

# MIT Faculty Newsletter

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

**in this issue** we offer Tom Kochan's final piece as Faculty Chair on faculty governance at the Institute (page 4); our feature *Teach Talk* addressing "Technology Enabled Transformation in the MIT Learning Experience" (page 8); a brief biography of new Faculty Chair Sam Allen (page 12); and "Preventing Utter Devastation in Tornado/Hurricane Prone Areas," by Ernst Frankel (page 13).



303 Third Street, Cambridge

## Can Nuclear Disarmament Become a Reality?

David Lewis

**IN 1963, JERRY WIESNER**, at the time MIT Institute Professor and special assistant to President Kennedy, met with the President and explained to him that because of above-ground nuclear testing, common rain was polluting the world. Wiesner urged Kennedy to ban above-ground testing, and the President agreed. One of Kennedy's last acts as President was to fulfill this promise.

Wiesner's meeting with Kennedy was just one of many remembrances shared by long-time MIT researcher Kosta Tsipis, as part of the May 4th forum, "Putting the Genie Back in the Bottle: MIT Faculty and Nuclear Arms Reduction." Co-sponsored by the *MIT Faculty Newsletter*, the Technology and Culture Forum, the Program in Science, Technology and Society, and the MIT Physics Department, the afternoon event featured

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## An MIT Housing Dream Finally Comes True

O. R. Simha

**THE DREAM WAS TO CREATE** a residence close to the campus where members of the MIT family, across the age spectrum, could build a convenient and comfortable community. That dream, reflecting the best of MIT's culture of mutual support and collaboration, is finally coming to fruition, though not without considerable struggle. The courage and tenacity of a small cadre of faculty, staff, alumni, and friends, who would not let the dream die, deserve a special salute as they begin finally to move into their new homes at 303 Third Street in Cambridge.

The story of this amazing effort begins in the spring of 2003 when a group of MIT and Harvard faculty and alumni came together to explore the idea of creating a cooperative residence where like minded people could age in place and

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## Editorial A Letter to the Class of 2011

**GREETINGS TO YOU, THE** graduates and your families!

We share with the thousands of families gathered on the oval for MIT's 2011 commencement, the excitement, pride, and promise of our new graduates. During the past four years you have been under the tutelage of our faculty colleagues, and your future careers and contributions to society are the proudest product of our academic labors.

At the same time, we are anxious about the world you are moving into: a depressed and uncertain economy; a political environment in which the major institutions supporting science and technology in our nation are having their budgets cut back; states disinvesting in public education and teachers; and continuing foreign wars.

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\*Editorial Subcommittee for this issue

### Address

MIT Faculty Newsletter  
Bldg. 11-268  
Cambridge, MA 02139

### Website

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

**Telephone** 617-253-7303

**Fax** 617-253-0458

**E-mail** [fnl@mit.edu](mailto:fnl@mit.edu)

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**A Letter to the Class of 2011**  
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MIT faculty do not have magic answers or prescriptions to these problems. Most of us do, however, believe that investment in new knowledge of the natural and engineered worlds is invaluable; that the application of advances in science and technology to pressing social problems is among the most effective means of raising the human standard of living; and that such progress depends on an educated and dedicated scientific and technical workforce. We also know a great deal about the ills that afflict human populations, including disease, lack of clean water and air, the burdens of poverty, and the destructiveness of large-scale war. We know that in the world of the twenty-first century there can be no true democracy without an electorate that can reason analytically, and is scientifically, historically, and technologically literate. We also know that science and technology must be used wisely, taking human needs and history into account.

We note with pride the active interest that many of you have taken in mitigating

and reversing the consequences of climate change. The desire to improve the Earth and the well being of its inhabitants is one of the pillars of an MIT education. In this tradition, the adjoining column has an account of a forum on MIT faculty and nuclear arms reduction, "Can Nuclear Disarmament Become a Reality?" (page 1) sponsored by our *Faculty Newsletter* in May. The forum commemorated the MIT faculty who, following the dropping of atomic bombs on Hiroshima and Nagasaki, played leading roles in the subsequent effort to prevent the further use of nuclear weapons, by controlling and limiting their development and spread. Despite progress, thousands of nuclear weapons are still on hair-trigger alert around the world, reducing our security through their possible accidental use, and draining productive economic resources.

We are deeply disturbed by the predominance of military solutions to settle conflicts, with the loss of lives and the diversion of hundreds of billions of dollars that could be used to develop our own and other societies. Redirection of these fiscal resources into alternative energy programs, new approaches to

diagnosing and treating diseases, improved education, and continued expansion of telecommunication networks and technologies, offers enormous prospects for concrete advances in our economy and general standards of living. Sharing these advances with other countries could make the world more secure for all. These are the kinds of jobs that we hope many of you will be doing in the future.

The resolution of conflicts and the reduction of nuclear arsenals would release resources needed to permit you and our future graduates to put your enormous talents, good will, and learning to use, making a better world for all of us. We hope that you, the current graduates, will be able to carry on our work in the years to come, improving on the world we have left you.

On behalf of the entire faculty, we wish you the strength and commitment for these tasks. We know that you have the skill and training. May you have good luck as well.

Professors Jonathan King  
Aron Bernstein  
John Belcher

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## A Call for Nominations to Faculty Newsletter Editorial Board

**FOLLOWING PROCEDURES OUTLINED** in the *Policies and Procedures of the MIT Faculty Newsletter*, an Institute-wide election for new members of the FNL Editorial Board will be held in the coming weeks. All regular faculty members and professors emeriti will be eligible to vote.

Nominees for the Editorial Board will be selected by the *Newsletter* Nominations Committee from submissions by the Institute faculty. Please submit all nominations to: [fnl@mit.edu](mailto:fnl@mit.edu), or via interdepartmental mail to FNL, 11-268. Deadline for all nominations is June 15.

Elections will be electronically based, with each eligible voter receiving an e-mail with a link to the voting site. Faculty and faculty emeriti will need to have MIT Web certificates installed on their computer, to allow for voter authentication. No record of individual voting preferences will be kept.

According to the *FNL Policies and Procedures*:

"The Nominations Committee will have the responsibility of recruiting and evaluating candidates for the Editorial Board, taking into account the need for

representation from different schools and sectors of the Institute, junior, senior, and retired faculty, male and female, underrepresented groups or faculty constituencies."

"Candidates for the Editorial Board should give evidence of commitment to the integrity and independence of the faculty, and to the role of the *Faculty Newsletter* as an important voice of the faculty."

We encourage the participation of everyone eligible to vote. ■

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## From The Faculty Chair **Faculty Governance @ MIT: Strengths and Future Challenges**

Thomas A. Kochan

**OVER THE PAST TWO YEARS** I have come to appreciate the unique nature of the MIT governance structure and process. I would like to use my last column as Faculty Chair to comment on some of its strengths we should celebrate and carry forward, and some challenges that will test its ability to adapt and facilitate changes that lie ahead.

### **Strengths**

MIT is rather unique in not having either a faculty association or a faculty senate. Instead the heart of the governance structure is built around 11 standing faculty committees plus several focused awards committees. Approximately 100 (10 percent) of the faculty participate in any given year on one or more of these committees, and in doing so oversee a broad spectrum of educational programs, student life, and community affairs. A key to the success of these “faculty committees” is that the faculty members are joined by students, administration representatives, and professional staff. Students not only bring their fresh eyes and perspectives to bear on agenda items, but their presence signals the inclusive nature of our governance system – with all its shared responsibilities. Each committee is also supported by an able and experienced staff person who knows how to get things done at MIT and provides continuity and institutional memory for rotating chairs and members.

The Faculty Policy Committee (FPC) coordinates the work of the separate committees and is the gatekeeper for bringing resolutions and changes in rules to the faculty meetings. These are its routine

functions. But the FPC is also the closest thing we have to a “strategic” committee. It can take up any agenda item of concern or interest. This year FPC started something I hope will be replicated in the future: Individual members visited departments to get first-hand impressions of faculty concerns and priorities. By getting peer-

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to-peer input and then comparing across departments, new data and new themes emerged, which we summarize in a separate article in this newsletter (see page 6).

