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MIT Faculty Newsletter

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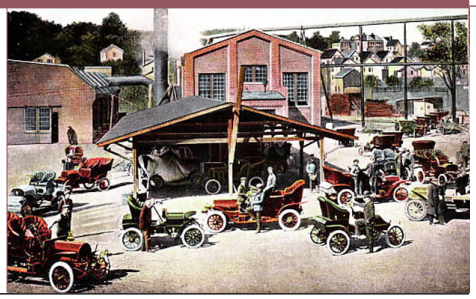
in this issue we offer two pieces continuing the discussion of the fate of manufacturing in the U.S. – "Rise of the Rest, Fall of the Best?" (below) and "A Letter to President Hockfield" (page 16); "Communication," by new Faculty Chair Sam Allen (page 4); an article celebrating 10 years of the Communication Requirement (page 6); and "MIT Ranked 3rd in the World, 5th in the U.S.?" (page 17).



Franklin Auto Factory
Syracuse, NY 1913

Putting the Genie Back in the Bottle: MIT Faculty and Nuclear Disarmament

Kosta Tsipis

On May 4 of this year, the MIT Faculty Newsletter, *the Technology and Culture Forum at MIT, the Program in Science, Technology and Society, and the MIT Physics Department sponsored a forum entitled: "Putting the Genie Back in the Bottle: MIT Faculty and Nuclear Arms Reduction." Following is a transcription of the presentation given by Dr. Kosta Tsipis, long-time MIT Research Associate in the Department of Mechanical Engineering.*

LET ME START WITH an anecdote that encapsulates the debate about the utility of nuclear weapons during the Cold War. In 1991, Mr. Gorbachev organized a huge nuclear arms control conference in Moscow and part of that was a reception at the Kremlin. Everybody who was anybody was there: Mr. Gorbachev, Jerry Wiesner (the science advisor to Kennedy,

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Rise of the Rest, Fall of the Best?

Alice Amsden

Ed. Note: *The following article continues the discussion initiated by Pres. Hockfield in her August 29* New York Times *Op-Ed, "Manufacturing a Recovery."*

MIT IS GEARING UP to attack the country's serious manufacturing problem: manufacturing accounts for a stagnant share of GDP, less than 15% (although manufacturing output is growing absolutely), and a persistent declining share of total employment (see graph, page 14). This comes at a time when the prices of world manufactured exports are rising much more slowly (30%) than the prices of fuels and metals (almost 300% each), which may divert investors' attention towards non-manufacturing activity and raise manufacturing costs. It is also happening when the investments in learning of the post-World

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Editorial

Political Climate Change Threatens Scientific Endeavors

FOLLOWING A SUMMER OF record-breaking heat and devastating storms, from tornadoes to hurricanes, students, faculty, and staff have returned to the relatively safe haven of the academic semester. Whereas the summer weather may have represented the reality of climate change, the summer was also replete with the reality of American political climate change – the rise of the right wing of the Tea Party, the Republican elevation of the federal deficit as the defining feature of the U.S. economy, rather than its productive components; the emerging budgetary threats to Social Security, Medicaid, research, and education.

Congressional unwillingness to invest in the U.S. economy and eagerness to cut social support programs does not bode well for millions of people out of work, with the young particularly at risk. The

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Political Climate Change
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pursuit of a policy that represents disinvestments in the U.S. economy and in our people will soon spill over into erosion of federal support of our institutions of higher learning, research universities in particular. The emergence of Presidential candidates critical of the teaching of evolution and skeptical of the scientific study of climate is deeply disturbing. Those of us in a position to understand the essential role of knowledge, science, and technology in the development of the economy and society will need to speak more clearly, more loudly, and more effectively.

The Coming Year

There are many issues of both national and local concern that the *Faculty Newsletter* hopes to address in the coming academic year. Some of the topics discussed by the FNL Editorial Board are listed below. At the same time, we strongly encourage our faculty colleagues to offer us additional suggestions for articles they'd like to see (or write!) in the FNL. Although the print version of the *Newsletter* only circulates to MIT personnel, the Web version is visited by many tens of thousands of individuals throughout the nation and the world.

- Decreasing federal financial support for research universities – are critical programs at risk?
- Issues of U.S. manufacturing: Are we losing ground to the rest of the world and MIT's potential role in improving the situation (see Prof. Amsden's article in this issue, page 1);
- Post-Japanese tsunami follow-up: How has it affected the outlook for nuclear energy and engineering?
- How best to prepare our students for life after MIT;
- The MIT-Russia research program. Who, what, where, why, and how much $?

The emergence of Presidential candidates critical of the teaching of evolution and skeptical of the scientific study of climate is deeply disturbing. Those of us in a position to understand the essential role of knowledge, science, and technology in the development of the economy and society will need to speak more clearly, more loudly, and more effectively.

- Implementation of plans for increasing faculty, staff, and student diversity;
- Proliferation nationally of alternate education scenarios (for-profit colleges and universities, virtual learning; privatization of K-12 public schools);
- Changing aspects of MIT education – increased class sizes, loss of student athletic opportunities, other cost-saving measures;
- Loss of faculty benefits through the years;
- Issues of faculty governance at the Institute (see "From The Faculty Chair," page 4).

In order to pursue these topics (and others) in the depth they deserve, we will need the continued assistance of you, our faculty colleagues. Please send us your comments and ideas, and don't be surprised if we contact you for some further assistance.

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George Verghese New FNL Secretary

FACULTY NEWSLETTER EDITORIAL Board member and Professor of Electrical Engineering George C. Verghese was elected Secretary of the FNL by acclimation at the Editorial Board meeting held on September 8. Verghese was elected for a two-year term, and in addition to his duties as Secretary he will also chair the *Newsletter* Nominations Committee, which is responsible for vetting candidates for the FNL Editorial Board.

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Editorial Board Elections to be Held in October

IN ACCORDANCE WITH THE *Policies and Procedures of the MIT Faculty Newsletter*, Institute-wide elections for new members of the FNL Editorial Board will be held in October. The elections will be electronically-based, and all faculty members and emeritus faculty will be eligible to vote. E-mail providing a link to the voting site will be sent to all eligible voters, and we encourage all faculty and emeriti to participate in the only Institute-wide faculty election at MIT.

Editorial Subcommittee

From The Faculty Chair

Communication

Samuel M. Allen

WHEN PEOPLE FIRST LEARN that one has become Chair of the Faculty, the two most common questions are: "What does the Chair of the Faculty *do*?" and "What do you hope to accomplish as Chair of the Faculty?" Tom Kochan's final column as Chair of the Faculty ("Faculty Governance @ MIT: Strengths and Future Challenges," *MIT Faculty Newsletter*, May/June 2011) addresses the first question based on his experience during his two-year term as Chair, so I'll focus this column on the second one.

My overarching goal is to improve the communication between the MIT faculty and the administration, in particular by working to ensure that important decisions are made with an accurate view of the faculty's perspective.

We often say that MIT's shared governance system is a collaborative effort between the "faculty" and the "administration." Who comprises these groups? In most ways, they are defined by the Institute's organizational structure. The faculty are represented via membership on Standing Committees of the Faculty, which report to the Faculty Policy Committee (FPC). The Officers of the Faculty sit on FPC, and have various opportunities to interact with the upper administration (President, Provost, and Chancellor). The administration includes the five School deans, several academic deans and vice presidents, the Chair of the Faculty, and a few others. This group comprises MIT's Academic Council. The Chair of the Faculty is thus in a unique position at the faculty/administration interface.

