouhani called for the resumption of serious negotiations with the P5+1 (the acknowledged nuclear weapons states – U.S., Russia, China, England, France, plus Germany) on Iran's nuclear program. These commenced in October 2013. On April 2, after several years of negotiations that became quite intense in the previous week, Iran and the P5+1 came to a historic, preliminary outline of an agreement that exceeded my expectations; it is surprisingly detailed. It contains many major concessions by both parties, particularly by Iran. The central agreement is that for the next 15 years Iran will dramatically limit its present stockpile of reactor grade enriched uranium (< 4%) from its current 10,000 to 300 kilograms. The number of running P1 centrifuges (their least efficient models) will be reduced from 10,000 to 5060 and be stationed only in their Natanz facility for 10 years. This combination should ensure that the breakout time is increased to one year, the number that President Obama has been stating as required.

In addition, there are limits placed on Iran's research into more advanced reactors and their deployment, as well as the conversion of the deep underground facility at Fordow into peaceful nuclear physics research without any centrifuges enriching uranium. The heavy water Arak reactor being constructed by Iran (frozen under the interim agreement of November 2014) will be reconfigured so that very little plutonium will be produced. All of these are subject to the strictest IAEA inspections that have ever been conducted. In return, Iran is to be relieved of many sanctions and will obtain official recognition from the international community for the first time of their right to enrich uranium. Supporters of the agreement in Teheran have used both of these issues to counter arguments from their hard liners.

U.S. Secretary of State John Kerry, center, and British Foreign Secretary Philip Hammond, second from right, wait with U.S. Under Secretary for Political Affairs Wendy Sherman, left, and U.S. Secretary of Energy Ernest Moniz, second from left, before a meeting with Russia, China, France, Germany, European Union, and Iranian officials at the Beau Rivage Palace Hotel in Lausanne, Switzerland, Monday, March 30, 2015.

These negotiated goals need to be finalized by the end of June, as well as several important and potentially difficult issues that were deferred. These include how the reduction of the enriched uranium stockpile is to be reduced (Iran has ruled out shipping this material out of the country) and the U.S. demand that the IAEA be allowed to conduct inspections any place in Iran, including military bases. A sign of how difficult these future negotiations will be can be seen in the differing versions of the leadership in Washington and Tehran (see, e.g., M.Gordon, *The New York Times*, April 4, 2015). The issue that has received the most attention is the timing and nature of the sanctions relief. The P5+1 is stating that they will be

reduced on a step-by-step basis as Iran demonstrates that it is complying with the agreement. The Iranian leadership is asserting that all of the sanctions will be terminated, not phased out, as soon as the accords are finalized June 30. Stay tuned for the same cliff hanging, intense negotiations that occurred at the end of March.

In order to have any chance of success the negotiations did not address any of the many outstanding political differences that we have with Iran. These include their support of Hamas and Hezbollah, general antagonism towards Israel, the lack of civil liberties inside their country, and its role in the Shia-Sunni conflict. This will require some heavy diplomatic lifting that the Obama administration is already dealing with. In addition, there is a great deal of opposition in Congress which has taken on an unfortunately partisan character and which will be an issue in the 2016 presidential campaign.

It is important to step back and take a longer and more fundamental view of what should be accomplished. It is rarely acknowledged in the political commentary, but we are fortunate that Iran seems committed to be part of the NPT treaty and since the interim agreement was reached, have allowed the most intensive IAEA inspections ever conducted of their facilities and some of their uranium mines. It is also encouraging that Ayatollah Khamenei has issued a FATWA stating that they will not develop nuclear weapons. On the other hand, we should not be naive about their intentions. We know that Iran had a nuclear weapons development group and that they probably know how to quickly build a nuclear weapon once they have the required fissionable material. U.S. intelligence estimates that this effort ended in 2003. We also know that in the past they did not completely live up to their NPT inspections obligations, for which they were sanctioned many times.

For their part, Iran is angry about our cyber sabotage efforts on their enrichment centrifuge program and at Israel, who they link to the U.S., for their refusal to join the NPT, for its possession of nuclear weapons, and for assassinations of several of Iran's nuclear scientists.

These specific nuclear issues are a small fraction of the many contentious issues between our countries, and with our close ally Israel. In my personal view, there is little doubt that Iran has worked hard to position themselves to be able to produce a nuclear weapon without taking the final step. Clearly, it is in our interest to keep them from taking this important last step. It is therefore necessary to successfully conclude the negotiations that will slow down their ability to quickly produce a nuclear weapon and allow a vigorous inspection regime. It is rarely mentioned in the debate that it is in our interest to give them sufficient incentives so that they do not want to take the final step towards making a nuclear weapon. In my view, we should not let the pursuit of the perfect deal prevent the reasonable one that now appears to be possible. As is often the case, the goal should be to minimize risk, since eliminating it is quite unlikely. The alternative to an agreement appears to be escalating conflict, possibly war, and a fractured P5 alliance on this issue, and possibly Iranian nuclear weapons in the next few years. Finally, in my judgment, even though Iran's nuclear program has attracted intense interest, the more important nuclear arms control issues include U.S.-Russian reductions and taking our missiles out of "hair trigger" alert mode, the dangerous India- Pakistan standoff, and North Korean isolation and nuclear weapons development.