The faculty officers (Chair, Associate Chair, Secretary, and Chair-elect) constitute a team that meets monthly with the President, Provost, and Chancellor to plan agendas for faculty meetings. The regularity and informality of these meetings provide opportunities to discuss issues on anyone’s mind and serve as another channel for informal input and dialogue.

The Faculty Chair serves as both the representative of the faculty and as a voting member of the Academic Council, and has access to confidential personnel (voting on all promotion and tenure decisions), financial, and other information. Like all such high level deliberative bodies, influence is the joint product of the trust and unique information one carries into these discussions.

These features produce a climate that supports collaboration and problem solving. This governance process will continue to work well as long as the faculty trusts and respects the administration’s need to make decisions, and administration leaders respect the faculty’s role in setting or reaffirming the

Institute’s basic values and principles. Faculty officers need to maintain their independence and to “tell truth to power” when necessary, and to advocate for changes in practices or decisions that the faculty deem important enough to question or challenge. Losing touch with the faculty, or being marginalized by administration leaders, will set in motion processes that will lead to more formal, arms-length, and second-best governance arrangements. So it is important that we stay the course with this unique MIT experiment in shared governance.

### **Challenges Ahead**

MIT is a diverse place and getting more diverse by the day. In contrast, most of the faculty rules and regulations were written in an era when department boundaries were well defined and teaching was carried out on campus in conventional lecture halls and laboratories at uniform

times of the day in fall and spring semesters of uniform length. Much of this has already changed and more change is on the way. One of the greatest challenges (and opportunities) facing the governance system in the years ahead will involve managing – indeed facilitating – these changes.

All of these changes can be either slowed down or made difficult by holding to rules written for another era, or facilitated and aided by our experimental mindset. The governance system must be agile enough to support and learn from these innovations . . . .

We have seen a glimpse of the future and associated challenges these past two years.

- New discoveries and emerging global problems have led to new majors and minors. The Energy Minor required invention of a new (experimental) governance system that will soon be extended to oversee a sister Minor on Environment and Sustainability that is under development. These new programs are forcing our committees to rethink the basic purposes of a Minor and the rules governing them. For example, do we expect students to take mostly additional coursework outside of their major to be certified as having mastered the Minor's domain or should prior coursework be counted?
- New flexible and cross-departmental degrees are emerging in Engineering, Science, and Management in response to

breakthroughs in science and technology that require new analytical or computational skills (think Computer Science and Biology), recognition that innovation requires integration of organization, technical, and human skills (think Leaders for Global Operations), and awareness that big complex problems

require effectively designed and managed complex systems (think Engineering Systems Division and System Design and Management).

- As our teaching mixes more on- and off-campus experiences and/or incorporates new student populations, the traditional calendar and associated rules no longer fit the schedules of these programs (think Executive MBAs, and our growing number of international alliances in Singapore, China, the Middle East, etc.).
- As teaching moves more toward project- and action-based learning (think D-Lab, S-Lab, G-Lab, and forthcoming experiments in modular courses sponsored by the Provost), end-of-term regulations governing when classes end and exams may or may not be given no longer serve their original intent of protecting students from overloads at exam time.

- As on-line and social networking technologies advance, new opportunities for asynchronous teaching, peer-to-peer learning, and global reach of our educational materials proliferate, how, who, when, and where we teach and learn will change dramatically.

All of these changes can be either slowed down or made difficult by holding to rules written for another era, or facilitated and aided by our experimental mindset. The governance system must be agile enough to support and learn from these innovations while holding everyone accountable for maintaining and indeed raising the standards of excellence that are the hallmark of MIT.

These are just some of the changes that I believe will transform MIT in the years ahead. As we facilitate these changes, it will be important to maintain what I have come to see as a defining feature and enduring strength of the MIT culture – our commitment to maintaining a singular MIT community – one in which students, staff, faculty, and administration are tied together by a common passion for excellence and a common concern for each other. Continuing this tradition will not only serve us well, it will be a model other institutions in society would do well to emulate. ■

**Thomas A. Kochan** is a Professor of Management and Faculty Chair ([tkochan@mit.edu](mailto:tkochan@mit.edu)).

## Thanks to the 150<sup>th</sup> Staff

On behalf of the MIT faculty we want to thank the many staff, faculty, and students who worked tirelessly to organize and manage this year's 150<sup>th</sup> Anniversary events. By all accounts, the celebrations – the many symposia, convocation at the convention center, open house, FAST events, and more – have been great successes and fitting displays of MIT's creativity and contributions to the world.

We deeply appreciate how much behind-the-scenes work has gone into this effort. Special thanks are due to the 150<sup>th</sup> Steering Committee co-chairs David Mindell and Gayle Gallagher, and to the staff they assembled. MIT is fortunate to have so many talented people who go beyond their normal "day job" duties to take on challenges like this and to produce results that far exceed anyone's initial expectations. Congratulations and thanks to all for jobs well done!

**The Faculty Officers** (Samuel Allen, Thomas Kochan, June Matthews, and Albert Meyer)



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## Report of the Faculty Policy Committee **Faculty Priorities for MIT**

**THIS TERM, MEMBERS OF THE** Faculty Policy Committee visited with faculty in a cross section of departments to gain an informal sense of the issues of greatest interest and concern to the faculty. A full report on the rich array of information and ideas generated has been shared with the President, Provost, Chancellor, and other members of the Academic Council.

Here are some recurring themes that we heard.

### **Infrastructure**

Not surprisingly, space and infrastructure ranked high on the minds of the faculty. But we heard some new aspects of these longstanding concerns that reflect changes underway in how we teach and do research. Faculty in several departments noted the need for not just upgrading existing laboratories and research facilities, but also for space and resources for faculty to explore new collaborations with colleagues in other disciplines, and to do the initial research needed to attract sustaining funding from government or industry. Some worry that Harvard and other peer institutions are ahead of MIT in providing space and infrastructure support to explore new areas.

Classroom renovations tailored to emerging models of teaching came up in many of the meetings, but again with an interesting twist: *Flexibility* in classroom space and technology was stressed. Not all faculty want to rely solely on electronic media for communication. Chalk and talk still reign supreme in many classes. The growing emphasis on teamwork was cited as another reason for reconfiguring tradi-

tional classrooms. Flexible, multi-purpose spaces and tools are key priorities.

### **Basic Research**

“Curiosity” based research remains a core value and strength of MIT. Yet shrinking government funding, the significant chal-

Classroom renovations tailored to emerging models of teaching came up in many of the meetings, but again with an interesting twist: *Flexibility* in classroom space and technology was stressed. Not all faculty want to rely solely on electronic media for communication. Chalk and talk still reign supreme in many classes.

lenges encountered in dealing with under-recovery from foundation funded research, and the increasing attention given to attacking big and known problems may lead some to think MIT is no longer the place to follow one’s instincts and curiosity about questions of pure scientific research and theory. We must find the resources needed to promote pure research.

Considerable interest was expressed in having MIT expand and improve its efforts to demonstrate and communicate the importance of scientific discovery to the world. One idea that emerged was to encourage and support writing that communicates better the results and implications of basic science and discovery to the media, government leaders, and the public. One faculty commented: “The world is getting more complicated and the challenges we face demand a diversity of experts....Let me suggest that MIT attempt to play a significant role in helping others to under-

stand the big picture in areas that we understand.”

And, on this theme, our award for the most novel suggestion goes to: “We ought to start a law school, so that more scientifically trained people get into decision-making positions.”

### **Interdisciplinary Research and Teaching**

We heard a lot about the growing trends toward interdisciplinary research and teaching. Faculty across the Institute recognize the reasons these trends are growing and many see themselves moving in this direction. But many also see significant barriers to doing so. The need for facilities that support new cross-disciplinary experiments and projects was mentioned above. Time was noted as a scarce resource. Strong interest was expressed for having funds available to support “bridging” activities and developmental opportunities needed to invest in new, often mid-career ventures. One faculty member noted that from time to time the School of Engineering has provided funding for “internal sabbaticals” to support faculty contemplating a transition to a new research and/or teaching area.

A wide range of “big” problems was put forward as high-potential investment opportunities, most of which reflected

discussions already taking place across faculty from different departments and laboratories. We are likely to see more ideas and proposals for new, problem-based research bubble up from the faculty in search of Institute funding and support in the future. Widespread interest was expressed in seeing the Institute develop a strategy and resource base to respond to these “bottom up” ideas.