Two examples of faculty/administration friction I observed during my one-year term as Chair-Elect of the Faculty were: the decision to increase the current undergraduate enrollment by about 400 students over a four-year period, and the administration's initial efforts to enter into an agreement with Russia's Skolkovo Foundation. Both issues caused some faculty to feel that they had, at best, only a very limited opportunity to voice their opinion before the administration put in motion steps that would make significant changes. When the faculty complained about not being heard, the administration's response was to review its past actions to demonstrate that faculty had indeed had opportunities for input. With more collaboration between the faculty and the administration, additional faculty input could inform the decision-making processes and strengthen the administration's subsequent actions. Moving forward with important changes could be much more collegial and efficient.

My overarching goal is to improve the communication between the MIT faculty and the administration, in particular by working to ensure that important decisions are made with an accurate view of the faculty's perspective.

The *mechanisms* for broad faculty input on important issues may seem limited, but they certainly exist. Individual faculty communicate directly to department heads, then flow via the "bottom-up" route to deans, Academic Council, and the senior administration. A second communication channel is our system of faculty governance. The Chairs of Standing Committees, other Faculty Committees, and FPC members welcome input and feedback from the faculty.

The Faculty Officers (Associate Chair Mary Fuller, Secretary Chap Lawson, and I) are another important link to the administration, and we welcome your comments, suggestions, and viewpoints. This year the Officers are meeting weekly with various committee chairs and their staff, to exchange information, strategize, and coordinate ongoing efforts. We can bring important issues to FPC and to Academic Council via the Chair of the Faculty. Our ability to represent you depends on us knowing your views. Otherwise, we are likely to fall back on our own personal perspectives. An easy way to reach us is by e-mail to: *fac-officers@mit.edu*.

Faculty have opportunities to communicate their views directly to the administration through two additional routes. The first is at Institute Faculty Meetings. Each meeting concludes with an off-the-record question-and-answer session with the President, Provost, and Chancellor; I believe these Q & A sessions have been underutilized by the faculty. The second route is occasional Faculty Forums that

are organized to inform the faculty about key issues and provide a forum for faculty to give their views. One Faculty Forum was held in February 2011 to discuss MIT's international engagement strategies, and to discuss a potential initiative in Russia. There was a respectable faculty turnout for this Forum (much better than for some monthly faculty meetings). A second Faculty Forum was held on September 20, continuing the faculty discussion begun in February, and included the current status of MIT's proposed collaboration with Russia's Skolkovo Institute of Science and Technology.

So I hope to achieve my goal of improved communications through invigorating the communication along existing channels, by close coordination between the Faculty Officers and Faculty Committees, through keeping faculty informed about important issues, and by clearly articulating faculty viewpoints to the administration. I encourage you to do your part by making your views known to those of us on the "front lines."

It's a real honor to serve as your Chair. I still have many, many colleagues to meet and work with, and I look forward to doing so. I welcome comments or feedback, as it is essential in being your representative in helping to shape MIT's future.

Samuel M. Allen is a Professor in the Department of Materials Science and Engineering and Faculty Chair *(smallen@mit.edu).*

Teaching this fall? You should know …

the faculty regulates examinations and assignments for all subjects.

Check the Web at ***web.mit.edu/faculty/termregs.html*** for the complete regulations.
Questions: Contact Faculty Chair Sam Allen at x3-6939 or *smallen@mit.edu*.

No required classes, examinations, exercises, or assignments of any kind may be scheduled after the last regularly scheduled class in a subject, except for final examinations scheduled through the Schedules Office.

First and Third Week of the Term
By the end of the **first week** of classes, you must provide a clear and complete description of:

- required work, including the number and kinds of assignments;
- an approximate schedule of tests and due dates for major projects;
- an indication of whether or not there will be a final examination;
- grading criteria; and
- a clear presentation of your expectations about working alone or working with other students.

By the end of the **third week**, you must provide a precise schedule of tests and major assignments.

For all Undergraduate Subjects, Tests Outside Scheduled Class Times:

- may begin no earlier than 7:30 P.M., when held in the evening;
- may not be held on Monday evenings;
- may not exceed two hours in length; and
- must be scheduled through the Schedules Office.

No Testing During the Last Week of Classes
Tests after Friday, December 9, 2011 must be scheduled in the Finals Period.

Collaboration Policy and Expectations for Academic Conduct
Due to varying faculty attitudes towards collaboration and diverse cultural values and priorities regarding academic honesty, students are often confused about expectations regarding permissible academic conduct. It is important to clarify, in writing, expectations regarding collaboration and academic conduct at the beginning of each semester. This could include a reference to the MIT Academic Integrity Handbook ***web.mit.edu/academicintegrity/***.

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Vol. XXIV No. 1

Innovations in Communication Instruction at MIT: Celebrating Ten Years of the Communication Requirement (CR)

Lorna Gibson
Caspar Hare
John Ochsendorf

THIS FALL 2011 TERM marks 10 years since the first entering class was subject to the Communication Requirement (CR). Beginning with the Class of 2005, the new CR replaced a narrower writing requirement that asked students to demonstrate competency in writing at two levels.

Under the current CR all MIT undergraduates fulfill a Communication Requirement by completing a program of four communication intensive (CI) subjects that integrate substantial instruction and practice in writing and oral communication. The CR requires that students complete at least one CI subject in each year of undergraduate study in order to ensure that their communication training is distributed. Two of the required CI subjects are chosen from a group of designated humanities, arts, and social sciences subjects (CI-H) and provide a foundation in effective writing and oral communication in the context of the subject's focus. The other two required CI subjects, designated as Communication Intensive in the Major (CI-M), are taken in the student's major department(s). These subjects teach the specific forms of communication common to the field's professional and academic culture. As a result of this structure, there are approximately 152 CI-H subjects and 148 CI-M subjects spanning a diverse range of topics and formats (including laboratory classes, seminars, senior theses, and independent research projects) offered across all five Schools of the Institute.

In celebration of this tenth anniversary and as a part of the MIT150 events, the faculty-led Subcommittee on the Communication Requirement (SOCR) sponsored "Innovations in Communication Instruction: Lessons from Ten Years of the Communication Requirement" on April 27. With the goal of collecting and sharing examples of best practices in communication instruction, SOCR invited several CI-H and CI-M instructors to discuss the successes and challenges of teaching CI subjects at MIT. Professors Sandy Alexander and David Jones discussed their CI-H subjects, while Professors David Wallace and Haynes Miller, in collaboration with Susan Ruff, a Lecturer from Writing Across the Curriculum, described their CI-M subjects. Also joining the conversation was Naomi Stein '10 – a former SOCR member, recent graduate of MIT, and current graduate student – to reflect on her experience with the CR. The session concluded with a lively open discussion moderated by Diana Henderson, Dean for Curriculum and Faculty Support and Professor of Literature. A few key themes emerged from the presentations and the discussion:

- The students and faculty value the importance of instruction in communication skills and recognize that without the CR's structure, instruction might not be as effective as it is.

- It can sometimes be a challenge for faculty to balance the demands of teaching the subject's disciplinary content, writing, and oral communication. All of the panelists discussed various strategies for meeting these demands.

- Students appreciate when communication assignments are well integrated in the subject, and are better motivated to communicate ideas effectively when they are interested in the topics about which they are writing or presenting.

- The collaborations between instructional staff (often from Writing Across the Curriculum) and faculty are vital to the success of many CI subjects. Some panelists wished for additional support to provide more one-on-one attention for students.