The other nuclear proliferation issue that is likely to generate extensive news coverage is the next five-year NPT review scheduled from April 28 thorough May 9, 2015 at the U.N. The NPT came into force in 1970, and currently includes 189 states. Notably absent are India, Israel, Pakistan, and North Korea (who withdrew) which have nuclear weapons. The bargain to establish the NPT was that the five nuclear weapons states (the P5) were grandfathered in but agreed to eliminate their nuclear weapons; Article VI that covers this does not specify a specific time scale or process. The rest of the signatories are entitled to utilize nuclear power, subject to IAEA inspections, but are not allowed to have nuclear weapons or to help others obtain them. It is anticipated that the 2015 meeting will be "stormy" (see ***www.armscontrol.org/act/2014_04/Rough-Seas-Ahead_ Issues-for-the-2015-NPT-Review-Conference***) with many of the non-aligned, non-nuclear weapons states such as Ireland, Norway, etc., demanding that the established nuclear weapons states get specific about their Article VI commitments. What is anticipated is that there will be a call to establish some concrete guideposts about nuclear weapons reductions. It is also anticipated that the nuclear weapons states will focus on the proliferation issue, particularly for Iran and North Korea. The P5 met in London and issued a bland statement on February 4 (***www.state.gov/r/pa/prs/ps/2015/02/ 237273.htm***) that is unlikely to satisfy the critics who want to see some tangible progress on the part of the existing nuclear powers, particularly the U.S. and Russia, making disarmament a priority, not just a distant objective.

In addition to the formal conference there are many non-governmental activities planned around the NPT review with people participating from all over the world. Our Faculty Newsletter Chair, Jonathan King, is actively working on this, serving as Chair of Massachusetts's Peace Action's committee organizing for the Conference. On this 70th anniversary of the bombing of Hiroshima and Nagasaki a large Japanese delegation is expected to show their support for eliminating nuclear weapons. Many student and university groups are expected from the U.S., including MIT and other local universities. As someone who learned so much from my older colleagues who worked on the Manhattan Project, and who has been long concerned about nuclear weapons, I hope that this attention plays a role in preventing them from ever being used again.

Aron Bernstein is Professor Emeritus in the Department of Physics *(bernstein@mit.edu).*

Advancing a Respectful and Caring Community

Edmund Bertschinger

Editor's Note: On the following 9 pages we offer a variety of reactions to Institute Community and Equity Officer Ed Bertschinger's recent report, "Advancing a Respectful and Caring Community: Learning by Doing at MIT."

IN 2013, I SHIFTED ROLES from Physics Department head to the Institute Community and Equity Officer (ICEO) at MIT. This new position includes oversight of MIT's efforts to promote diversity and inclusion for faculty and staff, and much more. The breadth of the role is reflected by its title: the community includes over 23,000 students, staff, postdocs, visitors, and faculty in Cambridge, more than 3,400 Lincoln Laboratory employees in Lexington, and the MIT Corporation members, alumni, and many others affiliated with MIT.

The first 18 months in this role provided a unique opportunity to study MIT's community, culture, and values. Numerous faculty reports were reviewed, including the 1999 and 2002 reports on women faculty and the 2010 Report on the Initiative for Faculty Race and Diversity as well as the 1998 Report of the Task Force on Student Life and Learning. Scores of other reports, articles, and books were read, and hundreds of community members were interviewed. Crucial ideas came from students, staff, and alumni.

The product of this study was a lengthy report (***iceoreport.mit.edu***) released in February 2015 that addressed three questions. What makes MIT special? Which elements of the MIT culture support its mission and which ones hinder it? How can we do better as individuals and as a community? Most MIT reports present ideas to change the world. This one presented ideas to change MIT in our grand tradition of learning by doing.

The overall goal of this effort is summarized by the ICEO mission statement – "to advance a respectful and caring community that embraces diversity and empowers everyone to learn and do their best at MIT."

After exploring MIT's community, culture, and values, the report weaves together recommendations and data providing the means and ends for shifting the culture. The first recommendation is to establish a process leading to an MIT Compact.

MIT Compact process

Assemble a representative working group to write a brief statement of what we aspire to as a community and what we expect of one another as MIT community members.

Properly understood, this recommendation is radical: it removes the labels and privileges of our positions and asks us to hold honest conversations about our values and community standards. Although the deliverable outcome is a one-page document, the most important part of this recommendation is the process of engaging in deep, community-wide conversations about core values, aspirations, and norms. These conversations will launch our mission of advancing a respectful and caring community into orbit.

Two questions come to mind: why do we need this, and are we ready for it?

We need a Compact process because graduate students have called for fair treatment in a document, "Common Values on the Graduate Student Experience," intended for their faculty advisors. We need it because support staff have advanced an initiative for "Civility and Respect at MIT." We need it because our undergraduates organized an event: "We Are One: Building a Better MIT Through Conversation." We need it because, all across MIT, people are coming to realize that there are unhealthy aspects of the MIT culture (***tech.mit.edu/V135/N7/hao.html***).

We are not, however, ready for the full-scale process of an MIT Compact. We try to do too much and, in the process, become less. An example comes from how we manage stress on ourselves and others. According to conversations with students, many faculty did not take time during classes the week following two student suicides to offer students the chance to talk about how they're feeling and to make clear that we are there for them, despite receiving a request from the Chancellor, Provost, and Chair of the Faculty on March 9, 2015 that they do so. As reported in the March, 2015 issues of *The Tech*, and in the *Boston Globe* on March 17 (***www.bostonglobe.com/metro/2015/03/16/mit-students-open-about-stress/dS61oA5tiKqjvVsJ5VZRAL/story.html***), a few faculty reached out to students in thoughtful, inspiring ways (***tech.mit.edu/V135/N8/davis.html***). Let us strive together to advance a respectful and caring community (***tech.mit.edu/V135/N6/letters6.html***).

If holding these conversations is important and we are not sufficiently ready, what should we do? This being

MIT, let us practice *learning by doing*. Start the conversations in your research group. Ask your administrative assistant how she or he is coping with stress. Then listen humbly (***web.mit.edu/fnl/volume/272/schein_letter.html***). Prototype the MIT Compact process in your department, lab, or center. Be sure you include students, postdocs, and staff – and if you don't know where to begin, ask them. After some initial discomfort, you will likely find the process inspiring and energizing. With your help, perhaps by 2016 MIT will be ready for scaling up of these conversations community-wide.