### Faculty Life

We spent considerable time discussing the quality of faculty life and ways to improve it. Perhaps the best way to summarize the ideas that surfaced is to refer back to the faculty life cycle model described in the last FNL:

- **Pipeline and Recruitment:** A number of faculty reflected on times they have spent going out to high schools and elementary schools to build interest in science and technology studies. There is a perception that we may be doing less of this today than in the past and a widely shared interest in doing more in the future. Some suggested more direct financial and/or other support for providing materials and educational programs for elementary and high school teachers by building on several models already offered for teaching math and selected science and engineering con-

cepts at the elementary and high school levels.

- **Early Career:** The need to increase support for childcare was a recurring theme. Appreciation was voiced for the expanded support that has been put in place in recent years. But it is clear that additional resources will be needed to help young faculty meet their professional and family responsibilities in the early years of their careers.

resonated with a significant cross section of faculty.

- **Renewal:** The common theme for faculty retirements is one of transition. Instead of seeing retirement as a sharp end point of their professional work, most of our colleagues see it as a gradual transition from full-time to part-time research and teaching, supplemented by other personal, professional, and civic activities. Demand for

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- **Mid-Career:** Discussion of the idea of mid-career transitions, as noted above, sparked interest and spirited discussion in many departments. It appears that many faculty have had an interest in considering mid-career transitions but have not had convenient opportunities to voice or act on this interest. Once the issue was put on the table, the need for resources – time, physical infrastructure, and seed funding for starting up new research and teaching activities –

more community involvement (see discussion above regarding schools) and for other phase down activities will continue to grow as the faculty ages. The key to renewal will lie in how well we support these transitions.

We want to thank our faculty colleagues for participating and department chairs for facilitating these discussions, and we look forward to continuing these conversations in the years ahead. ■

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## MIT Class of 2015: Incoming Freshmen Stats

- 17,909 applicants
- 1742 admitted students (9.7%)
- 1125 enrolling students/yield (65%)
- 45% women
- 24% underrepresented minorities (African American, Hispanic, Native American)
- 10% international (from 65 different foreign countries)
- 34% primary language not English (55 different languages)
- 14% first generation college attendees
- 42% high school valedictorians
- Mean SAT Scores
  - 762 (Math)
  - 710 (Verbal)
  - 711 (Writing)
- 90% in top 5% of high school class
- 31% founded an organization in high school

## Teach Talk

# Technology Enabled Transformation in the MIT Learning Experience

Daniel Hastings  
Hal Abelson  
Vijay Kumar

**LAST FALL, PROVOST REIF** charged the MIT Council on Educational Technology (MITCET) to develop a strategy that would fundamentally enhance the educational experience of students by:

- Increasing the emphasis on experience-based learning that is hands-on, globally connected, and research-intensive.
- Integrating living and learning through technology-enabled, residence-based education that supports the very best in-person and on-line pedagogy.

### Technology Transitions

The Provost's charge comes at a time of major innovation at MIT, and also a time of significant transitions in information technology. There are currently three major technology shifts that could have enormous implications for higher education:

1. **The continuing sophistication and lowering cost of networked communications:** Audio and video conferencing in tandem with shared documents, even internationally, have become cost-effective and convenient enough that they are now a regular part of the operation of many firms. There is often no need for specialized equipment. For many purposes, people can participate in remote meetings using laptop computers and ordinary network connections.
2. **The shift toward cloud computing infrastructures:** Cloud computing is being driven by the economies of scale

for data centers and support functions. For education, it is now possible to provide media services and interactive computing at global scale, even at modest cost – sometimes even cost-free with YouTube videos.

3. **The shift toward mobility, away from laptop computers and toward smartphones and pads:** Many people, includ-

Students echoed the importance of faculty-student interaction. At the same time, a review of subject-level evaluations revealed that students value technology as an enabler for learning but not as a replacement for teaching.

ing many students, now inhabit a world where they are always connected and where the boundaries between computer-augmented communication and face-to-face meetings have begun to blur. [According to an April 2010 study by the Pew Research Center, one out of every three teens in the U.S. was sending more than 100 text messages per day, or 3000 texts per month [[pewresearch.org/pubs/1572/teens-cell-phones-text-messages](http://pewresearch.org/pubs/1572/teens-cell-phones-text-messages)]. The continued blending of real and on-line life presents opportunities, but it also raises troubling concerns. Prof. Sherry Turkle's recent book, *Alone Together*, is a perceptive and provocative study of this evolving world.] Educational technologists have begun to talk about the possibilities of "everywhere learning," but the larger implications for residential education have hardly begun to be explored.

### Opportunities for MIT

It's difficult to predict how these three shifts will play out, even in the short term. But it's apparent that they could provide opportunities for increased flexibility in MIT's educational programs: flexibility for students, faculty, departments, and for the Institute as a whole, in a way that contributes to the richness and excellence of our educational programs.

Through educational technology, MIT could:

- Address the varied abilities (capacity, preparation, interests, motivation) of its students through providing alternative pathways to learning, delivery, and resources including leveraging resources elsewhere.
- Redefine the model of a semester from being a fixed-time or fixed-content construct to being one in which learning occurs in modules of varying durations with opportunities for varied experiences.
- Move from teaching content to providing hands-on and research experiences powered by the inquisitive and entrepreneurial nature of MIT students and faculty.



- Increase the quantity and quality of interaction among all of MIT's constituents – students, faculty, staff, and alumni.

In considering opportunities, we heard from faculty members that any initiative needs to carefully consider the affordances and implications of technology to faculty-student interaction. Students echoed the importance of faculty-student interaction. At the same time, a review of subject-level evaluations revealed that students value technology as an enabler for learning but not as a replacement for teaching. Consider some possibilities:

**Example 1:** The increasing diversity of MIT's student population is making it increasingly difficult to design subjects that are appropriate for all students. It's common for a class in an entry-level subject to include absolute beginners, as well as students with considerable experience, although typically not enough experience to place out of the subject. Judicious use of on-line material could give departments the flexibility to create paths into the subject appropriate for both kinds of students, as well as "bridges" to serve as entry paths to advanced material in a manner that better accommodates individual student differences than does our current system of semester-subject prerequisites.

**Example 2:** The Institute is increasingly experimenting with activities in service education, short-term internships, and entrepreneurial project courses – experiences that may not fit comfortably within the confines of semester calendars and class schedules that must juggle four or five subjects at once. Typically we've dealt with this by scheduling these experiences during IAP, when "classes won't interfere with education." With advances in communication and improved on-line materials, it could be practical for faculty and departments to create subjects that include "expeditions" that take students off campus for two or three weeks during the semester.

Students could continue in their other classes during those weeks, or make up missed work asynchronously.

Going further, students on international exchange or a co-op placement might still be able to participate in an MIT on-campus course during the time they are away. Similarly, we could accommodate intense on-campus experiences, such as letting students spend a couple of weeks in an immersive UROP project and make up for the missed work later.

The strength and uniqueness of MIT's educational program rests on our integration of teaching and research. Given the increasing sophistication of interactive educational materials, we could imagine a transformation where the primary educational role of the faculty would be mentoring students in small-group settings.

**Example 3:** Many members of the MIT community could be effective tutors and coaches for students working with on-line interactive materials. As tutors, they would check that students are making regular progress and answer questions. This could be done in an hour or two each week without interfering with an individual's primary appointment. MIT is almost unique in the range and talent of our academic research staff, and it was part of the genius of UROP to engage them in our educational mission. But we could go much farther: we could provide every MIT student with a personal tutor in each core subject.

**Example 4:** The strength and uniqueness of MIT's educational program rests on our integration of teaching and research. Given the increasing sophistication of interactive educational materials, we could imagine a transformation where the primary educational role of the faculty would be mentoring students in small-group settings. That would be a fundamental change in the MIT experience, and a controversial one. But it's a direction that information

technology can open to us if we want to go that way.

