

MIT Faculty Newsletter

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

in this issue we report on proposed changes at MIT Medical (see interview below); an update on faculty and student response to the earthquake in Haiti (page 4); a piece by the Chancellor and the student deans (page 16); and an In Memoriam for long-time MIT mainstay Art Smith (page 18).



Using One Laptop Per Child in Haiti

MIT Medical Director Discusses Changes: Community Care Center Proposed

THE FOLLOWING DISCUSSION between MIT Medical Director William M. Kettyle (WMK) and the *Faculty Newsletter* (FNL) took place on April 21 of this year.

FNL: *You are proposing some changes in services at MIT Medical. Over the past few years there have been some service changes and others are proposed. Are these changes in response to the budgetary pressures experienced at MIT and in our economy?*

WMK: We have continued to strive to use our resources here to the fullest. Indeed, at Medical and across the campus fiscal constraints are a reality. We have tried and strived to make sure that these limitations have had and will continue to have the least impact on patient care. We also need to make sure that our care systems evolve

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Is President Obama Reducing the Probability of Nuclear War?

Aron Bernstein

ON APRIL 5, 2009 IN PRAGUE, President Obama announced his intention to work towards the long-range goal of total elimination of nuclear weapons, in accordance with Article VI of the Nuclear Non-Proliferation Treaty (NPT). With this, he signaled his belief that whatever role nuclear weapons have had in the past in deterring war – and particularly nuclear war – the presence of enormous numbers of nuclear weapons and huge stockpiles of fissionable materials, is rapidly becoming counterproductive in an age of terrorist groups and “rogue states.” This article will examine whether a stated goal of eliminating nuclear weapons increases security, and whether Obama’s recent activities consistently work towards this goal.

The incredible destructive power of even the smallest nuclear weapon can be

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Editorial New Opportunities Toward Nuclear Disarmament: Reviving Faculty Roles?

THE RECENT APRIL 9 SIGNING by the U.S. and Russia of a revised START treaty was a welcome step in defusing hidden but intense dangers to international security. As described in the article by Aron Bernstein (page 1) these negotiations, while they made significant progress, need to be augmented in the future. In addition, the required Senate ratification lies ahead. The opening of the UN Review Conference on Non-Proliferation of Nuclear Weapons also brings the issue into public view. With on the order of 20,000 active nuclear warheads deployed on planes, submarines, and ground launchers, international security remains at risk. Unfortunately, the national movements that previously pressured the government toward true nuclear disarmament are no longer active.

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Photo credit: Page 1, Amritaa Ganguly; Page 4, Michel DeGraff; Page 18, Courtesy of the MIT Museum; Page 19, Ray Cowan.

Toward Nuclear Disarmament

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Scientists in the Manhattan Project were central to bringing nuclear weapons into existence; they also led the effort to ban them. Linus Pauling's original campaign to stop atmospheric testing was the first.

Last year, a small group of faculty and students attempted to revive a Nuclear Abolition coalition. One of the striking discoveries was the significant number of our students who were unaware of the enormous arsenals at constant ready.

MIT faculty were leaders in subsequent efforts: Vicki Weisskopf, Herman Feshbach, Philip Morrison, Henry Kendall, Vera Kistiakowsky, Bernard Feld, George Rathjens, Jack Ruina, Jerome Weisner, Kosta Tsipis, Aron Bernstein, and many others. The Union of Concerned Scientists was founded at MIT in 1969 around the issue of stopping the nuclear arms race. For decades, the *Bulletin of the Atomic Scientists* was edited from here. Only Tsipis and Bernstein remain active at MIT.

Last year, a small group of faculty and students attempted to revive a Nuclear Abolition coalition. One of the striking discoveries was the significant number of our students who were unaware of the enormous arsenals at constant ready. We suspect that the Cold War nuclear weapons buildup is not covered or not reached in current high school history curricula. At MIT, the principal concern for the Earth is now expressed through efforts to reduce anthropological climate change. This is an important step forward in campus consciousness and engagement, but doesn't directly address the pressing shorter term weapons dangers.

Since the end of WWII, nuclear weapons development has been directed through the Department of Energy (DOE). For many decades, DOE paid only limited attention to the overall energy needs of the nation, but rather ensured

weapons design, production, and maintenance. In recent decades DOE has evolved and supported important advances in basic and applied civilian science and technology. The appointment of Steven Chu as head continues to move the agency toward true national needs around energy. Nonetheless, the DOE weapons

labs are major employers in their states and their Senators continue to fiercely uphold the weapons missions and activities. The technological resources devoted to nuclear weapons would be far better employed in nuclear arms control and inspections, basic science, or in the development of alternative energy sources.

It seems unlikely that movements such as Ban the Bomb or the Nuclear Weapons Freeze Campaign will reappear in this period of economic distress. As scientists, engineers, and scholars in a position to understand the dangers of, as well as the historical forces that led to the current buildup, we need to find ways to ensure that our citizenry is clear on the need to actively and aggressively reduce the weapons in our own arsenal, the world's largest, and use that as the leverage for pressing other nations to proceed in the same direction.

As a first step, we ask our colleagues to try to place support for Senate ratification of the START treaty on the Congressional agenda of their professional organizations, and to speak out as concerned citizens to inform the Senate and the public why nuclear arms reduction and the new START treaty are so vital to our security. Perhaps we need an MIT Taskforce on Nuclear Disarmament.

Online MIT

As burgeoning numbers of online newsletters, journals, departmental offerings, and the like continue to proliferate Institute Websites, it has become increasingly difficult for MIT community members to keep track of what's available and where to find it. So as a service to the Institute at large, the *Faculty Newsletter* has compiled a list of current online publications with a link to each of them. A link to this list can be found on our homepage (web.mit.edu/fnl) or can be accessed directly at web.mit.edu/fnl/MITPublications. The list will be updated regularly and all Institute online publications are encouraged to participate. Please submit the name and URL for your publication to fnl@mit.edu and include the words "Publication URL" in the Subject line.

Tweet with the Faculty Newsletter

With the intent of continuing dialogue between *Newsletter* publication dates, the FNL now has a Twitter site. To participate, go to [twitter.com](https://twitter.com/mitfnl). Our Twitter name is "mitfnl."

A Heartfelt Thanks

As we reach the end of another academic year, we would like to take this opportunity to thank all of you who have been so generous with your support and assistance all year long. In particular, we would like to thank the members of the Office of the Provost/Institutional Research. Nearly all the wonderful "numbers" we've presented all year (charts, graphs, etc.) have been provided by Director of Institutional Research Lydia Snover and her staff. After all, this is MIT, and this place just wouldn't be the same without "MIT Numbers."

We'd also like to thank Deborah Puleo, Ed Pasqual, and all the members of MIT Mail Services for their continuing assistance with labeling, mailing, and (most importantly) meeting our often ridiculously tight deadlines so that faculty and others can receive their hardcopy *MIT Faculty Newsletter* with all due speed after it is printed. ■

Editorial Subcommittee

From The Faculty Chair MIT in Action in Haiti

Thomas A. Kochan

WHILE THE DEVASTATION IN HAITI may have slipped off the front pages, colleagues at MIT continue to help our neighbors address their monumental challenges. Moreover, the Provost has asked Associate Provost Philip Khoury and me to help develop a long-term strategy for MIT initiatives in Haiti. Thus I would like to use this column to highlight two examples of the fantastic things our faculty and students are doing in Haiti, and to outline the priorities that are emerging for MIT's ongoing involvement. Please read this as an invitation to join in applying your energy and expertise to these efforts.

Two weeks ago, Michel DeGraff, Dale Joachim, and Barry Vercoe led several project teams of students from their Media Lab class to Haiti. Here is an excerpt from the students' report on their work, taken from the blog by Amrita Ganguly.

In early February I signed up for a new class at the Media Lab titled MAS.963: New Media Projects for Haiti. After 11 weeks of lectures on Haitian culture, the French/Haitian Creole debate, education, health, and sustainable development our group of seven students and three faculty went to Haiti for the last week of April.

Our class split into three main focus groups: creating a system for generating electricity using pedal power; using art, drama, and dance to promote self-expression in children; distributing water testing kits and focusing on water and sanitation media campaigns.

The reality of traveling to Haiti didn't strike me until we were already in the center of Port-au-Prince, driving around the col-



Generating Electricity Using Pedal Power

lapsed presidential palace, on our way to the hotel. Our group had seen poverty before, in India, Brazil, and Rwanda, but the view of thousands and thousands of people living in gray tents with USAID stamps was surreal. Where there once were buildings were now piles of rubble and cement blocks.

With the pedal power group we traveled to Carrefour to meet with an auto mechanic, Jean-Aurélus Narcisse, at his Technique Club Garage. As we described the setup for a pedal power electricity generator, Mr. Narcisse kept shaking his head and exclaimed that this was "easy" and that our design would be something that he would be extremely interested in building. From our idea the mechanic employed his own ingenuity and eventually adapted our project into his own, with plans to make additional units for regions in dire need of energy and to teach other mechanics as well.

Next we headed to Plas Timoun, a school catering to six- to 10-year-olds held in six school buses donated by the First Lady of the Dominican Republic. The children were introduced to the Speak program on the One Laptop Per Child machines we had brought and our group led activities in step dancing,

arts, and crafts. It was an uplifting experience to interact with children who are able to smile, dance and sing despite the hardships they are facing.

During the week the water group spoke to many representatives from DINEPA (Direction Nationale de l'Eau Potable et de l'Assainissement – National Direction for Drinking Water and Sanitation), the government agency in charge of water and sanitation issues as well as NGOs (Non-Governmental Organizations). We attended Water and Sanitation Hygiene cluster meetings led by UNICEF to learn more about the public sanitation and health campaigns, as well as to present D-Lab's water testing kit. The group handed out five kits to AIDS/HIV clinics, schools, and NGOs. One example test we conducted on government-supplied water from CAMEP showed a presence of e-coli.