Theodore Roosevelt said, "People don't care how much you know until they know how much you care." While this is not easy at MIT, we do things here not because they are easy, but because we love to solve important problems. Showing that you care will help to solve problems.

Quantifying diversity, equity, and inclusion

MIT faculty thrive on data. The ICEO report samples data from institutional surveys as well as qualitative data from interviews to show where the mission is succeeding and where we are lagging. Encouragingly, overall satisfaction has increased markedly over the last decade, by 19% for staff and 13% for faculty, whose satisfaction exceeds that of faculty at our major peers. However, if one subdivides the data by different groups, one finds that White and Asian undergraduates are significantly more satisfied than Black, Hispanic, and Native American undergraduates, and similarly for heterosexual undergraduates compared with lesbian, bisexual, gay, transgender, and queer undergraduates.

Data from the Quality of Life surveys reveals chilly climates for staff, students, postdocs, and/or faculty in several departments, labs, and centers. Usually, students or employees of these work units have called out for help in dealing with abrasive conduct, and sometimes the remedies are unsuccessful. Alarmingly, in every category of student and employee, women are significantly more likely to report feeling overwhelmed by all they have to do than men, although their overall satisfaction was the same. The report shows the community challenges facing us and provides a set of "community" recommendations intended to address the challenges and exploit the opportunities for moving MIT into a leadership role in how we treat people, as called for by President Reif.

The ICEO report also provides data concerning equitable treatment (rank, salary, etc. as functions of gender, race/ethnicity, etc.) and on progress towards diversity goals called for in previous reports and in a 2004 Faculty Resolution. Although the doubling of underrepresented minority faculty and the tripling of underrepresented minority graduate students called for in 2004 has not quite been achieved, significant progress has been made as a result of proactive recruitment efforts described in the report. The greatest disappointment was the discovery that MIT seriously lags both the technology industry (Facebook, Google, Apple, etc.) and our own faculty itself in the presence of underrepresented minorities among postdocs, academic staff, research staff, and Lincoln Laboratory technical staff – even if one excludes international scholars.

Filling in our blind spots

The persistent underrepresentation of women and minorities in faculty positions and in leadership roles of many kinds remains a blot on universities purporting to be meritocracies. It is appropriate to ask whether aspects of faculty culture diminish our return on investment by making it harder for people to succeed who are different.

The answer to this question is universally affirmative, and has nothing to do with faculty status or privilege, but with human nature. Each of us has a limited perspective shaped by our own experience, resulting in blind spots. For example, the ICEO report says almost nothing about how MIT can improve the experience of students and employees with disabilities, an oversight that will be corrected in the final version. This neglect was unconscious, a bias arising from my lack of experience with issues of accessibility.

Seven years ago, MIT female full professors earned, on average, 94% of what male full professors did, comparable to the ratio at our peer institutions. This difference could not be accounted for by accomplishments, experience, or other factors, but was due to gender bias. The bias was identified and systematically corrected with the result that for the last three years, female and male full professors earned as much, on average, at MIT – but not at our peers, who did not identify and correct unconscious bias.

Google has undertaken impressive efforts to educate all its employees about unconscious bias and steps to correct it. One of the report's major recommendations calls on MIT to do the same by hiring a social scientist to implement a community-wide training and assessment program. Success will require faculty being willing to learn and, perhaps, to change some habits.

Implementation

The ICEO report cannot be implemented by the ICEO or by the Provost. It is too far-ranging for anything but MIT's distributed leadership to effect, working with HR, with student leaders, with all of Academic Council, and with many others. The report contains 17 major recommendations (of which only two have been mentioned above) and numerous "minor" recommendations, which are often lesser only in that their implementation is less cross-cutting.

For example, one recommendation calls on every head of a department, lab, or center and every administrative officer or equivalent to attend a leadership workshop and take an online course on leadership. It also calls for the development of an MITx course, *Introduction to the MIT Community*, for new community members to take during orientation. It also calls for facilitated conversations about community standards in each

continued on next page

Advancing a Respectful and Caring Community
Bertschinger, from preceding page

department, lab, or center for all faculty and supervisory staff, using video skits created in a Bystander Intervention Video Competition. Should this broad recommendation be accepted, it will be important for the senior administration to explain why it is important. The report contains a great deal of background information in Sections 1 through 6. The large scope of this recommendation means that it would take several years to fully implement, with oversight being provided by the deans, vice presidents, and directors on Academic Council.

Some faculty have asked me what has happened with previous faculty equity reports. Good progress has been made on the recommendations of the reports for women faculty in science and engineering (***web.mit.edu/faculty/reports/pdf/women_faculty.pdf***), but less so for minority faculty. That is why a recommendation calls on deans and department heads to review and implement the recommendations of the Race Initiative report and other reports, and for the provost to review progress every five years. In addition, another recommendation calls for each dean, vice president, and director on Academic Council to appoint an Equity Committee to advise and work on improving equity. Most of the committees already exist. Finally, the Corporation Visiting Committees have an important role in reviewing the success of many MIT units, and their work will be aided by a dashboard summarizing community and equity data for their unit. Visiting Committees should also seek candid input from students and staff, who are often more aware than faculty are of challenges to equity and inclusion.

What can one do, given the heavy demands of academic life? We are all busy and many will not have the time to read the full ICEO report. As a first small step, I urge you to read Section 1, which shows some ways that you can make a difference and why it matters. If you have a little more time, join me for dinner with students excited about MIT yet feeling trapped in "the bubble," or organize your own extracurricular events. They will appreciate your humanity and be inspired by your stories. Finally, discuss with colleagues how you can advance a respectful and caring community in your department, lab, or center. Learn by doing.