**Example 5:** On-line homework can provide students with immediate feedback on their understanding. It can also provide immediate feedback to faculty. You could give a homework assignment and, on the very next day, see an analysis showing where students are gaining understanding and where they are having difficulties. You could then incorporate

that information as you plan your next class. Such "digital dashboard" efforts are being pioneered at CMU. [W. Brown, M. Lovett, D. Bajzek, J. Burnette, "Improving the Feedback Cycle to Improve Learning in Introductory Biology Using the Digital Dashboard," *Proc. Assn. for Advancement of Computing in Education, World Conference on e-Learning, 2006*; M. Lovett, O. Meyer, C., "The Open Learning Initiative: Measuring the effectiveness of the OLI statistics course in accelerating student learning." *Journal of Interactive Media in Education* (2008).]

### Experiments in Modularity

MICET has identified the theme of modularity as a key enabler of ideas like the ones above. Rather than trying to dictate specific initiatives, our goal is to foster an educational system at MIT that is more modular and flexible both in time (not always organized into one-semester chunks) and geography (not always on campus). We will be funding a small number of department-initiated experiments aimed at demonstrating the benefits of modularity and possible ways to achieve it.

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**Technology Enabled Transformation**  
Hastings, et al. from preceding page

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The focus is on initiatives that could have broad scope and applicability across the Institute. Funding for these experiments is being provided through the generous support of the Class of '60 in addition to resources from two DUE offices, the Office of Educational Innovation and Technology and the Teaching and Learning Laboratory.

Following a series of discussions with departments to solicit ideas for specific activities/experiments to begin in fall 2011, we are now reviewing proposals for prototypes from Mechanical Engineering, EECS, Chemistry, and ESD. The ideas include:

- Web-based, video-intensive, user-friendly bridges between modular concepts in early-stage courses and the same concepts in (a) upper level courses and

(b) specific experiments in laboratory courses.

- A set of continuously available courses in areas of well defined core knowledge (e.g., programming) via on-line tutors for self-learning.
- Some part of a course to be done remotely. Group interaction can still be encouraged via Facebook-like sessions.
- Scaling the reach of a course through a combination of modularized content, various new technologies, and teaching methodologies to include students from around the globe.

In thinking about next steps, we're motivated by the following questions:

- How will the proposed activity make things more flexible for MIT students, what is the impact on the student experi-

ence, and how will educational technology be used effectively?

- What will we learn from each prototype, and how it will scale and transfer?
- How does the activity fit into a long-term vision for where the department sees itself as moving in its educational offerings?

We look forward to reporting to the faculty on the progress on these initiatives as they unfold over the next year, and on soliciting further proposals. In the meantime, we welcome your comments. ■

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**Daniel Hastings** is the Dean for Undergraduate Education ([hastings@mit.edu](mailto:hastings@mit.edu)); **Hal Abelson** is a Professor in the Department of Electrical Engineering and Computer Science ([hal@mit.edu](mailto:hal@mit.edu));

**Vijay Kumar** is the Director of the Office of Educational Innovation and Technology (OEIT) and Senior Associate Dean in the Office of the Dean for Undergraduate Education ([vkumar@mit.edu](mailto:vkumar@mit.edu)).

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## Interim Report on the HASS First-Year Focus Pilot Program, to be Renamed the HASS Exploration Program

Jeffrey Ravel

**OVER THE PAST SEVERAL YEARS,** MIT faculty members have created classes in the humanities, arts, and social sciences geared specifically towards first-year students and focused on "big ideas." Funding from the d'Arbeloff Funds for Excellence in Education and the School of Humanities, Arts, and Social Sciences (SHASS) Dean's Funds has supported these pilot subjects. In May 2009, the faculty voted "...to continue experimenting with creating a special program within the HASS Requirement, addressed particularly to first-year undergraduates, termed the 'First Year Focus (FYF) Program,' that would provide opportunities and materials for a shared conversa-

tion among undergraduates, particularly first-year students." The Committee on the Undergraduate Program (CUP) Subcommittee on the HASS Requirement (SHR) was asked to oversee this pilot program and recommend no later than fall term AY2014 whether it should become part of the HASS General Institute Requirements (GIRs).

During the past year-and-a-half, SHR members have undertaken a review of the FYF experiment thus far. The Subcommittee began by revisiting reports and proposals from earlier groups who had carefully articulated this concept, to understand the perceived needs in the undergraduate program and

the ideas of those faculty members. SHR also surveyed first-year programs in the humanities at peer institutions. Members reviewed assessment activities and findings of the current pilot subjects, spoke with colleagues who have created and taught FYF subjects, and worked with the Teaching and Learning Laboratory (TLL) to continue assessment of faculty and student downstream experiences. This summary reports the Subcommittee's key findings of the initial phase of the experiment and its recommendations for its second phase.

During the First Phase of the First Year Focus experiment, 10 pilot subjects with various approaches were created and

taught by faculty from seven Departments/HASS teaching units. Enrollments in these classes varied between 4 and 75 undergraduates from all years. The Subcommittee found that the pilot was a success, in the sense that faculty members created a limited number of subjects that were interesting and appealing to students and faculty.

These findings and others lead SHR to conclude that FYF subjects are a valuable experience for many of our students, and a stimulating teaching exercise for faculty. We do not currently believe, however, that they should become a required part of the HASS Requirement, nor do we think their enrollment should be limited to freshmen. Students clearly do not want

- They should introduce students to major interdisciplinary concepts and to disciplinary methods in the Humanities, Arts, and/or Social Sciences.
- They should encourage students to think critically and analytically, and expose students to ambiguities inherent at complex levels of analysis within fields.

These findings and others lead SHR [Subcommittee on the HASS Requirement] to conclude that FYF [First Year Focus] subjects are a valuable experience for many of our students, and a stimulating teaching exercise for faculty. . . . We suggest the continuation and expansion of the current program, with the goal of making it a recommended, not required, part of the MIT undergraduate curriculum.

These subjects met the criteria articulated in the 2006 Report of the Task Force on the Educational Commons, and they appear to be sustainable from a faculty perspective. The Subcommittee concluded that there is value in offering these subjects to students. Some specific findings include:

- Students appreciate the interaction between first-year students and upperclassmen as part of their learning; some faculty members agree there is a benefit to having upperclassmen in these subjects.
- Students also appreciate the interdisciplinary learning experiences and benefit from the more interactive modes of instruction.
- Instructors value collaborations with other instructors. They cite the opportunity to learn new content and teaching strategies.
- Teaching experiences require more preparation before and during the term than other classroom commitments.
- Continued funding to support creation, evolution, and assessment, as well as administration, is needed.

another large, anonymous lecture/recitation subject required in the first year. HASS faculty would prefer to provide the students with a more intimate, interactive, classroom experience. Furthermore, limits on faculty resources make us skeptical that it would be possible to offer enough FYF subjects to provide places for every member of each freshman class. At present, therefore, we do not recommend that the Institute make FYF subjects a required part of the GIRs. Instead, we suggest the continuation and expansion of the current FYF program, with the goal of making it a recommended, not required, part of the MIT undergraduate curriculum. SHR furthermore proposes that we rename the program “HASS Exploration,” to underline the fact that these subjects provide an opportunity to explore the interdisciplinary content and disciplinary methods that characterize the Humanities, Arts, and Social Sciences at MIT, and that they are open to all undergraduates.

As recommended, during the Second Phase of the experiment (AY12 - AY14) SHR will actively foster the creation of new subjects to supplement the promising HASS Exploration subjects already established during the First Phase. These subjects should fit the following criteria:

- They should feature pedagogically innovative techniques, as well as extensive opportunity for faculty/student interaction.
- Regular faculty should lecture and lead recitations, possibly in collaboration with Senior Lecturers.

By fall 2014, SHR hopes to present a program to the CUP and the faculty as a whole that will include approximately 15 subjects taught annually. Collectively, these subjects should offer approximately 650 spaces to students, or enough to accommodate one-eighth of the entire undergraduate student body, or half of one class. Subject capacity will vary in size from 30 to 60 students.

The complete SHR Interim Report on the First Year Focus Pilot Program, with a list of the pilot subjects, will be posted by the end of the spring term on the SHR section of the HASS Requirement Website: [web.mit.edu/hassreq.html](http://web.mit.edu/hassreq.html). ■

**Jeffrey Ravel** is a Professor of History and Chair of the CUP Subcommittee on the HASS Requirement ([ravel@mit.edu](mailto:ravel@mit.edu)).