Along the way we encountered so many people with such incredible stories. We visited a primary school in Darbonne which was now held in a tent after their school had completely collapsed. We spoke to university students like ourselves who are eager to help in the rebuilding process but don't know where to start. We spoke to the President of the State University, Jean-Vernet Henry, who described his quest to rebuild Haiti's universities.

Among the most painful stories we heard was that of Haiti's Faculté de Linguistique Appliquée (FLA), the Linguistics Department of the State University. In 35 seconds the academic unit lost its dean, vice-dean, faculty members, and more than 200 students after their four-story building completely collapsed. One of the professors described that he was on the first floor of the school, in the dean's office, when the earth-

quake happened. He fell to the floor and managed to curl up. When the earthquake stopped he could see a small tunnel leading out of the rubble but it was too narrow for his shoulders. He waited 30 minutes for some of his surviving friends to dig him out with an ice pick while he listened to one of his students in the next room crying for help because he had lost a foot.

From the pile of rubble, some of the remaining professors and students have managed to salvage a meager amount of damaged textbooks. I will never forget the joy on the professors' faces as they skimmed through the titles of the four boxes of books donated by MIT Press. This was the first gift of books that they have received since the earthquake.

Our week in Haiti has provided us with a learning experience unlike any other. We can only ask that the administration, faculty, and students at MIT reach out to their colleagues in Haiti during this rebuilding process, creating new partnerships with Haitian universities, the Haitian government, the Haitian population both in Haiti and in the diaspora, and with those aid organizations that best serve the country's interests.

A second example comes from a team from MIT Lincoln Laboratory, the Center for Transportation and Logistics, and the Sloan School of Management that has been taking stock of the state of food, shelter, water, health, and security for residents of Haiti at the request of the U.S. military's Joint Task Force in Haiti, known as JTF-Haiti. Initially tasked with humanitarian assistance and disaster relief, JTF-Haiti soon took on a role of coordinating and collaborating with lead agencies such as the U.S. Agency for International Development and the U.N. Stabilization Mission in Haiti. To serve the entire community, JTF-Haiti initiated a data collection effort that drew on expertise from many organizations, and specially-trained personnel gathered in-person information from hundreds of displaced individuals, camp leaders, and health facility workers on a rolling basis every day for some two months, recently completing the first phase of the effort.

The project was initiated in late January, when the need for information became clear to Dr. Marc Zissman, Assistant Head of the Communication Systems and Cyber Security Division at MIT Lincoln Laboratory, who was called to Port-au-Prince to support the JTF-Haiti efforts. Dr. Zissman contacted MIT campus colleagues, asking for help, and eventually assembled a wider team. Now, Dr. Israel Soibelman, Division Head of Homeland Protection and Air Traffic Control at Lincoln Lab and colleagues from across Lincoln Lab are involved, as is the ad-hoc MIT campus team that first formed in early February.

The all-volunteer campus team paired nine graduate students from across MIT and elsewhere – some lining up class projects, others simply volunteering – with Dr. Jarrod Goentzel, director of the Master of Engineering in Logistics Program and the Humanitarian Logistics Research Project, and MIT Sloan Senior Lecturer Dr. Anjali Sastry, along with ESD PhD student Erica Gralla. The team developed a set of white papers to present context and background to stakeholders, then examined the data as it came in, identifying questions, assessing trends, and helping to develop a picture of needs as the situation unfolded. The students spent much of their spring break working at MIT, and gave up weekends and early mornings to meet and collaborate. A subset focused on one critical area – housing – asking what the existing literature and the incoming data suggested about potential interactions and trajectories.

The campus team is now refining their final analysis of data collected in Haiti and documenting lessons learned, which will be combined into a final report. Lincoln Lab is organizing a day-long "After Action Review" to further consolidate insights gained through the data collection and analysis effort in Haiti. The combined MIT team aims to share materials and participate in the wider dialog about how to better manage and assess efforts in humanitarian emergencies.

An Ongoing MIT Haiti Strategy?

These projects illustrate MIT at its best. In addition to coordinating and supporting proposals like these that bubble up from faculty and students, I see two ways in which MIT might be helpful to Haiti on an ongoing basis, both of which reflect requests for this assistance received from Haitian leaders.

The first way would be to help rebuild the country's university system. Most of the physical facilities occupied by the State University System (UEH) and by private universities have been destroyed, and over 3,000 faculty members and 12,000 to 15,000 students perished in the earthquake. A new state university system needs to be built. The UEH Rector has written to President Hockfield requesting our assistance in helping to build consensus around a vision and strategy for the UEH. MIT, either acting on its own or in partnership with other universities, could assist in this process and perhaps help organize joint initiatives and potential exchanges for students and faculty – at the UEH and possibly some of the private universities.

The second potential initiative was requested by Mr. Patrick Delatour, Chairman of Haiti's Presidential Commission for Reconstruction, during his visit to MIT in April. An Interim Recovery Commission, co-chaired by Prime Minister Jean-Max Bellerive and President Clinton, has been created to make decisions on how to allocate resources from donors to specific projects. Minister Delatour indicated that there is a pressing need to assist the Commission in developing and training a staff of professionals to review, process, and make recommendations among funding priorities. A number of our colleagues in MIT's Urban Planning Department are now following up on this request to explore how they might help the Commission develop these professional capabilities.

If you would like to join any of these initiatives or have additional ideas, please contact Philip Khoury (khoury@mit.edu) or me. ■

Thomas A. Kochan is a Professor of Management and Faculty Chair (tkochan@mit.edu).

MIT Medical Director
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with advances in care and meet the needs of our community. Some of the changes reflect evolution of care systems and changes in the practice of medicine in our community, and others are in response to budgetary pressure.

FNL: You have proposed discontinuation of overnight, on-site care. Can you explain the proposal and tell us how this proposal was developed?

WMK: Over the last several years there have been significant changes in the utilization of our Inpatient Unit. We have seen the number of admissions decline significantly. Over the past five years there's been a persistent reduction in admissions (see table next page). During this same time period there has been a dramatic increase in what we call "transient visits." These are visits to the Inpatient Unit that don't involve an overnight stay, but do involve the provision of care – care that is in keeping with changes in the delivery of services and the management of medical conditions. The administration of intravenous fluids and drugs, dressing change, administration of other injectables, teaching, etc. We have seen a significant increase in the utilization of our facilities and personnel for care episodes that are not admissions.

This change in usage parallels important developments in the flow and mechanics of care in the medical environment around us. Hospital stays have gotten shorter. There are increasing, high quality resources available in our community to provide care at home or at a living facility. There have also been significant changes in medical care that allow the treatment for certain conditions to be done as an outpatient rather than as an inpatient. For example, there are antibiotics that can be given once a day instead of three or four times a day. We now have drugs to treat blood clots that can be given by the patient to himself or herself rather than

via an intravenous drip. The availability of home physical therapy and occupational therapy is also reflected in a significant decline in the utilization of the Inpatient Unit for post illness or post-operative rehabilitation.

In addition, many of our senior members are moving to living facilities where extended care or assisted living services are available. Home hospice services have improved significantly and for many patients home is the most comfortable place for care at the end of life and we have seen a significant decrease in the utilization of our unit.

We've been aware of these changes in usage and have been and still are looking for ways to utilize our personnel and our bed space to maintain an appropriate use of our resources, to cover the fixed costs of having the Inpatient Unit remain open.

Options explored to defray the fixed costs of providing care in the Inpatient Unit have included the following:

- Shorten acute hospital stays by transferring patients to the Inpatient Unit – thereby decreasing acute care hospital costs. (The mechanics include "payback" methodologies based on hospital payment arrangements.)
- Commercial research – drug trials
- Respite/post-op care (aka "The Charles Hotel model").
- Sleep studies
- Hospice care (in coordination with the MGH)
- Colonoscopy center
- Rehabilitation facility

After feasibility review, none of the above has been practical enough to operationalize. In addition we have, for the past several years, been staffed at what we feel is the minimal level to support high quality care – decreasing staffing without changing services is not an option.

Our proposal also includes some changes in our Urgent Care service. The Urgent

Care area provides walk-in and same-day appointment service for all those eligible to use the MIT Medical Department. The visit volume varies widely, with the late afternoon and evening being the busiest times. After 11:00 pm the frequency of visits decreases significantly (see chart next page). The vast majority of the visits seen during the night (midnight – 7:30 am) are of the convenience kind ("I'm still up and I've had this X [where X = cold or rash or sore knee] for several Ys [where Y = days or weeks or months]"). During the night and in some cases during regular business hours, visits of a truly emergency nature are triaged by phone or, after a brief initial assessment, sent to an acute care hospital emergency room with a larger range of diagnostic and therapeutic services – X-ray, CT scanning, emergency room level care – for fractures, other trauma, heart attacks, abdominal pain, high fever, etc.

The proposal we are putting forth is to rebalance the deployment of our resources. We want to increase and augment services of the "transient visit" kind and support this enhancement with resources that are currently underutilized.

The Proposal

Create a Community Care Center – staffed by nurses trained in care management who will be knowledgeable regarding the availability of resources, who can coordinate and monitor the delivery of services. This team of nurses will also provide the nursing care services for the "transient visits." The potential for involvement of these nurses with living units and segments of our community will enhance care and likely improve outcomes. The Center would be open from 7:00 am until 7:00 pm on weekdays.

- **Discontinue overnight services in the Inpatient Unit.** One of the important responsibilities of the Community Care nursing team will be to help arrange alternative care plan for those who historically would have spent the night in the inpatient unit.

