

## **Dean for Undergraduate Education**

In a year of unprecedented challenges at MIT and in higher education, the Office of the Dean for Undergraduate Education (DUE) kept its eyes on the prize—our mission “to enroll, educate and inspire some of the world’s brightest students with a passion for learning and sense of self so they become the next generation of creative thinkers and leaders in a global society.” Some results of that focused effort are summarized in this overview, which describes progress on priorities set out in the 2006 DUE Strategic Plan and on other initiatives that epitomize our mission. We also describe some of our actions to address the budget crisis and prepare for upcoming budget processes. Taken as a whole, the office reports that follow convey DUE’s collective success in enriching life and learning for our students and faculty over the past year.

DUE is one of the units at MIT whose central mission is to assure the quality of the educational experience for our students, with particular responsibility for enhancing undergraduate education. The DUE portfolio includes activities that provide mission-critical functions for the Institute (e.g., admissions, financial services, registration, first-year advising, teaching assistant training), create new services and capabilities (e.g., support for educational innovation, creation of new educational technology for faculty), and define new ways to think about education (e.g., creation of a new financial aid policy, engagement in the national debate about learning assessment, formulation of new K-12 activities). DUE is also responsible for some of the enabling educational infrastructure (such as learning spaces, the student information system) that span the educational enterprise across the Institute.

Priorities identified in the 2006 Strategic Plan continue to be a cornerstone of DUE. Our six strategic themes are (1) the Task Force theme (catalyzing the undergraduate educational commons); (2) the holistic theme (developing the whole student, with emphasis on leadership); (3) the global theme (creating and enhancing global educational experiences for our students); (4) the diversity theme (enhancing the diversity of the student body); (5) the teaching-to-learning theme (helping the faculty shift from teaching students to helping students learn); and (6) the information technology (IT) theme (providing the best information infrastructure for MIT, i.e., the next-generation student services system). Additionally, rethinking MIT’s financial aid policies is an Institute and DUE priority.

### **Catalyzing the Undergraduate Commons**

In response to advances in science and technology, a greater emphasis on globalization, and other priorities facing us in the 21st century, the Task Force on the Undergraduate Educational Commons called for changes in the MIT curriculum. This included increasing flexibility in the core requirements and defining a new core science, mathematics, and engineering (SME) requirement and humanities, arts, and social sciences (HASS) experience; promoting collaborative learning; improving advising; and supporting diversity and other aspects of undergraduate education.

DUE continued to undertake experiments and support the faculty committees in putting these changes in place. Progress was made in improving the General Institute

Requirements (GIRs) and advancing principles of the Task Force. Supported by the Office of Faculty Support (OFS), the Educational Commons Subcommittee (ECS) of the Committee on the Undergraduate Program (CUP) completed work on a set of proposals for curricular reform that modified initial changes proposed by the Task Force. While the faculty did not pass their comprehensive resolution as a package in February, several elements moved ahead separately this year, most notably changes to the HASS requirement, which were overwhelmingly approved in May. These changes are supported in DUE by OFS, the Office of the Registrar, and others. The OFS report that follows details the year's successes in catalyzing the undergraduate curriculum and supporting the faculty.

### **Championing Information Technology**

Historically, MIT student systems were leading edge. However, the current systems are over 15 years old and must evolve to keep pace with new technology, student expectations, and a backlog of new requirements. Therefore, in recent years, MIT has been developing a next-generation student services system (NGS3) vision to support the expanding needs of the MIT community and improve the student experience. Success in this endeavor took on a different meaning in AY2009 in response to seriously constrained software development funds for student systems. Using an incremental approach, NGS3 focused on exploring and collecting business requirements on core processes identified in the Student System Vision Study, assessing the viability of the Quali Student community source project as a possible solution for MIT, and analyzing the current system to determine how best to migrate it in the future. The next step will be a scoping project to assess and help guide us through the changes ahead.

DUE and Information Services & Technology (IS&T) worked closely on projects that furthered the educational agenda, including technical implementation of the shift from double degrees to double majors (delivered on time and under budget) and the new Who's Teaching What and online subject evaluation systems. The Student Systems Steering Committee, coordinated with great effectiveness by Mark Damian of IS&T, balanced equitable decision making with an excess of worthy demands for scarce resources. IT theme leader Mary Callahan's understanding of student information systems and MIT's academic culture helped to inform consideration of how best to migrate from the current system to a future system and ensure that the functional scope of NGS3 covers MIT's needs.

### **Enhancing and Enabling Global Education**

Global education has been an area of increasing DUE leadership in recent years. In July 2008, the Global Education Office (GEO) was created as one of the two elements of the Global Education and Career Development Center (previously the MIT Careers Office.) This carried out a top recommendation of the Global Educational Opportunities at MIT (GEOMIT) Committee that a central office be created as a focal point for global learning opportunities at MIT. The office, together with the diverse international programs at MIT, supports a seamless experience for our undergraduates as they prepare for, proceed on, and return from a global experience. A faculty committee chaired by professor Linn Hobbs advises GEO about curricular matters.

The global theme team took the lead in collaborating with existing global programs to define how to expand current opportunities, develop new ones, and remove barriers to student participation. Global opportunities increased this year through a second D-Lab class, offered for the first time with nonrecurring funds from the provost; new summer research exchanges developed as international undergraduate research opportunities program (UROP) experiences, termed IROPs; and new study abroad arrangements supported by GEO. Next year a global management system, with functionality for risk management, travel and emergency contacts, and data reporting, will be implemented.

### **Championing and Increasing Pipeline Diversity**

The diversity theme aligns with the 2008 Diversity Congress goal to begin to transform MIT into a leader in the movement to link diversity and excellence. Two pilot programs introduced through the diversity theme support research findings on the value of social support and integration as key factors in underrepresented minority (Blacks, Hispanics, and Asians) persistence and success. Lessons learned from the pilots led to program improvements and expansion in AY2009. The Office of Minority Education (OME) piloted the Mentor Advocate Partnership (MAP) in 2007, with OME staff members as mentors. Informed by lessons from its first year, MAP was officially launched in February 2008 with 50 students and 20 staff and faculty mentors. In fall 2008, the program welcomed 69 students and 44 mentors, including 16 DUE mentors. Subsequently, a peer mentoring program was added, with sophomores and juniors serving as associate mentors to small groups of freshmen.

Laureates and Leaders, launched in 2007 with 10 sophomores, inducted 43 students into the program at a February 2009 celebration. Steps were taken to enhance the program's academic stature, including instituting a minimum GPA requirement and requiring interviews for admission and retention. Also this year, progress was made on plans to develop survey tools to assess these programs and establish mentoring relationship quality measurements. Future diversity theme plans include development of a proposal that will include a study of roadblocks to underrepresented minority success and an MIT symposium on underrepresented minority student success in science, technology, engineering, and math (STEM).

### **Advancing from Teaching to Learning**

In an era in which there is strong demand for improvements in STEM education along with pressure regarding accountability for learning outcomes, DUE focused on advances in teaching and learning that provide students with the highest quality education possible. The Teaching and Learning Lab (TLL), where this theme is centered, made exceptional progress in helping teaching assistants (TAs) and doctoral students expand their teaching skills.

Interest in TLL's new Grad Student Teaching Certificate Program, established in October 2008, greatly exceeded expectations. One hundred students registered, 27 completed the program in spring 2009, and 49 students are currently enrolled. The TLL report that follows gives details of additional initiatives that have focused attention on learning; developed innovations in curriculum, pedagogy, and educational technology; and disseminated advances to the faculty over the past year.

## **Developing a Holistic Student Experience**

DUE supports a holistic approach to education, which values and encourages learning inside and outside the classroom, enables development of confidence, facilitates development of leadership skills, and raises awareness of the importance of student-faculty interaction. The holistic theme is spearheaded by the Office of Undergraduate Advising and Academic Programming (UAAP) and is supported by virtually every DUE office.

This year DUE provided new opportunities for interaction between students and faculty, influenced the standard of undergraduate advising and mentoring, and supported programs that build leadership, confidence, and reflective practice. A Reflection Model that had been used in several MIT settings was incorporated into programming in study abroad, athletics, associate advisor training, orientation leadership training, freshmen sessions, and other areas. UAAP piloted a new Independent Activities Period (IAP) series to help freshmen acquire life skills and perspective on how to succeed at MIT, and developed plans for a Women in Leadership colloquium to take place in AY2010. Professor Robert Feld received the second annual Earll M. Murman Award for Excellence in Undergraduate Advising, established by UAAP to recognize a faculty member whose advising and mentoring of undergraduates has significantly affected their personal lives and academic success.

## **Selected Accomplishments**

### ***Admissions***

We had a strong admissions season, with applications taking a quantum leap of 17%, the largest increase in 30 years. Under the leadership of dean of admissions Stuart Schmill, MIT began a partnership with Questbridge to further diversify the undergraduate student body and extend need-blind admissions to the neediest applicants. Questbridge is a nonprofit organization that connects high-achieving high school students with highly selective partner schools. The yield was 54 Questbridge Scholars, who will be among the 1,075 freshmen entering MIT this fall.

### ***Change from Double Degrees to Double Majors***

DUE led the implementation of the move from double degrees to double majors, a historic change for MIT undergraduate education. Within an aggressive five-month time frame, a working group on double majors composed of staff from several DUE offices expertly moved a complex faculty mandate through the various phases required for implementation. On Registration Day for spring term, the Committee on Curricula (COC) began accepting applications for double majors. On the first day of classes, three students applied for double majors.

### ***DUE Communications***

DUE Communications played a vital role in promoting DUE's programs, services, and mission within MIT and in connecting the DUE community. DUE's communications manager worked on concept development and implementation of a video titled Extraordinary Learning, developed communication plans for the double majors

transition and for improving communication between the Chancellor's Office and students, made progress on the design of the new DUE website (to be launched in fall 2009), and created an online guide to faculty-student engagement opportunities to raise awareness among faculty about the many ways they may interact with students (<http://web.mit.edu/du/facultyengagement/>).

### ***Distinguished Fellowships Program***

The outstanding success of MIT students in the competition for prestigious fellowships this year is attributable in part to DUE's Distinguished Fellowships Program, whose staff prepare our students to compete. MIT students received 17 major awards; 33 reached the final rounds of the award competitions, a remarkable achievement given the relatively small pool of MIT applicants. Two students won Rhodes Scholarships and four won Marshall Scholarships, tying Harvard and the US Naval Academy for the most Marshall Scholarships awarded this year.

### ***Affirmative Action Goals and Successes***

DUE is proud to be one of the most diverse organizational units at MIT, largely due to our ongoing commitment to developing a workforce that reflects the rich diversity of MIT's student body. The responsibility to work toward achieving affirmative action goals is shared by DUE office heads, hiring managers, and supervisors; the DUE director of human resources; and the dean for undergraduate education. Every DUE employee shares responsibility for fostering an inclusive work environment in which all employees can perform their best work. The dean has articulated his expectation that DUE office heads will show leadership in the area of diversity. This year DUE was very successful in attracting and hiring underrepresented minorities to fill open positions across DUE. Thirty-nine percent of all positions (seasonal and regular ongoing positions) were filled by underrepresented minorities; 43% of all ongoing regular positions in DUE were filled by underrepresented minorities in the past 12 months. Forty-eight percent of all positions (seasonal and regular ongoing) were filled by women and 39% of all ongoing regular positions were filled by women in the past 12 months.

### ***Space***

This year, DUE completed the second phase of a planned renovation to DUE program space in Building 12. Last year's moves and renovations allowed for the expansion of the Global Education and Career Development Center's footprint. The renovation of this space allowed for private offices for counseling staff, open space for a library and reference area, more flexible space for on-campus recruiting and interviews, and a mini-suite for preprofessional advising and internships. With funds from the Committee for the Review of Space Planning, we were also able to address critical heating, ventilation, and air conditioning issues for the Office of Faculty Support.

### ***Response to Economic Uncertainty***

Through AY2009, concerted efforts were made to identify immediate and long-term cost savings in DUE and prepare to make hard decisions ahead. Though no budget reductions were mandated for FY2009, savings were sought to buffer future cuts. Steps included a thorough review of all expenditures, identifying ways to immediately cut



FY2009 spending, a formal hiring review, and in-depth discussions at DUE leadership team retreats to prepare for upcoming budget cycles. Several DUE staff participated in the Institute budget task groups, including dean for undergraduate education Daniel Hastings, who cochaired the Education Task Force.

Early in 2009, three DUE working groups were formed to look for specific, cross-cutting, actionable recommendations within the purview of DUE that could save or raise money without compromising our mission or quality. DUE office heads cochaired the groups, which focused on (1) the first-year experience (i.e., freshman year programs and resources, including orientation, freshman alternative programs, etc., led by Lori Breslow of TLL and Julie Norman of UAAP), (2) supporting faculty in sustaining educational innovation (DUE offices and services that support the faculty, led by Diana Henderson of OFS and Vijay Kumar of OEIT), and (3) program and service delivery models (new staffing models that could lead to cost savings, led by registrar Mary Callahan and Melanie Parker of GECDC.) In June, cochairs submitted reports to the dean who, with his budget director, human resources director, and senior associate dean, read all recommendations. Among the 30 recommendations, seven identified specific cost savings while several others proposed only greater efficiencies. In most cases, further analysis, data and/or discussion are needed this fall to determine how to proceed.

### **New Appointments**

DUE completed searches for two members of the DUE leadership team. DiOnetta Jones, director of diversity programs for the College of Engineering at Cornell University, accepted our offer to become director of the Office of Minority Education and associate dean for undergraduate education. Elizabeth Hicks, associate vice president of student financial services and university registrar at Columbia University, rejoined DUE as executive director of Student Financial Services (SFS.) We are grateful to Julie Norman and Carlene Chisom-Freeman for their interim leadership of OME and SFS, respectively.

During 2008–2009, DUE expertise came into play on complex issues related to tuition, competition for students, strengthening innovation in teaching and learning, globalization, the accountability push from Washington, and the pressing need to cut costs. While we anticipate that the hard choices ahead will require us to rephrase some of our priorities, we will continue to set aggressive goals that will guide our work.

**Daniel E. Hastings**

**Dean for Undergraduate Education**

**Professor of Aeronautics and Astronautics and Engineering Systems**

**Elizabeth Reed**

**Senior Associate Dean for Undergraduate Education**

*More information about the Office of the Dean for Undergraduate Education can be found at <http://web.mit.edu/duel/>.*

## Office of Admissions

The MIT Office of Admissions enrolls a diverse and talented undergraduate student body composed of some of the world's most intelligent, creative, and passionate individuals interested in science and technology, and coordinates and supports the graduate admissions process. The students we enroll add to a vibrant campus community and will become the leaders and innovators of our global society. We uphold a commitment to meritocracy and fair access to our process for students from all backgrounds.

At various times throughout the year, we work closely with Student Financial Services, the Office of Undergraduate Advising and Academic Programming, the Registrar's Office, the Office of the President, the Alumni Association, the Office of Minority Education, and the Committee on Undergraduate Admissions and Financial Aid. During Campus Preview Weekend, we also coordinate with other offices in DUE, the Division of Student Life (DSL), the Department of Facilities, and academic departments. We also support the admissions process for the Minority Introduction to Science and Engineering (MITES) program run by the School of Engineering.

## AY2009 Review and Accomplishments

This was an interesting year in admissions, with the downturn in the economy causing significant uncertainty. In the end, things turned out well for admissions, resulting in a strong freshman class to enter MIT in the fall of 2009.

We received 15,661 applications in AY2009, an increase of 17% over last year and 38% in the last three years; this is the largest increase in the last 30 years. Admitted students totaled 1,675, which represented 10.7% of the applicant pool. Yield was down slightly from 66% to 64%, due primarily to the fact that more of our admitted students were also admitted at other top-level universities, notably Harvard, Yale, Princeton, and Stanford. We expect to enroll approximately 1,075 freshmen in fall 2009. Out of the 435 applicants for transfer admission, we admitted 29 and expect to enroll 26.

The year started with a robust recruiting season. We sent mail to 65,000 rising seniors, gave presentations on MIT and admissions to 13,000 students and parents in 75 cities around the nation and world, and visited 4,000 students in 400 high schools. More than 14,000 visitors attended an on-campus information session and tour, and our [mitadmissions.org](http://mitadmissions.org) website now has over 3,000 blog entries, primarily from MIT students. These personal accounts of life at MIT continue to be the most popular feature of our admissions recruitment site; blogs are becoming a standard feature of other admissions websites throughout the country.

This season also marked our first year as a Questbridge partner school. Questbridge is a nonprofit organization that recruits high-achieving students from low-income backgrounds and connects them with partner schools, which are among the most highly selective in the country. Questbridge changes the lives of the students in the program, many of whom would not have had the guidance in their high schools to steer them toward colleges of MIT's caliber. We will be welcoming 54 Questbridge Scholars to our campus as part of the class of 2013.

Our partnership with Questbridge accounted for about a third of the increase in applications; the other two-thirds was likely caused by a combination of our recruitment efforts, the economy—both in the recognition that the type of education MIT provides may be more attractive given the recent financial uncertainty and the fact that we offer generous financial aid—and the growing awareness of the importance of science and technology in our society.

The incoming class is 45% women, 24% underrepresented minorities, 19% first-generation in their families to attend college, and 8% international citizens. Students will be coming from 48 states and 52 countries. Almost half the class (48%) speaks a language other than English at home, and 78 foreign languages are represented, from Albanian to Yoruba. Three-quarters of the class of 2013 were the leader (president, captain, etc.) of an organization, and one in six founded an organization or business. Forty percent are valedictorians and 89% are in the top 5% of their high school class.