The CR [Communication Requirement] requires that students complete at least one CI [Communication Intensive] subject in each year of undergraduate study in order to ensure that their communication training is distributed. Two of the required CI subjects are chosen from a group of designated humanities, arts, and social sciences subjects (CI-H) . . . . The other two required CI subjects, designated as Communication Intensive in the Major (CI-M), are taken in the student's major department(s).

- The demands of CI subjects have necessitated innovations in course design, pedagogies, and instruction. In particular, Mathematics developed a site called the MIT Mathematics CI Space which allowed instructors to share and archive materials, develop and refine pedagogy, and make use of teaching tips. This site has evolved into a Web-based tool, the Educational Collaboration Space (ECS), that it is available for download at ***ecs.mit.edu***.

- Students and faculty view the revision component of CI subjects as essential and successful, and stressed the value of providing feedback to students early and often in order to allow time for them to learn from the revision process.

SOCR has long sought to develop a "Best Practices Inventory" for teaching CI subjects, and to share this collection with the MIT community. The Subcommittee hopes such a study will inform the design of new CI subjects, offer the potential to improve existing ones, and promote conversation among faculty members teaching CI subjects. This well-attended event presented SOCR with many ideas for moving forward with the project. The Subcommittee hopes this will be the first of several events designed to share faculty practices and perspectives on teaching the Communication Requirement. We look forward to continuing this conversation about communication instruction throughout the Institute. If you have ideas or suggestions, please e-mail *commreq@mit.edu*.

Video of the event is available through the CR Website at: ***web.mit.edu/commreq/faculty.html***.

Lorna Gibson is a Professor of Materials Science and Engineering and Co-chair of the CUP Subcommittee on the Communication Requirement *(ljgibson@mit.edu);*
Caspar Hare is an Associate Professor of Philosophy and Co-chair of the CUP Subcommittee on the Communication Requirement *(casparh@mit.edu);*
John Ochsendorf is an Associate Professor of Architecture and former Co-chair of the CUP Subcommittee on the Communication Requirement *(jao@mit.edu).*

College Admissions 101

IF YOU HAVE A CHILD who is applying to college soon, whether to MIT or elsewhere, Dean of Admissions Stu Schmill will give you a picture of the current college admissions landscape and offer some advice as you go through the process.

The college admissions process can seem quite opaque, especially if you haven't gone through it in the last few years. Dean Schmill will offer tips on helping your child navigate the college search process, insight as to how college admissions offices make admissions decisions, and will also offer specific insight as to what to expect if your son or daughter is applying to MIT. Anyone with a child in high school will find this session useful, regardless of his or her college plans.

The session is open to all MIT faculty and staff, and will be held on Wednesday, October 12, from 12:00 – 1:00 in Room 1-190.

Please contact Paulina Baltazar at *paulinab@mit.edu* or 617-258-5514 to register or with questions.

HASS Exploration Program: Entering Phase Two

Diana Henderson

A call to action

FOLLOWING LAST SPRING'S interim report from the Subcommittee on the Humanities, Arts, and Social Sciences Requirement (SHR), the HASS Exploration Program (formerly called the First Year Focus Program) enters its second phase: we are looking to expand the roster of these exciting foundational subjects. If we continue to build on early successes, the HEX subjects – as, in the MIT tradition of distinctive acronyms, SHR is now dubbing them – have the potential to play a crucial part within the HASS requirement.

Working towards that goal, SHR (staffed by members of the Office of Faculty Support) is seeking existing subjects that fit HEX program parameters as well as soliciting interested faculty to design and teach new subjects. Advantages of being part of the HEX program include the opportunity to explore topics from multiple perspectives along with colleagues, to become more familiar with others' pedagogical techniques and strategies, and to share and develop new research ideas. Instructors in the SHR-recommended program can also take the occasion to build relationships with fellow faculty in other departments and often to teach previously unreached students about their area of expertise.

A bit of context

In 2006, the Task Force on the Undergraduate Educational Commons proposed the creation of HASS subjects geared towards first-year students, to generate a common discussion among undergraduates and familiarize them with fundamental topics and methods. Especially in the wake of changes to the HASS Distribution requirement (i.e., HASS-Ds being phased out and replaced by a much larger set of options), some core educational practices beyond those addressed by the Communication Requirement seemed worth modeling and exploring with students early in their undergraduate training. Funding from the SHASS Fund for teaching and Learning and the d'Arbeloff Funds for Excellence in Education was made available to design and sustain these conceptually innovative subjects. The experiment was continued in 2009, when the faculty, via the CUP, charged the Subcommittee on the HASS Requirement with the task of determining whether the First Year Focus Program should be recommended to the faculty as part of the HASS Requirement in 2014.

Advantages of being part of the HEX Program include the opportunity to explore topics from multiple perspectives along with colleagues, to become more familiar with others' pedagogical techniques and strategies, and to share and develop new research ideas. Instructors in the SHR-recommended program can also take the occasion to build relationships with fellow faculty in other departments and often to teach previously unreached students about their area of expertise.

Under the chairmanship of Professor Jeff Ravel, SHR has since worked to assess the First Year Focus Program, to determine the commonality between experimental subjects and whether that commonality filled an important educational niche. Two years into the assessment process (AY2011), SHR renamed the program, believing the HASS Exploration Program more accurately reflected the subjects' constituency, and established a common set of parameters for HEX subjects:

- Introduce students to major interdisciplinary concepts and to disciplinary methods in the Humanities, Arts, and/or Social Sciences.
- Encourage students to think critically and analytically, and expose students to ambiguities inherent at complex levels of analysis within fields.
- Feature pedagogically innovative techniques, as well as extensive opportunity for faculty/student interaction.
- Regular faculty should lecture and lead discussions, possibly in collaboration with Senior Lecturers.

In the second phase of the experiment, SHR (now chaired by Professor Andrea

Campbell, a veteran of the committee) will assess whether these defined parameters in combination provide a crucial undergraduate experience otherwise absent from MIT's curricular requirements, and whether the HEX Program should continue as a recommended set of subjects or the faculty should consider making a HEX subject a required part of the GIRs.

How to participate

Faculty interested in developing and participating in these thematically innovative subjects should consider applying for funds from the d'Arbeloff Funds for Excellence in Education (***web.mit.edu/darbeloff/***) and/or the SHASS Fund for Teaching and Learning (***shass.mit.edu/inside/resources/internal/ teaching-learning***). Both programs are actively seeking to support HEX experimentation. To find out how your subject might join the HASS Exploration Program or how to apply for funding, contact your Department Head, SHR, the Office of Faculty Support (ofs@mit.edu), or the SHASS Dean's Office.

For a listing of HEX subjects offered in Academic Year 2012 visit: ***web.mit.edu/hassreq/exploration.html.***

We look forward to working with more of our talented fellow faculty!

Diana Henderson is Professor of Literature and Dean for Curriculum and Faculty Support with the Dean of Undergraduate Education's office *(dianah@mit.edu).*

MISTI Expands Faculty Seed Funds and Launches New MIT-Chile Program

April Julich Perez

MISTI (MIT INTERNATIONAL SCIENCE and Technology Initiatives) has increased the geographic range of MISTI Global Seed Funds, an initiative that helps MIT faculty and researchers launch early-stage international projects and collaborations.

MISTI Global Seed Funds consists of a general pool for projects in any country and several country funds. Funding may be used to cover travel, meeting, and workshop costs to facilitate international projects and collaboration. Applicants are encouraged to involve MIT undergraduate and graduate students in their projects. In addition to country funds for projects in Brazil, China, France, India, Italy, Japan, and Spain, the program also now includes Belgium, Chile, and Germany.