Inpatient Unit Utilization

	2005	2006	2007	2008	2009*
Admissions	406	352	284	260	152
Patient Days	1255	1382	1050	913	518
Occupancy	25%	27%	21%	18%	10%
Average Daily Census	3.4	3.8	2.9	2.5	1.8
Transient Visits	416	526	502	704	898**

Inpatient Unit Transient Visits

	2009*
Overnight Observation Stays	163
Adjusted Patient Days	681
Adjusted Occupancy	13%
Adjusted Average Daily Census	2.4
Transient Visits	898**

* 2009 data includes two-month summer closing

** Includes 178 visits for injections only

Urgent Care Utilization

	2008	2009
Total seen (all hours)	15,361	17,027
Total seen (12 am – 7 am)	446 (2.9%)	459 (2.6%)
Where Patients Went After Being Seen		
Home	384	407
Inpatient Unit	17	16
Emergency Room	24	18
Unknown	20	18

• Continue to provide Urgent Care Service from 7:00 am until 11:00 pm. This would provide convenient, on-site care for mild-to-low acuity problems. Overnight we will arrange access to local emergency room facilities.

• Engage a triage call system, staffed by trained nurses following accepted protocols to provide advice when our facility is not staffed. From 11:00 pm until 7:00 am this dedicated service, a service that is aware of the available resources, will provide advice and instructions.

Our plan is to build the Community Care Center and provide the enhanced services before making any changes in the availability of on-site, overnight services. Our current overlap horizon extends until the end of the calendar year. We are making a major effort to engage community input and have talked with faculty, departments, and student groups – seeking comments, suggestions, input.

FNL: The Inpatient Unit was closed for two months over the summer. Why was this done and what was the impact on care for our community?

The proposal is indeed a work in progress.

WMK: Inpatient utilization is very low during what we call the summer – roughly June 15 until August 15. In addition to decreasing our personnel expense, this closure gave an opportunity to evaluate our Community Care proposal. The summer of 2009 experience demonstrated that closing the Inpatient Unit overnight and closing the Urgent Care area from midnight until 7:30 am resulted in no measurable increase in emergency room visits or hospital admissions (based on insurance billing data) and we are not aware of any adverse effect on the quality of patient care or problems related to the overnight closings. Prior arrangements were made with Mount Auburn Hospital to offer care and to facilitate the continuity of care for members of our community needing services during the night. In addition, the telephone triage service I described earlier was put in place with excellent acceptance by both patients and clinicians.

FNL: Will the proposed changes result in significant cost savings?

WMK: Our proposal, in fact, involves spending more in some areas and less in others. The net annual saving – after spending more in some areas and less in others – is about \$1 million or ~ 2.5% of our annual operating budget. The cost savings are significant, but the opportunities to enhance the care we provide and more efficiently use our resources are the major components of the proposed changes. Having highly trained nurses and doctors remain idle during the night is not ideal professionally or fiscally.

FNL: How will members of our community obtain care during the night?

WMK: That depends upon what they need. For many patients the daytime activities in the proposed Community Care Center will have included arrangements for overnight care, if needed. That could include supportive services at home or transfer to another medical facility.

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MIT Medical Director
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Building on long and strong relationships with area health care facilities we are exploring arrangements that will facilitate the transfer of patients requiring inpatient level of care.

The urgent challenge is really in the realm of providing students with care overnight. Gastroenteritis, mononucleosis, alcohol intoxication, often require prolonged intravenous fluid administration and or supportive care. We are currently in negotiation with Mount Auburn Hospital and with their hospitalist services to provide bed space for students for overnight care in situations like those mentioned. We are also exploring an arrangement with Harvard University Health Services. For MIT Health Plan members and retirees, our long-standing relationships with both Mount Auburn Hospital and the Massachusetts General Hospital will not change significantly. We will, however, be more involved and active in discharge planning for patients hospitalized at these or any of the other local facilities.

FNL: *How will a Health Plan member, student, or retiree know what to do or where to go in an emergency situation?*

WMK: Call. Calling our number to access care will automatically connect them with our staff or our triage service. Overnight advice might also include contacting the MIT clinical on call. Internal Medicine, pediatric, OB/Gyn and Mental Health clinical will remain on call 24/7 under the proposed system and will be available to patients via the call system. Mental Health services will continue to be available 24/7. The venue for overnight mental health, face-to-face evaluations is being determined.

The nocturnal call service will report all calls and advice given at 7:00 am the next day. A member of our Community Care Center team will review the log of calls and provide follow-up care, advice, facilities appointments, etc.

The Call Center nurses are trained to provide advice to those seeking help for a medical condition, injury or other concern. For some callers the advice might be:

“It sounds like this could wait until later in the morning. I will let the Community Care Center team know that you called. How can they best reach you at about 8:00 am?”

Or

“Try to get the fever down with some ibuprofen – take two (200 mg., each) now and again in about four hours, drink plenty of fluids. I will let the Community Care Center team know that you called. How can they best reach you at about 8:00 am?”

Or

“I think you need evaluation tonight. Please go to the Mount Auburn Emergency room.....they are located at.....I will call them and let them know you are on your way...I will also let the Community Care Center team know about this call and they will follow up with the hospital and with you. . . .I hope you feel better soon. . . .”

FNL: *How will those needing care get to the emergency room?*

WMK: That depends on the illness, the acuity and the locally available resources. An ambulance is the way to travel for any one with a severe, unstable, or uncertain condition. Our on-campus student-run EMT service is excellent. When the MIT EMT service is not on duty, or for off-campus needs, professional ambulance services should be engaged. The triage service will know what resources are available. For less acute transportation needs a taxi or private car are probably the most realistic forms of transportation. For students we will provide cab services.

FNL: *What are the cost issues for someone referred to an emergency room overnight?*

WMK: An emergency room visit sug-

gested by the overnight phone service would likely have been an emergency room visit in any event – even if we had overnight services here at MIT. High acuity, urgent care situations do now require and will continue to require hospital-level emergency room care. The co-pay system for this type of care would remain unchanged.

For a student, co-payments would be borne by the Medical Department or by the student’s insurance, depending on the diagnosis, the acuity, and the care needed. For most members of our community there will not be a significant change in out-of-pocket costs.

FNL: *Are there other changes in clinical services that are slated for the MIT Medical Department?*

WMK: There are two other changes that have been put in place.

We have had 18 different dermatologists here in the last five years. This presents a significant issue administratively and clinically. Because of this and because we have seen a significant increase in the availability of high quality, nearby, off-campus, dermatologic services, we have decided not to have a dermatologist on site. We will continue to have an on-site dermatologic nurse specialist.

One other change is driven by changes in technology. We will no longer be doing echocardiograms on site. Our equipment needs to be updated and the number of studies we do does not support the purchase of the latest equipment. We have easy access, with relatively short queues, to state-of-the-art echocardiography at three or more different facilities in the area. There will be no change in the billing for echocardiography.

FNL: *At our last interview we discussed broadening the use of the MIT Medical facilities for member of the community who are not students or MIT Health Plan members. Has this materialized?*

WMK: We are continuing to put into place operational changes that will support this valuable endeavor. There has been a slight increase in the utilization of our facilities by members of our community who are not students or Health Plan members. We are continuing to work toward increasing this utilization.

FNL: *Can you provide us with an update on your community mental health outreach activities?*

WMK: We are continuing a number of activities to increase awareness of service, decrease stigmatization, and help identify those who might benefit. There have been no reductions in our mental health services. The proposed changes in overnight services will not affect our mental health care activities. We continue to be actively involved in reaching out to our campus community with regard to mental health needs. We are also actively screening members of our community for depression and other significant mental health issues.

FNL: *The focus of the Mental Health Service appears to be on student care. How is that going?*

WMK: We have indeed increased our focus on students at our mental health service. We are seeing more students and I think our outreach efforts are effective. This is a very important component of our medical service and we will continue to support these endeavors.

FNL: *Co-pays have been initiated for some services. How was that decision made and why are these necessary?*

WMK: We have long avoided co-pays. The reasons to avoid them are many and most are obvious. Changes in legislation have forced us to add co-pays for certain services. The concept of mental health parity is based on the premise that mental health conditions should not be managed differently than medical conditions. We have had co-pays for psychiatric or mental

health services, and in order to comply with mental health parity laws, we have added co-pays for other specialties. We decided to consider mental health services as a specialty and along with other specialty services have put a co-pay system in place. There is no co-pay for services that we consider "primary care." Internal medicine, pediatrics, obstetrics and gynecology are considered primary care services and co-pays do not occur in those areas. Specialty consultations do involve a co-payment. The co-payment is \$10 across the board for specialty services – this means a decrease in mental health co-payments, but an increase in subspecialty co-payments otherwise.

There are no co-pays for most student services obtained at the Medical Department.

FNL: *Will there be changes in the Dental Service?*

WMK: Our dental service has continued to evolve in several ways that provide outstanding support for the MIT Community. We are now "dentally digital." Our x-rays, record keeping and billing are all done electronically. Productivity has increased and we have aligned our mix of on-site services to maximize convenience for our patients. For most dental needs, our department can provide all the services.

FNL: *During the current fiscal year several members of your staff took unpaid furloughs. Is this part of your fiscal management plan going forward?*

WMK: Several members of our department are taking or have taken furloughs to decrease our personnel expenses for the current fiscal year. The furloughs were scheduled to minimize impact on patient care and vital operations. When we decided that furloughs would be part of our reaction to the fiscal pressure we faced, we realized that this was a temporary, short-term, and hopefully not shortsighted approach. We used this

mechanism to buy time, to make plans that would enable us to preserve care systems and to minimize personnel reductions. We do not plan on any furloughs for the coming fiscal year and beyond.

FNL: *How much has your budget been cut over the past two fiscal years?*

WMK: During Fiscal Year 2010 we experienced approximately a 5% reduction in resource availability. For Fiscal Year 2011 we are proposing a further reduction of approximately 2.5%.

FNL: *Has your staffing changed significantly?*

WMK: Nearly 300 people work at MIT Medical – some are employees and there are a number of contractors. There have been and will be some small reductions in force, but in most areas our workforce is incredibly stable – except in dermatology – we have had a very low turnover rate.