The Educational Council achieved a record number of 2,862 alumni interviewers this year. The 11,022 interviews conducted represent an increase of 17% over last year. Our pool of interviewers is 17% international, 32% female, and 4% underrepresented minorities. The current group of Educational Counselors includes members from the classes of 1934 to 2009, with 70% of the volunteers representing the 30 most recent graduating classes.

We will enroll a talented and diverse freshman class. But there was a great deal of uncertainty as to what enrollment choices students would make, given the effect of the economy on many of our families. More families applied for and compared financial aid awards. Four hundred fifty parents had private meetings with a financial aid counselor during Campus Preview Weekend—a 33% increase from last year. More students deferred enrollment decisions until the last minute, an indication of increased concern about financial aid awards, and our admissions staff were having more conversations with students and parents about finances. In the end, however, students and families made decisions the way they have in the past, and our yield is quite similar to last year's.

The downturn in the economy will have one lasting effect, however. Like offices across DUE and MIT, we are cutting our budget significantly for next year. The two biggest areas of change in our office will be (1) becoming more efficient with our workflow to process applications and handle inquiries with a reduced staff, and (2) changing how we recruit students, significantly reducing our direct mail program and staff travel in favor of adding resources to our website.

Despite the challenges of the last year, as conditions evolve across the nation, the world, and at MIT, we will continue to attract the best students to our campus and keep our community as dynamic as ever.

### **Staffing**

Stuart Schmill served his first year as dean of admissions after being appointed to the position in April 2008. In AY2009 the Admissions Office comprised 15 full-time administrative staff, 19 support staff, and two temporary six-month administrative



staff, consisting of 25 women and 10 men, with one position open throughout the academic year. The AY2009 staff consisted of 25 Caucasians, three African Americans, two Hispanics, and five Asian Americans. Due to anticipated budgetary constraints and recognition of recent increases in undergraduate applications we converted three support staff positions to admissions officer positions for AY2010. These conversions made permanent the two temporary reader positions noted above, and added one assistant director to the staff.

**Stuart Schmill**  
**Dean of Admissions**

*More information about the Office of Admissions can be found at <http://web.mit.edu/admissions/>.*

### **Office of Educational Innovation and Technology**

The Office of Educational Innovation and Technology develops, disseminates, and advances the sustainability of educational innovations through the strategic use of technology for the MIT community. OEIT complements other DUE offices through engagement in curriculum development and delivery, innovation outreach, and educational infrastructure initiatives to support excellence and readiness for 21st-century education at MIT. Our activities are largely directed toward three key areas to which we bring unique perspective, skills, and methodologies: bridging research and learning, linking digital content to the curriculum, and fostering communities of innovation and practice.

### **Accomplishments**

OEIT's work with MIT faculty to reify opportunities enabled by technology to make a significant impact on the educational experience of our students has been directed toward the following outcomes:

- Enabling innovative practices for teaching, thus allowing faculty to address topics and concepts in ways that could not be done before
- Identifying and developing programs that bridge research and educational activities of faculty
- Leveraging content and resources across courses and programs
- Offering transferable skills for students
- Informing the development of educational infrastructure and services

These outcomes are reflected in OEIT's key accomplishments in the areas described below and presented in the Impact Matrix at <https://wikis.mit.edu/confluence/display/OEITDocs/Home>.

## ***Bridging Research and Learning***

### ***Software Tools for Academics and Researchers***

The Software Tools for Academics and Researchers (STAR) group continues to support and improve its software offerings: StarBiochem, StarBiogene, StarHydro, and StarMolsim. Over the last year, three new software products were added to the STAR suite: StarGenetics, StarORF, and StarHPC, leading to an estimated increase of 300 in the number of students using the STAR software suite. The total number worldwide, estimated at 1,500–1,800 last year (1,000 of whom are MIT students), has increased to almost 6,000.

Funding from the Davis Educational Foundation and the addition of contractual staff has allowed the STAR program to expand its efforts to create contextual materials and problem sets for MIT faculty and students. These are also available to faculty and students worldwide. The team has conducted several workshops with a number of undergraduate institutions, mostly in New England, and high schools.

### ***Geographical Information Systems***

OEIT's extensive engagement in supporting geographical information systems (GIS) applications across the curriculum, largely through the leadership of Daniel Sheehan and through the GIS Lab (7-238) in partnership with MIT Libraries, spanned several academic endeavors in AY2009. These included the Terrascope freshman year program; helping students compile an online, spatially focused diary; developing and teaching class and lab exercises and introducing technology (e.g., raster GIS) tools for subjects and faculty in Earth, Atmospheric and Planetary Sciences (EAPS), Civil and Environmental Engineering (CEE), and Urban Studies and Planning (DUSP); curriculum support for 11.952, a project-based learning subject that has some 100 graduate students; and UROP projects, such as the iHouse MIT@Lawrence experience.

### ***Linking Content and Curriculum***

OEIT worked with a number of MIT faculty in this area. Selective accomplishments this year are highlighted below.

*SpokenMedia.* Building on the Computer Science and Artificial Intelligence Laboratory (CSAIL) Spoken Lecture project and on XMAS (iCampus), OEIT launched the SpokenMedia development project (<http://oeit.mit.edu/spokenmedia/>) to increase the effectiveness of web-based lecture media by improving the search and discoverability of specific, relevant media segments and enabling users to interact with rich media segments in more educationally relevant ways.

*Shakespeare Performance in Asia (SPiA,* <http://web.mit.edu/shakespeare/asia/>). This project seeks to create a video catalog of works by Shakespeare performed in different Asian languages. OEIT is exploring how SpokenMedia tools could be used to enhance teaching and research using SPiA.

*Edgerton Digital Collections.* An online community is being built around Harold "Doc" Edgerton's life and work. This includes all of Doc's notebooks, in which he captured in

great detail the experiments that resulted in his world famous images and video. The project will enable curators and archivists to work with Doc's colleagues, students, and friends to create a richer record of Doc's work.

*Recommender Services.* OEIT is exploring the development and implementation of recommender services to increase the usefulness of resources such as OpenCourseWare (OCW) by enabling users to explore the interconnected nature of learning (across courses), integrate OCW into current courses (in Stellar), and across media types (web pages and lecture videos).

*Alumni grant projects.* OEIT staff contributed to the development of new programs and courses supported by alumni grants. These included professor Elizabeth Wood's project, Bringing Russian and Soviet History into the Digital Age, for which OEIT is building a Russian history portal, and professor Beth Coleman's project, Transmedia Storytelling Alumni, for which OEIT is providing video and 3D animation support.

*Open Knowledge Initiative (OKI, <http://www.okiproject.org/>).* Efforts continued to bring the open service interface definition specifications up to version 3.0. During the summer of 2008 this activity focused primarily on repository-based interoperability.

### **Content and Curriculum Outreach**

OEIT hosted two conferences in AY2009. At the Network for Content and Curriculum conference in November 2008, approximately 40 educational technology and digital content experts launched a focused discussion on community-based efforts to address issues related to enabling the access and manipulation of content needed by scholars, students, and researchers from applications they might choose to use.

The AcademiX conference (see <http://maclearning.org/>) was hosted in March 2009 in collaboration with Apple and the MacLearning community. More than 150 participants focused on all aspects of emerging digital learning environments, including the democratization of content creation, new tools for distribution (such as iTunes U), mobile devices, and collaborative solutions.

### **Flexible Learning Environments**

The flexible learning environments operated by OEIT support the growing interest in the use of digital media authoring and production as well as provide spaces to support innovative educational experiments. Specific activities supported include:

Project-based learning in Room 1-142, which has been used as a learning lab for active learning for subjects from Electrical Engineering and Computer Science (EECS) and EAPS.

Advanced visualization in Room 37-312 to meet needs for subjects in EAPS, Mechanical Engineering, DUSP, Physics, Architecture, and Aeronautics and Astronautics.

Digital Media capabilities at the New Media Center (Room 26-139) and Room 4-035.

Providing students with the opportunity to experiment with new media and supporting departments, labs, and centers such as the Edgerton Center, Comparative Media Studies, DUSP, Health Sciences and Technology, Literature, and Music and Theatre Arts.

OEIT's work in the area of developing and providing flexible learning environments also included two new initiatives.

*Flexible Laptops.* Through one-time resources provided by DUE and through collaboration with IS&T, OEIT made a mobile set of Mac laptops available to provide ad hoc computing environments for subjects such as HST.583 and 6.963, and for outreach efforts. The set-up will serve as a model for flexibly delivering ad hoc computing clusters efficiently, without permanently committing facilities for this purpose.

*Advanced Innovative Learning Environments.* AILEs is an initiative that involves working with faculty and students (graduate and undergraduate) from the School of Architecture and Planning to conceptualize and prototype new learning space designs that will allow faculty to incubate new teaching methods.

OEIT has also engaged in limited exploration of the educational value of virtual worlds. In fall 2008, working with Susann Luperfoy and Undergraduate Practice Opportunities Program (UPOP) students, we conducted an in-class experiment using a virtual classroom. That was followed by a three-part IAP lecture series titled Virtual Worlds at MIT in January 2009. In April 2009, OEIT produced an event titled Expanding Boundaries, which examined the presentation of educational content in ways unique to three-dimensional environments. In the coming year, we expect to collaborate with the Center for Educational Computing Initiatives (CECI) and professor John Belcher in exploring integration of virtual world environments with current experiments for enhancing the global learning experience of our students.

### **Outreach**

OEIT undertook the following activities in AY2009 as part of its educational outreach strategy:

- Developed a set of case studies that describe how MIT faculty members are innovating in their classroom with technology (<http://web.mit.edu/oeit/browse/case-studies/index.html>)
- Developed portals for tools and resources specific to particular disciplines or educational technology (<http://web.mit.edu/oeit/connect/index.html>)
- Organized Crosstalk forums titled "Curveship: Interactive Fiction and Interactive Narrating," by Nick Montfort, assistant professor of digital media, and "Rethinking Educational Platforms: A Vision of a Truly User-centered, Online Educational Experience," by Llorenç Valverde, vice rector of technology at the Open University of Catalunya in Spain.

*iCampus.* OEIT placed renewed emphasis on supporting the diffusion of a small set of iCampus projects, specifically the iLab, XMAS, and Spoken Lecture Browser projects, for wider usage in the MIT community and elsewhere as well as for advancing their

sustainability. Brandon Muramatsu was hired as an educational technology consultant and coordinator for iCampus partly to lead the effort in this area. For iLab, OEIT funded CECI for the development of curriculum/training materials for a three-day workshop to teach the process of building robust, educationally valuable iLabs with LabVIEW. OEIT also participated in the launch of the iLab Consortium in June 2009.

*Student Innovation.* OEIT and the MIT Council on Educational Technology launched the annual Microsoft Research iCampus Technology Innovation Student Prize to recognize innovative applications of IT by students to enhance education and/or to improve student life.

Dr. Toru Iiyoshi was hired in December 2008 as senior strategist to lead OEIT's educational outreach efforts.

### **Online Subject Evaluation/Who's Teaching What project**

OEIT participated in developing the Online Subject Evaluation/Who's Teaching What (<http://web.mit.edu/se-project/>) online application, a joint DUE-IS&T project with OFS as the business owner. An initial pilot in fall 2008 was followed up with a larger production pilot (230 subjects, 16 departments, 563 instructors, 3,989 students) during spring 2009.

### **OEIT's Response to Budget Reductions in DUE**

OEIT's FY2010 budget reduction scenarios were derived directly from the extensive strategic planning undertaken during the spring and summer of 2008. Specific steps included:

- Elimination of one planned open position (one full-time equivalent), that of the learning spaces system administrator. While this will certainly have a detrimental impact on our work, we have formulated arrangements to mitigate its effect through reassignment of responsibilities and reconfiguring the work
- Making term appointments and using soft funding for the other prioritized open positions and redefining them to be more of a shared resource across units in OEIT as well as DUE
- Sizable reductions in travel, professional development, and operating expenses
- Plans to aggressively pursue grant opportunities

### **ACCORD**

OEIT continued its active engagement in ACCORD (<http://web.mit.edu/accord/>), providing leadership and coordination for ACCORD's efforts, specifically for strategic planning and furthering the work of the Image Tools group as well as that of the Stellar-OCW-DSpace team. Details are available in the ACCORD 2008–2009 Activities Report, available at <https://wikis.mit.edu/confluence/display/OEITDocs/Home/>.



## **OEIT Staff**

OEIT's strategic planning exercise was very useful in shaping its staffing decisions, with open positions being carefully redefined and prioritized rather than automatically filled. OEIT's attention to diversity was reflected not only in its availing itself of DUE's Diversity Fellows program to recruit Sara Bonner for the STAR group but through the appointment of Toru Iiyoshi and Brandon Muramatsu. Joshua Allen and Dr. Phil Long left in September 2008. Justin Riley was confirmed in the role of programmer analyst III. Rocklyn Clarke and Dr. Lourdes Aleman joined the STAR project to work on outreach funded by the Davis Foundation.

## **Professional Contributions and Leadership**

OEIT staff continued to participate in a range of relevant professional activities. Ivica Ceraj, Justin Riley, Chuck Shubert, Brandon Muramatsu, Amitava "Babi" Mitra, and Molly Ruggles coauthored papers and delivered presentations at several conferences, including the New Media Consortium (NMC) Conference in Monterey, CA; the North East Regional Computing Program (NERCOMP) 2009 Annual Conference in Providence, RI; the 31st International Conference on Information Technology Interfaces (ITI 2009) in Croatia; the ED-MEDIA 2008 World Conference on Educational Multimedia, Hypermedia, and Telecommunications in Vienna; AcademiX in Cambridge, MA, and at Duke University; the OpenCourseWare Global Meeting in Monterrey, Mexico, and the Moodle Share Faire in Framingham, MA.

OEIT staff also served on program and advising committees for several organizations, including MacLearning (Andrew McKinney), the World Economic Forum Global Agenda Council on Technology and Education (Toru Iiyoshi), Sakai (Babi Mitra), NERCOMP (Molly Ruggles, Babi Mitra) and NERCOMP SIG Workshop on "Images: Content Management, Teaching, and Learning" (Peter Wilkins). Jeff Merriman chaired the OpeniWorld: Europe 2008 conference. Babi Mitra continued as a member of the board of trustees for NERCOMP. Vijay Kumar and Toru Iiyoshi were coeditors for the Carnegie Foundation book *Opening Up Education* that was published by the MIT Press and launched this year. Vijay Kumar was invited to deliver keynote addresses at several conferences, such as the Commonwealth of Learning in London and IT-World in Barcelona (through MIT-Spain), and was on the plenary panel for the PanIIT Conference in Chennai and European Association of Distance Teaching Universities–UNESCO seminar in Paris.

## **Awards**

The DUE Infinite Mile Award was conferred on Daniel Sheehan, GIS consultant for innovation and customer service. The STAR project received an award at MacLearning. The Spoken Lecture Browser project received an award at the AcademiX Conference held at Duke University.

## **Looking Ahead**

OEIT is well poised to respond to a growing institutional focus on making education delivery more effective and efficient, particularly for opportunities in online learning, leveraging course content, and other educational resources across programs. In our

activities we expect to deepen our collaboration with TLL and OFS to identify common priorities and share efforts in supporting educational innovation and excellence at MIT.

Resources for OEIT continue to present a challenge, specifically base funding for specialized hardware and software for application development and testing. Additional staff resources are also required to support the ongoing development and maintenance of the STAR software suite given the increasing interest and backlog of demand.

**M. S. Vijay Kumar**  
**Director, Office of Educational Innovation and Technology**  
**Senior Associate Dean**

*More information about the Office of Educational Innovation and Technology can be found at <http://web.mit.edu/oeit/>.*

## **Office of Experiential Learning**

### **Highlights and New Directions**

The Office of Experiential Learning (OEL) brings together the Edgerton Center, Concourse, and Terrascope. The director of OEL is professor J. Kim Vandiver, the dean for undergraduate research and the director of the Edgerton Center. The faculty directors for Terrascope and Concourse are, respectively, professors Samuel Bowring and Robert Rose. Each director has provided a separate annual report, which follow this brief introduction.

A notable change in leadership will take place upon completion of the 2008–2009 academic year. Professor Robert Rose is stepping down as the director of Concourse. After 19 years of dedicated leadership, he will retire. His replacement will be professor Bernhardt Trout of the Department of Chemical Engineering.

The individual reports for the Edgerton Center, Concourse, and Terrascope follow.

### **Edgerton Center**

The mission of the Edgerton Center (<http://web.mit.edu/edgerton/>) is to uphold the legacy of Harold “Doc” Edgerton by promoting hands-on and project-based learning by offering subjects, supporting student clubs and teams, involving students in international development projects, supporting individual student inventors, maintaining MIT’s expertise in high-speed and scientific photography, and improving K-12 education at local, state, and national levels.

### **K-12 Outreach**

The Edgerton Center began a program 13 years ago to bring fourth- through eighth-grade students from the Cambridge Public Schools to MIT to enrich their studies with hands-on science and engineering activities. The program has expanded and now

provides approximately 3,000 student visits annually, from public, private, and home schools in the greater Boston area. The trips are organized as half-day project-based lessons, which are aligned with the required curriculum in the Cambridge schools. Edgerton staff, Amy Fitzgerald (program coordinator), and Jessica Garrett lead the lessons with help from several MIT students. In high school, some of the Cambridge students continue their MIT connection by joining FIRST Robotics Team 97, which is mentored by MIT students and supported by the Edgerton Center. When we began in 1996, MIT was receiving zero college applicants from Cambridge Rindge and Latin High School (CRLS). Today we receive 8 to 14 applicants per year and one to three Rindge and Latin students enroll at MIT annually, including CRLS alumni of the FIRST team.