## Sam Allen New Chair of the Faculty

Newsletter Staff



**SAMUEL M. ALLEN, THE POSCO** Professor of Physical Metallurgy in the Department of Materials Science and Engineering, will succeed Tom Kochan as Chair of the Faculty on July 1, 2011 after serving the past year as Chair-Elect. Mary Fuller and Chap Lawson will have the roles of Associate Chair of the Faculty and Secretary of the Faculty, respectively.

Sam grew up on a family farm in Cannondale, CT, and attended the Wilton, CT, public schools. He received the BE in Metallurgy from Stevens Institute of Technology in Hoboken, NJ, in 1970. An important mentor at Stevens urged him to attend graduate school at MIT where he earned the SM in 1971 and the PhD in 1975, both in Metallurgy. After four years as a Research Associate, he joined the MIT faculty in 1979. He was a Visiting Lecturer at UC Berkeley in 1976 and worked during a sabbatical in 1987–88 for Nippon Steel in Kawasaki, Japan. Much more recently, beginning in

2009, he's been a student in the Graduate Program in Conflict Resolution and International Relations at UMass Boston. He will receive Graduate Certificates in Mediation and Organizational Conflict in June 2011.

Sam grew up on a family farm in Cannondale, CT, and attended the Wilton, CT, public schools. He received the BE in Metallurgy from Stevens Institute of Technology in Hoboken, NJ, in 1970. . . . He holds seven patents relating to the processing and applications of metal parts produced by three-dimensional printing, and he has published more than 100 technical articles.

Sam's research has spanned a range of topics in metallurgy, including phase transformations and mechanical behavior. Materials of interest in his work include intermetallic compounds, steels, superalloys, and shape-memory alloys. He holds seven patents relating to the processing and applications of metal parts produced by three-dimensional printing, and he has published more than 100 technical articles.

His teaching has included a healthy mix of assignments as lecturer in DMSE core subjects at both the undergraduate and graduate level. Two teaching collaborations with colleagues resulted in textbooks. With Ned Thomas, he wrote an undergraduate text, *The Structure of Materials* (1999) and with Bob Balluffi and Craig Carter he wrote the graduate text *Kinetics of Materials* (2005).

He has received the Outstanding Graduate Advising and the Outstanding Graduate Teaching Awards from the DMSE graduate student body, and the

Marion and Capers MacDonald Award for Excellence in Advising and Mentoring from the School of Engineering. Sam is a Fellow of ASM International.

Most years since joining the faculty Sam has been a freshman advisor. He

created one of the six inaugural Freshman Advisor Seminars, "Modern Blacksmithing and Physical Metallurgy." This seminar has been offered annually since its inception in 1986. He's served DMSE in many capacities, including Undergraduate Advisor, Graduate Officer, Executive Officer, and as Acting Department Head for nine months in 2004. His Institute service includes the IAP Policy Committee, the Nominations Committee, Secretary of the Faculty from 1996–2000, Faculty Policy Committee, Committee on the Hobby Shop, and Co-Chair and Chair of the CUP Subcommittee on the Communications Requirement for several years.

Sam lives in the Rectory of St. John's Episcopal Church in Jamaica Plain. His wife, Anne Fowler, has been Rector there since 1992. He and Anne also have a home in Georgetown, ME, in Maine's Midcoast Region. They have three grown children and one granddaughter, and all live close to home. ■



## Preventing Utter Devastation in Tornado/Hurricane Prone Areas

Ernst G. Frankel

**THE UTTER DESTRUCTION OF HOMES** and other buildings in Mississippi and other southern states, with an associated loss of lives and businesses, reopens an old question of building codes and methods as well as materials used in construction.

Most of the devastation was experienced in wooden buildings usually constructed of 2x4 studs and plywood nailed together. It was interesting that most concrete, even cinder block buildings suffered

were built on simple concrete foundation pads. In my experience, the cost of a concrete building is usually equal to that of a wooden building, even though the material and form costs are higher.

**Not only does traditional American wooden building construction pose a huge storm damage possibility, but also fire, tornadoes, and other risks.**

At the same time, the cost of insurance should be lower as the insurance risk is reduced. Not only does traditional American wooden building construction pose a huge storm damage possibility, but also fire, tornadoes, and other risks. The added costs of these risks would easily cover additional construction costs, if any. In fact, wooden houses on average have significantly higher lifetime maintenance costs than the same buildings or houses built of precast concrete. Lifetime ownership costs should therefore be considered in choosing building materials. Some owners may prefer wooden walls, particularly in the interior. This is easily and cheaply accomplished and should cost less than the brick or tile facing many builders use for exterior facing to make buildings look more solid.

A formal study of life cycle costs, including maintenance and insurance of standard housing and commercial buildings, would help decision makers choose materials and methods of construction more widely, and hopefully greatly reduce U.S. housing ownership costs. In fact, it may be interesting to develop standard designs and construction costs, not just of material quantity but of standard building units. Foreign experience shows that as

forms, etc. constitute a major part of construction costs, standardizing such costs could pay off handsomely. Similarly, utilities could readily be incorporated into the designs and casting forms. There is an

urgent need for safer housing and buildings in general and MIT could and should play an important leadership role in this issue.

In Japan, for example, major academic institutions play a significant role in developing earthquake-proof building methods and designs and the codes applied in regulating construction material, standards, and designs. Precast, reinforced concrete building methods have advanced greatly in recent years and even though the material-to-labor costs are higher, total costs should be and are comparable. Similarly, completion times are usually shorter. Obviously America has an abundance of lumber and the lumber industry is both important and influential, but wooden building construction is very labor intensive and quality standards are hard to define and control.

There is an urgent need for a definitive study of comparative cost for construction, maintenance, and insurance over the life of buildings, including all hazard and risk costs. Such research could readily become a national guideline for the construction and home insurance industry. ■

**Ernst G. Frankel** is a Professor Emeritus in the Department of Mechanical Engineering ([efrankel@mit.edu](mailto:efrankel@mit.edu)).



Tornado damaged home in Yazoo City, MS

much less, if any damage. More solid, hopefully precast concrete buildings would provide safer environments, prevent much loss of life, and also assure better maintenance of infrastructure and services. While many houses have or had concrete basements, there were others that



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**An MIT Housing Dream Finally Comes True**  
Simha, from page 1

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that would allow young people, just starting out, the opportunity to live close to the campus and more easily become part of MIT's intergenerational mentoring tradition.

Organized under the banner of University Residential Communities (URC) in the spring of 2004, and led by President Emeritus Paul Gray, nine founding members from MIT and Harvard moved forward. O. R. Simha, MIT's long-time Planning Director, agreed to serve as executive manager; Neil Harper, PhD from Civil Engineering, agreed to serve as treasurer; and Carl Sapers of Harvard agreed to serve as manager and legal guru.

Enthusiasm for this idea from MIT, Harvard, MGH, and the larger academic community grew rapidly. Over 100 MIT families signed up and made a modest payment to hold a place for the prospective development.

Also in 2004, URC teamed up with the Beal Company who provided the professional services and working capital that we needed to proceed.

URC sought the help of MIT President Vest, and later President Hockfield, from whom we received sympathy but, on the advice of their treasurers, no substantive support.

In contrast, after World War II, MIT's treasurers were creative in their support of faculty and presidential calls for increasing the housing community around MIT. One such effort resulted in the development of 100 Memorial Drive. More recently, however, we have found that MIT treasurers and investment managers have looked upon initiatives and proposals to use sites owned by MIT or to utilize the Institute's fiscal leverage for housing projects with little interest and, in some cases, outright hostility.

In 2005, we began the search for sites during a highly competitive real estate environment. We bid on several sites, but were often out-bid by a narrow margin by better-financed competition. In the late

fall of 2006, however, representatives of the New York Extell Corporation, the developers of an apartment complex at 303 Third Street, called on us. Their buildings had been designed and approved by the City of Cambridge; they were ready to go into construction and they wanted to explore our participation in their venture. We began a negotiation that finally resulted in an agreement signed in April 2007. The agreement included many of our suggestions for improvement in the design of the units and quality of the building; we increased the size and variety

The agreement included many of our suggestions for improvement in the design of the units and quality of the building; we increased the size and variety of the apartments and aligned them more closely to the needs of our community. But the agreement that had taken so long to negotiate meant that we would miss the primary sales season for homebuyers that begins in the spring.

of the apartments and aligned them more closely to the needs of our community. But the agreement that had taken so long to negotiate meant that we would miss the primary sales season for homebuyers that begins in the spring.