FNL: *How much influence did you have on your budget for Fiscal Years 2010 and 2011? Were you given a firm, fixed reduction target?*

WMK: We worked closely with the senior administration and Finance to look carefully at our resource utilization. Over the past several years we have put in place robust fiscal monitoring and management systems, and because of this today we have a much better handle on our resource utilization.

We paid careful attention to the work of the MIT Task Force and actively worked internally to find ways to make sure our resources were being effectively used. The work of the Institute-wide Task Force decreased the reduction burden for our department and other departments at MIT. We also actively worked internally to find ways to make sure our resources were being effectively used. These activities rendered some savings. We shared our work, our numbers, our assessments, and our plans

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MIT Medical Director

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with the senior administration and came to an agreement on how much we could reasonably plan to spend for Fiscal Year 2011. So in essence it wasn't a negotiation; it was collaboration – a collaboration focused on maximizing the use of our resources, and maintaining, as much as possible, the convenient, on-site, high quality service that we have traditionally offered.

FNL: Will the new federal health care legislation have a significant impact on MIT Medical and the health plans that it sponsors?

WMK: We are carefully looking at the potential effects of national health legislation on our insurance programs and care systems. One important change is the expansion of coverage up to age 26. This may lead to a decrease in enrollment in our student extended plan. Since we have not had significant benefit limits or eligibility issues in our plans, some of the other components of the health care reform act will not have very much effect on us. Clearly the final form is unclear and the impact on the Institute and our community is being evaluated.

FNL: Are you optimistic about MIT Medical in the future remaining the valuable Institute resource it is?

WMK: Looking forward – we are indeed quite optimistic about our ability to provide high quality, convenient, on-site care. The changes we propose — the formation of a Community Care Center and the reduction of on-site services overnight – will allow us to continue to provide high quality, convenient care for our community. Working with MIT leadership and with the communities at MIT we will find ways to meet the clinical needs with the resources available.

Thank you for the opportunity to share this information with you and with your readers. ■

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The MIT Medical Department 1901–2004: A Very Brief History

William M. Kettyle

The information presented in this brief account of the provision of medical care for the MIT community comes from a large file folder found in the files of the Medical Director's office, from a charming 91 page volume entitled "The MIT Medical Department 1901–1976; A Personal History," by Samuel D. Clark, MD, and from discussions with current and past members of the MIT Medical Department.

FOR THE FIRST 40 YEARS of its existence, MIT apparently did not have any organized system for the provision of medical care. Students commuted from home or lived in nearby boarding houses and presumably had their health care needs met within the Boston community.

Although provision for the care of illness and injury for students has been a clear goal of the medical services provided by MIT, there has also been an important emphasis on two other important roles: workplace care for those employed by MIT and active management of injury or disease resulting from the work of engineering and science. Using the same staff

and the same facilities, these three important roles have been played by the Department for most of its 100-plus years of existence.

In the large file folder, in Dr. Clark's book and in discussions with colleagues, the history of the Medical Department is variously described based on the physical facilities dedicated to the endeavor, the people involved and the services provided. What follows is a very brief review of the important events in the century of care provided to the MIT community by the Medical Department.

1901

Franklin W. White, MD, an 1890 graduate of MIT, was appointed Medical Advisor to the Institute. He provided medical care at his private office on Marlborough Street – not far from the Institute's Copley Square location. He also, apparently, provided lectures on health-related topics.

1910

A room in Pierce Hall (near the entrance

to the current Copley Plaza Hotel) was made available for Dr. White to see students without payment of a fee. Eventually, students were required to have a physician examination during their first month at the Institute. Apparently, careful anthropometric measurements were made and posture abnormalities were identified and corrective exercises recommended.

1915

Dr. White retires and J. Arnold Rockwell, MD (Class of 1896 and source of the name for the "Rockwell Cage" at the athletic facility) replaces Dr. White. As the "cage" that bears his name implies, Dr. Rockwell was very interested in college athletics and was an ardent supporter of athletic activities.

1917

The Institute moves to its present location in Cambridge and two rooms are set aside in Building 3 for the provision of medical care and a "First Aid Room" is set

up in the office of the Superintendent of Buildings.

A group of undergraduates, the “Ways and Means Committee,” recommends that a small amount (about fifty-seven cents per student when implemented) be added to the tuition as a fee, so that medical care could be made more available. This would, they argued, lower the threshold for seeking care and forestall serious problems. They stated, “that the expense of the medical service should be borne by the student body as a whole.”

1921

George W. Morse, MD replaces Dr. Rockwell and is given the title Medical Director. He was a graduate of Harvard College and Harvard Medical School and was a surgeon by training. Referred to by some as “the knife,” Dr. Morse was also named head of the Department of Hygiene. In this capacity, along with the support of Alan Rowe, PhD (not MD) who was Director of Research at Evans Memorial Hospital, a Boston University Medical School facility, he reportedly was also interested in health maintenance and preservation: “Pitfalls beset him [the student] at every turn and the greatest of these are the quick lunch counter and the unused bed.” In addition to lectures on hygiene, a physical examination for each student every six months was recommended!

1928

Named for Richard Holmberg '23, who died as a Senior of pneumonia, the Holmberg Infirmary (now Building 11) opened providing an inpatient hospital facility in addition to expanded space for the care of students and employees.

1942

Dental Services began to be available at the MIT Medical Department. Initially dental hygiene was all that was available, but gradually a wider range of services became available.

1946

Dana L. Farnsworth, M.D. – an Internist

and Psychiatrist – replaces Dr. Morse and is the first full-time Medical Director. Dr. Farnsworth came with 11 years of experience in college health at Williams College and several years of experience in the U. S. Army. He is reported to have said: “College health is mental health.”

During his nearly nine-year tenure, Dr. Farnsworth clearly focused his efforts on the development of services to support his objectives. A full-time psychiatrist and a full-time otolaryngologist were hired. Onsite laboratory services were added in 1947 and a program termed “Faculty Health Survey” was started in 1952. In this program, faculty members with the rank of Assistant Professor or higher could have – at no charge – an annual physical examination. In addition, consultations with available specialty services, psychiatry and ENT, were available. The “Faculty Health Survey” paralleled the “executive physical” that was popular in the 1950s and 60s in the business world. The eligibility requirements were frequently adjusted so that other, non-faculty members of the Institute could enjoy this service.

1948

The first full-time psychiatrist is appointed to the staff.

1949

Occupational Medical Service is established. Developments in science, engineering, and warfare brought new and special risks to the scientists, engineers and technicians who worked in laboratories and facilities like MIT. MIT was one of the first institutions to establish a program to actively identify and manage these issues. Dr. Harriet Hardy headed the program and became a recognized pioneer in this important endeavor.

1954

Dr. Farnsworth leaves MIT to become Medical Director at Harvard University Health Services. He is replaced briefly by J. Howard Means, MD, recently retired chief of Medicine at MGH and former president of the American College of Physicians. Dr.

Means was a strong proponent of high quality care for the entire community and proposed two radical, inter-related concepts – the Medical Department as a teaching department and a pre-paid program of medical care. He proposed that the Medical Department become a two-year Medical School. He felt that, especially at MIT, combining education, research, and practice should be done in medicine just as it is done so well in engineering. In addition, he proposed a pre-paid medical care plan for the MIT community. He argued that the teaching role of the Department and the provision of prepaid medical care would be the source of strength for each other.

Dr. Means also argued that on-site care for the MIT community not only made good medical sense, it also made good financial sense. In his view, the value of time lost from the work of the Institute – at any level or job – was at great cost, a cost that could be minimized by the provision of on-site care.

1955

James Faulkner, M.D. becomes Medical Director. He served until 1960.

1957

Obstetrical care needs were clearly identified and, in cooperation with the Boston Lying-In Hospital (BLIH, now Brigham and Women’s Hospital (BWH)), arrangements were made to have the chief resident (Dr. Ruby Jackson) provide pre- and post-natal care at MIT for one session per week. The service continued for several years at the BLIH facility and in 1963 a part-time gynecologist was hired by the Institute to provide on site OB and Gyn care. OB/GYN continued until 2004 to be provided at BLIH and its successor BWH.

1960

Albert O. Seeler, MD, an internist and toxicologist, becomes Medical Director. He had joined the Department in 1956 as an internist. Prior to coming to MIT, he was actively involved in patient care and teaching on the Harvard services at

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A History of MIT Medical
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Boston City Hospital and at Mount Auburn hospital. His relationship with the Mount Auburn hospital led to the frequent use of this facility for cases that could not be managed in the MIT infirmary.

His concern for the MIT community lead to continued growth of the Medical Department and most importantly to the establishment of the MIT Health Plan – a prepaid, HMO for the MIT community.

1960s

A number of changes are occurring in the financing of health care – Medicare, an insurance program for senior health care, goes into effect and health insurance becomes an important component of employee benefits in many industries. In an effort to control costs and improve care, pre-paid health care systems are developed and federal legislation is put in place to support the development of Health Maintenance Organizations (HMOs). Planning begins for what will become the MIT Health Plan.

To meet the increasing demands for dependent care, pediatricians and gynecologists are added to the staff.

1964

The MIT General Clinical Research Center (CRC) is established. The CRC is currently one of 80 centers across the country receiving major, continuing support from the National Center for Research Resources within the National Institutes of Health. It provides a facility where expertise in basic science and engineering can be applied to the study of human physiology and the treatment of human disease.

1970

After the Sancta Maria Hospital moves from its Memorial Drive location to Concord Avenue in Cambridge, the building is acquired by MIT. The Holmberg Infirmary moves from Building 11 to

Building W5, the refurbished Sancta Maria Hospital building. Outpatient care remains in Building 11.