Building on our Cambridge success, five years ago we began working with Boston's John D. O'Bryant School of Math and Science in Roxbury. For the last two school years, Ed Moriarty of our staff has been on site at O'Bryant and in the classroom most days, working with their four-year Engineering Pathway curriculum. Two O'Bryant graduates are now finishing their freshman year at MIT, we are delighted to report that a third O'Bryant graduate will enroll in September.

The Edgerton Center is in its second year of partnership with the Gloucester Public Schools to build interest in STEM fields among middle and high school students. Project coordinator Jessica Garrett recruited several other MIT K-12 groups to contribute, including the Lemelson-MIT Program, the MIT Sea Grant program, Haystack Observatory, the Teacher Education Program, the Center for Environmental Health Sciences, and the MIT Museum.

In its first year the pilot project has provided 26 teachers with professional development, implemented lessons developed at the Edgerton Center in middle school classrooms, provided a hands-on field trip to all 12 fifth-grade classrooms, enhanced afterschool programs, provided materials for classrooms, provided 20 students with a two-week MIT hands-on summer experience, and contributed to the planning of a technology resource center at the middle school. This year, the summer experience will double in size to 40 students. With Ms. Garrett's encouragement, a Gloucester High School team won a Lemelson Excite Award, a step in the process of becoming a Lemelson-MIT InvenTeam.

We believe that MIT's alumni (and alumni from other technical universities) are an important resource for improving science and engineering education in America. We are using our collaboration with Gloucester as a pilot program to learn how to empower MIT alumni around the nation to become involved in improving science, engineering, and math education in their local schools. Seven local MIT alumni have already stepped forward to assist with projects in Gloucester schools, speaking to classes, working with afterschool clubs, leading field trips, and contributing to curriculum development.

### ***International Development Initiative***

The International Development Initiative (IDI), a collaboration between the Edgerton Center and the Public Service Center, is a suite of programs for MIT students that fosters invention and entrepreneurship, helping spark innovation and develop technical and programmatic solutions for pressing community needs in developing regions. Each year, hundreds of MIT students work with thousands of people in developing countries

around the globe. Core activities include the IDEAS competition, public service fellowships, internships and grants, and the offerings of the D-Lab family of classes.

MIT students are particularly well suited for international development work, and the students themselves seek experience in the developing world as a part of their MIT education. At the forefront of this interest is our D-lab series of classes. D-lab (“D” for development, design, and dissemination) teaches students how to identify problems in the developing world in a variety of sectors, including health, agriculture, energy, and education. Students collaborate with the local people to find sustainable solutions to the problems they identify. They then use the other IDI programs to implement their projects. In fall 2008, D-Lab was heavily oversubscribed, with over 120 students vying for the 50 available spaces. In January 2009, student teams worked on projects in Brazil, China, Ghana, India, Peru, Sierra Leone, Tanzania, and Zambia, traveling overseas to work intensively in the field with community partners.

The brainchild of senior lecturer Amy Smith, the annual International Development Design Summit (IDDS) strives to create a global community of innovators committed to improving the lives of people living in poverty through collaborative technology design. In the summer of 2008 the second IDDS workshop was held at MIT. The design workshop hosted 60 people from developing countries around the world. Participants engaged with one another to identify community development challenges, formed teams to devise new solutions to those problems, and over the course of three weeks of lab work, developed their prototypes.

### ***Hands-on Learning for MIT students***

#### *Student Clubs and Teams*

The center is the home for approximately 23 student clubs and teams, including the Solar Electric Vehicle Team and the Formula SAE race car team. Our most ambitious team in recent years has been the Vehicle Design Summit, which was started in 2006 by undergraduate engineering majors Robyn Allen and Anna Jaffe. After bringing together 46 students from around the world in summer 2006 to design and build energy-efficient concept vehicles, they next set their sights on building a 200 mile-per-gallon equivalent commuter vehicle, which could be put into production. They have raised hundreds of thousands of dollars to support the project, and in the summer of 2008 held their second design and fabrication summit in Italy at one of their partner schools. By the end of the summer they completed a prototype all-electric vehicle. Their work continues as they work with manufacturers to develop the plans for a production car.

#### *New Project Space*

The center supports hands-on learning in many ways. One is the operation of a student shop, managed by Mark Belanger. Another is the new space in Building N51, behind the MIT Museum, that is the new home to several of our clubs and teams. We designed the renovation of the space to showcase student works, provide a central resource of tools, and ensure much better staff supervision. We are closely collaborating with the staff of the Department of Architecture student woodshop in N51 and have arranged for students to have access to the resources of both facilities. The renovation was paid for by the Provost’s Office, donations from alumni, and Edgerton Center resources.

### *Hands-on Academic Offerings*

The center offers 20 to 25 subjects for credit each year, including 6.163 Strobe Project Lab and eight subjects associated with D-lab. Two of the D-lab subjects (wheelchair design and prosthetics and orthotics design) are part of the Mobility Lab initiative. MIT students have already made creative advances in wheelchair design and in reducing the cost of prosthetic devices. Our summer professional subject in high-speed photography had a strong year, despite the weak economy.

### *Edgerton Archive Project*

With support from the Harold and Esther Edgerton Family Foundation, we are nearing completion of the project to put a large fraction of the Doc Edgerton collections in a web-based archive. By fall 2009, web visitors will be able to access all of Doc's notebooks, hours of high-speed movies, 5,624 images taken by Doc, and 9,164 slides of Doc, students, and colleagues engaged in activities around the world. The debut of the web-based archive will coincide with the opening of a new Edgerton exhibit at the MIT Museum. This is a joint effort of the MIT Libraries, the MIT Archives, the MIT Museum, Academic Media Production Services, the Office of Educational Innovation and Technology, and the Edgerton Center.

### *Finances and Funding*

The center is supported primarily by income from endowment and by external grants and gifts. The recession will impact our endowment income beginning a year from now. Over the past two years the endowment payout increased dramatically. In anticipation of large future declines in endowment income, we are banking these increases to serve as a reserve for leaner years to come. We will also be seeking additional outside funding for our efforts.

### *Personnel*

Amanda Gruhl joined the staff to support the expanding K-12 efforts, which was made possible by the external funding in support of the Gloucester project. José Gómez-Márquez and Victor Grau Serrat joined the international development team, and Suzana Lisanti became the project manager for the Edgerton Archive Project.

### *Concourse Program*

Concourse (<http://web.mit.edu/concourse/www/intro.html>) is a highly structured and integrated program for freshmen that covers standard core curriculum in mathematics, physics, chemistry, and the humanities. The structure of Concourse follows that of the standard curriculum, with scheduled lectures, recitations, problem sets, and quizzes. Small class size (60 students is the classroom maximum) and extensive personal interaction with faculty and tutors provide students with the intimate atmosphere of a small school while retaining the excitement and resources of a large institution like MIT.



### **Personnel**

Members of the Concourse faculty and staff for 2008–2009 were professor John Hildebidle, Literature Section; Dr. John Lewis, senior lecturer, Department of Mathematics; Dr. Sekazi Mtingwa, senior lecturer and director of academic programs, Office of Minority Education; Dr. Sahana Murthy, lecturer, School of Science; Dr. Jeremy Orloff, lecturer, School of Science; John Pope, graduate student, Department of Electrical Engineering and Computer Science; professor Robert M. Rose, Department of Materials Science and Engineering; Dr. Gabrielle Stoy, lecturer, School of Science; professor Jeremy M. Wolfe, senior lecturer, Department of Brain and Cognitive Science and professor of ophthalmology, Harvard Medical School. In addition, we employed 19 undergraduates as recitation instructors, tutors, and graders.

Staffing changes for the coming year: Bernhardt L. Trout, professor of chemical engineering, will replace professor Robert M. Rose as both the director of Concourse and the program's lecturer for 3.091 Introduction to Solid-State Chemistry.

### **Enrollment**

Interest in Concourse continues. As in recent years, initial registration during orientation week was well over the limit of 60 and a lottery was used to reduce the number; later in the term, by the drop date, the number remaining was 55. For the spring term, 29 students were registered.

### **Teaching and Curriculum**

SP.318 Introduction to Psychology was offered as a HASS elective in the fall term along with 3.091 Introduction to Solid-State Chemistry, 8.01 Physics I, 18.02 Calculus II and recitations in the calculus sequence 18.01A and 18.02A. In the spring term, SP.321 Madness and Literature was offered as a HASS-D, CI-H subject along with 8.02 Physics II and 18.03 Differential Equations.

### **Accomplishments**

Although budgetary constraints prevented continuation of the Giant Axon Project, other progress continued as planned at the Concourse retreat last year, namely the introduction of coordinated material into the chemistry and physics syllabi focused on the brain and nervous system. If the metric is intellectual passion and excitement, substantial advances were made. The curriculum continues to evolve in response to informal feedback from Concourse students, the most notable of which is the coverage of superconductivity in the chemistry and physics syllabi and in the January dinner lectures.

### **Terrascope**

In the year-long Terrascope program (<http://web.mit.edu/terrascope/>), freshmen work in teams to find solutions to complex, multidisciplinary problems of pressing environmental concern. The program couples theoretical problem solving with hands-on work in engineering design and construction. Students communicate the results of their work in formal presentations, large interactive exhibits, web pages, and radio broadcast segments. Faculty and staff are freshman advisors for the more than 80 students who enter Terrascope in the fall. During the MIT spring break, students take a field trip related to their year's work.

### **Program Highlights**

Fifty-nine students enrolled in Terrascope in AY2009. In the required fall subject, known as Mission (12.000 Solving Complex Problems), students developed a plan to ensure a supply of clean water in the North American west for at least the next 100 years. At the end of the term they presented their proposal before a panel of internationally recognized experts. To view a website displaying their solutions, as well as a link to the webcast of the final presentations, visit <http://web.mit.edu/12.000/www/m2012/finalwebsite/>.

In the spring subject (1.016 Communicating Complex Environmental Issues), small teams of students designed, engineered, and built large-scale interactive exhibits on some aspect of their year's project. Exhibits were open to the public.

Also in the spring, students in Terrascope Radio (an optional subject) produced a segment using interviews and other material gathered during the one-week field visit to Arizona. You can listen to the program, which aired on WMBR, by following the link <http://web.mit.edu/terrascope-radio/JustAddWater-LifeInArizona.mp3>.

### **Spring Break Field Research Trip to Arizona**

In March, 19 students, faculty, and staff visited sites in Arizona to see problems associated with water management. Highlights included the Salt River and Central Arizona Projects, the Central Avra Valley Storage and Recovery Project, the Gila River Indian Community Office of Water Rights, the Yuma desalinization plant, and the Imperial Diversion Dam on the Colorado River. The spring trip was funded by the Henry Luce Foundation.

### **Honors, Publications and Radio Broadcasts**

Three staff received awards during the year. Dr. Ari Epstein was acknowledged as MIT's Outstanding Freshman Advisor. Debra Aczel and Ruth Weinrib received a DUE Infinite Mile team award for community.

One article was published: Ari W. Epstein, Rafael L. Bras, and Samuel A. Bowring. Building a freshman-year foundation for sustainability studies: Terrascope, a case study, *Sustainability Science* 2009 4(1): 37–43. Published online 18 March 2009.

Radio segments produced by students in Terrascope Radio were broadcast over stations including WAMC Northeast Public Radio, WHUS in Connecticut, and WMBR. In addition, Terrascope Youth Radio, an outgrowth of Terrascope in partnership with the City of Cambridge and with support from the National Science Foundation, finished its first successful year. Several Terrascope alumni worked to help local teams develop radio pieces on environmental topics.

### **Staff**

Sam Bowring, Breene M. Kerr professor in geology in the Department of Earth, Atmospheric and Planetary Sciences became Terrascope's director in AY2009 and taught the Mission class, with help from teaching assistant Seth Burgess. Charles Harvey, associate professor of civil and environmental engineering, joined Terrascope as lead

faculty member for the spring subject, 1.016 Communicating Complex Environmental Issues. Dr. Ari Epstein cotaught 1.016, with support from Steven Rudolph. Dr. Epstein also taught Terrascope Radio. Debra Aczel was the program administrator; Ruth Weinrib was the administrative assistant.

**J. Kim Vandiver**  
**Director, Office of Experiential Learning**  
**Dean for Undergraduate Research**  
**Professor of Mechanical and Ocean Engineering**

**Robert M. Rose**  
**Director, Concourse**  
**Professor of Materials Science and Engineering**

**Samuel Bowring**  
**Director, Terrascope (2008–2009)**  
**Breene M. Kerr Professor of Geology**

*More information about the Edgerton Center, Concourse Program, and Terrascope can be found at <http://web.mit.edu/edgerton/>, <http://web.mit.edu/concourse/www/>, and <http://web.mit.edu/terrascope/>.*

## **Office of Faculty Support**

In AY2009, the Office of Faculty Support actively pursued its mission of helping faculty develop and coordinate the undergraduate curriculum and educational programming, supporting faculty governance, and providing information related to undergraduate education. Work to advance the DUE theme of catalyzing the undergraduate commons included strategic staffing of the Committee on the Undergraduate Program and of the Educational Commons Subcommittee through the conclusion of its mission; supporting several working groups spawned from that activity; moving forward reforms to the HASS Requirement; implementing double majors; and expanding the pilot of an Institute-wide online subject evaluation system. Ongoing activities included support for the Subcommittee on the Communication Requirement (SOCR) and other key groups addressing the undergraduate curriculum such as the undergraduate officers; overseeing and streamlining the budget for the Communication Requirement (CR); managing the selection process for and distribution of curriculum development funds; and supporting faculty innovation in education.

## **Catalyzing the Undergraduate Commons**

### ***Support for the Educational Commons Subcommittee***

OFS continued to support ECS as they developed their ideas over the summer via three faculty working groups and staffed full subcommittee meetings into the fall. ECS, with extensive assistance from OFS staff, released its final report in November and brought a

series of concrete action items to the Faculty. Recognizing the need for extensive cross-School faculty discussion, OFS devoted several undergraduate officers meetings to the proposals and assisted in consultations with the School of Science leadership seeking an adequate compromise amendment. As Faculty deliberations continued through a special Faculty meeting held in February, when the amended ECS proposals failed to carry by a sufficient majority, OFS continued to provide a conduit for communication among various constituencies and to assist those faculty wishing to pursue the work of curricular innovation and improvements.

### ***Changes to the HASS Requirement***

After the February Faculty meeting, ECS and CUP leadership met with various constituencies. During these discussions, the School of Humanities, Arts, and Social Sciences (SHASS) expressed their desire to move ahead with changes to the HASS Requirement based on the work of the Task Force and ECS. OFS staff assisted CUP and SHASS in their effort to bring a new motion to the Faculty. These changes were approved at the May Faculty meeting and are expected to go into effect no later than the 2011–2012 academic year.

The Faculty mandated the creation of a new CUP subcommittee charged with oversight of the HASS Requirement. This subcommittee, to be staffed through OFS, will begin work shortly as will the DUE-led working group on implementation tasked with planning and facilitating a smooth transition (chaired by OFS staff associate Genevieve Filiault). In support of the new Faculty initiative OFS, with Teaching and Learning Laboratory staff participation, held two gatherings of First-year Focus instructors this spring to facilitate discussion of these experimental subjects and their assessment. OFS and TLL staff will support this group with meetings in the fall and as appropriate during the next academic year.

### ***Implementing Double Majors***

Members of OFS and the Registrar's Office led the process and worked within the faculty committee system, including CUP and COC, to implement the transition to double majors in the undergraduate program. A final report on this transition was issued in June 2009.

### ***Subject Evaluation Project***

OFS, in collaboration with staff from OEIT and IS&T, continued implementation of the new Who's Teaching What and online subject evaluation systems. The ambitious goal of this multiyear project is to move Institute-wide subject evaluation from a paper-based system to an online system by the end of AY2010.

In the fall, team members expanded the pilot to include 53 subjects in nine departments, more than doubling the coverage from spring 2008 when 22 subjects in four departments were evaluated online. At the suggestion of students and with the cooperation of the registrar, the evaluation period was extended from the end of classes until the beginning of the examination period, resulting in a 68% average response rate, slightly higher than the average for previous paper evaluations of those subjects. The Department of

Electrical Engineering and Computer Science, which has its own student-run evaluation system, began uploading its teaching data into Who's Teaching What.

Development work on Who's Teaching What continued on features required for expansion, but most of this year's development centered on moving the online evaluation system and the evaluation reports from the initial vendor to in-house.

In the spring, the pilot increased substantially to 16 departments and 226 subjects across four schools. Among the subjects evaluated were three science General Institute Requirements: Physics, Mathematics, and Biology. The new survey includes a feature requested by students: the ability to save and continue working on an evaluation during the evaluation period. In the spring 2,196 students completed 4,912 evaluations, including ratings and comments for 558 instructors. The average response rate was 66%, slightly lower than the average response rate for previous paper evaluations of the subjects. Ratings of subjects and instructors are close to results from the paper system.

At the new subject evaluation website, <http://web.mit.edu/subjectevaluation/>, those with MIT certificates can search for any result that has been published online for the MIT community, including departmental online evaluation systems as well as Institute-wide paper and online systems. New web-based reports were created for the online evaluation results. Instructors and departmental administrators can access summaries of responses, as well as individual (anonymous) student responses, including quantitative data and comments. Students and others with MIT certificates continue to be able to view quantitative results by subject on the web. The success of the pilot thus far is in great measure the result of tireless effort and negotiations by the OFS business owner Mary Enterline and project manager Rosanne Santucci, assisted by Lee Leffler and Matt Davies. More information on the project is available at <http://web.mit.edu/se-project/>.

