

## War clouds hover over campus

### Clay: Respect other opinions

Members of the MIT community must maintain "civility and mutual respect in class, work and living settings" over the next few months as individuals and groups on and off campus react to national and international developments.

The request was made in an open letter dated March 13 that was addressed to faculty and students and signed by Chancellor Phillip L. Clay, Dean for Undergraduate Education Robert P. Redwine and faculty chair Stephen Graves.

The letter noted that MIT anticipates extraordinary activities and events, including demonstrations and walkouts, and respects the rights of members of the community to express their views.

The letter emphasized the ongoing importance of building community at MIT, urging sensitivity where differences occur.

"We have students, staff and faculty from dozens of countries and from a variety of ethnic and religious backgrounds," Clay wrote. "We have members of the community in the military. Passionate speech and public

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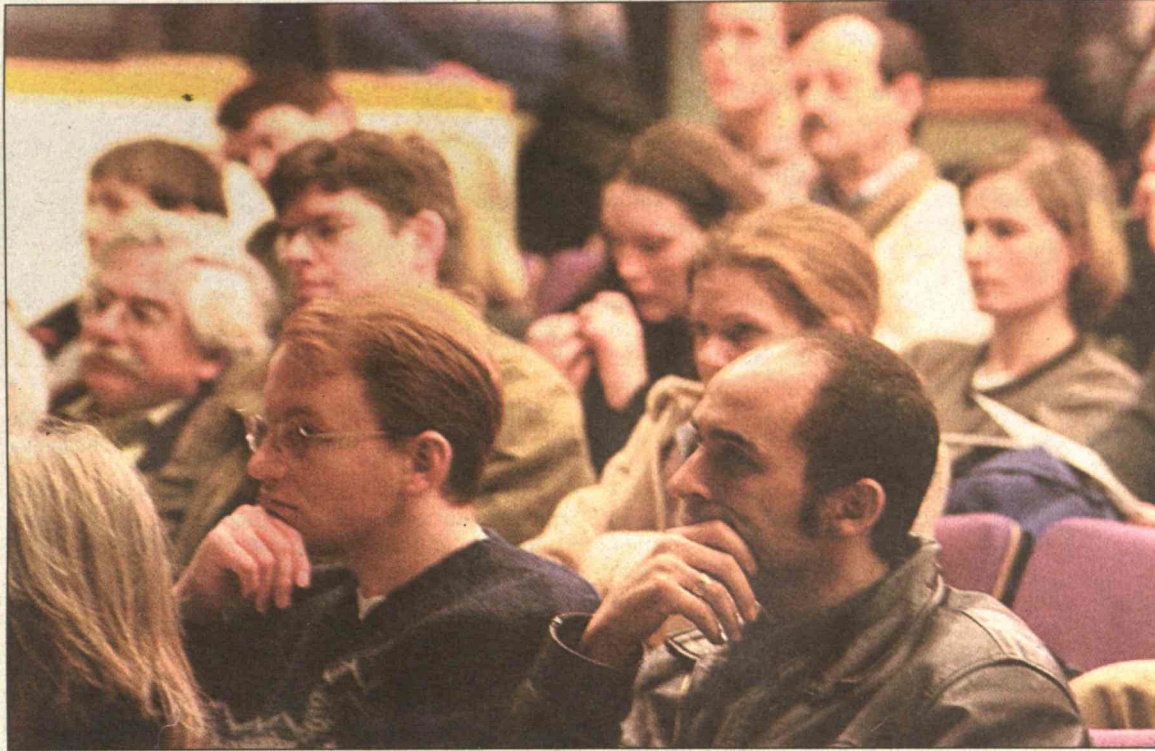


PHOTO / DONNA COVENEY

MIT audience members listen intently as U.N. weapons inspector Rocco Casagrande discusses his recent experiences in Iraq. See story on page 4.

### MIT won't shut down

Robert J. Sales  
News Office

With war in Iraq imminent, MIT plans to remain open and operational during all levels of homeland security alert. The alert was raised to orange, or high alert, shortly after President Bush's speech Monday night.

Residence halls have developed evacuation plans and identified safe areas on the premises. If an emergency occurs, those charged with implementing the plans will be notified. Coordinators for nonresidential buildings have been appointed.

The MIT Police department has increased security at key locations on and off campus and has joined the Statewide Anti-Terrorism Uniform Response Network (SATURN), which includes state, federal and local agencies.

MIT Medical has protocols for emergencies and maintains close relationships with Massachusetts General Hospital and Mt. Auburn Hospital. MIT Medical's psychiatrists, psychologists and social

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### Where to get emergency information

In case of an emergency on campus, members of the community should go to the MIT home page at <http://www.mit.edu>, which will be automatically linked to the MIT

emergency web site. Information will also be available at 617-253-SNOW. Breaking news will be reported on the MIT News Office home page at <http://web.mit.edu/news>.