Edmund Bertschinger is Institute Community and Equity Officer *(edbert@mit.edu).*

In Support of the ICEO Mission Statement

Paul E. Gray

MIT HAS BEEN A PRIME continuously evolving educational enterprise charted by the Commonwealth of Massachusetts for more than 15 decades. It has seen several periods of serious introspection and change:

- Creation of the Radiation Laboratory (RLE).
- The Undergraduate Research Opportunities Program (UROP).
- The creation of McCormick Hall and the opening of other undergraduate dormitories enabled gender equity for all.
- The affiliation with the Whitehead Institute.

Professor Edmund Bertschinger – the Institute Community and Equity Officer (ICEO) – has proposed a mission statement for all who work, study, learn, live and grow at MIT:

The mission of the Institute Community and Equity Office is to advance a respectful and caring community that embraces diversity and empowers everyone to learn and do their best at MIT.

This work deserves the attention of everyone in this community.

Paul E. Gray is Professor Emeritus, Department of Electrical Engineering and Computer Science, and President Emeritus *(pogo@mit.edu).*

Let's Get to Work in "Advancing a Respectful and Caring Community"

Thomas A. Kochan

INSTITUTE COMMUNITY AND EQUITY Officer Ed Bertschinger's report serves as a made-to-order blueprint for implementing the mission of his office: "to advance a respectful and carrying community . . . at MIT." The report itself is classic MIT – a thorough piece of research that builds on a host of social science research findings, provides new data from a year of interviewing and listening to members of our community, and distills the evidence into a plan of action.

But wisely Ed notes in his column in this *Newsletter* (page 14) that he is not proposing a top down strategy for changing the MIT culture. Instead he proposes we start locally – where the real power and levers for change lie.

So he needs our help. How might we do this? Let me give you a couple of examples that I hope will move you to action.

My home department, the Sloan School, writes our Mission on the wall for all to see: "To develop principled, innovative leaders who improve the world . . . ." These are nice pious words, but are we living the mission? We have a golden opportunity to test whether we really mean it. The Sloan faculty just voted to revise our undergraduate programs to expand and deepen our course and degree options, largely along technical (data analytics and finance) lines. These will serve our students well but how will we ensure they produce principled leaders? Our own research tells us that leadership is best learned through a three-step "action learning" approach: First we teach theories of leadership, then students put them to work in their team projects in other courses, extracurricular activities, and living groups, and finally they return to the classroom to reflect on lessons learned through written and oral presentations. Our curriculum revisions open up opportunities for students to apply these leadership and action learning principles in these new classes. If we take advantage of these new opportunities, we can help our undergraduates hone their leadership skills in their chosen field of interest while on campus as a prelude to becoming principled, innovative leaders who improve the world after graduation.

One key recommendation in Ed's report is to produce a new set of Bystander videos that help us all deal with inappropriate comments and behaviors or aspects of our culture that increase stress. I am happy to say that five student teams in my undergraduate *People and Organizations* course are taking up this call and will produce new Bystander videos that can be used across campus to deal with things such as the "imposter" syndrome and other stresses students have identified are part of the MIT culture. I hope these inspire others to enter the competition Ed plans to host for more such videos.

Another opportunity being proposed by several Sloan faculty colleagues is to use randomized experiments to test new approaches to freshman orientation, dorm assignments, or assistance provided to students experiencing academic or other difficulties. By using carefully designed controlled experiments such as these we could put our research and data driven traditions to work in solving known, longstanding problems affecting our students.

One key recommendation in Ed's report is to produce a new set of Bystander videos that help us all deal with inappropriate comments and behaviors or aspects of our culture that increase stress. . . . Another opportunity being proposed by several Sloan faculty colleagues is to use randomized experiments to test new approaches to freshman orientation, dorm assignments, or assistance provided to students experiencing academic or other difficulties.

These are just some ways we can put the Bertschinger blueprint to work in ways consistent with MIT's culture. Multiplying these examples with others like it across campus might go a long way toward realizing our goal of building a "respectful and caring community" for all.

Thomas A. Kochan is the George Maverick Bunker Professor of Management, Sloan School of Management *(tkochan@mit.edu)*.

The Faculty Role in Building and Sustaining Community

Phillip L. Clay

MIT'S MISSION STATEMENT:

"*To advance knowledge and educate students*"

"*To bring knowledge to bear on the world's great challenges*"

"*With the support and intellectual stimulation of a diverse community*"

"*For the betterment of humankind*"

MIT is a special community. We are guided by values (e.g., integrity, excellence, curiosity, openness to exploration) and dedicated both to generating and disseminating knowledge and to identifying and addressing the world's most important challenges. We attract some of the most talented and creative young people in the world.

We are entrusted with the task of preparing these young people to apply knowledge and wisdom to solving the world's problems, both technical and nontechnical. If our students are to work and lead with confidence and maximum impact, they need more from us than problem sets and lectures. They need our experience and values.

How can we best transmit this knowledge to them? We must not assume that our students will absorb our values, perspectives, and life lessons through mere proximity. We need to be proactive in engaging our students. And we need to better appreciate how valuable our reflection and wisdom are to these young, brilliant minds.

Some years ago, when I served as MIT's Chancellor, I was interested in developing a set of curricula and co-curricular activities that would emphasize leadership development. I wanted the faculty to be involved, and I engaged several faculty members about this initiative. One of these faculty members protested that he was a science professor, not a professor of leadership, and he did not have time to participate because of his responsibilities leading and developing scholarly activities and providing leadership on various MIT committees and within his department.

I couldn't ignore the irony. Although he and others I approached were major leaders in their fields, in the community, and at MIT, they did not consider themselves live models for leadership. But the fact is that they are. They model our ideals, challenging convention, taking calculated risks, championing inclusiveness, mentoring new people, and fostering global collaboration, and they also model styles of engagement and coping that our students need to learn if they are to succeed.