While developing an online subject evaluation, OFS continues to administer the paper system, which was used in evaluating approximately 500 spring 2009 subjects; Deborah Boldin again efficiently managed the paper process.

### **Support to Faculty Governance**

Support and coordination of faculty committees and other governance activities related to undergraduate education is central to the mission of the Office of Faculty Support. These responsibilities strengthen relationships between DUE and the faculty, and OFS staff (working with those in other DUE offices) endeavor to ensure that governance efforts are as well aligned as possible. In AY2009, CUP and its subcommittees on the educational commons and the Communication Requirement were staffed and supported by OFS, providing a valuable link between the work of DUE and that of the faculty committee(s) with primary responsibility for MIT's undergraduate program. OFS's Anna Frazer ably took the lead in coordinating the work of faculty committees across DUE offices, the President's Office, and the Graduate Students Office by convening regular meetings of staff to a number of the standing faculty committees, consulting and sharing materials from committee archives, and coordinating work and agendas for both committee and Institute Faculty meetings.



During AY2009, OFS staff participated in CUP's work to review a proposal for a new version of 8.02 Physics II, recommend updates to the Rules and Regulations of the Faculty, and review and approve a new minor in energy and frame an associated experiment with governance of such interdisciplinary programs. In collaboration with CUP, OFS continued to support and coordinate a final year of piloting project-based subjects. The office collected information and coordinated discussions regarding MIT's policy on hidden grades for freshmen and the conflict currently between that policy and federal eligibility requirements for the SMART and ACG grant programs.

### **Administration of the MIT Communication Requirement**

In collaboration with SHASS, other DUE offices, and those involved in instructional delivery, OFS coordinates the administration of the Communication Requirement and supports the work of SOCR. This year, OFS worked closely with the Registrar's Office to improve the subject approval processes overseen by both SOCR and COC. OFS staff members and the staff in the Catalog Office made use of an enhanced Curricular Information System (CIS) to ensure that both SOCR and COC were aware of Communication Intensive in the Major (CI-M) proposals in queue for approval. This functionality has greatly improved coordination of approvals and subject review and communication between the two offices and faculty committees.

OFS staff and SOCR also collaborated with the COC and its staff to resolve a conflict between the COC's guidelines and a CR policy associated with requirements for students returning after a long leave. This work will result in a motion to change Section 2.84 of the Rules and Regulations of the Faculty that will be brought forward in fall 2009.

The office has primary responsibility for auditing students' progress in the requirement and must spend considerable time doing so. The office receives petitions from students seeking exceptions and advises students on all aspects of the CR. In the last year, though stopping short of a planned comprehensive redesign, OFS modified its FileMaker databases to better support these activities. Since effective collaboration among members of SOCR, the Committee on Academic Performance (CAP), and OFS is an important aspect of tracking and enforcing students' progress toward completion of the requirement, OFS staff work hard to maintain strong communication among these constituencies.

OFS works with the DUE leadership to assess budget requests associated with CI-M subjects and other components of the requirement, and to allocate necessary support. This year, the staff have been responding to the 15% effective reduction in the CR operating budget. In the past year, OFS staff have consulted with many stakeholders and SOCR to achieve these necessary cuts while seeking to preserve the integrity and excellence of the CR as a General Institute Requirement; this work took much time and effort, and was politically challenging. We are grateful for the hard work of assistant dean for the communication requirement Kathleen MacArthur in negotiating appropriate compromises in difficult circumstances.

More information about the Communication Requirement can be found at <http://web.mit.edu/commreq/>.

## **Curriculum Development Funds**

More than \$700,000 was awarded to 20 faculty groups developing new curricula. Funding for these awards came from the d'Arbeloff Fund for Excellence in Education and from the Alumni Class Funds supported by the classes of 1951, 1955, 1972, and 1999. Both funds are administered by OFS.

The d'Arbeloff Fund was established through a generous \$10 million gift from Brit (SM '61) and Alex ('49) d'Arbeloff to support projects designed to enhance and potentially transform the academic experience of MIT's undergraduate students. The fall 2008 call for proposals focused on recommendations made by ECS encouraging innovations in curriculum design fall into the categories of: (1) "big ideas" subjects in Humanities, Arts, and Social Sciences, (2) design, and (3) science, mathematics, and engineering essentials. Also welcomed were proposals for initiatives involving dynamic, effective pedagogy in any of the GIR areas, including communication intensive subjects. The nine d'Arbeloff awards included seven new grants and two project renewals.

The Alumni Class Funds provide resources to MIT faculty for innovative educational projects, particularly to enhance undergraduate education. Awards serve as seed money for high-risk initiatives aimed at improving the quality of teaching and enriching the learning experience through creative curricular and pedagogical changes and the imaginative use of technology. Twelve new one-year grants were made from the Alumni Class Funds, including one to a project also selected for a d'Arbeloff grant.

As well as administering the awards, this year OFS worked with TLL to feature curriculum innovation made possible by the d'Arbeloff and Alumni Class Funds on MacVicar Day in March. Professors Dennis Freeman from EECS, Haynes Miller from Mathematics, Alexandra Techet from Mechanical Engineering, and Janet Sonenberg from Theater Arts described their projects during an afternoon event entitled New Directions in General Education @ MIT.

OFS staffers Mary Enterline and Sonia Brathwaite spent additional effort tracking the success and consequences of funded projects, and provided assistance to Resource Development in connection with the Campaign for Students.

## **Faculty Outreach**

During AY2009, OFS and the SHASS Dean's Office organized two events that brought together faculty teaching Communication Intensive subjects in the humanities, arts, and social sciences (CI-Hs). The first was a dinner that brought together faculty teaching CI-Hs to discuss what they most value and would like to see developed in CI-H subjects going forward. To address one issue raised, OFS organized an IAP workshop on teaching oral communication and how to give feedback, in time to help those preparing for spring term CI teaching. Given the success of both events, OFS staff hope to continue offering workshops and discussions related to the CR and communication instruction.

OFS staffed monthly meetings of the departmental undergraduate officers, where not only curricular reforms but distinguished fellowship advising, School of Engineering assessment, Career Day changes, and other educational concerns were discussed.

Especially given the extra demands on those who serve as education officers, we continue to value the highly committed subset of faculty who contribute extensively to faculty governance and provide important local perspectives. OFS continues to work to address the challenges of effective communication and collective educational policy development within a decentralized, department- and research-focused institution.

### **Infrastructural and Staff Changes**

OFS staff worked with dedication throughout the year, despite staffing changes, the uncertain economic times, and some facilities challenges during the summer months. Happily, Sonia Brathwaite came to OFS in mid-October from UAAP and is working as a data and communications specialist. In November, Lee Leffler joined us as a technical writer/usability consultant, working primarily with the online subject evaluation project. Elizabeth Cooper retired at the end of February 2009, and at the end of the year Margaret Udden completed her appointment in OFS as an administrative assistant. Patricia Fernandes, who has provided invaluable support to both CUP and SOCR, and helps with OFS administration and CR student advising, has commenced her maternity leave.

Of the 11 people who work full- or part-time in OFS, two—Matthew Davies and Gen Filiault—earned Infinite Mile Awards within DUE, and one more staff member was nominated. These achievements are indicative of the excellence and dedication of the OFS staff both individually and collectively, as they daily make efficient, substantial contributions to the excellence of MIT as an undergraduate educational institution.

#### **Diana Henderson**

##### **Dean for Curriculum and Faculty Support**

*More information about the Office of Curriculum and Faculty Support can be found at <http://web.mit.edu/facultysupport/>.*

### **Global Education and Career Development Center**

Our mission is to empower MIT students and alumni to achieve lifelong success through seamless access to transformative global experiences, comprehensive and holistic career services, and mutually beneficial connections with employers and with graduate and professional schools. Our vision is to engage students and alumni in self-discovery to craft lives that are intellectually challenging, personally enriching, and of service to the world. To achieve this, we provide experiences, programs, services, and access to resources that help students and alumni develop the self-awareness and skill to become effective leaders in a diverse society and prepare for the globalized world of work. These include global education and internship experiences, application support, counseling, workshops, classroom instruction, events, preprofessional advising (PPA), and connections to employers, fellowships, and graduate schools.

## New Initiatives

The MIT Careers Office and the Study Abroad and Distinguished Fellowship programs reorganized as the Global Education and Career Development Center, effective July 1, 2008. This reorganization created the Global Education Office, realizing one of the Committee on Global Education Opportunities for MIT recommendations by creating a one-stop information and referral office for all global education opportunities at MIT. The office's duties also expanded beyond managing study abroad and distinguished fellowships to include support and coordination services to facilitate the growth of global education at MIT.

Two new programs were added to MIT's portfolio of study abroad programs: the University of Pretoria–MIT Student Exchange, and the University of Hong Kong's Live, Learn and Intern in China program, a highly competitive summer program combining study with an internship.

In response to the economic downturn and resulting decline in recruiting, GECDC staff developed and implemented the Troubled Economy series of workshops and panels to help MIT students gain internships and employment. More than 100 students attended the series.

The GECDC initiated two new career fairs this year. MIT was selected as one of five universities nationally to host the Federal Agency Career Fair as a part of the Partnership for Public Service and US Office of Personnel Management's Call to Serve initiative. Over 30 recruiting organizations participated in the event, which attracted approximately 375 students. The Spring Career Fair, held in April, had 47 companies and more than 600 students in attendance.

Preprofessional Advising implemented online access to prehealth credential services and expanded the Physician Shadow Program to include Tufts Medical Center.

## Global Education

During AY2009, 64 MIT students participated in study abroad programs, as compared to 100 students during AY2008, a decline of 36%. Reasons for the decline include suspension of the IAP-Germany program, uncertainty regarding the Cambridge-MIT Exchange Program at the time of application, and the low value of the US dollar relative to many foreign currencies.

Beginning this year, GEO is tracking aggregate undergraduate global education participation statistics. In AY2008, a total of 543 undergraduates participated in global opportunities. The subtotals by program area follow:

Freshman/Alumni Summer Internship Program international internships	6
MIT International Science and Technology Initiatives internships	270
UPOP international internships	8
Public service and service learning opportunities	137
Study abroad	64

Singapore-MIT Alliance for Research and Technology Centre summer research	20
International UROP opportunities	38

### ***Distinguished Fellowships***

Distinguished fellowship efforts at MIT saw incredible success, with students and alumni receiving 21 highly competitive fellowship and scholarship awards:

Rhodes Scholars: Matt Gethers and Alia Whitney-Johnson

Marshall Scholars: Anjali Tripathi, Nate Sharpe, Richard Lin, and David Reshef

Gates Cambridge Scholar: Orian Welling

Truman Scholar: Tish Scolnik

Fulbright Scholars: Koyel Bhattacharyya, Nathan Cisneros, Greg Distelhorst, Erica Dobbs, Nicholas DuBroff, Xaq Frohlich, Jennifer Furstenuau, Anneka Lenssen, John Lopez, Matt Orosz, Amanda Shing, Gabrielle Kruks-Wisner, and Rebecca Wood

Merage Foundation for the American Dream Fellow: Siamrut Patanavanich

Kawamura Scholar: Wendi Zhang

Forty MIT applicants for distinguished fellowships became finalists, with 44% of Rhodes applicants, 52% of Marshall applicants, and 45% of Gates attaining the interview stage, while 64% of Fulbright went to the second round.

### **Career Services**

There were 4,429 visits for career counseling and walk-in services. This represents a decline of 6%, primarily due to staff turnover (~3 FTE fewer staff for six months). Of these visits, 2,110 individual students utilized this service, an average of two visits per student. An automated check-in system connected to CareerBridge (our online career management system) was implemented, which allows us to better track client usage of our programs and services.

GECD presented or coordinated the presentation of 98 career workshops, panel discussions, and seminars to 3,671 students, a decrease of nearly 34% from last year. Staff turnover contributed greatly to this decline. Workshops and seminars that are specifically tailored for presentation to departments, students groups, and residence halls increased fivefold this year. More than 1,231 graduate students attended career workshops tailored to the graduate student community.

The Freshman/Alumni Summer Internship Program (F/ASIP) had 107 students enroll in the program, compared with 106 last year. Summer internship placements saw 91% of students securing internships in their chosen fields. Selected US internship sites included iRobot, NASA, National Institutes of Health, Thomson Reuters, Xerox, CSN Stores, and CombinatoRx. International internship sites included PriceWaterhouseCoopers (China), Université Catholique de Louvain (Belgium), DKFZ Heidelberg (Germany), University of Magdeburg (Germany), Ben Gurion University (Israel), Siemens (Germany), Aachen



University (Germany), Lenovo Shanghai (China). New F/ASIP employers include the Clinton Foundation, CombinatoRx, and CSN Stores.

### ***Preprofessional Advising***

There were 131 MIT students and alumni (down from 194) applicants in the 2008 medical school application cycle, with 60 undergraduates, 11 graduate students, and 60 alumni. Nearly 84% of all applicants utilized one or more PPA services, as compared to 58% last year. For the 110 applicants, 2,664 letter of recommendation packets were sent. The average number of packets sent per student sent was 20. Acceptance rates and other admissions data follow:

Undergraduate applicants who used PPA services	86%
Aggregate applicants (undergraduate, graduate, alumni) who used PPA services	83%
Aggregate applicants who did not use PPA services	67%
National acceptance rate	46%
Average GPA for accepted undergraduates	3.7/4.0
Average MCAT score	35/45

There were 68 disclosed MIT students and alumni who applied to law school for the 2008 application cycle, a decline of nearly 7% from last year; 87% of MIT applicants were admitted, an increase of 13% over last year. The average GPA for all accepted MIT applicants to law school was 3.3/4.0 and the average LSAT score was 163.

Now in its third year, the Physician Shadow Program was offered at Massachusetts General Hospital and Tufts Medical Center, with 66 physician volunteers and 80 student participants. The shadowing opportunities spanned more than 13 medical specialties.

Additionally, a total of 39 presentations, events, workshops, and school information sessions were offered, 30 of which focused on prehealth and nine on prelaw.

### ***Employer and Recruiting Programs***

The undergraduate placement rate (employment or graduate studies) for the Class of 2008 was 87%, representing a slight decrease over 2007–2008. Master's degree recipients saw placement rates of 90%, while PhD graduates reported a placement rate of 93%. The average salary for undergraduates was \$65,655, a 7.4% increase over 2007. Nearly all other degree levels saw an increase. This represents the fourth year of salary increases for graduating seniors, and continues the annual trend of increases for most graduate degree recipients.

Despite the economic downturn, this year's preliminary placement data for our graduates is quite favorable. As of early June, with a 58% response rate, 36.3% of undergraduates and 69.9% of graduate students are planning to work after graduation. Of those planning to work, 88.8% of undergraduates and 81.4% of graduate students have accepted a job offer. The survey period concludes in August.

There were 346 employers conducting 4,323 interviews on campus this year, representing a 29% decrease over AY2008. The economic downturn was the chief

contributor to this decline in recruiting and GECDC proactively responded with targeted programming and an end-of-year career fair (described above).

In the first year in which employers were able to directly post positions to MIT students and alumni, 2,392 full-time jobs, 1,213 internship opportunities, and 5,271 student resumes were posted. Through iNet, an online internship consortium, 1,037 registered MIT users had access to 2,323 internship postings.

### **Facility and Personnel Activities**

The GECDC offices underwent major renovations during this past year, significantly improving our physical space by providing private space for all career counseling staff, adding new recruiting and preprofessional program suites, and creating a more welcoming space, clustered activity centers, and better traffic flow.

Over the past year, two staff members—John Nonnamaker and Deborah Rosencrans—left the organization. Brian Wahl was hired as assistant dean for global education and Erin Scott was hired as a counselor for preprofessional advising.

### **Professional Activities**

The following staff received DUE Infinite Mile Awards: Melissa Ackerman, Kim Benard, Bob Dolan, Kathleen Haggerty, Deborah Liverman, Tamara Menghi, and Marilyn Wilson.

Malgorzata Hedderick completed the Leader to Leader Program. She is a member of the DUE Global Theme team and the Global Advisory Committee.

Marilyn Wilson reviewed two professional books for publication in the *National Association of Colleges and Employers Journal*.

Deborah Liverman served on the MIT Martin Luther King Jr. Planning Committee and received the MIT MLK Leadership Award. She also coauthored an article on minorities in science, technology, engineering, and math published in a *New Directions* book.

Shonool Malik was appointed to the First-year Experience Working Group, charged with reviewing DUE programs and services focused on the first year and their importance to the academic success of first-year students and their transition to university life.

Melanie Parker is the chair of the DUE Global Theme team and cochair of the DUE Program and Service Delivery Working Group, charged with exploring new ways to deliver service, collaborate, and share resources in a reduced budget environment.

### **Future Plans/Issues**

We continue to work under a five-year strategic plan, prioritizing global education and comprehensive career services through a high-performing team, effective collaborations and partnerships, technology and assessment tools, and optimal facilities.

GEO is taking the lead in enhancing the safety and security of students abroad by implementing Horizons, a robust global management system for tracking and reporting

student participation and travel and emergency contact information. GEO is also developing guidelines for risk management and crisis/emergency response that reflect the best practices in the field.

The Prehealth Advising Program review will lead to the formation of a Prehealth Faculty Committee, changes to the advising and mentoring system, and adjustment of internal operations. This change will address issues of inconsistency in advising and letter writing, and calibrate the MIT applicants for evaluation by medical schools.