In 2010, MISTI received 112 requests for funding, and 46 projects were awarded a total of $903,912.

MISTI has also launched its eleventh country program, MIT-Chile. In addition to supporting faculty international collaborations, MISTI country programs connect MIT students with internships and research around the world. Thanks to a partnership with the Chilean Ministry of Economy, Development and Tourism, the MIT-Chile Program will place MIT undergraduate and graduate students in internships with Chilean companies and labs and facilitate collaboration between faculty at MIT and in Chile. The newly established MIT-Chile Seed Fund includes funding for projects with any Chilean institution, and two funds specifically for projects with colleagues at Pontifical Catholic University of Chile and Adolfo Ibáñez University.

MIT's primary international program, MISTI is a pioneer in applied international studies. Each year, the program places nearly 600 MIT students in professional internships and research with its network of leading companies, universities, research institutes, and NGOs around the world. MISTI currently has programs in Brazil, Chile, China, France, Germany, India, Israel, Italy, Japan, Mexico, and Spain. The program is a part of the Center for International Studies.

For more information, please visit our Website: ***web.mit.edu/misti/.***

April Julich Perez is Associate Director, MISTI *(ajulich@mit.edu).*

Putting the Genie Back in the Bottle
Tsipis, from page 1

and then president of MIT), Sakharov (the physicist who developed the hydrogen bomb for the Soviet Union), and several others. Gorbachev was telling Wiesner, "You know we need 3,000 nuclear weapons because otherwise we will not know whether we will have enough to deter you." Jerry said "Excuse me, may I ask you a question?" and Gorbachev said yes. "Suppose you attack us first and you eliminate all our nuclear weapons except 50. Would you give up Moscow for that?" Gorbachev says no. "Would you give up Leningrad?" No. "Would you give up Kiev?" No. Would you give up Vladivostok? No. "How many does that make?" asks Jerry. Gorbachev sheepishly said "ten?" "So you see," said Jerry, "you don't need 3,000." Gorbachev turns to Sakharov and says "Why are you telling me 3,000? – Ten, that's what you really need!" Sakharov went through the usual litany of not having enough to deter the U.S. after a U.S. first strike. And even though we knew that China had only two hundred ICBMs (Intercontinental Ballistic Missiles) with nuclear weapons, we also subscribed to Sakharov's argument, and kept accumulating nuclear weapons for 40 years.

So now let me go back to relating the role of MIT physicists in nuclear arms control over the years. What I have to say is very personal, therefore you have to excuse my errors and omissions for two reasons: Number one, I came to MIT in 1966, therefore I do not know what happened before, which apparently was very important. Number two, I'm an old man; I forget. So if I have forgotten instances and people's names and so on, I hope you'll excuse me.

Bernie [Feld] was one of the four physicists who came to MIT from Los Alamos: Bernie, Vicky Weisskopf, Phil Morrison, and Cyril Smith. Since Bernie's office was right next to mine, I would see him going back and forth to Europe and Washington and to nuclear arms control conferences, and one day I walked in and said "Professor Feld, I would like really to do what you are doing in terms of nuclear arms control. What should I do?" He looked up from his cluttered desk and said, "You work."

So I came here in 1966 to work with Martin Deutsch on particle physics and I was assigned an office in Building 26 that was right next to Bernie Feld's. Bernie was one of the four physicists who came to MIT from Los Alamos: Bernie, Vicky Weisskopf, Phil Morrison, and Cyril Smith. Since Bernie's office was right next to mine, I would see him going back and forth to Europe and Washington and to nuclear arms control conferences, and one day I walked in and said "Professor Feld, I would like really to do what you are doing in terms of nuclear arms control. What should I do?" He looked up from his cluttered desk and said, "You work."

In 1963, Jerry Wiesner walked into [President] Kennedy's office in Washington on a rainy morning and said to him: "Do you see that rain falling outside the White House? That rain is bringing down radioactive material from above ground nuclear tests and it is exposing to radioactive fallout everybody from Nevada to New York. You must do something about that." And Kennedy said, "What should we do?" and Jerry said, "We have to forbid above ground nuclear tests." So Kennedy got together with the Russians and indeed about two weeks before he was assassinated, signed an agreement not to have above ground tests anymore, which was enormously important.

So I started working, analyzing the technical and operational aspects of weapons like strategic cruise missiles, and MIRVs (Multiple Independently-Targeted Re-entry Vehicles) and submarine-launched long-range nuclear missiles, and informed the public, the opinion-makers and the decision-makers, about nuclear weapons, their uses and their effects.

But long before that, members of the MIT community had already contributed substantively to nuclear arms control. At the very beginning, in 1945, Phil helped organize the "Federation of Atomic Scientists" (which quickly became the "Federation of American Scientists") and then became its president for several years. At that time Bernie joined the Board of the "Council for a Livable World," an influential group promoting nuclear arms control in Washington, and also the Board of the *Bulletin of the Atomic Scientists* and was later its editor for many years.

In 1963, Jerry Wiesner walked into Kennedy's office in Washington on a rainy morning and said to him: "Do you see that rain falling outside the White House? That rain is bringing down radioactive material from above ground nuclear tests and it is exposing to radioactive fallout everybody from Nevada to New York. You must do something about that." And Kennedy said, "What should we do?" and Jerry said, "We have to forbid above ground nuclear tests." So Kennedy got together with the Russians and indeed about two weeks before he was assassinated, signed an agreement not to have above ground tests anymore, which was

enormously important. If you look at *The New York Times* (May 3, 2011) there was an article which showed how much radioactivity was dropped on the United States because of our and the Russians' above ground nuclear tests. Since the 1960s we never had again such big radioactive fallout anywhere as when we were testing weapons above ground.

So Jerry Wiesner was one of the first to contribute to nuclear arms control from MIT.

And then in 1964 there was an MIT professor of political science and electrical engineering by the name of Jack Ruina, who attended an annual Pugwash Conference in India. Pugwash conferences were the ones that Russell and Einstein started in 1957 to get scientists together to think how we're going to avoid catastrophe, how we're going to avoid nuclear holocaust. These conferences started in Pugwash, a small village in Nova Scotia, and occur every year. In 1964 it was held in India. There Jack Ruina presented a paper that explained why ABMs (anti-ballistic missile systems) would be a disaster if deployed. The Russians said what do you mean? It's a defensive weapon! And he explained to them how if they develop a defense against ballistic missiles, we would think that it's perfect, so we'll have to keep on building more and more ballistic missiles to counter it and if we do that then the Russians will build more and more and more ABMs. In 1964, Jack was the first one to say that in public. And eventually, of course, by '71 or '72 the agreement was made between the U.S. and U.S.S.R. to do away with the ABM. We built a single such system in North Dakota to protect an ICBM field, but we never manned it. It was never in any way operational.

Then in 1969, we had a big demonstration here in Cambridge with MIT being the target – it had to do with the Draper Lab. The Draper Lab was completely devoted to the Air Force and everybody was complaining about what the Draper Lab was doing with the Air Force in Vietnam. So to protest the work at Draper Lab in that war – the students were very active at the time opposed to MIT dealing with weapons and war and at that point – Henry Kendall, among other people, (Scott Paradis, Francis Low, Leo Marx, Salve Luria) started the Union of Concerned Scientists, which played a major role in the years to come.