On June 11, 2007, after a public presentation at the Broad Institute, sales began, although the developer had not fully developed the sales contract materials and had not yet provided, as promised, a sales office. In spite of that, the URC/Beal team began to accept agreements from buyers who were enthusiastic about the building at 303 Third Street, which they could see was now under construction. But time was not our friend. The economy had begun to slow and families eager to join this enterprise were worrying about selling their current homes. Still, interest in the project grew and sales increased, although challenges continued apace.

But just as we were getting started, the original Boston partner in the developer's team, the person with whom we had

negotiated our agreement, decided to leave the company. We now found ourselves dealing with new partners who did not necessarily share our vision. We began to notice evidence of their interest in unraveling our agreements. However, the strong interest from the university communities in the idea of a cooperative residence continued to bring forward interested buyers. But, as we began to make good progress on sales, out of left field came a dispute about the rights of Massachusetts residential cooperatives to choose their members. Uncertainty about

pending legislation governing coop status did not help us. Happily, the issue was finally settled in favor of existing coop legislation and we could once again move forward.

A key feature of our agreement with the developer was that we would agree to sell enough units at milestone dates to assure that the project would be successful. The first of these milestones was in March 2008, the second three months later. Although we were able to make the first milestone, we were shy of the target at the second. But being so close to our goal, we put our faith in earlier indications that MIT would be willing to buy a number of units to be held for Institute visitors. We presented a proposal for the acquisition of apartments to President Hockfield and Provost Reif, who were sympathetic. However, the Institute's Executive Vice President and Treasurer needed to make the call. Unfortunately, too late to meet the second milestone, we heard that this was not to be.

While disappointed, we took heart in the fact that even though the rate of sales had slowed, it had continued at a rate better than any other project in the city and that the reservation list continued to grow. While we now faced the prospect of losing some of the amenities for which we had initially negotiated, such as control of commercial space for a restaurant on the ground floor, we worked hard to make the case that, as we were reaching out to other university community members in the Boston area, we would ultimately succeed in selling all of the units.

All through the summer and fall the original developer, the Extell Corporation, encouraged us to believe that they would stay the course with us. We only later realized that their partner, EQR of Chicago, the owner of the rental apartment building that made up the other half of the project, was pressing to acquire sole ownership of the project and was quietly seeking to end our ability to sell units so that they could take over the entire project as a rental building. This divergence of interests between the two owners was finally resolved when EQR bought out Extell. Then, on November 21, 2008, the managers of the URC were told by EQR that they could not sell any more units, that the 16 buyers who had reservation agreements would have those agreements cancelled, and that the 38 families who already had purchase contracts were invited to give up their contracts and have their down payments returned.

Our community was stunned by this action and gathered together to formulate a response. Some of the buyers felt they needed to move on with their lives, while others were anxious to have their deposits returned so that they could find other solutions to their housing needs. Several buyers had developed serious health problems during this stressful period and were regretful about leaving the fold as they looked for other alternatives close by. However, a phalanx of about 15 individuals and families decided to stand and fight.

By early 2009, our group had retained legal counsel and hoped for a rapid reso-

lution in the courts. Sadly, our hopes were dashed as the case was caught up in delays generated by the developer's attorneys. Finally, in April 2010, a Superior Court judge determined that the developer's arguments were without merit and that they were in breach of contract. This decision was followed by a judgement on June 30, 2010 that provided for specific relief requiring the developer to promptly execute the purchase and sale agreements the buyers had contracted for. When a couple of buyers decided that their delays had been too great and health issues prevented the completion of their purchase,

Instead of responding to the spirit of the judgement, the developer sought to impede the execution of agreements through a series of maneuvers that were both crude and clever. In March 2011, two years after litigation commenced, the buyer's group asked the judge to find EQR in contempt of court . . . . In open court on April 5, 2011, the judge chastised the developer for unnecessary delays and instructed their attorney to execute purchase and sale agreements without delay . . . .

the developer pounced. EQR created the impression that the buyers were not really serious and did not have the resources to buy their units. ERC also raised numerous other specious arguments designed to delay the process and confuse and weaken the determination of the group to realize their goal. The judge, in an effort to be responsive to the developers' last ditch complaint, allowed that if fewer than six buyers were prepared to complete their purchase, the defendant could seek a stay of the entire process.

Instead of responding to the spirit of the judgement, the developer sought to impede the execution of agreements through a series of maneuvers that were both crude and clever. In March 2011, two years after litigation commenced, the buyer's group asked the judge to find EQR in contempt of court, which would enable the judge to impose punitive actions unless the developer completed the steps that would allow buyers to execute the purchase

of their units. In open court on April 5, 2011, the judge chastised the developer for unnecessary delays and instructed their attorney to execute purchase and sale agreements without delay and to report no later than April 21 on their meeting the requirements of the judgement. The developer finally relented and the first completed purchase was made on April 21, 2011; it has been followed rapidly by others. Happily, the local managers of the building have been warm and welcoming to the new owner-residents and there is every indication that living at 303 Third Street will be friction free.

By now, the determination of this pioneering group has resulted in an extraordinary commitment both to one another and to the creation of a real university community at the site. This goal, for so long delayed and very nearly throttled so many times, was achieved by an extraordinary group of MIT families and friends who, by their willingness to commit their time and treasure to work toward creating a humane community adjacent to the MIT campus, are owed a well-deserved tribute. Although this beginning falls somewhat short of our original dream, we believe our new community will thrive and grow over time and ultimately not only represent a dream fulfilled, but also be a model for many more such efforts, helping to make MIT a more welcoming and supportive community. ■

**O. R. Simha** is a Research Affiliate in the Department of Urban Studies and Planning, and former MIT Planning Director (*simha@mit.edu*).

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## Center for Work, Family & Personal Life Changes Name

**THE CENTER FOR WORK,** Family & Personal Life has changed its name to the MIT Work-Life Center. “The change was a natural outgrowth of our plans to create new materials and new channels of communication for the community,” said Rae Simpson, PhD, who co-manages the Center with Kathy Simons. “The name better reflects the broad diversity of services that the Center offers,” Simpson said.

The MIT Work-Life Center offers members of the MIT community (students, faculty, staff, postdocs, and their partners and families) a wide range of resources to help balance work and personal life. Among the services provided through the Center are a 24/7 phone consultation and Web service, a faculty work/life Website, a lending library, oversight of MIT’s child care centers, coordi-

nation of new child care initiatives, in-home caregiver services, research on work/life policy issues, and more.

To learn more about the resources at the Center, including those specifically for faculty, visit the Website at [hrweb.mit.edu/worklife](http://hrweb.mit.edu/worklife) or e-mail: [work-life@mit.edu](mailto:work-life@mit.edu). ■

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### Can Nuclear Disarmament Become Reality? Lewis, from page 1

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speakers approaching the issue of nuclear disarmament from a variety of viewpoints.

Moderated by MIT Professor of Anthropology Jean Jackson, the forum began with a brief introduction by MIT Physics Department Head Edmund Bertschinger, in which he recalled being terrified of nuclear war in the 1970s and the school exercise “duck and cover.”

Next Harvard Department of History of Science Lecturer and Kennedy School Research Fellow Alex Wallerstein provided an historical background, speaking on “Why build so many nukes?” Accompanied by an informative visual presentation ([web.mit.edu/fnl/volume/235/wallslides](http://web.mit.edu/fnl/volume/235/wallslides)) Wallerstein hypothesized six reasons why during the Cold War the U.S. built an absurdly and fundamentally unnecessary number of nuclear weapons.