1970

The Harvard-MIT Division of Health Sciences and Technology (HST) is launched after several years of planning. The HST program represents the first lasting major academic collaboration between Harvard and MIT. It fosters collaborative efforts in medical education, biomedical research, and health care. The MIT home of the HST program is housed in Building E25 and shares a common entrance atrium with the Medical Department, Building E23. In addition, several Medical Department staff members are actively involved in the activities of the HST program.

1974

The MIT Health Plan starts. Initially a trial program, it was limited to 1000 members. It was a very popular and successful endeavor and soon grew to the 7000 to 9000 member range. The presence of this pre-paid plan allowed for growth of the Medical Department and a marked expansion of the services available on campus. Clearly, this benefited not only the members of the Health Plan but also the students of MIT.

1976

Charles J. Hatem, MD joins the staff of the MIT Medical Department and supervises the medical care of MIT patients at the Mount Auburn Hospital. His role was essentially that of what would be called a “hospitalist” today. This arrangement continued until his retirement in 1997.

1982

After several years of planning, the MIT Medical Department moves into its current home, Building E23.

1997

The MIT Medical Department enters into an affiliation agreement with Partners Health Care (the umbrella organization

that includes the Massachusetts General Hospital (MGH) and Brigham and Women’s Hospital (BWH)). On the occasion of Dr. Hatem’s retirement the question of hospital affiliation was reassessed and a decision was made to hospitalize MIT patients for medical and surgical care at the Massachusetts General Hospital. Obstetric and gynecologic hospital care continued at the Brigham and Women’s Hospital.

2003

A group of MIT students, graduate and undergraduate, form an ambulance service. In addition to providing ambulance services the group has set up an active education program enabling a large number of students to become certified emergency medical technicians. With the help of the Medical Department, the Office of the Dean for Student Life, and the Campus Police, the service provides high quality, student- and campus-friendly emergency medical transportation.

2004

Hospital level care provided by the Obstetrics and Gynecology Service moves to the Mount Auburn Hospital. High-risk obstetrical care and complex GYN surgery continue to be provided at the Brigham and Women’s Hospital. Midwifery and access to obstetrical care in the western suburbs are now available via the Medical Department’s care programs.

For over 100 years MIT has provided care to its community. Students, faculty, staff, and their families can receive care at a facility that has a long tradition of caring for the medical and health needs of this special community.

The people, the buildings, the affiliations and some of the services have surely changed over the past century, but the commitment to the health, safety and care of the MIT community has not changed. ■

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Academic Integrity

Sheila Widnall

ACADEMIC INTEGRITY IS A core value of the culture at MIT. The faculty Committee on Discipline (COD) deals with instances of violations of academic integrity policy by students brought to it by faculty and staff. These cases, although involving only a minute percentage of the students at MIT, provide a window on the current challenges and highlight the crucial importance of faculty holding students responsible for their actions, as well as being willing to bring it to the attention of COD when violations occur.

One recurring theme, which seems to have increased in the past few years, are incidents of plagiarism, primarily in CI-M and CI-H courses. Professional writing has become an important part of the MIT curriculum. Students carry out and document laboratory studies, undertake literature reviews, and write summary papers of important developments in their fields. The Committee has been impressed by the depth and subtlety of the instruction in CI-M and CI-H courses regarding the complexity of identifying and avoiding plagiarism. The MIT handbook on academic integrity, provided to all freshmen (web.mit.edu/academicintegrity/), lays out the subtleties of proper citation of sources, paraphrasing, referencing, “cutting and pasting.” In the plagiarism cases we have heard, we had no doubt that the faculty in question went to great lengths to include in classroom discussion, preliminary writing assignments, specific feedback, and one-on-one classroom interactions, sufficient material to make clear the standards to which the students were held. Despite this, students sometimes argue

that they did not understand exactly what the expectations are about proper use of sources.

Cutting and pasting from Wikipedia, citing sources that had not actually been read or were actually unavailable but had been cited in other references, or copying but not referencing a source: we have seen all of this. Because MIT faculty take these issues seriously and go to such lengths to include them in the course material, COD concluded that, in the cases we heard, students were aware of the standards to which they are held and, for a variety of reasons, chose to violate them.

Other “one-of-a-kind” cases that were recently heard by COD are:

- A student went to the “box” in which problem sets were handed in. The student removed another student’s pset from the box, erased that student’s name, wrote in their own name, and submitted the pset as their own work. This was repeated three times. The violation was identified because one of the students whose problem set was stolen did not get it back, recognized their work in the “return” box, and inquired.
- In another case, of a type we have seen before, a student modified a “returned” exam before resubmitting it for regrading. Because requests for regrading had occurred before with this student, the professor xeroxed the exam before handing it back. When the exam was resubmitted for regrading, the violation was clearly identified.

- In another case, a student gained access to a professor’s personal on-line Athena folder, which was inadvertently left unprotected, and found a copy of the upcoming final as well as other exams and psets. Rather than notify the faculty member, the student made use of the information to improve their own grade in the remainder of the course.

The COD urges faculty to make their academic expectations clear and to have a consistent culture across faculty and TA staff in a course. The Institute’s academic integrity policy leaves the response to an act of academic dishonesty to the sole discretion of an individual faculty member. A faculty member can fail a student for the assignment, lower their grade, or fail them for the entire course. In addition there are two options for the faculty member to more formally document the act of academic dishonesty. The simplest option is to place a letter in the student’s file with the Office of Student Citizenship (OCS), which has templates for those letters available on its Website, web.mit.edu/citizenship. If a faculty member feels that the incident needs to be taken further, they are encouraged to file a complaint through OCS to be heard by the COD. If you are unsure about how you would like to handle a particular situation, you can contact the Chair of COD or Dave Kennedy (ledave@mit.edu), Director of OCS, staff to the COD, to talk through your options. ■

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Reducing the Probability of Nuclear War
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seen by the destruction visited on Hiroshima and Nagasaki where a single bomb (10 to 20 times less powerful than today's typical weapons) destroyed a city. To create the same level of destruction in WWII took hundreds of bombers dropping thousands of conventional weapons. The political results of 9/11, in the U.S. and abroad, were catastrophic and long lasting; a single terrorist nuclear event, even at the relatively small and crude Hiroshima level, would cause orders of magnitude more damage.

It would obviously be best to eliminate terrorism and war, but unfortunately this does not appear to be realistic. There is precedent for eliminating poison gas, another indiscriminate killer, from the arsenals; thus the goal of eliminating nuclear war is possibly a more realizable, although difficult, goal. To achieve this will require multiple concrete steps: 1) the U.S. and Russia reduce their arsenals to 1000 weapons each, limit their use to deter nuclear war, and allow inspections to verify the reductions; 2) the Nuclear Non-Proliferation Treaty (NPT) and the International Atomic Energy Agency (IAEA) inspection system must be strengthened; 3) China, the U.K., France and the non-NPT nations (India, Pakistan, Israel, N. Korea) must agree to reducing and limiting the numbers and uses of nuclear weapons; 4) all responsible nuclear power and weapons states must lower the risk of theft of fissile material and nuclear weapons by terrorist groups; and, finally, at the end of this process, 5) the negotiations to zero weapons.

This is clearly a long and difficult agenda. Is implementation possible? If we don't try it's guaranteed not to happen. If this agenda is carried out will it increase security? If done carefully, with adequate inspections and increased political trust, it should – with the possible byproduct of lessening all wars. Finally, even if we do not reach zero nuclear weapons, each of

the other steps outlined here are important in their own right and should be taken to increase security for all parties. Taking these criteria into account, are the recent activities of the Obama administration consistent with these strides forward, and with this long-range goal?

On April 8, 2010 the new START treaty, reducing the number of U.S. and Russian nuclear weapons by about 30%,

Two days prior to the treaty signing, the U.S. released its Nuclear Posture Review. . . . It reduces the role of nuclear weapons in U.S. national security by stating that the primary role of nuclear weapons is to deter a nuclear attack on the U.S. and its allies, and limits the circumstances under which the U.S. would consider using nuclear weapons.

was signed. More importantly, this treaty brought up to date the vital counting rules and inspection procedures that had been negated in December 2009, when the START treaty had been allowed to lapse. In my view, this is a vital step towards strategic stability, which enhances mutual security, even though these modest numerical reductions do not significantly reduce the overkill capacity still present in these arsenals. The step is also important politically for U.S.-Russian relations, and sets the stage for more significant reductions in the next stage of negotiations. However, the next step is the treaty ratification process in the U.S. Senate, requiring 67 votes. This could be difficult in the present partisan political climate in Washington. This is a critical step as failure to approve this treaty will severely set back nuclear arms control.

Two days prior to the treaty signing, the U.S. released its Nuclear Posture Review. The result of this yearlong study of nuclear weapons policy places the prevention of nuclear proliferation and nuclear terrorism atop the U.S. nuclear agenda. It reduces the role of nuclear weapons in U.S. national security by

stating that the primary role of nuclear weapons is to deter a nuclear attack on the U.S. and its allies, and limits the circumstances under which the U.S. would consider using nuclear weapons. The Review also states that the U.S. will not conduct nuclear explosive tests or develop new nuclear weapons.

On April 12-13, the President hosted the leaders of 47 countries at a Nuclear

Security Summit, whose goal was to reach agreement on the steps needed to secure and safeguard vulnerable nuclear materials, and cope with the worldwide terrorist threat. Among the commitments made, Ukraine and Canada announced the elimination of all of their highly enriched uranium, and Russia announced the closure of its last plutonium production facility.