Each MIT faculty member has a special opportunity to impart habits of mind and styles of leadership to students. But few students have any exposure to these other dimensions of faculty, which shine most brightly outside of lecture halls and labs. By declining to share their experience, these colleagues missed opportunities to expose students to the complex social technology of caring and inclusion.

First, I believe that we should share our personal journeys with our students. We collectively possess a remarkable array of stories of resilience, success against the odds, and cultural integration. We are the products of many transitions, from many cultures, and from backgrounds of poverty as well as privilege. We have lived multicultural lives. We have embraced challenges and made contributions that extend far beyond our disciplines.

A "respectful and caring community" is not merely tolerant and civil. It is not uniformly neutral to issues, and it doesn't repress difference. At MIT, we take on hard problems such as honoring differences and attempting to learn from them, so that we can receive the best each person has to offer, and work for a world where the benefits of progress help all to advance. We regard difference as an asset to be used, not a convenient filter for exclusion.

The statement President Reif delivered when he took office reminded us that leadership is neither mechanical nor sterile, but grounded in commitments to "meritocracy and integrity," "excellence," "care for the MIT community," "equity and inclusion," and "[teaching students] not only the rigor of their disciplines, but also how to use their gifts, and human values that make those gifts worthwhile."

So, as faculty, how do we harvest and share our experiences and our values in action? There are several approaches I would suggest.

First, I believe that we should share our personal journeys with our students. We collectively possess a remarkable array of stories of resilience, success against the odds, and cultural integration. We are the products of many transitions, from many cultures, and from backgrounds of poverty as well as privilege. We have lived multicultural lives. We have embraced challenges and made contributions that extend far beyond our disciplines.

Moreover, each of us is on a leadership journey, but we rarely even acknowledge this, let alone compare notes. Our faculty could tell hundreds of stories of overcoming shyness, rising to the occasion, growing into different roles, and dealing with failure and loss. But we don't often tell these stories. To do so, we will need to overcome any resistance we have to sharing our wisdom.

Our personal stories are of great value not only to doctoral students but to all students who will take similar journeys, regardless of their ultimate destinations. Students don't always get to hear these stories from their families of origin. When we share our object lessons with eager learners, we help them manage their own fears of the unknown, and we shine a light on paths by which they can achieve their aspirations. This will not be easy but we have created community solutions to far more complex problems.

The second approach I would suggest is to enlist our spirit of entrepreneurship. Derived from the French verb *entreprendre*, to undertake, entrepreneurship is central to MIT's legacy. Entrepreneurs don't just theorize or dream – they take action. Our history underscores the power of this narrative as an institutional tradition. We should encourage students to apply this concept to their roles in the MIT community as practice for a life of taking initiative, risks, and responsibility.

Students are already comfortable seeking recognition for the clever machines and software they invent. This enthusiasm can be expanded to social invention and learning. Student embrace of public service signals a readiness for these opportunities. If students recognize an unmet need, at MIT or elsewhere, we should encourage and support them in addressing it. A legacy of involving students in all aspects of our institutional life means that we can be joint agents with students, supporting and advising them, and engaging them as partners.

The final approach I would suggest is to teach our students how to lead in non-MIT communities. There are three basic strategies we can use to do this. The first is to teach the theory and methods of analysis and change. We do a decent job of this. The second is to involve students in Institute affairs and provide them with practice opportunities to use the theory that they have been taught. We do a fair job of this. The third strategy, teaching students to understand themselves in an organizational or environmental context, is where we fall short.

Students are already comfortable seeking recognition for the clever machines and software they invent. This enthusiasm can be expanded to social invention and learning. Student embrace of public service signals a readiness for these opportunities.

By expanding our efforts and working with our student-life deans, we could help students situate themselves in organizational and community settings, including new and uncomfortable ones, and help them navigate the challenging, fundamental questions that often arise in such settings: Who are you? What are your responsibilities and opportunities in this setting? What knowledge do you need to obtain to understand what is going on? What talents do you bring to the table? What talents do others bring? How do you set goals for yourself, and how do you measure personal progress or success? What problem-solving approaches work best in this situation? What support do you need to be effective? How do you grow? How do you learn? From whom do you learn?

Students who leave MIT capable of framing such questions for themselves in novel settings with people different from themselves will be more capable of making an impact with the talents they possess. They will inspire all sorts of people to engage and embrace them. And they will be better equipped to create and sustain caring and respectful communities, wherever they go.

In the classroom, we can create opportunities to empower students in creating and sustaining caring and respectful communities. For example, if, as part of our teaching, we assign students to groups, or we encourage students to form groups, we can take the next step of helping them use these group opportunities to address some of the core questions noted above and, in any case, make the group a learning community that works for all. Students can subsequently use this experience in other kinds of groups and relationships on campus. Over the course of their time, students will get progressively more challenging opportunities to lead and to follow.

The report *Advancing a Respectful and Caring Community* provides important insight into our community and offers valuable suggestions for how we can advance our community goals and enrich the student experience. In particular, the report suggests actionable steps by which we can more strongly activate our core values and make them more real. Our suggestions for the faculty here can play a role in many of the report's recommendations. Faculty embrace of these recommendations would normalize these ideas for students, reinforce administrative leadership, and empower all staff – not just those with formal student-life responsibilities – to implement them.

Phillip L. Clay is Professor of City Planning, Department of Urban Studies and Planning *(plclay@mit.edu).*

letters

Supporting the ICEO Report

To The Faculty Newsletter:

I AM WRITING IN SUPPORT of the recommendations in "Advancing a Respectful and Caring Community: Learning by Doing at MIT," by Professor Edmund Bertschinger, the Institute Community and Equity Officer. The report is comprehensive, reflecting the input that Professor Bertschinger has received from across the MIT community: from students, postdocs, staff, and faculty. The report describes a number of issues, including inequities, unconscious bias, bullying, sexual assault, and excessive stress, that hinder the ability of everyone in our community to contribute as much as possible to our mission of education, research, and service. The report recommends that MIT take action to address these issues, from creating an MIT Compact, a statement of institutional values that enable the MIT mission, to education of the community about unconscious bias and bystander intervention techniques to revisions of the policies on formal complaints to the gathering and sharing of data.