1. Lack of deliberation (secrecy)
2. Inter-service rivalry
3. Shift toward tactical nukes
4. Problematic targeting models
5. Endless quest for “certainty”
6. A quest for supremacy, not parity

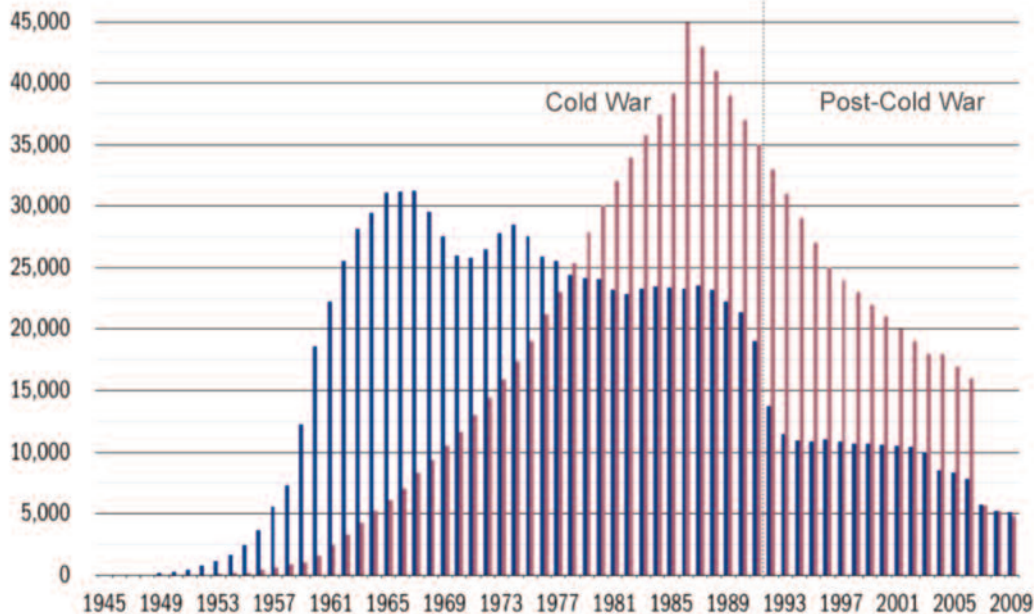
Kosta Tsipis, reflecting the co-theme for the forum of recalling and honoring past MIT professors and researchers who played an integral role both in initially creating the first nuclear bomb and subsequently leading the anti-nuclear movement, spoke of the role Jack Ruina, Henry Kendall (founder of the Union of Concerned Scientists), Bernard Feld, Herman Feshbach, Philip Morrison, Vera Kistiakowsky and others played throughout their years at the Institute. Tsipis recalled with great pleasure that when in 1979 President Reagan announced his Star Wars initiative, Tsipis wrote a piece condemning the whole idea – which appeared in *Playboy*!

Then James Walsh of the Security Studies Program at the MIT Center for International Studies spoke about the political, and not necessarily well-known, international efforts toward non-proliferation. He pointed out that the desire for nuclear weapons among countries was actually declining, as opposed to the commonly held belief that “everyone wants a nuke.” The record is actually one of restraint, he said: seventy-five percent of countries that considered acquiring nuclear weapons reversed course and ultimately decided against it.

Walsh spoke directly to the question/fear about Iran acquiring nuclear weapons, explaining why that possibility is far from inevitable. Among the points he made were:

- Iranian nuclear weapon acquisition was actually a capability decision, not simply fulfillment of a desire for a nuclear weapon.

### U.S. Nuclear Stockpiles, 1945-2009



Source: U.S Dept. of Defense (May, 2010), and NDRC

• There has not been the typical crash program to create nuclear weapon capability.

Finally, Aron Bernstein, Professor Emeritus in the MIT Physics Department, spoke on “putting the genie back in the bottle.” Bernstein expressed optimism

be the most crucial factor to ensuring passage.

Still, Bernstein’s optimism wasn’t of the naïve kind. He pointed out how even today U.S. and Russian nuclear weapons are on hair-trigger alert; that the India sub-continent is probably the most likely place for a nuclear conflict to take place; and that the still enormous number of nuclear weapons presents/constitutes a fearsome threat to us all. He pointed out the Los Alamos scientists who had developed the nuclear bomb thought that “1 bomb = 1 city” was the right formula to apply; they couldn’t even have imagined a nuclear stockpile of more than 100 nuclear weapons – as opposed to the 5000 that the U.S. still possesses today.

A feeling of both increased knowledge along with cautious optimism permeated the room after the question and answer period that followed. Many MIT professors have clearly been at the forefront – both scientifically and politically, currently and historically – in the nuclear disarmament debate. With continued awareness and well-planned intervention the reality of a nuclear weapon-free world might actually come to pass. ■

#### States Interested in Nuclear Weapons or Inherited Nuclear Weapons but Remained Non-nuclear

Argentina	Indonesia	Romania
Australia	Iran	S. Korea
Belarus	Iraq	S. Africa
Brazil	Italy	Sweden
Canada	Japan	Switzerland
Egypt	Kazakhstan	Taiwan
Germany	Libya	Turkey
Greece	Norway	Ukraine
		Yugoslavia

Possible: Nigeria, Algeria, Spain, Mexico, Belgium, Chile, Syria, Holland

- Iran publicly disavows the desire for nuclear weapons, saying that nuclear weapons violate laws of Islam.
- Iranian society is actually deeply divided over the nuclear capability question.
- Iranian desire for nuclear weapons became even more unclear after their elections in June 2009.

about the possibility of true nuclear disarmament, saying he was heartened by steps taken by the Obama administration. He noted the non-proliferation treaty and the recent START treaty as positive steps in the right direction. He further emphasized the importance of the U.S. Senate passing a comprehensive Test Ban treaty, and acknowledged that public support and political pressure from voters would

David Lewis is Managing Editor of the MIT Faculty Newsletter (dlew@mit.edu).

## MIT Subject Evaluations Now Online

Diana Henderson

**AS OF FALL 2010**, MIT's subject evaluation system went entirely online and a new "Who's Teaching What" (WTW) Web-based application is now being used to improve the quality of teaching data and the ease with which it is collected.

The applications were developed by a team from the Office of the Dean for Undergraduate Education (DUE) and from Information Services and Technology (IS&T) in a four-year project which is being completed this spring. The Office of Faculty Support within DUE administers the new systems. As part of Digital MIT, nearly 40,000 paper forms have been eliminated each term.

As a faculty member, you will see a number of benefits:

- Everyone involved in a subject can be evaluated – there is no longer a limit on the number of instructors who can be evaluated.
- You can add your own questions and reuse those questions in future terms. Upon request your departmental evaluation coordinator can send you a preview of the evaluation as it would appear to students, including both the Institute set of questions and your own questions.
- Student comments are collected for each instructor as well as the subject as a whole.
- Evaluations can be run for half-term subjects as well full-term subjects.
- During evaluation periods you can monitor response rates, and your evalua-

tion coordinator can send reminders to students who have not yet responded.

- Reports are available immediately after the grading period at the end of the term.

- The Subject Evaluation Advisory Group (comprising faculty, administrators, and students, and convened by me in my role as Dean for Curriculum and Faculty Support)

You can add your own questions and reuse those questions in future terms. Upon request your departmental evaluation coordinator can send you a preview of the evaluation as it would appear to students, including both the Institute set of questions and your own questions.

- You can search for reports by subject number or name; evaluations are retrievable 24/7.
- Report data can be filtered by student type (credit or listener), by subject number (for joint or meets-with subjects), and by section (if section assignments have been recorded in WTW).
- Reports for faculty and department administrators include comments on your teaching and the subjects as a whole, frequency distributions, and sets of responses from single students. (Other members of the MIT community continue to see only summaries of quantitative data.)

### Response Rates and Other Challenges

Throughout the pilot phase, feedback was solicited from many sources:

- Students from the Student Committee on Educational Policy (SCEP)
- Department Heads
- Undergraduate Officers
- The Committee on the Undergraduate Program
- Evaluation coordinators (departmental academic administrators) and faculty contacts within each department
- Students and instructors participating in evaluations

The most frequent issue raised by faculty is how to improve response rates. MIT's average per subject response rate has dropped approximately 10-15% since going online. This is consistent with online systems at other universities, except for those that withhold the release of final



grades until the student has completed his/her evaluations.

Some have suggested more positive incentives such as giving extra credit or holding a raffle. For extra credit to be awarded, the professor must know which students have completed the evaluation; this would require a change of policy since anonymity could be compromised, particularly in a small class. The central system has so far not offered raffle prizes because research has shown that external incentives can prevent internalization of educational incentives such as helping other students select courses and providing valuable feedback to instructors.