Pugwash conferences were the ones that Russell and Einstein started in 1957 to get scientists together to think how we're going to avoid catastrophe, how we're going to avoid nuclear holocaust. . . . In 1964 it was held in India. There [MIT Professor] Jack Ruina presented a paper that explained why ABMs (anti-ballistic missile systems) would be a disaster if deployed. The Russians said what do you mean? It's a defensive weapon! And he explained to them how if they develop a defense against ballistic missiles, we would think that it's perfect, so we'll have to keep on building more and more ballistic missiles to counter it and if we do that then the Russians will build more and more and more ABMs. . . . Jack was the first one to say that in public.

Now between 1973 and 1977 I was Science Advisor, Science Director at SIPRI, the Swedish International Peace Research Institute. The reason I mention it is because there, in SIPRI, was an American administrative assistant by the name of Randy Forsberg. Randy came and said, "I'm very much interested in this kind of thing you guys are doing so I'd really like to come to MIT to get a PhD in arms control." But I was in the Physics Department, and I couldn't tell the Political Science Department what to do. But next year, George Rathjens, another professor in Political Science who was deeply involved in defense issues, went to SIPRI and convinced her to come. So Randy came in 1978 and, at that time, completely unrelated to her, George Kistiakowsky, (the legendary Harvard chemist who made the explosive lenses that made the plutonium bomb possible), Bernie Feld, and I would meet every Wednesday afternoon to discuss what the arms control community could do about this unbridled proliferation of nuclear weapons; and I don't remember who said it, but someone said "How about proposing to freeze the number of weapons in both the U.S. and U.S.S.R. arsenals?" and we broke up. Such ideas are a dozen a minute in academia, but they evaporate unless someone works to convert them to actions. At some point after our meeting, perhaps a few days later, I saw Randy in the corridor and told her about the freeze idea someone had mentioned at our meeting. Randy picked it up and she started this huge Freeze movement that culminated in half a million people in Washington and New York marching in favor of freezing the number of nuclear weapons in our arsenal. She was really another very strong voice that came out of MIT since the Freeze was clearly her doing. We should never minimize what Randy has contributed to nuclear arms control even though, unfortunately, she died at a very young age.

Now people outside the Physics Department, Jack Ruina, George Rathjens, and Bill Kaufman, even though they were Pentagon aficionados, fought against nuclear weapons and nuclear war, and they were also people who came from MIT.

In addition, you had the Biology Department; Maury Fox was a member of the Council for a Livable World and he was very active. So was Salva Luria; so was Ethan Signer; so were David Baltimore who came the year I did, and Jon King.

continued on next page

Putting the Genie Back in the Bottle
Tsipis, from preceding page

And in the Physics Department there were additional people like Leo Sartori who came and joined the group of arms controllers. In 1978, Herman Feshbach, Bernie Feld, and I started the "Program in Science and Technology for International Security" (PSTIS) in the Physics Department. About the same time Jack Ruina and George Rathjens started a similar program focusing on policy in the Center for International Studies. In PSTIS we trained a lot of students in nuclear arms control who are all now very prominent: Matt Bunn is now at Harvard's Kennedy School, managing the Atom Project; Steve Fetter is now working with John Holdren in the White House; Joe Romm now has a strong Internet voice about both nuclear weapons and global warming.

We published a lot of stuff; the effects of a nuclear attack on a city, laser weapons, particle beam weapons – we published 11 articles in *Scientific American* about nuclear weapons and nuclear war. But my pride and joy is that when Mr. Reagan announced Star Wars in 1983, I wrote an article in *Playboy*(!) in which I said that President Reagan knows little and understands less about physics and the laws of nature. PSTIS published the first article about anti-ballistic particle beam weapons in 1979, saying it's not going to work. Then another one in 1981 saying ABM laser beam weapons could not work.

But anyway, an enormous amount of work was done at MIT: the Biology Department, Physics Department, the Center for International Studies, graduate students, undergraduates, post-doc scientists, mid-career physicists – it was really an assembly of dedicated scientists working against a global threat: nuclear war.

And then in 1993, some of us thought, "Clinton is coming in, let's go to Washington and tell him what to do." So Phil Morrison, Jerry Wiesner, and I wrote a little book called *Beyond the Looking Glass,* and we went to Washington and had a press conference outlining our proposals for the new Administration. We were assaulted by everybody asking how many nuclear weapons do we need, and we answered about 500, and we were just dismissed completely. Everybody expected us to say "zero."

But then many from MIT (Feld, Rathjens, Fox, Tsipis, Bernstein, et al.) became active in the "Council for a Livable World" that was started in 1962 by Szilard, as an anti-nuclear war lobby group in Washington focusing on Senatorial elections. Bernie was head of that for many years, and then George Rathjens became head. And then in addition was the participation of MIT scientists in Pugwash. There were lots of influential people in Pugwash that came from the MIT Political Science Department, from Science, Technology and Society, from Physics, from Biology. George Rathjens became Secretary General of Pugwash many years ago and he was there for 12 years. So there's an enormous amount of nuclear arms control work that originated here at MIT but was conducted outside the Institute proper.

Then in '79, the Boston Study Group put together "The Price of Defense," a thorough analysis of the costs of the arms race, written mostly by MIT scientists: Randy Forsberg, Martin Moore, Phil Morrison, Paul Walker, Fred Kaplan – all graduates or undergraduate students, some professors. And then in 1984, Jack Dennis and many others (Feld, Morrison, Jon King, Tsipis) produced *The Nuclear Almanac*; everything you wanted to know about nuclear weapons and their potential uses. It is another book about nuclear weapons also from MIT.

But anyway, an enormous amount of work was done at MIT: the Biology Department, Physics Department, the Center of International Studies, graduate students, undergraduates, post-doc scientists, mid-career physicists – it was really an assembly of dedicated scientists working against a global threat: nuclear war.

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Finally at the very end, Phil and I wrote a book, *Reason Enough to Hope*, about what the United States should be like in the twenty-first century. It was Jerry's proposal that he, Phil, and I work on it, but we lost him prematurely.

So this is a very brief history of what faculty and students did at MIT. And I think the most important people were Jerry, and Vicky, and Herman who said OK, nuclear arms control is an integral part of Physics and we're going to keep it that way 50 years after the origin of nuclear weapons in Los Alamos. Thank you.

Kosta Tsipis is a Research Associate in the Department of Mechancial Engineering *(tsipis@mit.edu).*

Faculty Fallout

Benjamin Ginsberg

Administrators have taken over U.S. universities, and they're steering institutions of higher learning away from the goal of serving as beacons of knowledge.

B. Ginsberg, "Faculty Fallout," The Scientist*, 25(8):70, 2011. Reprinted with permission of* The Scientist *LLC ©2011.*

DURING MY NEARLY FIVE decades in academia, the character of the university has changed, and not entirely for the better. As recently as the 1970s, America's universities were heavily influenced, if not completely driven, by faculty ideas and concerns. Today, institutions of higher education are mainly controlled by administrators and staffers who make the rules and increasingly set the priorities of academic life.

A recent study showed that between 1997 and 2007, the number of administrative and support personnel per hundred students increased dramatically at most schools – 103 percent at Williams College; 111 percent at Johns Hopkins; 325 percent at Wake Forest University; and 351 percent at Yeshiva University, to cite some noteworthy examples. My book, *The Fall of the Faculty*, exposes this troubling reality.

The ongoing transfer of power from professors to administrators, who often lack academic credentials, has important implications for curricular and research agendas. On the surface, faculty members and administrators seem to share a general understanding of the university and its place in society. If asked to characterize the "mission" of the university, both groups usually agree with the idea that the university is an institution that produces and disseminates knowledge through its teaching, research, and public outreach efforts.