F/ASIP will explore changes in the structure of the program to increase efficiency and ensure sustainability. Areas for review include whom the program should serve, application and selection processes, and utilizing other career services staff in the delivery of instruction and in providing program support.

**Melanie Parker**

**Executive Director, Global Education and Career Development Center**

*More information about the Global Education and Career Development Center can be found at <http://gecdc.mit.edu/>.*

## **Office of Minority Education**

The mission of the Office of Minority Education at MIT is to recognize and propagate academic excellence among students of underrepresented minority groups, with the ultimate goal of developing leaders in the academy, industry, and society. OME supports MIT's academic mission to provide the best possible education for all students while serving the nation's need to have underrepresented and underserved students in science and engineering fields pursue higher education and success in these fields.

### **New Initiatives**

In AY2009, OME began the initial preparation for the Interphase Program's 40th anniversary celebration. To this end, OME built and populated a database with all Interphase alumni to be used for communication, event invitation, and fund development initiatives. In addition, the office began to define potential celebration activities for fall 2009.

This year, OME organized the first Laureates and Leaders Program induction ceremony, held in February 2009. Forty-three students, representing three cohorts, were inducted into the program with appropriate recognition and celebration. Within the context of the program, OME planned the first—and very successful—roundtable dinner discussions with faculty.

The Mentors Advocate Partnership program was expanded in AY2009 to include complementary peer associate mentors. Fifteen sophomore and junior protégés were selected as associate mentors. The associate mentors were trained and matched with

four to five first-year student protégés. The aim is to enhance the mentoring relationship between the administrators/faculty and first-year students with an additional peer resource. The peer mentors were well received and the program will be sustained moving forward.

The first module of the OME Student Information System (OMESIS) was completed. This database will ultimately support data related to student counseling, Interphase, Seminar XL, and other OME programs. The completed work represents not only the foundational structure of the database, but also included the specifications for the Interphase program. The Interphase component was utilized in the invitation/application process for the Class of 2013 and the new cohort of Interphase participants.

The OME Student Advisory Council (OMESAC), composed of the presidents of 16 student groups that primarily serve underrepresented undergraduate populations, met throughout the spring with Chancellor Clay, Dean Hastings, Dean Norman, Dean Stevens and staff, to identify priority issues for the group, and to define future initiatives and available Institute resources. The group is struggling with its organization and identifying its common goals. A reevaluation of OMESAC, its role, responsibilities, and composition is intended.

The Leadership Development Workshop Series is designed to support student leaders as they balance managing their organizations and excelling academically. In September, almost 60 students attended the third annual Leadership Development Retreat at Endicott House. Following the retreat, OME sponsored monthly workshops for the executive board members of OMESAC's organizations. Speakers for the leadership series were recruited from within MIT and the OME Industrial Advisory Council for Minority Education. Led by MIT staff, alumni, and students, the workshops explored topics ranging from budgeting and fundraising to recruitment and succession planning. Fifty students participated in the workshops, with 26 students attending two or more. A special dinner on May 8 recognized the achievements of the student leaders and workshop presenters.

The Second Summer Program is an educational workshop for freshmen that enriches and supports students' intellectual growth while helping them develop a keener sense of their professional possibilities. As a consequence of very active recruitment and marketing process, 22 freshmen (more than twice as many as in 2008) participated in engineering design teams that conceived, designed, and built a product prototype. The workshop was taught by alumnus Marc Graham, who was supported by five teaching assistants. Members of the OME Industrial Advisory Council for Minority Education attended the final presentation by students and subsequently interviewed all participants for internships. Unfortunately, in the current climate, only two students were offered internships. On the other hand, all of the freshmen had the experience of developing resumes and cover letters and being interviewed.

OME partnered with staff from the Global Education and Career Development Center who assisted with the review of resumes and cover letters of the Second Summer participants. Additionally, we worked with GECDL to identify other companies that could potentially have summer internships.

### **Fund Development**

A \$40,000 grant was awarded by the Lord Foundation to support the Laureates and Leaders Program. A \$10,000 gift was received from 3M to support minority student participation in UROP. A \$5,000 gift was received by an alumna in support of the Interphase 40th anniversary.

### **Functional Enhancements**

The Interphase program is a rigorous residential academic program for admitted freshmen in the summer preceding matriculation. The seven-and-a-half-week program builds community and confidence while fostering high achievement and content mastery for underrepresented minorities and other students who have overcome significant odds to be admitted to MIT.

Several enhancements were made to the program in AY2009. For example, the duration of teaching assistant/resident facilitator training was increased from one to two weeks. This provided the opportunity for collaboration with the Teaching and Learning Laboratory to expand and enhance training for the teaching assistants (20 undergraduates) and instructors and for more teambuilding and enhanced time to learn teaching and residential responsibilities.

Another enhancement was the implementation of a new OMESIS model, allowing for increased efficiencies for tracking applications and for access to records and background information.

After thoughtful consideration and in response to budget reductions, the size of the Interphase instructional staff was decreased, slightly increasing the ratio of students to recitation instructors. Additionally, off-campus weekend activities were streamlined and the food budget for program activities was reduced to meet financial objectives.

Seminar XL offerings were expanded to meet demand; first-year students participated in these small-group academic enrichment seminars each term. Students may register for two 3-unit subjects in calculus, physics, chemistry, and/or biology. There were over 300 registrations in Seminar XL—more than 200 in fall and more than 130 in spring.

After both a financial analysis and utilization review, the Tutorial Services Room (TSR) hours were reduced by closing the resource on Friday and Saturday evenings. Resources have been refocused to support higher demand periods and yet save resources. While TSR is typically used by first-year students, tutorial support is available for other subjects. Over 1,300 tutorial visits were made to TSR in AY2009, despite reduced operating hours.

Marketing efforts for the Mentor Advocate Partnership program were increased by relying on the personal outreach efforts of past protégés, flyers, PowerPoint presentations in the Infinite Corridor, recruitment during the Majors Fair, individual and mass email broadcasts, and a targeted invitation letter from the interim director, dean Julie Norman.



Several small expendable funds that provide support for minority student engagement in UROP were transferred to the Office of Undergraduate Advising and Academic Programming. The funds will be awarded through the UROP approval process to ensure distribution of the funds and support the stewardship and annual reporting effort of the Institute. OME and UAAP work closely to encourage and support the participation of underrepresented students in UROP.

Enhancements were made to the Laureates and Leaders Program as well. Recruitment was shifted toward first-term sophomore rather than first-year students, and a minimum GPA requirement for applying to and remaining in the program was implemented. Additionally, a required interview was added to the selection process.

### **Future Plans and Initiatives**

The requirements for the next two modules (Seminar XL and MAP) of OMESIS are being gathered and will be developed over the next year.

All MIT tutoring resources will be reviewed to ensure that the needs of students are being met and that duplication of effort is minimized. In general, TSR is utilized by first-year students and departmental resources are focused on major subject support. The exception is departments teaching GIR subjects; a review of tutorial resources specifically supporting the GIR subjects is necessary.

An independent evaluator will be hired to provide a comprehensive three-year assessment of the Mentor Advocate Partnership Program.

The OME Faculty Advisory Council has not been functional for three years. The new OME director will reestablish this faculty advisory group, recruit new members, and work to establish a charter for the council.

Over the next year, the Second Summer Program will be thoroughly evaluated both with respect to the viability of the program and, if it continues, the curriculum. The engineering design component will be reassessed and the feasibility of using case studies to accomplish the same goals and objectives will be considered. Assuming the program will move forward, a preregistration process would be implemented, the application process would be streamlined, and the application deadline would be moved as late as possible in the fall term to facilitate recruitment and marketing.

OME will work with the associate dean for freshman advising to facilitate and ensure a strong transition for Interphase participants to their freshman advisors. The office will also continue to engage the Interphase cohort throughout the academic year and build community through intentional planned activities and programming.

As planning gets under way for the Interphase 40th anniversary and connections are being reestablished with program alumni, initiatives are being defined to strengthen those relations for the long term.

Seminar XL will be assessed, particularly with respect to the efficacy of facilitator training and the impact of the program on participants' academic success.

OME/MIT is proposing to be the lead institution in building an alliance with several local universities—including Harvard, Tufts, Wellesley, Simmons, and Boston University—to submit a grant proposal to the National Science Foundation (NSF). The aim of the grant is to increase the number of underrepresented minority students in the STEM fields. Up to \$1 million per year for 10 years is available through this specific grant program; NSF is expected to fund two new alliances in this grant cycle.

In the continuing development of the Laureates and Leaders Program, goals for AY2010 include increasing alumni involvement, expanding teambuilding activities to strengthen the community of scholars, and increasing the number of faculty and student events.

### **Staffing Changes**

OME director Karl Reid resigned his position in August 2008. Julie Norman, senior associate dean for undergraduate education and director of the Office of Undergraduate Advising and Academic Programming was appointed as interim director of OME pending a search. A new director has been hired and will assume her role August 2009.

OME's academic staff was expanded by hiring John Pope, a current graduate student and Concourse physics instructor, to support Dr. Mtingwa in coordinating the Seminary XL academic enrichment seminar and the Tutorial Services Room. John will be the academic coordinator for Interphase summer 2009; beginning in fall 2009, he will have a joint appointment between Concourse and OME.

Lisa Strack, program coordinator for the Mentor Advocate Partnership, resigned in late June; this position will remain open until the new OME director arrives in August 2009.

**Julie B. Norman**  
**Senior Associate Dean for Undergraduate Education**  
**Interim Director, Office of Minority Education**

*More information about the Office of Minority Education can be found at <http://web.mit.edu/omel/>.*

### **Office of the Registrar**

The Office of the Registrar promotes the educational goals of MIT by:

- Conveying to the MIT community and beyond accurate, timely information and providing services related to enrollment, registration, and graduation
- Implementing and enforcing academic and administrative policies related to the above
- Creating, updating, preserving, and issuing academic records for past and current students and alumni
- Developing and communicating official subject, schedule, and curricular program information

- Managing and maintaining classroom space

To fulfill its mission, the Office of the Registrar works with faculty members, Institute and faculty committees, departments, staff, and students to guide and assist development and modification of educational policies and procedures in accordance with Institute policy and local, state, and federal laws. The office continues to gather, maintain, interpret, and share information through new technologies, broadened capacities, and enhanced communications in areas the Institute has entrusted to its charge.

### **Accomplishments**

The Institute continued to rely on the Registrar's Office in various and complex ways. We continued to achieve the highest level of service, accuracy, and integrity. The staff worked hard to support important educational initiatives during a year when faculty committees were extremely active. A subset of members was deeply involved with the Next Generation Student System project.

### **Technological Highlights**

In partnership with Information Services and Technology, we

- Played a leading role in facilitating the Institute's participation in the National Student Clearinghouse
- Implemented approved changes in the definition of directory information, a key part of the Institute's policy on the use of student information
- Implemented the double major program, which was approved by the Faculty in April 2008
- Provided key business leadership in the implementation of the graduate student P/D/F grading option
- Led the implementation of changes to race/ethnicity data recording and reporting
- Provided key business leadership in the implementation of Summer UROP for credit
- Began the project of "branding" registrarial pages on WebSIS to integrate WebSIS more effectively with the new Registrar's website, released in January 2009
- Engaged key business owners in the planning for NGS3

### **Policy Work**

We played a major role in advising senior administrators on several complex student issues involving tuition, registration, cross-registration, and degree programs. Highlights are listed below.

Registrar's Office staff worked with the Committee on Curricula to approve major curriculum changes as follows:

- Course 2      Approved revised degree programs for Courses 2 and 2-OE to add a computation subject as a requirement and reduce the number of units for another requirement from 6 to 3 to stay within the limit of 8½ subjects per year. The proposal sparked extensive discussion of Faculty rule 2.84b.
- Course 6      Approved the new curriculum for the Course 6-P MEng program, which builds upon the flexibility of the revamped undergraduate program.
- Course 8      In consultation with CUP, approved a proposal to establish a new version of 8.02 Physics II GIR. 8.021 is an alternative to the teaching enabled active learning format, intended primarily for students with previous experience in 8.02.
- Course 22     Approved a revised degree program that reduces the number of restricted electives, increases the number of unrestricted electives, and adds more choices within the requirements.
- Course 24-2   Approved a restructuring of the Linguistics and Philosophy program. The revised program includes several new subjects, three new categories in the Linguistics track (Linguistic Analysis, Philosophy, and Experimental Results), additional required subjects in the Philosophy track, and more flexibility in the restricted electives for both tracks.

As part of a larger review that also included CUP and the Faculty Policy Committee, COC approved an experiment for the governance of a new inter-School minor in Energy Studies, the first interdisciplinary program that will not be housed within an academic department. The Catalog Office assisted COC and the Energy Education Task Force in moving the proposal forward and drafting copy for the *MIT Bulletin*.

The Registrar's Office worked closely with the project team from IS&T and headed a working group within DUE to implement the double major program on time and within budget. Students began applying for double majors in February 2009.

The office provided data and analysis for COC and SOCR to facilitate a review of policy and practice concerning the readmission of students who wish to complete their undergraduate degrees after a long absence. It also presented information to COC and the Committee on Graduate Programs (CGP) to facilitate their review of policies governing relationships between subjects and the determination of H-level credit.

Working closely with the School of Science in developing the spring and fall term schedules, the office facilitated the first steps toward implementing scheduling recommendations developed by the Classroom Committee during the previous academic year. This effort will continue into the new academic year, the primary objectives being to enhance student choice and to improve the overall experience for first-year students.

The office also analyzed, with the General Counsel's Office, the impact on the community of the new changes in the Family Educational Rights and Privacy Act.

### **Operational Highlights**

- Constructed a new Registrar's Office website, including an online academic calendar with downloadable iCalendar (.ics) file.
- Worked with COC to approve 82 new undergraduate subjects. New subjects include 30 new HASS electives and three new CI-H subjects, one of which is also

- a HASS-D subject. COC approved major revisions to 313 existing undergraduate subjects.
- Worked with CGP to approve 81 new graduate subjects and to make substantial revisions to 448 existing graduate subjects.
  - Processed 1,961 editorial changes to graduate and undergraduate subjects; graduate subjects account for 54% of the total.
  - Scheduled and allocated rooms for 2,052 subjects during the fall term and 2,850 subjects during the spring term. This represents an increase from the previous year of 3.3% for fall and 6.7% for spring.
  - Made room assignments for 15,263 ad hoc classroom reservations, and processed 7,209 reservations for academic classes, exams, reviews, tutorials, and office hours. In responding to 22,472 scheduling requests and 2,459 maintenance requests, the staff generated 31,257 e-mails, and increase of 30% from the previous academic year.

### ***Classroom Management Highlights***

- Led the effort as client for the renovation of lecture hall 10-250. The eight-month renovation included the installation of new room heating, ventilation, and air conditioning systems; new upholstered seating with electrical outlets at each seat; energy efficient LED lighting; and ceiling, acoustical walls, and floor treatments. The Level IV audiovisual system installed included three video projectors, speech, program sound and the capability to record classes and special events with four dedicated cameras.
- Installed new fixed seating in E51-145, E51-149, and E51-151
- Installed new tablet armchairs and instructor's tables to 66-144, 66-154, 66-156, 66-160, and 66-168
- Installed new conference table, chairs, and carpeting in 66-148
- Carried out code modifications to the AV Crestron Control system in Kirsch Auditorium (32-123)
- Installed new sliding chalkboards, new student tables and chairs, instructor table, and a motorized projection screen in 24-407
- Installed new carpeting in 24-121
- Installed motorized projection screens in 1-135, 4-231, 4-237, 5-216, and 56-114
- Installed new video projectors and control systems in 3-133 and 5-216
- Purchased new student examination tables for Walker Gym (50-340)
- Installed new acoustical wall panels in E51-372 and reupholstered fixed seating in 3-270
- Installed a new Level IV audiovisual system in classroom 56-154. Installation included new video projector, program audio, and connection points for laptops
- Installed a new Media Link Control System and video projectors in 4-249, 14E-310, and 54-100



- Installed Media Link Control Systems and new connection plates for laptops in 2-131 and 2-132

### **Data Requests Highlights**

- Provided data and advice to several faculty committees regarding academic pedagogy
- Completed implementation of new collection and retention methods regarding student racial and ethnic data categories
- Provided data regarding graduation and retention rates as well as class size for multiple internal, external, and government reports
- Processed more than 1,000 ad hoc data requests

### **Registration**

In AY2009, student enrollment was 10,299, compared with 10,220 in AY2008. There were 4,153 undergraduates (4,172 the previous year) and 6,146 graduate students (6,048 the previous year). The international student population was 2,703, representing 9.4% of the undergraduate and 37.7% of the graduate populations. These students were citizens of 115 countries. (Students with permanent resident status are included with US citizens.)

In AY2009, there were 3,792 women students (1,885 undergraduate and 1,907 graduate) at the Institute, compared with 3,679 (1,857 undergraduate and 1,822 graduate) in AY2008. In September 2008, 489 first-year women entered MIT, representing 46.5% of the freshman class of 1,051 students.

In AY2009, there were, as self-reported by students, 3,001 minority students (1,946 undergraduate and 1,055 graduate) at the Institute, compared with 2,922 (1,921 undergraduate and 1,001 graduate) in AY2008. Minority students included 462 African Americans (non-Hispanic), 67 Native Americans, 717 Hispanic Americans, and 1,755 Asian Americans. The first-year class entering in September 2008 included 520 minority students, representing 49.5% of the class.

### **Degrees Awarded**

Degrees awarded by the Institute in AY2009 included 1,146 bachelor's degrees, 1,463 master's degrees, 11 engineer's degrees, and 607 doctoral degrees—a total of 3,227 (compared with 3,325 in AY2008).