## Endicott team blossoms at spring show despite winter casualties

Victimized by a tough winter, the MIT Endicott House horticulture team lost most of its bulbs and perennials and had to improvise ground cover for the team's entry in the annual New England Spring Garden Show.

Nonetheless, the exhibit in Hall B of the Bayside Exposition Center won a bronze medal and was popular with the spectators during the show's first weekend.

The show runs daily from 10 a.m. to 9:30

p.m. through Sunday, March 23.

"We'll just have to work harder next year," said Steve Wiswell, horticulturist at Endicott House, a Dedham estate that MIT runs as a conference center. The team won two awards and a silver medal last year and six awards and a gold medal in 2001.

This year's Endicott House exhibit

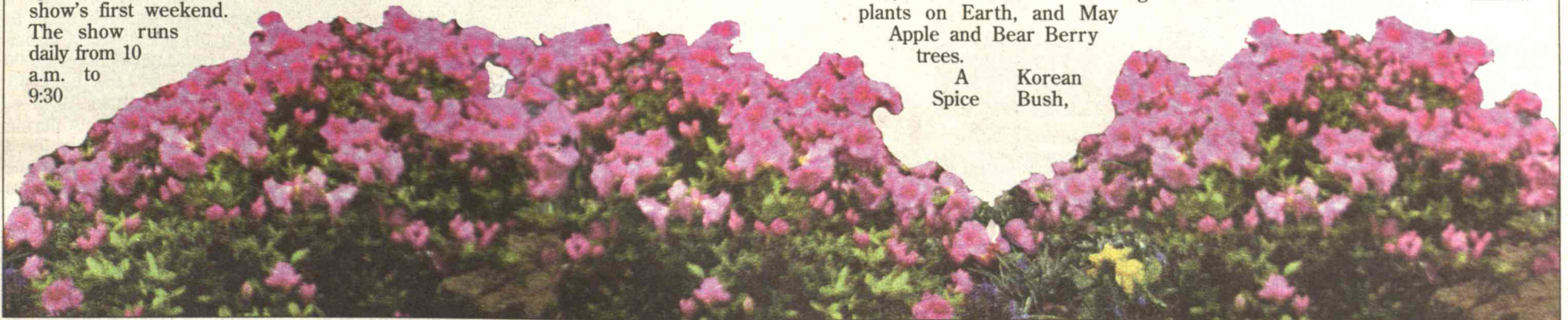
includes more than 300 specimens of 25 varieties of plants and flowers in a 14-by-40-foot plot. The exhibit is divided into two sections by a Chinese moon gate, with plants on one side from North America and specimens from the rest of the world on the other.

The North American section features a Bristlecone Pine from the Rocky Mountains, one of the oldest existing plants on Earth, and May Apple and Bear Berry trees.

A Korean Spice Bush,

whose sweet fragrance permeates the surrounding area, along with a Dawn Redwood and Pink Discovery Azaleas, with origins in the orient, brighten up the international area.

Besides Wiswell, Andy Turcotte, head of Endicott House grounds department, Tom Willard of grounds, and Dave Loud of conference services worked on the exhibit.



### NEWS — PEOPLE

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The Chorallaries vie for the a cappella national title.

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# Basal ganglia are brain's Dr. Jekyll and Mr. Hyde

Deborah Halber  
News Office

Habits tend to be "friendly little fellows" that help us coast through the day, says Ann M. Graybiel, the Walter A. Rosenblith Professor of Neuroscience in the Department of Brain and Cognitive Sciences.

But the same loop in our brains that helps us perform tasks on autopilot can go awry, causing problems ranging from Parkinson's disease and obsessive-compulsive disorder to addiction. On Monday, Graybiel delivered the 31st Killian lecture, "The Robot Within Us: Neural Mechanisms Underlying Habit Formation."

Graybiel, a principal investigator in the McGovern Institute for Brain Research at MIT, is recognized worldwide for her pioneering work on the architecture and neurochemical organization of the large forebrain region known as the basal ganglia.

"Even though it's buried under the cortex, the main output of the basal ganglia is to supervise the 'big boss' lobes of the cerebral cortex," the brain's executive responsible for the daily and long-term decision-making that shapes our lives, she said. A loop of signals and receptors help us select what to do and what not to do, and this system can be very powerful. This same loop is responsible for harmless rituals and uncontrol-

lable, debilitating compulsions.

The basal ganglia house the brain's dopamine receptors, and dopamine is a potent reward signal. "We lurch somehow through life between rewards and punishments," Graybiel said. In conditions where the ability to take up dopamine is lost, such as in Parkinson's disease, behavior and cognition are profoundly affected. In addition, drugs such as cocaine target these receptors and send them into overdrive, causing physical changes in the brain that are hard, if not impossible, to reverse.