This similarity, however, is deceptive. To faculty members, scholarship and teaching are the lifeblood of academic life, and the university is an instrument necessary to achieve those ends. But to administrators, the faculty's research and teaching activities are, first and foremost, means of generating revenues, not ends in themselves.

These differing orientations give administrators and professors divergent views of teaching and research activities. Administrators have what might be called a demand-side view of the curriculum. They believe that a college curriculum should be heavily influenced, if not completely governed, by the interests and preferences of potential customers – the students, parents, and others who pay the bills.

The faculty, on the other hand, views teaching as an end more than a means, leading them to take what might be called a supply-side view of the curriculum. Professors are more concerned with teaching topics they consider important than with placating students and other campus constituencies.

With regard to research, academics tend to take the view that ideas and discoveries should be broadly disseminated through peer-reviewed publications and presentations at professional meetings. Some professors, to be sure, are interested in the possibility of profiting from their discoveries. But most professors are more concerned with the process of discovery and the professional recognition that comes from developing new ideas in the laboratory, and they see any pecuniary gain to themselves as incidental to their main goals.

University administrators, on the other hand, view faculty research mainly as a source of revenue for the institution. They are not particularly entranced by its intellectual merits, except when commissioning puff pieces for the alumni magazine. In recent years, through the introduction of technology transfer offices, administrators have taken charge of knowledge dissemination. To administrators, scientific discoveries are primarily sources of hundreds of millions of dollars in potential overhead fees and licensing fees.

What is the ultimate purpose of these administrative efforts? Administrators say their goal is to financially strengthen their institutions so they may better pursue their teaching and research missions. If, however, we focus on what administrators do, rather than what they say, a different picture emerges. What administrators do with a good many tuition and research dollars is reward themselves and expand their own ranks. At most schools, even mid-level administrators are now paid more than all but the most senior professors in the professional schools, and considerably more than professors in the arts and sciences. And new deans are cropping up everywhere.

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Rise of the Rest, Fall of the Best?
Amsden, from page 1

War II de-colonized generations are handsomely paying off. This intensifies global competition, not least of all on an underground playing field paved with subterfuges to circumvent the liberal intent of World Trade Organization law. In this demi-monde an accurate account of real government policies to promote manufactures is hard to grasp.

MIT has an excellent teacher to guide it in this endeavor – a past community-wide attack on manufacturing problems that resulted in a landmark study in 1989, "Made in America," published by the MIT Commission on Industrial Productivity. This earlier Commission focused on high-tech, clusters, and outsourcing. As shown in the graph, after the study's publication, the share of manufacturing in GDP fell briefly and then stabilized, probably for serendipitous reasons (Toyota and other Japanese giants began investing in American manufacturing in 1990); possibly also reflecting the short but very widespread national discussion of manufacturing which MIT stimulated, but also reflected. This second round follows the first under a new MIT committee for the twenty-first century, Production in the Innovation Economy (PIE), with many of the same experienced corps of people as the old Commission, and an even greater emphasis, as its name suggests, on fighting for competitiveness with frontier innovations.

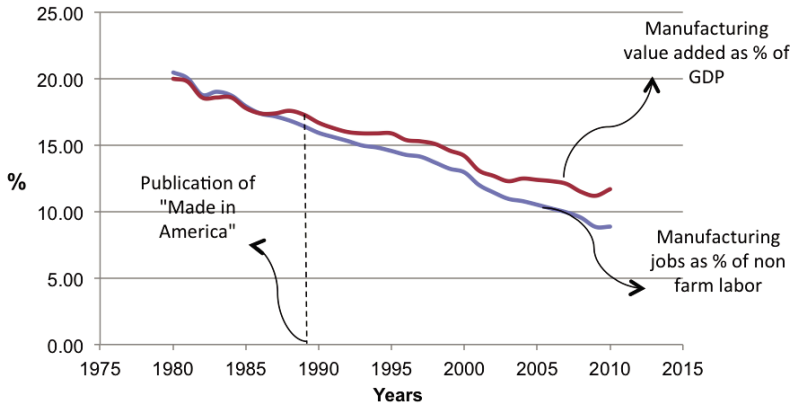
This is a very American way to look at an American problem, which seems appropriate enough, but does this way gain enough insight into the countries that are our new competitors, the BRICs (Brazil, Russia, India, and China) and other emerging economies – not Germany and Japan, against which we've already learned to compete, of necessity, with state-of-the-art technologies? These new countries' huge trade surplus with us is largely in "mid-tech," not high-tech, and the mid-tech component would be even larger if the electronics sector, classified as high-tech, had its unskilled assembly operations subtracted (Malaysia, a country with relatively weak technological capabilities, has an astounding 67% of its exports in high-tech due to this accounting error). Mid-tech industries such as steel, shipbuilding, and semiconductors are mature but demand is still growing, and new technologies – some highly advanced – are being borrowed from other industries or generated internally to cut costs and improve product design, not necessarily to foster new technological frontiers.

If the U.S. is serious about raising manufacturing employment and output, it has to run on two tracks: one runs from the manufacturing problem to advanced technologies as solutions, and the other runs from the manufacturing problem to mid-tech industries, many of which are high-wage, large-scale employers. *Fortune's* 500 largest international firms (in terms of revenues) in 2008 ranked two Taiwanese electronics firms as 109th (Hon Hai) and 342nd (Quanta Computer) while Google ranked 423rd and Amazon ranked 485th (lean and mean). If the networks connected with these firms were factored in, the size disparity might be even larger. This is where the jobs are.

If the U.S. is serious about raising manufacturing employment and output, it has to run on two tracks: one runs from the manufacturing problem to advanced technologies as solutions, and the other runs from the manufacturing problem to mid-tech industries, many of which are high-wage, large-scale employers.

Besides running on the high-tech track, PIE must ensconce itself even deeper in the culture of mid-tech to get into the minds and motivations of the world's leading manufacturers. Only then can PIE also anticipate revolutionary technologies that emerge from mid-tech sectors, such as high-speed rail, a fast-growth industry with dense linkages to other sectors that have left the U.S., once the railroad king, woefully behind.

High-tech is also emerging out of mid-tech in the field of energy, and just as Detroit withered under competition from the Far East's manufacturing corridor, Houston may follow under competition from the Middle East's oil fields. OPEC members now regard themselves as "green energy suppliers;" they use oil and petro-



Source: BLS and BEA

chemicals as cash cows to finance R&D in clean technologies such as wind, solar, hydro, and nuclear power. The U.S. has long been the leader in the oil, gas, and petrochemical business; Japan never became especially competitive in this field. But emerging economies are moving fast, favored by the fact that their best and brightest chemical engineering graduates want to work for national oil companies, because they invest heavily in R&D, whereas this is not the case with American graduates. Will PIE get its hands dirty examining the energy, mining, and minerals industries, including rare earth metals (the U.S. has only one company, Molycorp, active in this field)? These sectors now bear heavily on the cost-effectiveness of manufacturing, and can only attract the best graduates by investing in knowledge and the environment.

The shipbuilding industry is now sometimes classified as high-tech due to having achieved record rates of speed and safety in carrying hazardous cargoes. Korea is the world's largest shipbuilder, employing upwards of 10,000 workers, having aced out Japan (but quivering at the rise of China). It began life in the 1960s, at the same time as the Brazilian shipbuilding industry, which failed. Now Brazil is trying to restart shipbuilding; Brasilia has ordered its state-owned oil company, Petrobras (ranked 34th on *Fortune's* 500) to source its oil tankers from local shipyards. Is it possible for the U.S. to start a shipbuilding industry of its own?