Students frequently have suggested that we reduce the number of standard questions – in their words, many questions are “abstract,” “redundant,” “confusing.” This would free up space for more relevant questions from departments and instructors, and students are more likely to respond to questions that matter to them.

Students also would like to see the end-of-term evaluation period extend through finals week. The current faculty view is

Students frequently have suggested that we reduce the number of standard questions – in their words, many questions are “abstract,” “redundant,” “confusing.”

that if evaluations were extended through finals, responses from some students might be excessively colored by the exams or by the grades the students receive.

The suggestions noted above would require approval from a faculty committee. The CUP Chair and FPC Chair have consulted about the possibilities and the proper constitution of such a committee, possibly beginning in fall 2011. Thus far, the Subject Evaluation Advisory Group, representing the five Schools and including experts in surveys and statistics, has played an invaluable role in providing good counsel.

Based on the experience of the pilot phase, here is what we have found helps boost response rates:

- **Faculty reminders are essential.** Students have told us that when faculty stress the importance of evaluations and communicate how past results have changed the way they structure classes, it makes a strong impact.

- **Have students complete evaluations in class.** It is still possible to run the evaluations during class time, and many faculty who do so achieve excellent response rates. Students have indicated that they would be willing to bring computers to class in order to complete the survey.

- **Send carefully spaced reminder e-mails.** The Office of Faculty Support sends e-mail notices to non-respondents every few days during the evaluation period. In addition, subject evaluation coordinators have the option of sending their own reminders to non-respondents in selected subjects within their department (without revealing who those students are). OFS alerts the subject evaluation coordinators to its reminder schedule to help avoid multiple e-mails being sent on the same day. Each time a reminder is sent out, there is a corresponding spike in the response rate. Departments that choose to send their own reminders tend to get higher response rates than those that don't.

Please feel free to contact the project team or me with any suggestions, concerns or questions you might have.

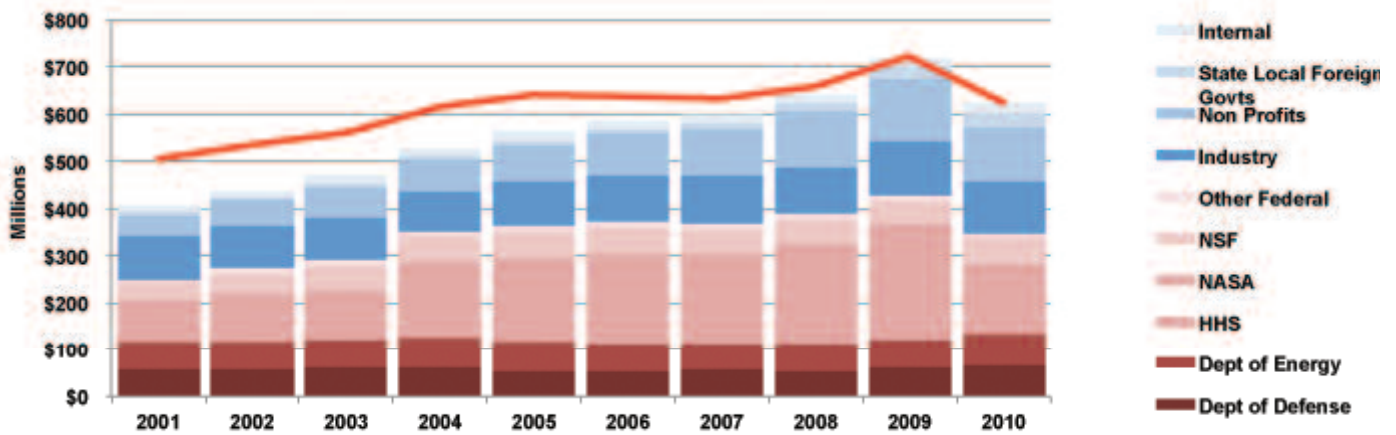
**For more information**

Project Website: [web.mit.edu/se-project](http://web.mit.edu/se-project)  
 Project e-mail: [se-wtw@mit.edu](mailto:se-wtw@mit.edu)

**Diana Henderson** is Dean for Curriculum and Faculty Support and a Professor in the Literature Section ([dianah@mit.edu](mailto:dianah@mit.edu)).

Fall 2010 End-of-Term Evaluations by the Numbers	
<b>744:</b>	Subjects flagged for evaluation in fall 2010 end-of-term evaluations
<b>32:</b>	Departments participating
<b>1331:</b>	Individual instructors who were flagged for evaluation
<b>62%:</b>	Average response rate per subject
<b>5.8:</b>	Average overall rating of subject (on a scale of 1-7)
<b>5.9:</b>	Average overall rating of instructor (on a scale of 1-7)
<b>427:</b>	Additional questions added to surveys by departments and instructors
<b>4:</b>	Types of questions that were added (rating scale, open-ended, numeric, multiple-choice)

## M.I.T. Numbers Sponsored Research Expenditures\* (2001 – 2010)



Primary Sponsor	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
DOD	\$60,971,292	\$60,116,710	\$62,903,973	\$61,146,137	\$54,402,984	\$54,195,586	\$57,113,631	\$55,525,708	\$63,650,161	\$69,478,056
DOE	\$57,779,536	\$59,658,339	\$59,209,577	\$63,935,561	\$62,722,158	\$60,179,039	\$55,990,324	\$57,238,752	\$58,183,287	\$65,034,647
HHS	\$69,539,391	\$74,806,400	\$81,837,491	\$141,014,585	\$162,170,453	\$174,170,399	\$177,175,426	\$198,204,980	\$231,448,666	\$129,333,942
NASA	\$18,591,812	\$25,118,655	\$26,251,572	\$21,949,332	\$19,257,983	\$19,405,127	\$16,535,646	\$14,923,271	\$16,433,254	\$20,463,995
NSF	\$37,520,049	\$44,878,299	\$48,803,593	\$54,405,715	\$56,205,824	\$54,412,356	\$52,006,145	\$51,119,892	\$47,864,487	\$54,678,389
Other Federal	\$6,777,207	\$11,561,813	\$12,452,528	\$10,765,225	\$10,163,572	\$11,569,359	\$12,025,115	\$12,715,545	\$12,643,762	\$11,376,292
Industry	\$92,036,459	\$91,260,609	\$89,104,608	\$82,894,573	\$92,852,630	\$99,712,160	\$99,771,121	\$100,285,250	\$116,288,518	\$110,853,522
Non Profits	\$45,105,084	\$51,678,927	\$64,178,421	\$69,006,585	\$77,567,497	\$86,014,899	\$99,933,668	\$117,469,121	\$128,327,300	\$111,711,038
State/Local/For. Govts	\$8,619,950	\$8,144,939	\$9,737,902	\$9,737,174	\$9,883,123	\$11,480,322	\$12,451,323	\$18,354,654	\$26,951,236	\$33,005,394
Internal	\$10,482,436	\$11,958,604	\$17,274,787	\$14,599,274	\$22,197,355	\$16,356,117	\$15,265,671	\$17,206,274	\$16,412,629	\$20,625,244
<b>Grand Total</b>	<b>\$407,423,216</b>	<b>\$439,183,296</b>	<b>\$471,754,452</b>	<b>\$529,454,162</b>	<b>\$567,423,580</b>	<b>\$587,495,904</b>	<b>\$598,268,072</b>	<b>\$643,043,447</b>	<b>\$718,203,299</b>	<b>\$626,560,519</b>
<b>% Federal</b>	<b>62%</b>	<b>63%</b>	<b>62%</b>	<b>67%</b>	<b>64%</b>	<b>64%</b>	<b>62%</b>	<b>61%</b>	<b>60%</b>	<b>56%</b>
<b>Constant\$</b>	<b>\$504,323,857</b>	<b>\$534,180,021</b>	<b>\$561,455,583</b>	<b>\$616,638,531</b>	<b>\$641,554,216</b>	<b>\$639,880,935</b>	<b>\$635,186,914</b>	<b>\$658,330,887</b>	<b>\$725,153,655</b>	<b>\$626,560,519</b>

\*Including the Broad Institute

Source: Office of the Provost/Institutional Research