### **Personnel Changes**

Brian Canavan joined the office as an associate registrar.

**Mary Callahan**  
Registrar

*More information about the Office of the Registrar can be found at <http://web.mit.edu/registrar/>.*

## Reserve Officer Training Corps

### Air Force Reserve Officer Training Corps

The mission of the Air Force Reserve Office Training Corps (AFROTC) is to develop quality leaders for the US Air Force.

#### *Accomplishments*

The quality of our cadet corps continued to improve and our cadets were recognized by the air force for their performance. In fact, our unit was selected as the best small detachment in the nation, winning the AFROTC Right of Line Award. In March, the air force's Air Education and Training Command conducted a unit compliance inspection. This inspection happens every three years and is an in-depth look at all the detachments programs and activities to ensure the best training for our cadets. The results were fantastic. Two inspected areas, cadet training and recruiting, received an "outstanding" rating—the highest possible rating. All other areas received an "excellent," the second highest rating. This was a phenomenal achievement for such a small detachment. In addition, Captain Kristin Hort received "Professional Performer" honors for her work with the cadet training program. She was only the second officer to receive the honor in over 50 such inspections. The results were a true testament of the quality of cadets and cadre at Detachment 365.

Increasing the size of our cadet corps continues to be one of our priorities. We will commission 10 cadets this year, the largest commissioning class in five years. Additionally, we project that 12–15 cadets will join our program in the fall and anticipate meeting our recruiting goals by the start the year. Part of this success is due to our participation in a variety of MIT programs, such as the Campus Preview Weekend, the Undergraduate Practice Opportunities Program, and Minority Introduction to Engineering and Science.

For the third straight year, the academic and fitness scores of our cadets have increased, which has made them more competitive candidates for air force opportunities. Each year, AFROTC identifies those cadets that rank in the top 10% nationally as Distinguished Graduates. Incredibly, three of our 10 cadets who graduate this fiscal year earned Distinguished Graduate honors; two of them are from MIT. Having 30% of a graduating class recognized as Distinguished Graduates is an unprecedented achievement.

#### **Year-end Enrollment in Air Force ROTC as of June 2009**

	Freshmen	Sophomores	Juniors	Seniors	Total
MIT	6	5	2	9	22
Harvard	1	1	0	0	2
Tufts	3	1	1	2	7
Wellesley	0	0	0	1	1
Salem State	0	1	1	0	2
Gordon	0	0	0	0	0
Endicott	0	0	0	0	0
<b>Total</b>	10	8	4	12	34

Highlights of the cadet training include a geopolitical war game held at Tufts University involving Detachment 365 cadets, Tufts political science students, and senior military officers from Tufts, MIT, and Harvard advanced degree programs; water survival training; and cultural awareness training. The cadets also participated in a day-long field training exercise at Hanscom Air Force Base and we finished the fall semester with our annual dining-in with Colonel Phil Haun, an MIT alum and current MIT PhD student, as our guest speaker. The Air Force, Army, and Navy ROTC programs combined to conduct a successful Cadet Award Ceremony, Pass-in-Review, Commissioning Ceremony, and a formal Joint-service Military Ball.

In addition to the weekly leadership training, we sent three cadets to the Arnold Air Society's National Conclave in Arizona and sent two cadets to the National Character and Leadership Symposium and the US Air Force Academy. The cadet wing hosted 34 voluntary events over the course of the year, including morale and training events.

### **Staffing Changes**

There were quite a few staff changes over the last year. Lieutenant Colonel Lawrence McLaughlin replaced Lieutenant Colonel Tim Slauenwhite. Captain Melissa Keller was replaced by Captain Joseph Adelman who took over as the detachment's unit admissions officer. Finally, Technical Sergeant Camille Shephard arrived in July 2008 to replace Master Sergeant Vince Meno. Master Sergeant Meno retired from the air force after 23 years, with eight years at MIT. We expect minimal changes to our staffing in the coming year. We will see one addition to our staff as we welcome Second Lieutenant Ryan Frank. Lieutenant Frank recently commissioned from the University of Massachusetts at Amherst and will be working out of Detachment 365 as a recruiter for the New England area for the next year.

#### **Lieutenant Colonel Lawrence McLaughlin United States Air Force**

*More information about the Air Force Reserve Officer Training Corps can be found at <http://web.mit.edu/afrotc/www/>.*

### **Army Reserve Officers Training Corps**

The mission of the Army Reserve Officers Training Corps (AROTC) is to select, retain, train, and commission cadets from MIT, Harvard, Tufts, Lesley, Wellesley, Salem State, Gordon, and Endicott in a two-, three-, or four-year program in order to prepare them for future leadership roles in the US Army, the nation, and the world. Our vision is to develop leaders of the highest character and values who have the foundations of leadership to lead the US Army and the nation.

### **Accomplishments**

We commissioned 12 officers this year, meeting our army-assigned viability goal of 12 line commissions and falling short of our 1 nurse commission mission. Three of these

officers were from MIT and six of the 12 earned the honor of Distinguished Military Graduate (top 20% in the nation). As of June 11, 2009, 71 students were enrolled in the Army ROTC program, an increase of four cadets over last year and \$1,594,754 was awarded in scholarships. Our program successfully awarded 25 new scholarships for AY2009, helping make up the almost \$1.6 million, and is poised to issue 17 new scholarships for AY2010.

#### **Year-end Enrollment in Army ROTC as of June 2009**

	<b>Freshmen</b>	<b>Sophomores</b>	<b>Juniors</b>	<b>Seniors</b>	<b>Total</b>
MIT	1	5	1	3	10
Harvard	4	3	6	4	17
Wellesley	0	0	1	0	1
Tufts	3	4	0	4	11
Lesley	1	0	0	0	1
North Shore Schools	7	19	4	1	31
<b>Total</b>	<b>16</b>	<b>31</b>	<b>12</b>	<b>12</b>	<b>71</b>

Our cadets continue to achieve excellence academically, physically, militarily, and morally/ethically. At the annual Leader Development and Assessment Course conducted at Fort Lewis, WA — attended by more than 4,000 rising seniors nationally — our cadets exceeded local, regional, and national averages in nearly all measurable areas, as they do every year. The cadets in the program are excellent scholar-athlete-leaders.

Our instructors continue to excel at classroom leadership instruction and hands-on training of cadets and of non-ROTC students here at MIT. Army ROTC continues to be a preeminent source of high-quality leadership instruction at MIT. Our cadre participated in its 12th consecutive year instructing a for-credit special seminar in leadership with the Sloan School during IAP.

In this past academic year, MIT Army ROTC conducted a cadet orientation in September, conducted a field training exercise at the Fort Devens Army Reserve Forces Training Area in October, hosted a dining-in event in November, conducted the Combat Water Survival Test in January, participated in the Air Force ROTC–hosted Joint-service Military Ball in March, conducted a joint spring field training exercise with Boston University AROTC at Fort Devens in April, and finished off the year’s events with four commissioning ceremonies at MIT, Harvard, Tufts, and Endicott.

#### ***Staffing Changes***

The army assigned one new instructor during the past year: Master Sergeant Robert Hinkle (senior military instructor) replacing Master Sergeant Carlos Santiago. This year also saw the departure of our operations noncommissioned officer, Sergeant First Class (SFC) Kazimir Karwowski, with no projected replacement. With the departure of SFC Karwowski we will be short one instructor after a year of operating at our full strength. We will continue to augment our cadre with part-time reserve officers to enhance the leadership experience and training for our cadets. Based on the continuity of most of our

staff we are positioned for success to meet our army commission mission for the coming and future years.

### **Challenges and Plans for the Future**

MIT Army ROTC's continued challenge is to remain viable by increasing the number of cadets in the program, especially from MIT. Although we increased the number of students enrolled in ROTC from the consortium, low MIT enrollment is a significant issue that has been noted and is being reviewed by US Army Cadet Command. The problem is exacerbated by the fact that other local ROTC host schools (Boston University, Northeastern University) and similar schools (Princeton University) are thriving in terms of numbers of cadets. Admission of qualified Army ROTC applicants to MIT continues to be our most significant issue. It would help us to receive support from MIT in terms of increased awareness of Army ROTC as a department to current and prospective students while continuing the "Star Status" consideration begun this year. Our highly talented scholar-athlete-leader applicants often do not gain admission to MIT or instead accept appointments to the US Military Academy or ROTC scholarships to other schools.

**Lieutenant Colonel Timothy Hall**  
**United States Army**

*More information about the Army Reserve Officer Training Corps can be found at <http://web.mit.edu/armyrotc/>.*

### **Naval Reserve Officers Training Corps**

The mission of the Naval Reserve Officers Training Corps (NROTC) program at MIT is to develop midshipmen mentally, morally, and physically. We imbue them with the highest ideals of duty and loyalty, and with the core values of honor, courage, and commitment, to commission college graduates as naval officers. Our program desires officers who possess a basic professional background, are motivated toward careers in the naval service, and have the potential for future development in mind and character so as to assume the highest responsibilities of command, citizenship, and government.

At MIT, the officers and staff assigned to the Naval Science Department are committed to ensuring that every midshipman balances his or her time and energy to realize the tremendous benefits of an MIT, Harvard, or Tufts education, along with the professional development opportunities afforded by the NROTC program.

During the 2008–2009 academic year, 13 midshipmen from MIT, Harvard, and Tufts were commissioned as ensigns and second lieutenants. Program enrollment prior to Commencement in June is reflected in the table below.



**Year-end Enrollment in Naval ROTC as of June 2009**

	Freshmen	Sophomores	Juniors	Seniors	Total
MIT	4	4	4	5	17
Harvard	1	1	5	3	10
Tufts	1	1	0	5	7
<b>Total</b>	6	6	9	13	34

***Accomplishments***

The 2008–2009 academic year was successful in many regards.

During the summer, all scholarship midshipmen participate in active duty training with deployed naval units. Last summer, midshipmen served aboard submarines, maritime patrol aircraft, aircraft carriers, and amphibious assault ships, and they exercised with Marines. This training provided invaluable experience for future naval officers.

MIT NROTC completed instruction in nine naval science courses. These classes convened at 7:30 am so as not to interfere with the academic schedules of the host and affiliate universities. These classes were monitored by the visiting professor of naval science to ensure a high quality of instruction.

The MIT NROTC unit hosted various navy and non-navy guests, including:

- General David Petraeus, Commander, US Central Command
- Admiral (ret.) William J. Fallon, former commander of US Central Command, currently an MIT fellow
- Colonel Thomas D. McCarthy, PhD student at Tuft University's Fletcher School of Law and Diplomacy, former military aide to the president
- Timothy P. Murray, lieutenant governor of Massachusetts
- Eric Rosenbach, executive director for research at Harvard University's Belfer Center for Science and International Affairs
- Lorenzo Vidino, senior fellow at the Fletcher School of Law and Diplomacy
- Sharron L. Sinnott, professor at Curry College

MIT midshipmen were involved in numerous activities throughout the year. During the last two weeks of the summer, the midshipmen prepared for the arrival of the incoming class. A 10-day training event was held in Newport, RI, at which the high school graduates were oriented to life as student-military members. This program was designed, coordinated, and implemented fully by the midshipmen. In the fall, the midshipmen coordinated an annual formal ball to celebrate the birthdays of both the navy and the Marine Corps. Midshipmen participated in the POW/MIA day in Boston. The midshipmen battalion was also active in community service. Midshipmen participated in military excellence competitions at Villanova University and the College of the Holy Cross. The annual regatta was held at the MIT sailing pavilion in April, and NROTC units from the East Coast competed. For three years in a row, schools as far away

as Purdue University and Ohio State University sent teams to the event. The Marine Option midshipmen completed two field-training exercises in preparation for future service in the Marine Corps. An annual Joint-service Military Ball was held in the spring, in coordination with Air Force and Army ROTC. The midshipmen battalion ended the year by hosting the joint-service ROTC Pass-in-Review ceremony on Berry Field.

We completed another year of leadership experience gained from participating in a largely self-run organization. MIT NROTC midshipmen are responsible for handling all the operational, financial, and other core responsibilities that any large organization requires. This provides valuable leadership lessons and tools, which midshipmen also must learn how to pass on as they are rotated through the organization.

Midshipmen use their leadership and management skills in ways that benefited their respective school communities. Midshipmen were teaching assistants for classes, held executive board positions on their schools' chapters of national organizations, served in leadership positions within their dormitories and fraternities to build community within their living groups, led Bible study and church groups, and played key roles in their school athletic teams, such as crew, lacrosse, squash, swimming, baseball, and football.

The culmination of four years of training was reached on June 5, 2009, as five MIT naval ROTC students joined MIT Army and Air Force ROTC cadets to be commissioned as ensigns and second lieutenants inside the US Coast Guard Station in Boston, MA. The guest of honor, General David Petraeus, gave an inspiring speech to the new officers at the ceremony, which was especially meaningful as he was able to commission his son, Second Lieutenant Stephen Petraeus, one of the Army ROTC MIT students.

Three of the Navy ROTC MIT graduates will enter the Naval Nuclear Propulsion Program, with one entering the submarine force, and two becoming surface warfare officers (nuclear). The navy greatly values the outstanding MIT graduates that enter the Nuclear Propulsion Program. Another graduate will begin naval flight training in Pensacola, FL, and the fifth graduate will attend the Basic School in Quantico, VA as a Second Lieutenant in the United States Marine Corps.

**Captain Curtis R. Stevens**  
**United States Navy**

*More information about the Navy ROTC can be found at <http://web.mit.edu/navyrotc/>.*

## **Student Financial Services**

Student Financial Services ensures the access and affordability of MIT. We enable students to finance their MIT education by providing financial information, products, and services. We are a focal point for student contact and we work collaboratively across MIT to make all administrative tasks—not just those associated with financing an MIT education—less time-consuming for students.

Our core responsibilities operate around two major functional areas: billing and collecting tuition, fees, and other Institute charges; and administering student financial aid, including student and parent loans and student employment.

## **Operating Activities**

### ***Tuition, Fees, and Other Major Institute Charges***

Tuition, fees, and other major Institute charges assessed through Student Financial Services totaled \$468.8 million in 2009, a 7.3% increase over the previous year; tuition assessed totaled \$405.1 million, a 5.3% increase. Graduate tuition comprised \$257.7 million, accounting for 63.6% of total tuition assessed, and undergraduate tuition was \$147.4 million, or 36.4%. The following table provides more detail for the 2008–2009 Institute charges.

#### **Tuition, Fees and Other Major Institute Charges, 2008–2009**

<b>Charge</b>	<b>Amount (\$)</b>
Tuition	405,111,479
Student activity fee	2,435,696
Housing	44,025,450
Dining	3,971,371
Health insurance (students who have MIT Health Plan Insurance)	12,518,716
Medical/dental (copays or expenses not covered by health insurance plans)	374,741
MIT Monthly Payment Plan finance charges	61,057
Late payment fees	314,999
<b>Total</b>	<b>468,813,509</b>

### ***Student Refunds***

Students are eligible for refunds when the credits on their student account exceed their charges. In 2009, approximately 5,684 refund checks totaling \$22 million were issued to students. This represents approximately a 3.3% increase in the number of refunds issued and a 6.8% increase in the total dollars refunded.

### ***Student Account Receivables***

Overdue student account receivables decreased 47% in the past year. The student account receivables balance as of June 30, 2009 was \$4.8 million, of which \$4.4 million is advance billing for the FY2010 terms, leaving overdue student account receivables of \$400,000. During 2009 approximately \$96,069 in uncollectible student account receivables was written off against the student account reserve.

### ***Education Loan Note Receivables***

Student Financial Services administers MIT's Educational Loan Plan. Under this program, loans are made to eligible employees to help finance the undergraduate or graduate education of their eligible dependent children. In 2009, \$1.8 million was loaned

to faculty and staff and \$1.3 million collected. The year-end receivables balance for this program continued to climb, rising 12% to \$5.6 million.

The overall education loan notes receivables for Student Financial Services education loan programs, including the faculty and staff loan program as well as Federal Perkins Loans, MIT Technology Loans, and the MIT Parent Loan Plan, increased 3.2% to \$51.9 million. During 2009 approximately \$345,381 in uncollectible MIT loan receivables was written off against the individual loan note receivables and \$45,725 in uncollectible Federal Perkins Loans was assigned to the US Department of Education.

## **Undergraduate Student Financial Aid**

### ***Principles of MIT Undergraduate Financial Aid***

MIT recruits and enrolls the most talented and promising students without regard to their financial circumstances. MIT awards aid only for financial need. It does not award undergraduate scholarships for academic or athletic achievements or any other nonfinancial criteria. MIT guarantees that each student's demonstrated financial need is fully met.

### ***Who Pays for a MIT Undergraduate Education***

MIT believes that parents and students have primary responsibility, to the extent that they are able, for paying the costs of an undergraduate education. In 2008–2009, the annual price of an MIT education totaled \$50,500 per student—\$36,390 for tuition and fees, \$10,860 for room and board, an estimated \$2,850 for books, supplies, and personal expenses, and a per-student average of \$400 for travel.

With 4,148 undergraduates enrolled, the collective price for undergraduates was \$209.5 million. Of this amount, families paid \$104.8 million, or 50%, and financial aid covered the remaining 50%. Over the past eight years, families have paid less of the price to attend MIT and financial aid has covered more. Since MIT subsidizes the cost of educating undergraduates through its tuition pricing and continues to be the largest source of financial aid to its undergraduates, the Institute is the primary source for paying for an MIT undergraduate education, and families the secondary source.