The 17 recommendations of the report are ambitious. As a first step, I suggest focusing on the following:

- Create an MIT Compact
- Launch an education campaign about unconscious bias and bystander intervention
- Continue implementing the recommendations of existing faculty equity reports
- Create and use a Community and Equity Dashboard (demographic and climate data for each department)
- Revise policies and procedures on the handling of complaints

I urge the faculty to support the recommendations in the report and the administration to act on them. I would like to thank Professor Bertschinger for his efforts in reaching out so broadly across our community and in putting together a comprehensive report.

Yours sincerely,
Lorna J. Gibson
Matoula S. Salapatas Professor of Materials Science and Engineering
MacVicar Faculty Fellow

Advancing a Caring Community Through Enhanced Student-Faculty Interaction

Shruti Sharma '15
Billy Ndengeyingoma '15

THE UNDERGRADUATE ASSOCIATION (UA) is the student government of MIT and represents over 4,500 undergraduate students to faculty, administrators, and the Corporation to enhance student life at MIT. The UA is made up of an officers team and an executive team that includes the chairs of 14 committees such as the Committee on Student Support and Wellness, Committee on Education, and the newly formed Committee on Innovation. Student representation works widely across the Institute, and the UA's Nomination Board is responsible for nominating students to faculty and presidential committees. Interior to the UA, the officers and executive team regularly interface with the UA Council comprised of the Dormitory Council, the Panhellenic Association, the Interfraternity Council, and the Living Group Council. The structure of the UA enables a representative and efficient student leadership.

In its efforts to enhance student life, the UA continues to advocate for a supportive and inclusive community. We will once again stress the importance of harnessing strong student-faculty relations to provide students the mentorship needed for a successful undergraduate career. Academic and professional guidance is crucial, but students can hugely benefit from personal mentorship. Results from the Undergraduate Enrolled Survey from the Provost's Institutional Research show that 60.2% of students rarely or never talk to faculty, only 5.0% of students talk with faculty for personal concerns, and only 10.8% have engaged with faculty in an informal, social, or networking environment. On the other hand, over 88% of students have done or plan to conduct

research with a faculty member. [2011 ESS: ***web.mit.edu/ir/surveys/pdf/2011_ESS_Overall.pdf***, p. 6.] This indicates that programs such as UROPs that create academic communities do not necessarily bridge the communication barrier between students and faculty. We appreciate the myriad of avenues for academic growth offered to students, but hope these avenues can also become clear paths for personal growth.

The Undergraduate Enrolled Student Survey also reveals that 28.9% of students are dissatisfied or very dissatisfied with academic advising. We find that the current platform for advising does not reach its full potential as advising meetings are too infrequent and tend to be limited to course selection. We recommend advising take the form of individual development programs for undergraduate students that incorporate broader discussions of long-term goals and ambitions. In addition, we emphasize the importance of creating an academic community for undergraduates, and the significance of faculty interaction and positive feedback to students. Such interactions would not only elevate student confidence, but also foster a stronger sense of belonging to a caring MIT community.

We students look up to you as role models and cherish our interactions with you. Caring and holistic mentorship from faculty is undoubtedly a crucial component in advancing a respectful and caring community, as recommended by ICEO Ed Bertschinger in his MIT report of that title. [Bertschinger, E., *Advancing a Respectful and Caring Community: Learning by Doing at MIT*.]

Shruti Sharma is a senior in the Department of Materials Science and Engineering and UA President *(ss810@mit.edu);*
Billy Ndengeyingoma is a senior in the Department of Civil and Environmental Engineering and UA Vice President *(billyn@mit.edu).*

Graduate Student Perspective on the ICEO Report

Kendall Nowocin

THE INSTITUTE COMMUNITY AND Equity Officer report is a comprehensive document that identifies a broad spectrum of issues and prioritizations across the 26,400 person MIT community. From 1980-present, the graduate student body, with approximately 6,800 people, is the single largest demographic of the MIT community, outnumbering the approximately 4,500 and 1,000 undergraduates and faculty, respectively [MIT Facts FY 2015 (***web.mit.edu/facts/enrollment.html***)].

The issues (gender, geographic, socioeconomic, etc.) faced by graduate students, can be better understood by having a clearer picture of the demographic in context to students (graduate and undergraduate). The Graduate Student Council (GSC) views a graduate student as someone pursuing advanced studies (professional or graduate degree), who has representation across all departments, residence halls, and at large. The graduate student body is 60% (4080) domestic and 40% (2720) international (Figure 1a, next page) where 60% are single, 30% have a significant other, and 10% have a dependent(s). This more heavily male population (Figure 1b) has a 90% concentration between the ages of 22-30 (mean of 25). The majority of their time is spent in the research lab or on campus, and most prefer and live (68-76%) in close proximity to campus (Figure 1c), with the largest percentage increase from 2003-2013 being Cambridge (near). Graduate students are extremely price sensitive, with an approximate stipend of $35,000 with 50-58% going to housing (rent, utilities, and local transportation). This largest demographic of the MIT community affects MIT's sense of community, research productivity, and competitive edge.