From the 3rd to the 28th of May, the UN will carry out its five-year review of the 1970 Nuclear Non-Proliferation Treaty, which contains the only multilateral binding commitment to nuclear disarmament. In 1995, this treaty was extended indefinitely. Five years later, at the 2000 Review Conference, all 187 governments – including the five official nuclear weapon states – agreed to a 13-point Action Plan for the systematic and progressive disarmament of the world's nuclear weapons. Still, the 2005 Review Conference was considered a failure due to fundamental disagreements: The U.S. shifted its focus almost exclusively towards non-proliferation once North Korea surreptitiously developed nuclear weapons, and the IAEA found that Iran

had evaded its treaty obligations to provide timely and accurate information. On the other side, the non-nuclear-weapon states protested the Bush administration's exploration of new and modified types of nuclear weapons, its opposition to the 1996 Comprehensive Test Ban Treaty (CTBT), and its withdrawal from the 1972 Anti-Ballistic Missile Treaty.

All of these moves contravene the 13 disarmament steps agreed to at the 2000 NPT Review Conference. This goes to the heart of the NPT bargain, in which the five nuclear weapons states (China, France, Russia, England, U.S.) pledged to work toward giving up their nuclear weapons while all other states pledged to forego acquiring them. Because of the 2005 failure, and also due to heightened concern about the possibility of a terrorist group or rogue state acquiring nuclear weapons, it is important to strengthen the NPT by a successful 2010 review conference. The Obama administration has worked hard to improve the political atmosphere so that this will happen.

Are these recent activities of the Obama administration on target to reduce the threat of nuclear war? I believe they are good beginnings that must be maintained over a relatively long time frame if they are to bear fruit. Clearly, getting Iran and North Korea to change their course will require patient and skillful diplomacy at a minimum, and still might not ever succeed. On the other hand, there are really no viable alternatives. An international effort will be required, needing the support of "neutral countries," and a strong NPT consensus exerting political influence. We must reduce the more than 20,000 nuclear weapons in the world, most of them far larger than those used on Hiroshima and Nagasaki. Since many of these weapons in Russia and the U.S. are on hair trigger alert, it is possible (although unlikely) that they could lead to "accidental" nuclear war. Recently, the scenario that has caused the greatest fear and concern is a terrorist organization acquiring a

nuclear weapon or, alternatively, getting enough fissile material to fabricate a crude bomb that could be smuggled into a city and detonated. This is what drove the recent Nuclear Security Summit, and is of central concern in the 2010 NPT review conference.

Although I believe that President Obama is off to a good start and is moving as fast as is practicable, much

For the Obama strategy to succeed politically at home, many constituencies will have to be convinced that reductions in the number of nuclear weapons, and changing policy on their utilization, will not jeopardize the safety of the U.S. and its allies. After over 50 years of considering them as a deterrent, it is not easy for all parties, both at home and abroad, to shift towards seeing them as a threat.

more needs to be done for his strategy to work on a global scale. The importance, both in planning and prestige, of nuclear weapons needs to be reduced, so that they are less desirable. This will require all nuclear powers to make major reductions in their arsenals, and a firm global commitment to a no-first-use policy. This is a tall order, not to be accomplished in a year and, probably, not even in a decade.

For the Obama strategy to succeed politically at home, many constituencies will have to be convinced that reductions in the number of nuclear weapons, and changing policy on their utilization, will not jeopardize the safety of the U.S. and its allies. After over 50 years of considering them as a deterrent, it is not easy for all parties, both at home and abroad, to shift towards seeing them as a threat. The length of time that it took for the administration to formulate the Nuclear Posture Review indicates that the process of working with the U.S. military on this issue has been done carefully with appropriate consultation. The very important task of working with our allies is just beginning. Many countries do rely on U.S. protection in a willingness to forego a

nuclear arsenal of their own. This is particularly important for neighbors of North Korea and Iran.

The political issues of arms control are more difficult than the technical ones. Nevertheless, as in climate control, scientists and engineers have a significant role to play. Reasonable skeptics must be convinced of the strength of a regime with fewer nuclear weapons and stronger poli-

cies against their use. The American Physical Society has recently published a report on "Technical Steps to Support Nuclear Arsenal Downsizing," in which issues of verification, arsenal safety and reliability, and the assurance of the peaceful uses of fissile materials are emphasized. The National Academy of Science is working on an updated study of the reliability of the nuclear arsenal when they are not explosively tested.

I am reminded of the passion of the generation of scientists and engineers who, at the end of the Manhattan Project, worked so hard to inform Congress and the public about the realities of nuclear energy in order to realize its peaceful potential and to prevent the future use of it in weapons. With nuclear weapons issues in the news, and political debate focused on numbers and uses, as the Senate gears up for debate on the new START treaty, it is as vital as ever for the MIT faculty to make their voices heard, and to help provide scientific and technical bases for rational discussion. ■

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The Chancellor and Student Deans Ask Students to Share “What’s On Your Mind?”

Phillip L. Clay
Costantino Colombo
Daniel E. Hastings
Steven R. Lerman

MIT STUDENTS ARE EAGER to be involved in discussions of the key issues and challenges facing the Institute today. However, both real and perceived gaps have existed in communications between students and MIT’s senior officers. In the recent past, the Chancellor and three student deans engaged students through meetings with student leaders, by including students on key Institute committees, and talking with students at formal and informal gatherings. But students felt they were not being heard. They complained about the level of student participation in key decisions that affected student life and learning and criticized what they perceived as a lack of transparency.

In 2008, the Task Force on Student Engagement brought together students and senior officers to find more opportunities for student participation. While this was a good first step in improving student involvement, the Chancellor hoped to make even more significant strides by developing a thoughtful and deliberate process for open and frequent two-way communications with students. Last year, he formed a team with the three communications officers who represent the offices of the Dean for Undergraduate Education, Dean for Graduate Education, and the Dean for Student Life, and began to lay a new foundation.

This team created a plan – and a broad strategy for its implementation – that would enable the senior officers to communicate more effectively with students, and vice versa. Inherent to the plan were several key themes: student life and learning are inextricably linked; the Institute understands and cares about student con-

cerns; and while the Institute values student input, decisions need to balance the views of all stakeholders.

The team agreed on the following goals for more effective communications:

- Increase the transparency of decisions by sharing relevant data to the extent possible;
- Strengthen existing communications channels for students through student leaders and student government, particularly the student representation on faculty and other committees;
- Focus on efforts that support students’ contributions to current discussions and activities at the Institute;
- Ensure that students have many different mechanisms to make their voices heard.

Based on these goals, the Chancellor, the three student deans, and their communications officers initiated several mechanisms to exchange ideas with students.

Communicate more frequently via monthly letters to students

On a rotating monthly schedule during the academic year, the Chancellor or one of the student deans writes an e-mail letter to the student body on a topical theme. Topics have included hacking, the current job market, and the H1N1 flu. Letters are concise and informative, and often include links for more comprehensive information. They encourage students to submit their comments and reactions directly to the deans or Chancellor. These letters are also posted on each officer’s Website as

“letters to the community.” See web.mit.edu/odge/dean/letters/index.html.

Provide more ways for students to communicate via a “comment box”

Each senior officer has a “Comment Box” page on their Website where students share their thoughts, ideas, questions, and comments via e-mail. Each submission receives a personal response. Students have been very appreciative of the detailed, thoughtful replies. See web.mit.edu/chancellor/commentbox.html.

Create opportunities for open, two-way communication through Dinners with Dialogue and Cookies with Conversation

Two different venues were created to convene students with the chancellor and deans for a face-to-face exchange of ideas, questions, and answers. These events are loosely patterned on the longstanding and enormously popular series of Random Faculty Dinners, in which a small group of randomly selected faculty meets informally over dinner to discuss a theme of common interest. Similarly, invitations to these events are sent to a randomly selected group of students. As part of their response, students are asked to submit a written question or comment to guide the discussion. When their schedules permit, all four officers attend each event.

The Dinners with Dialogue are designed for a small group of 25 to 30 students and are held in one of the residence halls. These events begin with the students striking up a conversation over a meal. Then, the Chancellor or one of the deans takes the floor and leads an informal dis-

discussion. Cookies and Conversation resembles a town hall event for a larger group of 30 to 40 students. Light refreshments are served and one of the senior officers leads an informal exchange of questions and ideas. For the current academic year, seven separate events have been planned, three for graduate students and four for undergraduates.

In these gatherings, students express their thoughts and concerns on a wide range of topics, from the ramifications of budget cuts on everything from Athena clusters to sports teams; best practices for advising and mentoring; incentives for graduate students to interact with one another; to support for students with families. Without exception, conversations have been thoughtful and respectful, even though opinions vary. Most important, the feedback has been very enthusiastic – students continually express their delight and appreciation for such a unique opportunity to meet with Institute leadership.

Provide students access to current, relevant information via a Student Life and Learning Website

Another priority for the communications staff is to create an efficient online resource to help students learn about and

locate the broad array of campus services available to them. A few months ago, the three communications officers began collaborating on a new iteration of the MIT Webpage for “current students.” The updated site will be renamed “Student Life and Learning” and will be the first step towards creating a site that enables students to not only find resources they need but stay connected to what is happening on campus. Students are essential to this process; brainstorming sessions have included representatives from the Undergraduate Association and Graduate Student Council leadership teams. The enhanced Website will be introduced later this semester: web.mit.edu/student/.

Going Forward

By measures both subtle and concrete, these changes introduced over the past year have been successful in strengthening two-way communications – leading to a better understanding of how the administration works (on the part of students) and what students are looking for (on the part of administrators).

An example of one successful outcome appeared in a front-page article in *The Tech*, just one day after the Chancellor’s letter to the student community addressing controversial budget cuts (February

25, 2010). The article quoted the letter extensively and accurately; in it, the student reporter wrote:

“Clay’s response to the community and his recent email to students are part of the senior administration’s efforts to demystify the budget cuts for the community, to gain input from students and faculty, and to better address widespread concerns.”