Graybiel, who attended Harvard as an undergraduate, peppered her talk with good-natured digs at MIT's proclivity for numbers over words. "The first thing MIT undergrads do when they get up is turn on the computer," she said. "After that, everything is optional." Of the cerebral cortex, she said, "It's a phenomenal organ. It's sort of an MIT organ. We spend a lot of our time not on the plane but on autopilot."

A 2002 recipient of the National Medal of Science, Graybiel earned a Ph.D. degree from MIT in 1971 and has been a member of the faculty since 1973. She joins an impressive list of recipients of the James R. Killian Jr. Faculty Achievement Award, established by the MIT faculty in 1971 to recognize "extraordinary professional accomplishments" by members of the faculty and to honor Killian, former president and chairman of the corporation.



PHOTO / DONNA COVENEY

Ann Graybiel (left), professor of neuroscience and Medal of Science winner, is commended by faculty chair Stephen Graves prior to the Killian lecture Monday.

"Ann Graybiel has had a profound impact on research on the functional anatomy and physiology of the brain," Stephen C. Graves, the Abraham Siegel Professor of Management and chair of the faculty, read from the citation before

the lecture. "She is widely sought as a speaker because of the clarity and energy of her presentations and for her ability to make the complexities of the brain accessible to those who are not experts in the field."

## Help wanted: Undergrad survey responses

The Dean for Undergraduate Education invites all MIT undergraduates to participate in a web-based Consortium on Financing Higher Education (COFHE) survey about their experiences at MIT. Answers will be accepted through Monday, March 24.

The survey takes about 25 minutes to complete. The data will be confidential and participation is voluntary. Results are expected to be released mid-April and will be posted at <http://web.mit.edu/ir>.

The survey covers a wide range of topics, including time spent doing various activities in and out of the classroom, whether students believe their skills and abilities have changed since enrolling at MIT, and the sources of advice about academic, career and personal choices.

MIT's goal is to have 40 percent of the 4,066 undergraduates participate. By March 17, 32 percent had responded to the survey.

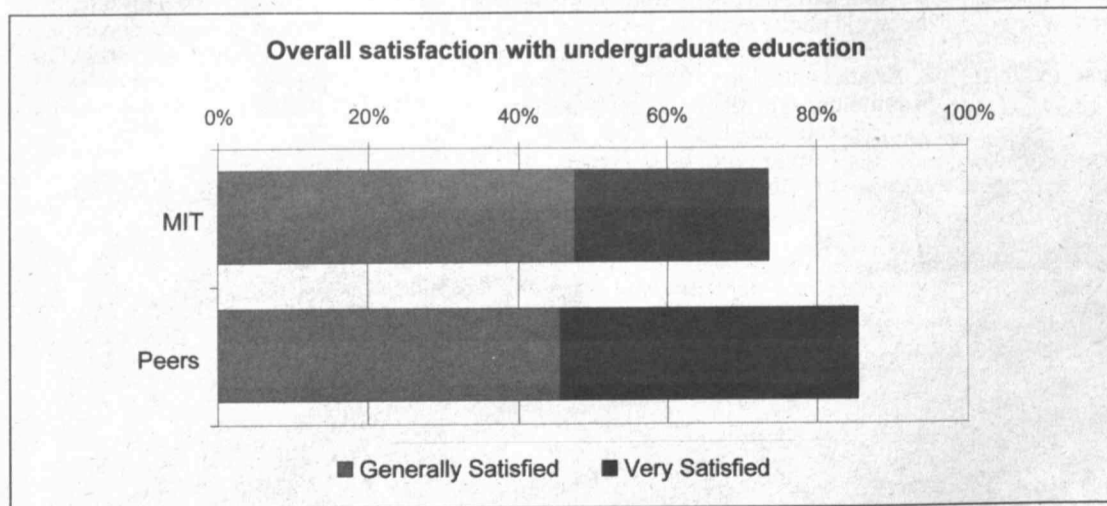
Ten percent of the MIT respondents will receive a \$25 gift certificate from the office of Provost Robert A. Brown. Students may choose an MIT Coop or Amazon.com gift certificate or a

deposit to their Tech Cash account. In addition to the gift certificates, five students will win a tour of the construction site of the Stata Center for Computer Information and Intelligence Sciences with the senior project manager for construction, Nancy Joyce. Other students will win a lunch with Chancellor Phillip L. Clay or Dean for Undergraduate Education Robert P. Redwine.

In the past, similar surveys have provided the impetus for changes at MIT, including modifications to the writing requirement and the dining program. MIT also learned that its students rate their experiences differently from many of its peers, including Harvard, Princeton, Stanford and Yale.