The report has many recommendations that resonate with the graduate community, with these being the top three:

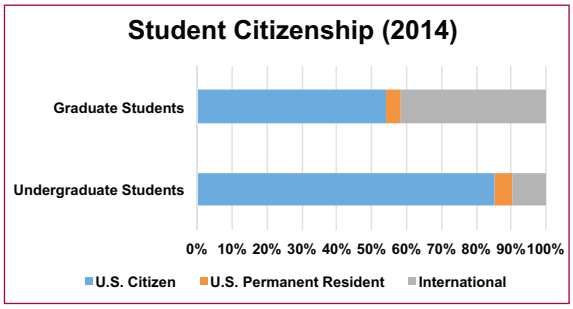
- The C1 recommendation for the community-wide Task Force on the MIT Compact (TFMC) should ideally have proportional representation based on MIT's population, due to the many MIT community stakeholders. The additional question of "What do we want out of our MIT experience?" should be added.

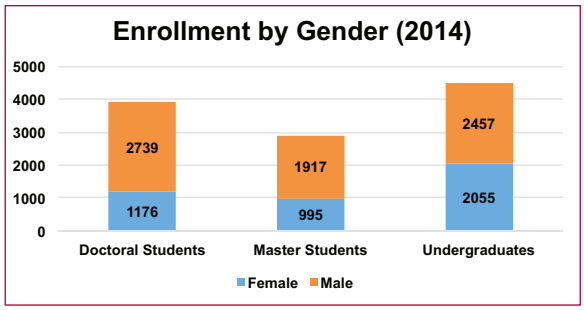
continued on next page

Graduate Student Perspective
Nowocin, from preceding page

- The report's recommendation for uniform medical, health, and wellness resources for the MIT community is strongly supported by graduate students. There are several areas where graduate student resources need improvement. Funded graduate students have covered health insurance, but non-funded graduate students and family members do not. The graduate dental coverage is not adequate, and access to the employee/postdoc plan should be permitted. Graduate students with family member(s), especially those international, are the most in need of additional support. A need-based grant proposal is being developed by the GSC and ODGE (Office of the Dean for Graduate Education), and some peer intuitions have a funded program. The Massachusetts Commission Against Discrimination (MCAD) policy of gender-neutral parental leave that took effect this April 7 should apply to students. Many of these efforts need faculty support, and fundraising or endowments should be part of MIT's capital campaign.

- The recommendations on awareness, assessment, feedback, and development of creative activities should leverage existing resources and channels to expand them where appropriate. The GSC and ODGE consolidating graduate student's rights and responsibilities into a single document can be a starting point for awareness. A formal mechanism, potentially an Institute Committee on Health and Wellness, can help assess and establish an appropriate interface for student's concerns. The DSL, GSC, UA (Undergraduate Association), and housemasters are developing a streamlined process for student policy review, and the lessons learned could be applied to other MIT policies. The GSC is a central hub that provides funds and information to the graduate student body, and should be leveraged to spark engagement, publicize relevant information, and expand the existing funding conduits. Existing programs oversubscribed and highly recommended by students, for example conflict management training, should be expanded. Students would like to see the ICEO, faculty, and senior leadership promote and recognize those that get involved in these activities on a non-periodic basis.





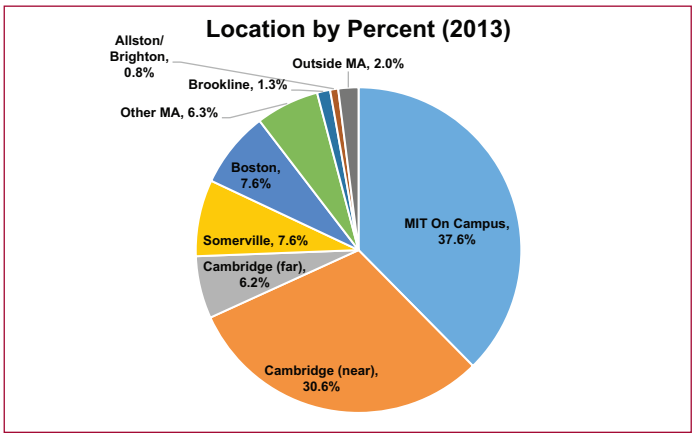


Figure 1a – c
a) FY15 student (UG and G) geographic distribution.
b) FY15 student (UG and G) gender by degree seeking distribution.
c) FY13 survey on graduate student living.
[Information from the GSC Housing and Community Affairs Committee with assistance from Institutional Research.]

There are many more recommendations the ICEO report makes that can benefit the MIT community and bring about positive change. The GSC would like to thank Professor Bertschinger for his continual improvement of the MIT community.

Kendall Nowocin is a graduate student in the Department of Electrical Engineering and Computer Science and GSC President *(knowocin@mit.edu)*.

ORCID Researcher Identifiers to be Integrated into MIT Systems Beginning this Summer

Lydia Snover
Micah Altman
Robert E. Campanella

ORCID (OPEN RESEARCHER & Contributor ID), the community standard for identification of contributors in scholarly communication, is being integrated into MIT systems. The Office of the Provost, the MIT Libraries, and Information Services and Technology are working together, in coordination with OSP, ODGE, the Office of the Registrar, Human Resources, and the Office of the VPR, to implement ORCIDs at MIT. We plan to integrate ORCID into MIT systems, to make it easy for all members of the MIT community to obtain and manage ORCID identifiers, and to distribute ORCIDs to current scholars at MIT.

The Institute has increasing responsibility for evaluating and understanding the success of its scholars, postdocs, and students. Collecting complete, comprehensive, and accurate information about research publications and other scholarly outputs is a persistent hurdle for MIT. A substantial part of this challenge – which ORCID aims to solve – is linking outputs to scholars, when individuals have names in common or names that have changed over time; or when publishers represent names in different forms, or make errors in recording names. ORCID solves this problem by providing an open persistent numeric identifier that distinguishes each researcher from every other.