The new channels of communication introduced over the past year are a means to close gaps that have existed between students and MIT’s senior officers. While they offer the opportunity for administrators to reinforce key messages: (“we want to provide what’s best for students with the resources at hand”), good communications is more than “messaging.” These opportunities to share ideas, to clarify views, and even to disagree respectfully – to truly hear from one another – are a foundation for developing mutual trust and respect. ■

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MIT Finance Advancing Digital Tools and Services: ePaystubs Available in June

IN A RECENT E-MAIL to the MIT community, Vice President for Finance Israel Ruiz highlighted progress on a series of projects to move to digital administrative tools and services. The projects are tied to themes that emerged from the Institute-wide Planning Task Force and are part of efforts to forge

what Ruiz calls a digital evolution at MIT.

In a major change to MIT’s payroll services, all MIT faculty, staff, and students will begin receiving electronic paystubs in late June. After a transitional period, they will no longer receive paper paystubs as of July 30. The ePaystubs service will be avail-

able through SAPWeb Employee Self Service and will provide access to historical paystubs for up to 24 months.

To learn more about ePaystubs, please visit: vpf.mit.edu/site/epaystubs. For more information on the Office of the Vice President’s works to forge a digital evolution, see vpf.mit.edu/site/digital. ■

In Memoriam Arthur C. Smith

Robert M. Randolph



WHEN ART SMITH DIED RECENTLY, MIT lost a 50-year member of the community. When it comes to thinking about contributing members of the Institute, Art was always my best illustration. From Chair of the Committee on Academic Performance (1972-1974) to Chair of the Faculty (1983-1985) to Dean for Undergraduate Education (1990), Art was always willing to take on the task MIT asked of him. Whereas all these official efforts were important, it was the quiet leadership Art exhibited that touched so many areas removed from his formal roles.

Art was raised in Oklahoma and educated at the University of Kansas and Harvard. He came to MIT in 1959, and I always thought his commitment to students grew out of remembering where he had started. I arrived at MIT in 1979 while Art was acting head of the Office of Minority Education. When I went to see him I sat outside his office, and through

the glass watched one side of his conversation with his daughter, Amy. I learned two things that day: 1) his daughters always came first, and 2) never assume. Seeing Amy, I assumed she was adopted since I also assumed that the Head of OME would be black. Imagine my surprise.

But that was part of who Arthur Smith was. He believed in equality not because it was trendy, but because it was right. He had worked with Paul Gray and others to level the playing field in EECS for all students. It was a commitment he believed in and made real by actions. Later, the Committee on Student Affairs benefited from his leadership and he worked with the Minority Student Issues Group.

In 1990, Art began a term as Dean for Undergraduate Education that morphed into the Dean for Undergraduate Education and Student Affairs on the resignation of Dean Shirley McBay. He held the office for five years and turned over

the roll to Roz Williams in 1995. He oversaw the renovation of Senior House, a very emotional project. He also had the unfortunate experience of learning first hand the power of the press, when he mentioned in passing to *The Tech* that Ashdown House ought to be an undergraduate dorm. The reaction was quick and negative, but his wisdom was confirmed with the decision to build a new Ashdown and renovate the older residence for undergraduates. It only took 25 years to come to fruition! He was more careful with his comments to *The Tech* during the remainder of his time as Dean.

Art's commitment on issues of race also carried over to matters of gender. According to Sheila Widnall, he had done a study of the relationship between the Math SAT and the graduating cumulative grade point average for both men and women. He found that the Math SAT under-predicted the performance of women by about 30-40 points. This was the basis on which admissions decisions were modified. In one year, the percentage of women in the freshman class went from 26% to 38% (1990) and climbed thereafter. The subsequent results of the performance of women as MIT students confirmed expectations.

Art was a faculty leader. He was one of those who could bring faculty and the administration together in the event of a critical issue. He was central to the governance of MIT during difficult times; Viet Nam, and divestment from South Africa immediately come to mind, but matters of student privacy were also important to him, and he weighed in to support the right of students to grow into adulthood

protected from prying eyes. He was a key contributor to the faculty and administration working effectively together – which is how MIT does its best work.

Art could also be stubborn; but there is a fine line between being stubborn and holding steady. Young people can disappoint you when you expect the most of them, but Art did not let disappointment keep him from believing in our students.

When then-provost John Deutch appointed him dean, he spoke of “[Art’s] deep understanding of the institution and the concerns of the students, developed over more than 30 years as a teacher, faculty leader, advisor, and father of two graduates.” John could have also mentioned his passion for the Celtics, his ability to cook and bake, his interest in making good beer, and the textbooks he

co-authored. He did not need to mention everything Art gave us; he couldn’t have because for over 50 years Arthur C. Smith lived a life marked by quiet commitment to family, community, and MIT. We are the better for what he gave us and we owe his family thanks for sharing him with us. ■

Robert M. Randolph is Chaplain to the Institute (randolph@mit.edu).

In Memoriam Richard K. Yamamoto



RICHARD K. YAMAMOTO DIED

October 16, 2009 at the age of 74 from complications related to lung cancer. Yamamoto, who was born and raised in Hawaii, entered MIT as a freshman in 1953 and spent his entire career at the Institute. He loved hands-on experimental work and contributing to advances in the understanding of elementary particles.

Yamamoto earned his Bachelor’s and PhD degrees, both in physics, from MIT in 1957 and 1963, respectively. He joined MIT’s Laboratory for Nuclear Science in 1963 and became an instructor of physics in 1964. Joining the MIT faculty as an assistant professor in 1965, he then became a full professor in 1972.

Yamamoto’s career of particle physics research included experiments at Brookhaven, Fermilab, and SLAC. He

worked early in his career at Brookhaven, and when the National Accelerator Laboratory, which became Fermilab, was created near Batavia, Illinois, he assumed a leading role in the creation, operation, and exploitation of the 30-inch Bubble Chamber Hybrid Spectrometer in studying hadronic interactions. Later, at SLAC he joined the SLD Collaboration, to study production and decay of Z^0 bosons produced with polarized electron-positron collisions at the Stanford Linear Collider (SLC). Working on this experiment, he contributed to the most precise measurement of the electroweak mixing angle ($\sin^2\theta_W$) based on a single process ($e_{L,R}^+e^- \rightarrow Z^0$).

This measurement remains an important constraint on models of electroweak symmetry breaking, including the possible mass of the Higgs Boson in the Standard Model. A key element of this work, in which Yamamoto’s group played a central role, was the precise measurement of the electron beam polarization based on Compton scattering.

Yamamoto’s research team also conducted precise studies of decays of charmed and bottom particles with the BaBar Collaboration at the SLAC B-

factory. His group was heavily involved in the construction, calibration, and operation of the BaBar drift chamber, a key component of the BaBar experiment, and contributed to the measurement of CP violation, and other important properties of the heavy mesons.

Yamamoto loved working with students both in the classroom and in the laboratory. He taught Junior Lab at MIT for many years and was a master of all the experiments. He was happiest building something and making it work. Many of his students have gone on to careers in physics and carry with them his love of experimental hardware. Colleagues found him a pleasure to work with; his management was low-key, but quietly effective.

Yamamoto loved good Japanese food, was an excellent auto mechanic, and a devoted fan of fast cars. He was known for rebuilding his own car engines and enjoyed taking driving courses at NASCAR racetracks.

Yamamoto is survived by his wife, Kathleen Yamamoto; his former wife, Lily Yamamoto; three daughters, Cara-Jean Donaghey, Lani Yamamoto, and Sharon Yamamoto; and eight grandchildren. ■

The Foremost Resource Students Need Is Your Time

Allysa Piché

IF YOU ARE READING THIS ARTICLE, I would bet the balance on my loans to MIT that you had a mentor at some point. The importance of that individual or those individuals in your life is assuredly invaluable. However, I wonder if you have reached out to mentor someone else?

I write to you today on behalf of the Mentor Advocate Partnership program (MAP). It is a volunteer mentoring program for MIT first- and second-year undergraduates designed to foster their holistic development along both academic and non-academic dimensions. The MIT Office of Minority Education (OME) initiated MAP believing that building strong relationships throughout the college experience plays an integral role in academic success and personal satisfaction at MIT.

Studies have shown that students who are integrated and involved in both the academic and social mainstream of campus life are more likely to graduate [Brown, O. B. (1995). *Debunking the Myth: Stories of African-American University Students*. Bloomington, IN: Phi Delta Kappa.] and have greater satisfaction with their collegiate experience [Bowen, W. G., & Bok, D. (1998). *The Shape of the River: Long-Term Consequences of Considering Race in College and University Admissions*. Princeton, New Jersey: Princeton University Press.]. Specifically, students who report strong ties with faculty or staff and high quality interactions with peers generally fare better on key measures of collegiate success than those who fail to make these institutional connections [Tinto, V. (1993). *Leaving College:*

Rethinking the Causes and Cures of Student Attrition (2nd ed.). Chicago, IL: University of Chicago Press. Light, R. J. (2001). *Making the Most of College: Students Speak Their Minds*. Cambridge: Harvard University Press]. Thus, satisfaction in and about the college experience for many students is directly linked to the quality of peer and adult interactions.

MIT staff and faculty serve as mentors and help participating students, known as “protégés,” build their networks, monitor personal well-being, offer encouragement, and provide a proactive support

MAP aims to provide a sincere community of support between the community of mentors and protégés at MIT.

layer. The partnerships in the program are designed to extend for two years, but we encourage the connection between mentor and protégé to continue after this formal period ends. Designed to complement the current undergraduate advisor system, MAP aims to provide a sincere community of support between the community of mentors and protégés at MIT.

In September, students and mentors will attend a kick-off and orientation event where they meet each other for the first time and, through training, learn how to make the most of the mentoring relationship. Throughout the academic year, mentors and protégés attend MAP events and are encouraged to meet informally a few times per semester. Together, they create goals for the mentoring relationship, clarifying details such as the best way to get in touch with each other and the best times to meet.

Curious to be a mentor but don't know where to start?