Of undergraduates, 90%, or 3,737 of the 4,138 registered, received \$105 million in need- and merit-based financial aid. This includes scholarships, grants, student loans, and employment from institutional, federal, state, and private sources. Need-based aid recipients make up 62% of MIT undergraduates. The following table details the sources and forms of financial aid MIT undergraduates received in 2008–2009 and the number of student recipients for each category.

**Undergraduate Financial Aid 2008–2009**

Source	Scholarships/Grants		Loans		Employment		Total*	
	Amount (\$)	Students	Amount (\$)	Students	Amount (\$)	Students	Amount (\$)	Students
Institutional	73,352,577	2,454	330,037	118	6,160,882	2,245	79,843,496	3,441
Federal	6,620,654	1,015	5,809,768	1,098	1,609,662	560	14,040,084	2,077
State	269,429	122	N/A	N/A	N/A	N/A	269,429	122
Private	7,268,760	1,203	3,558,510	174	N/A	N/A	10,827,270	1,321
Subtotal*	<b>87,511,420</b>	<b>2,912</b>	<b>9,698,315</b>	<b>1,263</b>	<b>7,770,544</b>	<b>2,652</b>	<b>104,980,279</b>	<b>3,737</b>

\*The student subtotal and totals are unduplicated numbers of students.

**Sources of Undergraduate Student Financial Aid**

MIT provided 76% of all aid to its undergraduates in AY2009. Of this MIT aid, 92% took the form of scholarships, less than 1% was loans, and more than 7% employment.

Other sources of financial aid include the federal government, private sources, and state governments. The US Department of Education is the second-largest source of financial aid to MIT undergraduates, providing 13.5% of all aid from grant, scholarship, student loan, and student employment programs, including Federal Pell Grants, Federal Supplemental Educational Opportunity Grants, Academic Competitiveness Grants, National SMART Grants, Robert C. Byrd Scholarships, ROTC Scholarships, Federal Direct Stafford Loans, Federal Perkins Loans, and Federal Work-Study, including Federal Work-Study Community Service.

Private sources of financial aid—including charitable and civic organizations, corporations, foundations, banks, and other financial institutions—were the third-largest source of financial aid to MIT undergraduates, providing 10.5% of all aid. This aid includes private scholarship and alternative student loans (so called to distinguish them from federal loans). State aid is not a significant factor in financing an MIT education, even though several states including Massachusetts allow their residents to receive a state scholarship while attending MIT.

**Undergraduate Scholarships and Grants**

Scholarships and grants from all sources totaled \$87.5 million, with 70% of undergraduates (2,912 students) receiving scholarships.

MIT awarded \$73.4 million in need-based scholarships to 2,454 undergraduates, or 59%. The average MIT scholarship continued its upward trend, rising to \$29,891. Approximately 96% of MIT scholarships were funded from restricted sources and 4% came from the general Institute budget or unrestricted sources.

**Undergraduate Student Loans**

During the 2008–2009 academic year, 30% of undergraduates (1,263 students) borrowed \$9.7 million. For those students borrowing the average loan was \$7,679.



From 1998 to 2009, undergraduate borrowing decreased significantly as result of enhancements to MIT's financial aid program designed to reduce student debt. Median debt at graduation decreased 55% from \$23,640 in 1998 to \$10,740 in 2009. Approximately 45% of undergraduates in the graduating class of 2009 (449 students) borrowed at some point during their education. For those borrowing, the range of total debt was \$383 to \$246,184 with the 90th percentile at \$30,342. The average total debt was \$15,043.

### ***Undergraduate Student Employment***

Sixty-four percent of undergraduates (2,652 students) earned wages from on-campus employment and employment under the Federal Work-Study Program, including both on- and off-campus programs. Their wages totaled \$7.7 million, or an average of \$2,930 per student.

### ***Undergraduate Parent Loans***

Approximately 5% of undergraduate families, or parents of 223 students, borrowed through a parent loan program administered by MIT. Total parent loans were \$4.4 million and Federal Direct PLUS loans accounted for 93% of the dollars borrowed. For those parents borrowing, the average loan was \$19,781.

## **Graduate and Professional Student Financial Aid**

### ***Overview***

Graduate and professional students are provided with tuition support in connection with research assistantship, teaching assistantship, and fellowship appointments. These awards are supported by either MIT funds (general Institute budget or non-sponsored funds) or a sponsored program (research projects or sponsored funds). Tuition revenue support from MIT funds is considered financial aid, but is not included in this report since SFS does not administer these sources of support.

Graduate and professional students are eligible for need-based financial aid, including student loans as well as student employment under the Federal Work-Study Program, both of which are administered and reported by SFS. The following table provides the detail for graduate and professional student need-based financial aid.

### **Graduate Need-Based Financial Aid 2008–2009**

Source	Loans		Employment		Total*	
	Amount (\$)	Students	Amount (\$)	Students	Amount (\$)	Students
Institutional	156,242	4	N/A	N/A	156,242	4
Federal	18,170,305	736	1,760,123	159	19,930,428	775
State	161,573	7	N/A	N/A	161,573	7
Private	20,302,549	438	N/A	N/A	20,302,549	438
Subtotal*	<b>38,790,669</b>	<b>916</b>	1,760,123	N/A	<b>40,550,792</b>	<b>955</b>

\*The student subtotal and totals are unduplicated numbers of students.

In 2009, loans totaled \$38.8 million, an increase of 11.9% from the prior year, with 916 graduate students, or 15%, borrowing an average of \$42,348, which is equivalent to 116%

of the 2008–2009 tuition and fees. The percent of graduate and professional students borrowing remained the same, but the average amount borrowed rose by 8.3%.

Graduate student employment earnings under the Federal Work-Study Program, including on- and off-campus programs, totaled \$1.8 million with 159 graduate students, or approximately 2.6%, earning \$11,069 on average. This is the same percentage of graduate students working, but a 41% increase in the average amount earned.

### **Other Accomplishments**

Other organizational accomplishments include the following:

- *Financial aid calculator.* SFS developed, and launched on its website, a financial aid calculator that allows prospective students and their parents to determine their eligibility for undergraduate financial aid.
- *SFS wiki.* During FY2009, SFS completed its multiyear project to create an electronic tool for staff. Originally conceived as an intranet, the final product is a wiki that houses the organization's complete policies, procedures, and processes as well as daily staff communications.
- *Cross training.* Staff in the Student Services Center and Financial Aid were cross-trained in basic student account, student financial aid, and registrar service functions.
- *Student account receivables.* Despite the economic downturn, there was a 47% decrease in outstanding student account receivables.
- *Student loan defaults.* Again, despite the economic downturn, there was a decrease in the cohort default rate in the Federal Perkins Program from 3.81% to 1.88%.
- *New loan program.* The MIT Federal Credit Union was selected as a preferred lender for MIT Sloan School of Management Students.
- *National Student Clearinghouse.* MIT became one of the 3,300 colleges and universities to use the National Student Clearinghouse to verify enrollment for student loan borrowers, helping to ensure that MIT students do not go into default for failing to inform their lender(s) of their enrollment status.
- *Personally identifiable information.* In partnership with other Institute offices, SFS took measures to ensure that it implemented protocols to reduce the usage and storage of personally identifiable information, as well as to protect that information if it is critical to collect and maintain it.
- *Administrative streamlining.* SFS streamlined the process by which undergraduate students decide how much of their self-help offer to borrow and how much to earn term-time.
- *Operating budget savings.* SFS achieved an 8% reduction in its operating expenses.

## Staffing

During the past year, three staff members arrived and three left and there was one internal promotion. Minorities currently constitute 34% of the staff, with underrepresented minorities at 26%. Staff that arrived were: Christopher Chiampa, student services representative; Ryan Callahan, assistant director of financial aid; and Aimee Grandmaison, assistant director of financial aid. Staff who left were Elizabeth (Betsy) Hicks, executive director, Student Financial Services; Daniel Barkowitz, director of student financial aid and employment; and Hong Li, business analyst. Kimberly Mann was promoted from student financial aid and employment representative to communication officer.

### Carlene Chisom-Freeman

#### Interim Executive Director, Student Financial Services

More information about Student Financial Services can be found at <http://web.mit.edu/sfs/>.

## Teaching and Learning Laboratory

The Teaching and Learning Laboratory was founded in 1997 as a resource for faculty, administrators, and students who share a desire to improve teaching and learning at MIT. Its mission is to collaborate with members of the MIT community to promote excellence and innovation in teaching and learning throughout the Institute, and to contribute to MIT's standing as a leader in science and engineering education.

Although TLL—as all DUE units—has felt the stress associated with budget reductions at the Institute, our productivity was not been impacted in AY2009. We have expanded the number of programs we provide while maintaining our traditional stable of services. We have also become more involved in national and international activities to improve STEM teaching and learning. We are striving to maintain this high level of output even in this time of economic contraction.

This report details achievements in a number of areas, including contributions to DUE-wide initiatives, support for educational innovation, assessment and evaluation studies, and involvement in national and international activities. We wish to highlight the following achievements for this year:

- In collaboration with Institute partners, 80% of all MIT's teaching assistants participated in workshops on teaching and learning.
- An all-Institute teaching certificate program for doctoral students and postdocs was designed and implemented, with over 100 students registering.
- Activities were undertaken that will lead to curricular and pedagogical changes to improve students' retention of the key math concepts needed in downstream science and engineering subjects.
- A multifaceted evaluation of UROP, the first in 15 years, was designed and administered.

Details about these projects, as well as other TLL initiatives, follow.

## **Contributions to DUE-wide Initiatives**

TLL staff members played a role in a number of initiatives that spanned DUE, and they collaborated closely with staff from a number of other DUE offices. Notably, TLL staffers were members of all three working groups convened by the dean to examine DUE programs and services in light of budgetary constraints. Specifically, Dr. Lori Breslow, TLL director, cochaired Working Group #1; Dr. Janet Rankin, TLL associate director for teaching initiatives, was a principal member of Working Group #2; and Ms. Leann Dobranski, TLL assistant director, served as the subgroup leader for the Internal Staffing Models subgroup of Working Group #3.

Additionally, Ms. Dobranski was project manager/producer for DUE's "Extraordinary Learning" video (she is also a member of the DUE Communications Affinity Group); TLL initiated and coordinated the production of a TLL/OEIT/OFS joint outreach poster that was individually presented to 23 departments; and Dr. Rankin participated in OEIT's search for a director of outreach. Further collaborations between TLL and other DUE offices are described in sections of this report below.

## **Teaching and Learning Activities**

### ***TA and Doctoral Student Training***

We believe it is fair to say that more progress has been made this year in preparing MIT's TAs and doctoral students to teach than previously in the Institute's history. With the passage of the Policy to Strengthen the Professional Development of Teaching Assistants at MIT by the Deans Group in 2006, with very few exceptions, all Schools and departments provide TAs with some training before entering the classroom. We are actively working to elicit the cooperation of all Schools and departments, and we anticipate the percentage of TAs who receive training will approach 100% in fall 2009.

Two more activities have contributed to efforts to provide MIT graduate students the training they need to excel in the classroom.

First, we created an entirely new program, the Grad Student Teaching Certificate Program, primarily for MIT's PhD students. The program consists of a series of six workshops and a microteaching session. Participants must also complete pre- and post-workshop assignments (for example, they prepare a sample syllabus). Almost 100 students registered for the program, a number that far exceeded our expectations. Twenty-seven students completed the program in spring 2009, and 49 students are in progress. (Students may take more than one academic year to finish.) We asked students who "graduated" this year to evaluate the program, and of the 24 who returned the survey, 91% indicated they would definitely recommend the program to others, and 83% reported all six workshops and microteaching to be either "very useful" or "useful."

Second, Dr. Rankin undertook a widespread outreach effort during the year to learn how TLL could better serve the TA training needs of individual departments; she met with 16 faculty in nine departments. As a result of her efforts, TLL will be collaborating or continuing discussions with faculty in the Civil and Environmental Engineering, Brain

and Cognitive Sciences, Urban Studies and Planning, and Aeronautics and Astronautics Departments.

Finally, data from a pilot study done in the Chemistry Department to evaluate the revision of its TA training program, while preliminary, illustrate the efficacy these efforts. (Dr. Sanjoy Mahajan, TLL's associate director for teaching initiatives, was a principal architect of this new program.) The assessment showed that after participating in the improved training, 36% of the TAs were rated in the highest category (6.5–7.0) in comparison to 15% the year before, and no TAs were in the lowest range (0.0–4.4) in comparison to 9% the year before.

### ***Other Initiatives in Teaching and Learning***

A consistent educational challenge at MIT has been helping students to see the application of concepts they have learned in the math GIRs to their downstream science and engineering courses. Funded in part by the Spencer Foundation, Dr. Rankin and professor Haynes Miller (Mathematics) are collaborating to confront this difficulty. For example, they commissioned a survey to better understand how math concepts are utilized and reintroduced in downstream subjects. They have also organized and facilitated a series of interdisciplinary conversations between faculty and among students to gain perspectives on which math concepts are most/least important. This research will inform curriculum innovations to address this problem.

A second example of successful work in teaching and learning is the collaboration between Dr. Mahajan and Professor Dennis Freeman (Electrical Engineering and Computer Science). Last year, they made substantial changes to subject 6.003, and those changes have now been integrated into 6.01. Specifically, the R operator Dr. Mahajan invented for 6.003 has replaced the z-transform. According to Professor Freeman, this “approach to signals and systems is as revolutionary [as those in 6.001 done by] Hal [Abelson] and Gerry [Sussman].”

Third, in order to capitalize on the educational experience of MacVicar Faculty Fellows, Ms. Dobranski and Dr. Rankin have collaborated with select fellows to create posters that highlight their innovations in teaching and learning. These are displayed outside the TLL offices and in other venues.

These new efforts have been undertaken while maintaining TLL's regular programs and services, including the New Faculty Teaching Orientation, the IAP “Better Teaching @ MIT” series, and individual consultations for faculty and graduate students.

### **Assessment and Evaluation Studies**

The table below details the 15 research projects undertaken by Rudolph Mitchell and Lisa O'Leary Schuler, TLL's associate directors for assessment and evaluation.



**Teaching and Learning Laboratory Assessment Studies, 2008–2009**

<b>Subject/Study</b>	<b>Scope of Investigation</b>	<b>Client</b>	<b>Status</b>	<b>Researcher</b>
2.001/2.004	Analyzed pre-/ post-test data to measure learning after introduction of several educational innovations	Prof. W. Seering	Analysis complete	L. O. Shuler
3.091—Students as Scholarly Researchers	Study of the impact of integrating modules on online research into this chemistry General Institute Requirement	Prof. D. Sadoway	AY2008 Study complete; results presented at library conference	R. Mitchell
5.111*	Two studies include: (1) impact of interdisciplinary redesign of course, and (2) teaching assistant [TA] training. Latter used new scales to measure TA effectiveness	Prof. C. Drennan	Report written for fall 2008; data incorporated into Howard Hughes Medical Institute report	R. Mitchell
6.001	Study to measure learning gains after introduction of several educational innovations	Prof. H. Abelson	Data analyzed and reported to client	L. O. Shuler
6.UAT	Study to measure improvement in communication skills in Course 6 CI-M	Dr. T. Eng	Study under design for fall 2009	R. Mitchell
20.020	Assessment of new Course 20 subject	Dr. N. Kuldell	Report completed for fall 2008	R. Mitchell
Course 20 International Genetically Engineered Machine (iGEM) competition	Profile of iGEM experience and impact on participants	Dr. N. Kuldell, MIT lead [iGEM is a multi-institution initiative]	Key findings presented to National Science Foundation during program review	R. Mitchell
Graduate Education in Medical Sciences (GEMS)*	Assessment of Health Sciences and Technology training program in translational medicine	Dr. J. Greenberg	Two reports completed; data used in Howard Hughes Medical Institute review	R. Mitchell
Humanities, Arts, and Social Sciences d'Arbeloff Freshman Year Focus Subjects	Comprehensive assessment of these new subjects; new standard survey instrument has been developed and used in nine subjects	School of Humanities, Arts, and Social Sciences faculty	Reports completed for fall 2008 subjects; results presented to Committee on the Undergraduate Program	L. O. Shuler
Public Service Center	Faculty attitudes toward service learning and project-based learning	Public Service Center	Data analyzed and reported to client	L. O. Shuler
Undergraduate Research Opportunities Program	Administered and analyzed results of multifaceted evaluation, including comparative demographic results	Office of Undergraduate Advising and Academic Programming	Data analyzed and reported to client	L. O. Shuler

\*Funded by the Howard Hughes Medical Institute

Besides undertaking these studies, Dr. Mitchell and Ms. Shuler provided expertise to a number of members of the MIT community on assessment and evaluation. Clients included (within DUE) OEIT, OEL, OME, UAAP, Biomatrix, and the Global Theme team; and (outside DUE) MIT International Science and Technology Initiatives (MISTI), the MIT Library Working Group, and the Public Service Center.

### **Involvement in National and International Initiatives**

TLL staff were invited to participate in a number of national and international initiatives to improve STEM teaching and learning. For example, Dr. Breslow is a member of two working groups for the American Society for Engineering Education/National Science Foundation–sponsored project, Creating a Culture for Engineering Education Innovation. She was also asked to participate in an international meeting on strategic educational development cosponsored by Lund University and the Swedish Agency for Networks and Cooperation in Higher Education, as well as in an NSF–sponsored meeting, “Evaluation of Engineering Education Research Programs: Thought Leaders’ Workshop” to help craft the Engineering Education Directorate’s funding priorities in engineering education research. Dr. Rankin was invited to attend the most recent CDIO conference in Ghent.