The answer depends on the distinction between "made *by* Americans" and "made *in* America" – by foreign-owned companies from the de-colonized world. PIE has abundant economic expertise on board to figure out the best incentive system to rebuild American manufacturing. But this incentive system must leverage the outward foreign direct investments that emerging economies are now undertaking – accounting for one-quarter to one-third of total world outward Federal Direct Investment (FDI). India invests in China (China is India's largest export market) and China allies with Korea to invest in Indonesia; Taiwan now invests more overseas than foreign firms invest in Taiwan. The U.S. must rejuvenate its manufacturing sector by attracting the world's great manufacturers to invest in the U.S. Developed countries account for 95% of total FDI in the U.S., but the share of manufacturing in their investments is fast declining.

This may all seem a far distance from what MIT is good at, but PIE is the perfect organization to look carefully around the Institute, to find the many faculty with expertise in manufacturing technologies, both product and process, suitable for mid-tech. Unless it casts its net widely, PIE will be frozen in the late 1980s, uncomprehending of the "rise of the rest." Unlike 1989, it is no longer the case that manufacturing and outward FDI are undertaken almost exclusively by the U.S., Europe, and Japan, in which the most advanced technologies stole the show. ■

The U.S. has long been the leader in the oil, gas, and petrochemical business; Japan never became especially competitive in this field. But emerging economies are moving fast, favored by the fact that their best and brightest chemical engineering graduates want to work for national oil companies, because they invest heavily in R&D, whereas this is not the case with American graduates.

Alice Amsden is a Professor of Political Economy in the Department of Urban Studies and Planning *(amsden@mit.edu).*

Request for Preliminary Proposals for Innovative Curricular Projects

The Alex and Brit d'Arbeloff Fund for Excellence in Education

THE OFFICE OF FACULTY SUPPORT seeks preliminary proposals for faculty-led projects to enhance the educational experience of MIT undergraduates, preferably those that affect large numbers of students or transcend specific departmental curricula.

For guidelines and more information, visit ***web.mit.edu/darbeloff/*** or contact the Office of Faculty Support at x3-6776 or *darbeloff-fund@mit.edu*.

Preliminary proposals with an estimated budget are due by Friday, October 14. ■

A Letter to President Hockfield

Ernst G. Frankel

Susan Hockfield
President of MIT
77 Massachusetts Avenue
Cambridge, MA 02139

Dear Dr. Hockfield,

I READ YOUR OP-ED in *The New York Times* on the impact of the loss of manufacturing on the U.S. economy with great interest ["Manufacturing a Recovery," August 29, 2011].

While we lost much of our manufacturing to countries like China because of lower labor costs, we must recognize that other large manufacturing countries, such as Germany, Japan, and now also South Korea, continue to maintain a healthy manufacturing base though their labor costs are at least as high as ours, particularly in Japan and Germany. The reasons are therefore largely in the fact that we do not have an adequate, properly trained, skilled labor force, nor do we, like other large manufacturing nations, maintain a good life-long retraining program.

For example, when a former student and renowned Greek shipbuilder, Sotiris Emmanuel, tried to open the Quincy Shipyard, we found that the major reason preventing a successful reopening was that the only skilled labor force ready to work in the yard were older workers who had retired from the Bethlehem/General Dynamics yard 10-20 years earlier. We could not find young trained workers. While much of the outsourcing of manufacturing was done by U.S. companies such as GE and others because of lower costs abroad in the past, increasingly, as our experience with Quincy Shipyard showed, the reason is lack of availability of trained, skilled, American labor.

One reason for this appears to be the ill-conceived government policy of "college for all" which tries to encourage all high school graduates to continue with a four-year college education, whether they are qualified for college or not. As a result, we now have nearly 83% of high school graduates continuing their education in a college (often a for-profit college). Most of these college students have no idea why they are in college or what use they expect to make of what they learn. At the same time, enrollment in trade schools, community colleges, etc., has dropped. Not only did this generate a subprime student loan crisis which will soon parallel the subprime mortgage crisis, as an increasing percentage of college students fail to find jobs in their field and default on their loans, but our manufacturing finds fewer and fewer qualified workers.

Another result of this is that our economy suffers from the fact that the average age at which Americans join the workforce has increased from less than 19 years to well over 22 years, depriving our economy of three years' of output and contributions to social programs such as Social Security and health care. In fact, a simple calculation shows that if we had people join the workforce on average at age 19, as assumed when the Social Security program was established, the program would be financially sound and self-sufficient.

Another important issue that affects our manufacturing competitiveness is remuneration. I worked in Japan for Mitsui & Company for an extended period and found that not only were all workers affected by changes in technology involved in the technology change decisions – unlike the U.S. where such decisions were and are imposed from above – but remuneration was and is also more egalitarian, with the highest paid person at Mitsui limited to 50 times the total remuneration of an average technical worker. By comparison, many U.S. manufacturers are mimicking financial service companies by paying their executives obscene salaries and bonuses which bear no relation to their actual contributions.

Finally, I should mention that in other countries, such as Germany and Japan, economic planning not only includes industrial but also educational planning, which implies that future skills and professional needs are predicted and training/educational programs, support, etc., adjusted to assure availability of the required trained/educated workforce. This, as a result, not only assures greater employment, but also a greater balance between supply and demand. While many of our politicians may object to such planning, I feel that unless we start to move in this direction we will not only continue to lose more manufacturing but also jobs, and we will continue our economic decline.

I am at your disposal to supply further details on this subject which I believe is of enormous importance for the revival of the American economy.

With best regards and wishes,

Ernst G. Frankel
PhD, DBA, MBA
Professor Emeritus

MIT Ranked 3rd in the World, 5th in the U.S.?

Newsletter Staff

IN A SALIENT EXAMPLE of just how confusing college ranking systems can be, MIT was recently ranked third in the *QS World Rankings* (behind the University of Cambridge [U.K.] and Harvard University). But in the latest *U.S. News & World Report* undergraduate national universities rankings, announced in the magazine's "America's Best Colleges" issue published in late August, the Institute was tied for fifth, behind Harvard and Princeton (tied for first), followed by Yale and Columbia. In an unusual occurrence, there were actually five schools tied for fifth: Caltech, Stanford, the University of Chicago, and the University of Pennsylvania all received the same score as MIT.

The Institute maintained its place as the number one undergraduate engineering school in the country, and also remained second to the University of Pennsylvania in the undergraduate business school category.

Whereas the *U.S. News & World Report* rankings are the most well known and accepted in the United States, in addition to the *QS World Rankings* there are several other national and international ranking agencies. These include *Princeton Review*, *Kiplinger*, the *Times Higher Education*, among others.

It is important to note that each different ranking system uses both its own metrics, and focuses on different aspects of education. For example, *QS World Rankings* puts great emphasis on the production by faculty and employment of students (output) whereas *U.S. News* is far more concerned with input to students.

Categories (and weights) used by *QS World Rankings* include:

- Academic Reputation (40%)
- Employer Reputation (10%)
- Citations per Faculty (20%)
- Faculty/Student Ratio (20%)
- Proportion of International Students (5%)
- Proportion of International Faculty (5%)

Categories (and weights) used by *U.S. News* to judge colleges include:

- Undergraduate academic reputation (22.5%)
- Graduation and retention rates (20%)
- Faculty resources (20%)
- Student selectivity (15%)
- Financial resources (10%)
- Alumni giving (5%)
- Graduation rate performance* (7.5%)

*The difference between actual and predicted graduation rates.