We have trainings for protégés and mentors as well as support staff to lean on when you have questions. During this past 2009-2010 academic year, Institute Ombudsperson Toni Robinson explained what to expect and good ways to start out in a mentoring relationship. During January's National Mentoring Month, MAP held a joint session in which all participants were invited to speak with and discuss the different models of mentoring with Dr. Mary Rowe, an adjunct professor

who teaches a course on conflict management at the Sloan School of Management.

All formality and not enough good old-fashioned fun?

To encourage a strong community where protégés and mentors can find resources and a close-knit group, MAP holds events on and off campus, such as our spring event at the MIT Museum, and just-for-fun events, such as our competition in which program participants were encouraged to deliberate the finer points of local ice cream.

My purpose in this article was to remind you that your most valuable resource in a student's mind is your time. If interested, please e-mail me with any questions or fill out a mentor application online at: web.mit.edu/ome/programs-services/partnership.html.

Allysa Piché is MAP Program Assistant, Office of Minority Education (adpiche@mit.edu).

Graduate Fellows Build Community

Steven R. Lerman
Heather Fry

THE GRADUATE COMMUNITY

Fellows Program, created by the Office of the Dean for Graduate Education (ODGE), sponsors a cadre of graduate students who work on projects that enhance graduate community in unique ways.

The Fellows program represents one of the most recent outcomes of the last decade's shift toward building graduate community at MIT. Inspired by similar programs at Harvard, Yale, and the University of Pennsylvania, Senior Associate Dean Blanche Staton and ODGE Director of Communications Barrie Gleason proposed an MIT Fellows program. Pilot projects began in 2007 with five Fellows who reported to members of the ODGE's senior management team and supported a portion of their work. The assistant dean in charge of recruiting supervised two Fellows to assist with diversity efforts; the director of communications created a Fellow position to help administer the Graduate Student Life Grants [web.mit.edu/gslg], an open request-for-proposal process that funds creative programming to enhance graduate life; the senior associate dean took on a Fellow to support programming for women; and the dean responsible for the International Students Office hired a Fellow to organize programs for international students.

Each of these focus areas expanded over the three years of the program. The Graduate Community Fellows now number 13, served by Program Coordinator Heather Fry and supervised by five different offices, including the Office of the Dean for Graduate Education, the Office of Student

Citizenship, the Technology and Culture Forum, Organizational Development, and the Community Innovators Lab (CoLab). The Fellows' projects are both focused and far-reaching.

Diversity Fellow Joy Johnson is building a mentoring program that pairs first-year minority graduate students with postdocs. She also works with departments to identify student "success markers," which may then be shared with prospective students in order to better prepare them for graduate careers at MIT. Her teammates' efforts involve building relationships with feeder schools, developing existing programs like the MIT Summer Research Program, and documenting the Institute's diversity-related milestones.

Through his work with the Graduate Student Life Grants, Kevin McComber keeps in close touch with grant authors who run projects such as the Science Policy Bootcamp, informal Weekly Wednesday gatherings, and the FamilyNet Website. Other Fellows also reach a broad audience through a student mediation program called Resources for Easing Friction and Stress; through graduate student orientation; and by teaching others to use various media to tell their own stories more effectively.

Community Fellows Libby Putman and Annalisa Pawlosky organize the Path of Professorship workshop (web.mit.edu/odge/development/pop/), which gives women students more tools and resources to achieve their career objectives. They also conduct focus groups in order to learn about the graduate experience and how it may be improved, and are planning an extensive celebration of graduate

women for this spring. Remaining Fellow projects include international student programming and efforts to end violence against women.

The Fellows meet regularly to update one another on their work and to identify areas of collaboration. They also pool their observations, serving as an important conduit for informing the Dean about the needs of the graduate student community. Fellows receive a monthly stipend in return for a workload of 10 hours per week, and have access to additional funding for such purposes as focus group refreshments or travel expenses for out-of-town speakers.

The addition of a part-time program coordinator has enabled a centralized application process for Fellows and for offices that wish to request support for a Fellow, as well as the creation of an internal wiki to share information and resources, and a collection of reports from each Fellow on their annual body of work. Going forward, the program coordinator will solicit evaluations from the Fellows and from their supervisors in order to further refine the program and identify any unmet community needs.

As needs are determined and funds are available, the program will grow to support Fellows in new areas. The ODGE is always interested in forming new partnerships in the service of graduate life and learning. For more information, see the Graduate Community Fellows Website (web.mit.edu/odge/community/fellows). ■

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MIT Center for International Studies: Student Training and Faculty Funding

THE MIT CENTER FOR International Studies (web.mit.edu/cis/) conducts research and training on a broad range of global issues. Founded in 1951 and with an illustrious roster of scholars and practitioners as faculty and graduates, the Center has been a leader in describing and analyzing the challenges the United States faces in the fields of security studies, migration studies, international political economy, East Asia, and increasingly in the Middle East. Center scholars undertake research and training, mainly of graduate students, engage with the national policy community and the interested public, and with scholars, students, officials, journalists, and NGOs internationally.

The Center's MIT Science and Technology Initiatives (MISTI) (web.mit.edu/misti/), provides uniquely rewarding training to undergraduates and graduate students in a dozen countries, has developed a minor in applied international studies, and mounts many educational activities on campus presenting topics of culture, politics, social dynamics, and business on the dozen countries it now covers. Working closely with a network of premier corporations, universities and research institutes, MISTI matches over 400 MIT students (more than 80 percent of whom are from the School of Engineering and School of Science) with internships and research

abroad each year. MISTI Global Seed Funds (web.mit.edu/misti/faculty/seed.html) provide funding for faculty to jump-start international projects and encourage student involvement in faculty-led international research. Other Center funding opportunities for both faculty and students are available here (web.mit.edu/cis/fo_cisfg.html).

A summary of the Center's activities is published at the end of the fall and spring semesters, and available online in the Center's newsletter, *précis* (web.mit.edu/cis/newsletter.html). To receive our electronic newsletter, please subscribe online (web.mit.edu/cis/joel.html). ■

MIT Professional Education: Call for Summer 2011 Short Course Proposals

MIT PROFESSIONAL EDUCATION - Short Programs (originally "Professional Institute") celebrated its 60th anniversary last year. During the program's long tenure, several of MIT's faculty (Bob Langer, Danny Wang, Charles Cooney, Ed Crawley, Dan Nocera, to name a few) have contributed to teaching one or more three- to five-day courses for professionals over the summers.

"Today the need for higher education to connect with industry and professional communities to help solve global issues and concerns has taken on even greater importance," says Bhaskar Pant, Executive Director, MIT Professional Education. "And there is a growing population globally that is looking specifically to MIT to provide the latest insights and knowledge

on technical and non-technical areas relevant to its needs.

"We want our summer program schedule to be market-responsive and to be a showcase of the best that MIT has to offer to industry and to the world."

As an MIT faculty member, this could be a great opportunity for you to:

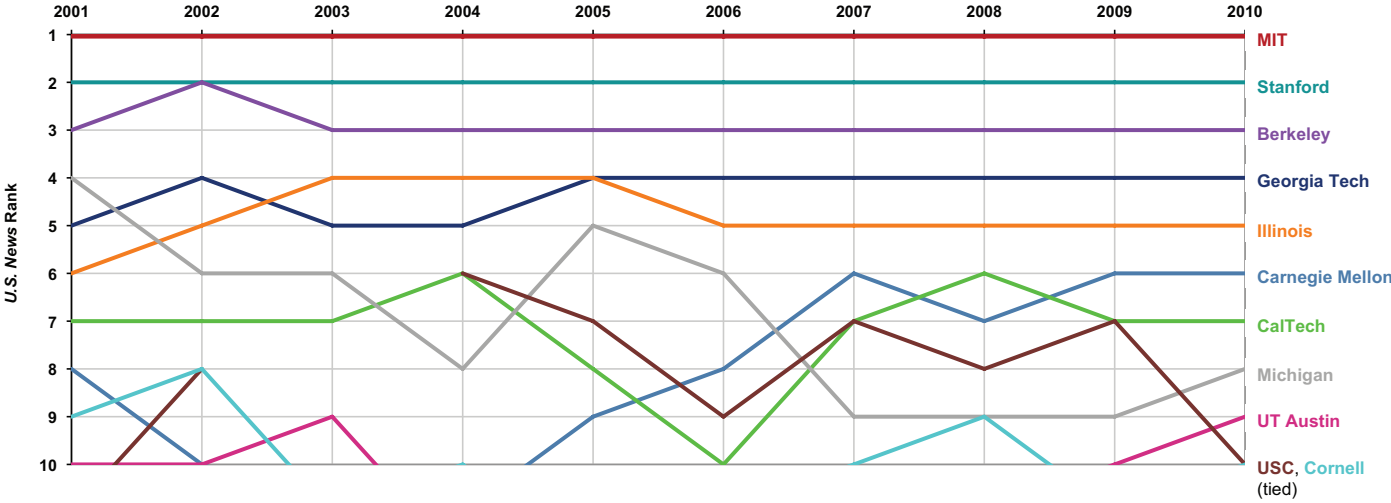
- Connect with industry professionals; make a difference
- Increase industry exposure for your research
- Gain global perspectives from international attendees
- Learn of new industry applications
- Earn attractive supplementary compensation.

To help in the development of new courses, MIT Professional Education is offering a limited number of curriculum development grants (of up to \$7500 each) for three- to five-day programs that focus on recent MIT initiatives and/or current market high interest areas such as energy, environment, transportation, and life sciences. Programs may include complementary material such as policy and regulatory matters that affect adoption of new technologies. High priority will be given to courses that provide the right combination of theory and applications, enabling participants to use their newly-gained knowledge readily on their jobs.

A template and additional instructions on teaching in Short Programs can be found at: shortprograms.mit.edu/2011programs. ■

M.I.T. Numbers
U.S. News & World Report
Graduate School Rankings 2001–2010

Ranking the Top 10 Engineering Schools



Ranking the Top 10 Business Schools