We continue our participation in the Network for Enhancing Teaching and Learning in Research Intensive Environments, the Forum on Excellence and Innovation in Higher Education (led by Harvard University), and the Center for the Advancement of the Scholarship of Engineering Education/National Academy of Engineering. In addition, Dr. Breslow is a member of the editorial advisory board for the *Journal of Engineering Education* and she regularly reviews for that publication.

Finally, we met with visitors from 17 countries who wished to learn more about MIT’s efforts in teaching and learning.

### **Proposals Submitted**

Undergraduate Teaching Opportunities Program, submitted to the Barker Foundation. Resubmission in fall 2009 was requested.

Assessing the Impact of International Research on Undergraduates, a preproposal submitted to the Research and Evaluation on Education in Science and Engineering (REESE) Program, NSF.

### **Presentations Given by TLL Staff**

Breslow, L. “A Divide at the Extremes: The Challenge of Assessing Graduate Outcomes for the 21st Century,” keynote address to the Higher Education Colloquium, University of Edinburgh, May 2009.

Breslow, L. “Trying to Foster Educational Innovation,” keynote address for the Higher & Community Education Teaching and Learning Forum, University of Edinburgh, May 2009.

Breslow, L. "Transplanting Pedagogies: An Experiment in Small-Group Teaching at MIT," research presentations for the Oxford Learning Institute, Oxford University, May 2009.

Mahajan, S. "2=1, or Teaching the Gentle Art of Lying," Theoretical and Applied Mechanics Spring 2009 Seminar Series, Cornell University, March 2009 and University of Colorado-Boulder, April 2009.

Mahajan, S. 61st Annual Conference on World Affairs, member of the following panels: "Electrifying Detroit: Where Are We Going with Transportation," "Teaching What to Think or How to Think," "Gattaca: What Happens When They Know Your Genes," "Global Warming: Too Little, Too Late," "There's No Such Thing as Agenda-Free Science," "Who Owns the Creative Commons," and "Science Literacy and the Un-dumbing of America," Boulder, CO, April 2009.

Mitchell, R., et al. "Development of the Cognitive Behavior Survey (Residency Level) to Measure Learning and Related Cognitive Behaviors," Annual Meeting of the American Educational Research Association, New York, March 2009.

### **Workshops Designed and Facilitated**

In addition to the aforementioned orientations for new faculty and new teaching assistants, TLL staff developed and facilitated workshops for d'Arbeloff finalists (to aid them in developing the assessment portion of their final proposal); Special Program for Urban and Regional Studies/Humphrey fellows on cross-cultural communication; MIT Summer Professional Program on cross-cultural communication in teams; Sloan doctoral students on teaching and academic writing; History, Anthropology, and Science, Technology and Society TAs on discussion teaching; the student diversity initiative on cross-cultural communication; Path to Professorship seminar for women graduate students on teaching and learning for new academics; and several offerings of Facilitating Effective Research workshops.

### **Teaching by TLL Staff**

Breslow: 15.279 Management Communication for Undergraduates, fall 2008; 15.289 Communication Skills for Academics, spring 2009.

Majahan: 6.055J Art of Approximation in Science and Engineering and 5.95J Teaching College-Level Science and Engineering, spring 2009.

### **Staff Changes**

There were no staffing changes in AY2009.

We wish to acknowledge the support of Daniel Nocivelli, TLL administrative assistant, in all the initiatives described above.

**Lori Breslow**  
**Director**

*More information about the Teaching and Learning Laboratory can be found at <http://web.mit.edu/tll/>.*

## **Office of Undergraduate Advising and Academic Programming**

The Office of Undergraduate Advising and Academic Programming sets a standard of excellence in providing quality student-centered services to all undergraduates, and specifically to freshmen, to enhance their academic success, social adjustment, and assimilation to the Institute. To achieve that vision, UAAP provides programming, access to Institute resources, and services that recognize the many needs, diversity, and uniqueness of students at MIT. This office is responsible for all freshman programming, including advanced placement and transfer credit processing, orientation, academic advising (including residence-based advising), major exploration programming, sophomore transition initiatives, learning strategies, and other academic support. Additionally, UROP management, operation, and oversight are UAAP responsibilities, as are the coordination of IAP and staff support to the Committee on Academic Performance.

UAAP leads development of a holistic student experience initiative, a priority identified in DUE's strategic plan. This theme is intended to articulate a holistic approach to the education of our students, setting the standard for undergraduate academic advising and mentorship, defining collaborative initiatives and programs for student leadership development, facilitating reflective practice, and developing global opportunity specifically through the International Research Opportunities Program.

### **New Initiatives**

UAAP defined a year-long celebration of UROP's 40th anniversary that included/will include:

- IAP 2009 seminar series: UROP@40—Past, Present, and Future
- Cosponsoring the Boston Undergraduate Research Symposium, 4/11/09
- MIT student poster session during Family Weekend, 10/17/09
- UROP 40th Anniversary Symposium, 10/29/09

An oral history of MIT is being taped in June 2009 and will include interviews with professor and president emeritus Paul Gray; professor and dean Daniel Hastings; professors Phillip Sharp, Dava Newman, Andrew Lippman, Nancy Kanwisher, J. Kim Vandiver; and Norma Norland, former UROP director and colleague of Margaret MacVicar. Additionally, a number of Institute-wide activities are planned to include large numbers of the community, such as anniversary cake for 2,500 people in Lobby 10, Top 50 UROP Facts, UROP snippets and class activities for faculty to showcase the program during the week of the Symposium, and so on.

UAAP developed IROP summer research exchanges with RWTH Aachen University (Germany) and the National University of Singapore (NUS). The exchanges are intended to not only engage students in research with the faculty of the host university, but to immerse MIT students in an international cultural experience. During summer 2009, two MIT students did research with NUS faculty and three were at the RWTH Aachen University campus. Correspondingly, we are hosting three students from each university.

In support of the MIT Global Initiative, UAAP executed an ambitious marketing plan and program development, and approved 38 IROP experiences during the past year. These placements occurred in 21 countries.

Additional efforts to improve advising, mentoring, and student development, described below, occurred in AY2009.

UAAP institutionalized its reflective dinner series. As well as providing an opportunity for students to share their experiences, these gatherings also, in some specific instances, provided the opportunity for student feedback to improve programs and better meet student needs. The focal groups and their discussion topics for the dinners included:

- IROPs, D-lab, study abroad, and PSC fellows—international experiences
- First-year students—a post-fall term look back on their transition, fall term, and lessons learned
- Associate advisors—personal growth and motivation to support others
- Returning orientation leaders—leadership growth, what the responsibility of being “the first face of MIT” meant to them
- Student Advisory Council to the UAAP—leadership growth and the perspective gained from having a substantial role and responsibility to an office and programming.

IAP 2009 presented a first-year experience pilot, *Balanced Life @ MIT*. The topics were defined as they related to a student being successful at MIT. Specific activities were designed around each topic, including leadership, communication, academic skills, exploration of studies/major/graduate school, public speaking, and ethics. Moving forward, the intention is to continue to work with DSL staff to incorporate these and other topics into residential programming.

UAAP assumed responsibility for sophomore exploratory subjects, including communication strategies and tracking participation. Thirty-eight percent (405 of 1,065) of eligible students in fall 2009 and 40% (433 of 1,082) in spring declared an exploratory subject on their registration. Special attention was paid to ensuring that those accepting early sophomore standing understood their eligibility during the spring term.

UAAP expanded the initiative to provide support and resources for undergraduate advisors of at-risk students; advisors are identified through the CAP end-of-term process. Training for faculty advisors of students on warning was strategically offered. Almost a dozen faculty attended each of the two programs offered. Although not a huge response, we are pleased to be making some progress with faculty development.

### **Functional Enhancements**

In keeping with the holistic theme, all potential opportunities for adding value to existing programs were assessed and new opportunities evaluated. Consequently, the following programs or programmatic enhancements were developed.



We continued to develop “women in leadership” programming by showcasing seven speakers. UAAP engaged the Network of Sloan Undergraduate Women and the Graduate Women of Course VI as partners to cosponsor select speakers and increase the audience.

UAAP fostered leadership development not only through existing UAAP programs (orientation coordinators, orientation leaders, associate advisors, resident associate advisors, UAAP advisory board, Baker Foundation, pre-orientation program coordinators, etc.), but also through our activities with networks of student groups, such as house governments, the Black Women’s Alliance, Chocolate City, the MIT Caribbean Club and African Students Association (leadership retreats), and others.

Also, we developed mentorship programming and resources to support student organizations’ peer mentorship activities.

The office collaborated with Student Life Programs on redefining the house fellow program and developing processes to ensure not only faculty participation but also wide distribution of house fellows throughout the housing system.

We added reflective practice as the final component for IROP participants, associate advisors, and UAAP Student Advisory Board. Additionally, we added a reflective opportunity for first-year students during IAP.

UAAP continued to lead the joint DUE/DSL committee that is defining our collective values and generating several short-time projects and long-term strategies for cooperation, collaboration, and effective program execution and transparent integration of student life and learning. Two priority efforts were carried out, including the creation of a searchable website defining opportunities for faculty to engage with students outside of the classroom. In addition to DUE and DSL opportunities, information on MISTI, UPOP, and Biomatrix was also added to the site. Also, we fostered the joint professional development of 25 staff through StrengthsQuest, and 75 DUE and DSL staff engaged in a program and dialogue on cultural competencies and creating allies.

We continued to participate in fund development efforts and stewardship with respect to pre-orientation programs, UROP gifts and endowment, and funds from the Amgen Foundation, the COOP Foundation, the Baker Foundation, and the Class of 1959. We committed to not only identify but also to pursue new resources to support UAAP initiatives, and strengthened relationships with key development staff.

UAAP continued to expand the academic offerings within the Freshmen Pre-orientation Programs to nine; the new additions were Brain and Cognitive Sciences and Urban Studies and Planning. Seventeen programs were offered during Orientation in 2008, with 510 freshmen participating.

In a continued effort to support the academic success of first-year students, study sessions before all math or science quizzes and learning strategy programming was provided. More than 30 study sessions and 15 learning strategy programs were offered. Online learning strategy modules were also expanded. The UAAP also worked

more closely with first-year instructors in complementing each other's resources and communicating all resources to first-year students.

We continued to offer a comprehensive professional development program for freshman advisors, including special workshops for new advisors; seven professional development programs are available to all advisors. Freshmen were advised by 75 faculty plus 124 lecturers, instructors, and administrators; this number includes those who led the 56 freshman advising seminars offered to the Class of 2012. Advisors were matched with 180 associate advisors who served as peer mentors to the first-year students.

In AY2009, we sponsored the India-China Entrepreneurial freshman advising seminar and provided \$5K in support to help send 12 students and a faculty member to China during IAP. This is an investment not only in the global initiative, but also in the potential development of future IROPs.

We sustained participation of underrepresented minority students as first-year advisors (15%), orientation leaders (22%), and as members of the UAAP Student Advisory Board (34%). However, we only engaged six underrepresented minority associate advisors. While we do recognize that many underrepresented minority upperclassmen serve as Seminar XL facilitators and TSR tutors, this is unsatisfactory. We must resolve this problem and ensure that we have a diverse group of associate advisors distributed across all race, ethnic, and residential communities.

UAAP completed the ninth year of the residence-based advising program for all freshmen living in McCormick and Next House, plus Spanish House and Chocolate City. Overall participation included 219 first-year students, 29 advisors, and 27 resident associate advisors. These advisors also committed to serving as house fellows within these communities.

During IAP 2009, 584 noncredit activities and 105 for-credit subjects were reviewed by UAAP for listing in the online IAP guide and calendar. Activities or subjects were sponsored by 33 departments, 22 interdisciplinary laboratories and centers, 37 administrative offices, 55 ASA groups, and 14 nonstudent groups.

The UAAP Student Advisory Board provided content for the Associate Link newsletter, organized four key freshman programs, participated in peer advice walk-in sessions in UAAP, served on UROP panels, and assisted with the Exploring the Majors Fair. Student members of both the Baker Foundation and the Student Committee on Educational Policy joined the Student Advisory Board. In addition, two freshmen were recruited from Interphase to serve on the board.

Training and ongoing development of associate advisors was an articulated priority. Seven different programs were strategically offered to almost 200 associate advisors throughout the academic year. This training included Mentoring@MIT; Successful Conflict Resolution; Stop, Think and Move Ahead: A Reflective Experience; Myers-Briggs Workshop; and Imperfect@MIT: Advising at Mid-term; Public Speaking and Active Listening Skills; and Leadership Development Workshop Series (the last three programs were each offered twice).

Facilitating an effective, smooth transition to the sophomore year remains a priority. Working closely with the departments and offering appropriate programming has enhanced this effort. Five strategic programs, including three offered during IAP, addressed specific aspects of self-exploration and assessment, academic and research opportunities, development of relationships with faculty, and global opportunities.

### **UROP Activities**

Within summer 2008 and the fall and spring terms of 2008–2009, 50.2% of UROP students were female and 49.7% were male. Of undergraduates graduating with their first degree in 2009, once again, 85% participated in UROP at least once during their time at MIT. Of this number, 66% (90 of 137) of graduating underrepresented minority students participated sometime during their undergraduate program; this represents a dramatic decrease from last year (82% participated).

During this academic year and summer, 2,696 UROP projects were completed. This is a 15% increase in the number of projects completed. Unfortunately, only 54% of the academic year projects were paid experiences; this is a decrease from the high of 73% seen in AY2002. From the comprehensive UROP survey and assessment that took place in spring 2008, we learned that 80% of those students who ended up doing a UROP for credit had originally requested funding and were denied. There is a huge gap between available resources and the requests for funding.

UAAP provided \$2,229,519 in direct funding. Faculty allocated \$3,951,436 in support of UROP, an increase of 6.9% from the previous year. This is the first increase in faculty funding in a number of years.

In the 2007–2008 academic year, the Institute provided \$400K in additional funding with the intention of financially guaranteeing one term of UROP support for scholarship recipients during their undergraduate career. Particular programming effort was dedicated to cultivating interest and participation among underrepresented and first-generation students. Ongoing tracking, data collection, and analysis has been undertaken to assess the efficacy of this program.

UAAP's annual UROP direct funding budget is comprised of endowment income (45%), expendable gifts (26%), general Institute funds (27%), and foundation grants (2%). The UROP book-value endowment is \$12.7 million, represented by 45 named endowed funds and 10 named gifts. New funds established in AY2009 include Baker Hughes and Class of 1959 UROP Fund.

In alignment with the values of MIT's global effort, IROP has resulted in strategic marketing to faculty and students, definition of potential opportunities, efforts to develop potential exchanges, and fund development. During this reporting period, 38 MIT students engaged in an IROP.

## Future Plans and Initiatives

As UAAP, with both programmatic responsibility and the charge of the holistic theme, sets its goals and objectives for AY2010, the following are currently defined initiatives:

- Expand the Freshman Advising Seminar, “From Good to Great: A Seminar in Leadership and Life Skills for Women,” to two residence-based advising residences. The seminar will be offered in both McCormick and Next House in fall 2009, with four senior women advisors representing DUE, DSL, Resource Development, and the Office of Major Agreements.
- Work with IS&T to define, develop, and program an online CAP petition and review system. The savings in time, effort, and printing will be defined as we look to move to a paperless process.
- Further expand advisor training and professional development to include not only freshman advisors but also undergraduate advisors; key departments have been identified to participate in a pilot of specific workshops designed to support major advisors.
- Upon receipt of the final detailed analysis by TLL on the comprehensive survey of MIT undergraduates and their UROP participation, develop programming in response to the findings and identified issues.
- Continue implementation of the financial aid initiative that guarantees financial support for one UROP position to scholarship recipients during their MIT careers; based on lessons learned from tracking, data collection, and analysis, respond to ensure efficacy of this program and participation of strategic populations.
- Continue to define and implement programs under the holistic theme umbrella that augment the student experience and produce the leaders of the future; almost 50 programs or projects have been proposed that encompass advising, mentorship, leadership development, reflection, and self-awareness; proposals must be developed and prioritized for implementation. Numerous creative and significant collaborations are expected to result from these efforts.
- Develop and market IROP, with the aim to expand participation in this global opportunity to 45 students in AY2010; work closer with faculty to increase the summer research opportunities.
- Explore the opportunity of cosponsoring the Boston Undergraduate Research Symposium with Harvard on an ongoing basis. The inaugural symposium included students and faculty from 10 area universities and was a successful event that showcased undergraduate research accomplishments.
- Develop and organize a colloquium on women in leadership. Three speakers will be scheduled for fall 2009, with a spring program to follow.
- Work with OME to develop strategic programming for underrepresented minority student engagement, and a thorough analysis of the UROP survey data pertaining to this population and its UROP experiences and participation.
- Define future initiatives sponsored by the joint DUE/DSL committee to facilitate cooperation and collaboration on projects integrating student life and learning.

- Continuing the planning and execution of UROP's 40th anniversary celebration throughout 2009.
- Exploring online testing systems and a paperless mailing to both increase efficiencies and reduce expenses.

### **Staffing Changes**

One new hire was made in AY2009. J. Alex Hoyt was hired as an administrative assistant; he provides support for UROP and the Amgen Scholars Program. Additionally, Alex dedicates 20% of his time in support of new student programming. Leslie Bottari was promoted from administrative assistant to staff associate for undergraduate advising. Additionally, Elizabeth Young and Donna Friedman were promoted from assistant deans to associate deans in recognition of their contributions and the significant increase in their responsibilities over time.

**Julie B. Norman**

**Senior Associate Dean for Undergraduate Education**

**Director, Office of Undergraduate Advising and Academic Programming**

*More information about the Office of Undergraduate Advising and Academic Programming can be found at <http://web.mit.edu/uaap/>.*