ORCID supports the creation of a permanent, clear, and unambiguous record of scholarly communication by enabling reliable attribution of authors and contributors. ORCID is an open, non-profit, community-based effort to provide a registry of unique researcher identifiers and a method of linking research-related items, such as articles, to these identifiers. ORCIDs offer a mechanism that distinguishes individuals with common names, and is not affected by name changes, cultural differences in name order, inconsistent abbreviations (and name formats), or use of different alphabets. And ORCID is researcher-controlled; the researcher always has the final word over information that is included in their ORCID record.

MIT will use ORCID to automatically update the electronic professional record, and as an aid to identifying student outputs and accreditation. Use of ORCIDs will also increase the quality of information in MIT's Open Access article collections, and decrease the cost of populating it.

For individual scholars, ORCIDs provide a means to distinguish between a researcher and other authors with identical or similar names. ORCIDs link together all of a researcher's works even if they have used different names over their career. ORCIDs make it easier for others (e.g., grant funders) to find a researcher's research output. ORCIDs help to ensure that a researcher's work is clearly attributed to them.

Publishers and funders are using ORCID to create automated links between a researcher and his/her articles and datasets (as well as other research-related items) through integration in manuscript and grant submission workflows. Nearly all major publishers and manuscript submission systems support ORCID, and many are prompting authors to create ORCIDs during the submission process. Funders and related agencies are using ORCIDs to aid in the evaluation process and to streamline their submission and reporting processes. For example, NIH has integrated ORCIDs into the inter-agency biosketch platform SciENcv. And the U.S. D.O.E. has integrated ORCIDs into its grant submission system.

A growing number of universities are now systematically registering ORCIDs on behalf of their researchers and students and automatically incorporating these into university systems. At MIT, ORCID identifiers will be integrated into key systems including the Electronic Professional Record, DSpace, and the MIT data warehouse.

The planned implementation at MIT includes several phases. The first phase – which will be completed in May, is to prepare for ORCID deployment by developing local systems integration; gathering information on the ORCIDs already registered by members of the MIT community; and developing supporting documentation. The second phase, scheduled for this summer, will be to distribute ORCID IDs to a selected DLC. The third phase, scheduled for late summer, will be to distribute ORCID IDs to all faculty, followed by postdoctoral researchers, graduate students, and other professional staff.

As the year progresses, the Office of the Provost will provide progress updates, and will begin to notify individual departments and faculty about their ORCID registration. Later this summer, information about ORCID integration will be available through the Libraries' author identifier resources page: ***libguides.mit.edu/authorids***; and the Libraries will provide consulting for MIT community members. In the interim, if you have any questions, please contact Lydia Snover or Micah Altman.

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Micah Altman is Director of Research and Head/Scientist Program on Information Science, MIT Libraries *(escience@mit.edu);*
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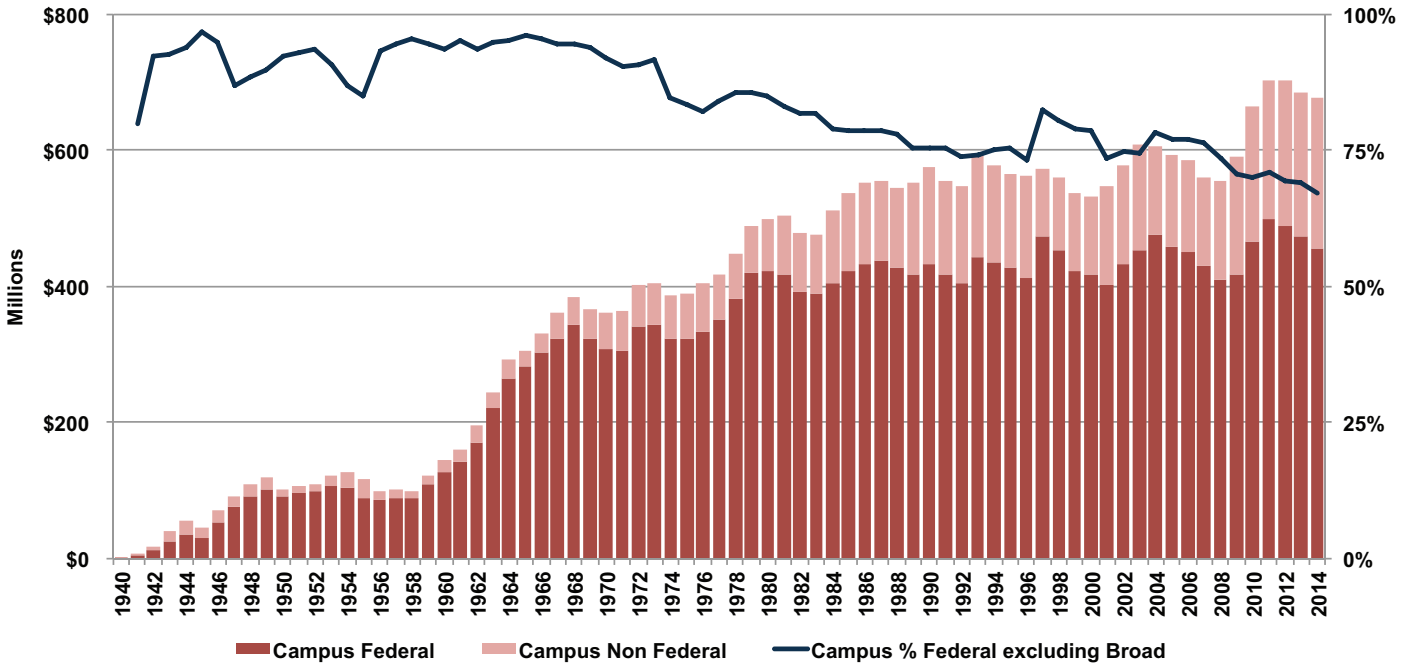
M.I.T. Numbers
MIT Campus Research Expenditures*



***(excludes Broad Institute)**
in Constant $ (2014 = 100)

Source: Office of the Provost/Institutional Research