U.S. News also rated individual engineering and business departments. Several of the Institute's programs in these areas were ranked in the top 10. They are:

Engineering

- Aerospace/Aeronautical/Astronomical (1st)
- Biomedical/Biomedical Engineering (4th)
- Chemical Engineering (1st)
- Civil Engineering (8th)
- Computer Engineering (1st)
- Electrical/Electronic/Communications (1st)
- Environmental/Environmental Health (7th) [tied with Michigan]
- Materials (1st)
- Mechanical Engineering (1st)

Business

- Entrepreneurship (5th)
- Finance (3rd)
- Management (9th)
- Management Information Systems (1st)
- Productions/Operations Management (1st)
- Quantitative Analysis (1st)
- Supply Chain (2nd)

Data was taken from the 2012 edition of the *U.S. News & World Report's* "America's Best Colleges."

Perhaps the most important thing to keep in mind, however, is that regardless of the ranking system or metrics, MIT tends to do very well indeed!

See "MIT Numbers" (back page) for the top 10 rated schools by *U.S. News* over the last decade.

letters

Commenting on "Departmental Discussions of Diversity and Inclusion"

To The Faculty Newsletter:

"THE MIT DEPARTMENT OF PHYSICS is committed to increasing the diversity of its faculty and student populations," Professor Edmund W. Bertschinger writes in the March/April 2011 *MIT Faculty Newsletter* (FNL) ["Departmental Discussions of Diversity and Inclusion"]. He then offers some analyses of MIT's "racial climate," and reports on his role in "leading change" in diversity and inclusion, mentioning the "lower probability" of success by black (and other "underrepresented") junior faculty, as well as making inferences about the *unspoken* thoughts of black (and other "underrepresented") students about their race.

The author addresses several issues concerning racial diversity and inclusion within MIT's Department of Physics and presents a how-to manual of sorts. Bertschinger describes his efforts to seek solutions through monthly catered lunches whose purpose is to discuss these issues. He describes ways to make discussions "fun and easy to reveal hidden bias." In the only unambiguous example that I am able to cull from his article, Bertschinger warns that "A sympathetic remark like 'It's okay to get a B'" to a black student "can be interpreted as 'You don't think I'm capable of earning an A because of my race.'" Now, when embedded in the appropriate constraints of discourse, "It's okay to get a B" is an innocuous sentence. However, in the absence of context, as presented by the author, such a remark is deeply problematic. In my opinion, this example actually has *nothing* to do with race. If we substitute "female" for "black" and "gender" for "race" the issue is clear. Bertschinger's article leads me to question the merit of writing about black people in this fashion.

At MIT we have been fortunate to have had numerous faculty and administrators who have positively contributed to diversity. As a student and junior faculty member, I had fantastic mentors and role models. I know other individuals who are currently proactive around these issues, some of whom I have personally visited to acknowledge and express gratitude for their support of black, as well as other, students. Because of MIT's Physics Department's world-class status, it is capable of doing great good. I know and respect several faculty colleagues in that department. But I question the value of Bertschinger's approach and am saddened by his language in the article.

Although many black students are withdrawing from Institute and departmental extracurricular activities, they are concurrently and increasingly perceiving themselves as members of a *post-racial society*. Go figure: There appears to be an inconsistency here, but crosscurrents and subtleties abound in racial matters, all the more reason they should not be treated callously and especially not with overtones of a master-chattel history. [I have decided to respect the preferences of our black students as choices of their journey, just as my parents' generation chose to defer to my generation's lie-ins, love-ins, and sit-ins. My most persistent advice to them is that they should (1) *not* draw a line between work and fun (2) set high and independent standards of thought and achievement for themselves (3) exercise, at least, a child's portion of common sense in their daily lives and (4) habitually use the words *please* and *thank you*. I rarely discuss matters of race with black students, and *only* if they ask me about the elephants in our backpacks. Black students at MIT are lugging around a lot of stuff: they are ensnared within the mottled and evolving sociopolitical tensions of affirmative action, extant – internal and external – prejudices, an ill temper of black angst and anger, and the ideals of equality.]

As I have written in previous FNL articles, the psychological damage to black students around these issues at MIT can extend beyond their graduation, often well into their careers. But some of them are reluctant to complain for fear of being labeled as unappreciative. An article that suggests that monthly catered luncheons where blacks are discussed in ways that are "fun and easy to reveal hidden bias" benefit black students needs to provide more evidence than simply asserting such benefits. Although, according to the author, "attendees regularly tell me how much they enjoy and look forward to these lunchtime discussions," we need to know that the information and interactions actually produce results, rather than simply allow faculty to feel less guilt about continued structural bigotry – at all levels – at MIT.

Referring to his lunch attendees, Bertschinger writes that "Everyone was concerned that underrepresented minority faculty members were being promoted with lower probability…," and described discussions of the "tension at MIT" concerning "diversity and inclusion versus excellence." But I worry that setting up an opposition of "diversity *versus* excellence" has the potential to create a toxic environment that would harm the careers of black junior faculty. In an MIT culture based on *diversity **versus** excellence*, what added obstacles will black junior faculty – indeed, senior black faculty too – confront when they solicit prospective research sponsors, teach their students, recruit graduate students, chat with MIT colleagues, communicate with colleagues from other universities, or interact with their families, friends, golfing buddies…? It would be a shame if readers of Bertschinger's article were to conclude that everything that any black faculty member accomplishes at MIT is evaluated using a diversity-versus-excellence scale.

Indeed, black faculty have every reason to feel insulted. I do not believe that this article represents the kind of discourse we should be engaging in at MIT. For what it's worth, I offer *one* modest near-term solution to the MIT Physics Department's acknowledged problems of diversity and inclusion.

Black Undergraduates in Physics: The Physics Department does not admit MIT undergraduates; they are admitted by the Institute. Undergraduates choose their course of study, and consequently determine the diversity within each department. *Thus, MIT's Physics faculty should simply treat their few black undergraduate majors precisely the same as they treat any (other) undergraduate.*

Black Graduate Students in Physics: The Physics Department barely has any *black graduate students. Thus, MIT's Physics faculty should simply admit and treat their occasional (if any) black graduate student(s) precisely the same as they treat any (other) graduate student.*

Black Faculty in Physics: The Physics Department has *no* black faculty.

There are authentic concerns regarding diversity and inclusion at MIT; a serious one being suggestions that black students and faculty don't belong here and would not be here except for policies like affirmative action.

James H. Williams, Jr.
Professor
Department of Mechanical Engineering

Twenty (20) years ago: Throughout April 1991, Professor James H. Williams, Jr. conducted a weekly fasting sit-in at the offices of the MIT president and provost. At that time, he was the only native-born black American faculty member in the combined schools of engineering and science. The primary, though frequently mischaracterized, purpose of that protest was to highlight several of the themes about black students discussed in this article.

Nominate a Colleague for the MacVicar Faculty Fellows Program

THE MACVICAR FACULTY FELLOWS Program recognizes MIT faculty who have made exemplary and sustained contributions to the teaching and education of undergraduates at the Institute. Together the Fellows form a small academy of scholars committed to exceptional instruction and innovation in education.

MacVicar Faculty Fellows are selected through a competitive nomination process, appointed for 10-year terms, and receive $10,000 per year of discretionary funds for educational activities, research, travel, and other scholarly expenses.

For more information and the nomination process, visit ***web.mit.edu/macvicar/*** or contact the Office of Faculty Support at x3-6776 or *macvicarprogram@mit.edu*.

Nominations are due on Monday, November 14.

M.I.T. Numbers

U.S. News & World Report
Best College Rankings for National Universities, 2003-2012