Twenty-eight of the 31 COFHE schools are participating in the current survey. In addition to MIT, COFHE members include the eight Ivy League schools, Stanford, Duke, the University of Chicago and Johns Hopkins.

The accompanying chart from a 2002 COFHE survey compares MIT seniors with seniors at peer institutions in overall satisfaction with their undergraduate education.



## Technology Licensing Office has terrific year, 'SuperWeek'

Denise Brehm  
News Office

The slump in the nation's mood and economy has not been accompanied by a slump in ideas at MIT. The Technology Licensing Office received 135 patents last year, making it second in the nation behind the University of California's 10 campuses, which had a total of 431 patents for the same period.

And one week last month, an invention licensed from the Technology Licensing Office (TLO) received FDA approval for a second use, while two other inventions went into Phase III trials. Professor Robert Langer was involved in all three of the inventions, and Professor Ram Sasisekharan was the principal investigator on one.

"All three of these events are relatively rare. Together their announcements made 'SuperWeek,'" said Lita Nelsen, director of the TLO.

"The number of patents [for 2002] is nice, but the feeling of celebration comes from those patents leading to real products—and companies and jobs—and, in the case of products, particularly ones that help people. We're bringing the results of research into the market and into daily life," she said.

The TLO staff of 30 didn't celebrate, Nelsen said. "Too busy." But clearly they're feeling the

results of a job well done. In 2001, MIT had 125 patents; the UC system had 402.

Caltech ranked third with 109 patents for 2002. Stanford is fourth with 104 in 2002; the University of Texas ranked fifth with 93. The numbers quickly drop after that, down to 49 patents for 10th-ranked Michigan State.

The product gliadel, licensed by Guilford Pharmaceuticals, has been used to treat one form of brain cancer and was approved by the FDA last month for treatment of another type of tumor. Gliadel is a dime-sized wafer placed in the brain to deliver chemotherapy as it dissolves (MIT Tech Talk Oct. 2, 1996). It was the result of 17 years of work by Langer, the Germeshausen Professor of Chemical and Biomedical Engineering, and colleagues.

Acusphere, an MIT startup, entered Phase III trials for a device that uses ultrasound to monitor glucose levels in diabetics, a Langer invention from 2000 (MIT Tech Talk March 1, 2000).

Neutralese, a drug used to neutralize anticoagulants during cardiac surgery, also entered Phase III clinical trials. It is one of several products to come from Sasisekharan's work with heparin (MIT Tech Talk Jan. 29, 2003). Sasisekharan is an associate professor of biological engineering. Neutralese is licensed by Biomarin Pharmaceuticals.

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# Speigelman's art is dark and demanding

Sarah H. Wright  
News Office

Cartoonist Art Speigelman, renowned for dark irony and demanding text, amiably discussed his own work, the history of comics and the possibility that MAD magazine was the "hidden cause" of anti-Vietnam War protests in two days of talks at MIT on Sunday and Monday, March 16 and 17.

"Comics have the power to fly under the critical radar and dive right into the brain. They get to the heart of what happens. They turn time into space. They're the power of still images in a world where everything is moving," said Speigelman, dressed in black and wearing an upside-down peace symbol pin.

The Sunday talk, titled "Comix 101," attracted an overflow crowd to Wong Auditorium. It was the 41st William L. Abramowitz Lecture at MIT.

Speigelman, 55, is best known for "Maus," his unique graphic cat-and-mouse tale of the Holocaust, which won the Pulitzer Prize in 1992. Until recently a designer for The New Yorker, Speigelman created the cover of the magazine immediately following Sept. 11, 2001. Its mournful twin black rectangles on a black background became an icon for the destroyed and unforgettable World Trade Center towers.

The twin towers still cast their shadow on Speigelman, whose home and studio are walking distance from ground zero.

Recalling the hours after the towers burst and fell, Speigelman said, "I wasn't going to be any good at pulling people out of the rubble, so I worked on that cover instead."

For solace and inspiration after Sept. 11, Speigelman, father of two, turned to comics such as "Hogan's Alley," a turn-of-the-20th-century slum scene. He showed one, "The Birth of Cruelty," to the MIT audience, noting, "You can see the moral outcome. The boy who was cruel to dogs gets hanged and dogs eat his intestines."

His current work is a glossy, densely drawn comic titled "In the Shadow of No Towers," published by the London Review of Books.

"It's my reporting on the war inside my own head. It's also my way of trying to assimilate what happened on September 11 and what's happening with this miserable adventure we're about to embark on," he said, referring to a looming U.S. attack on Iraq.

"September 11 taught me some lessons. One, cigarettes may not be what kills me. Two, I understood why the Jews didn't leave Germany after Kristalnacht: I loved New York. I wasn't leaving. And three, I was wasting my time doing anything besides comics," he said.

Speigelman discusses "Maus"

with a chef's delight in a good recipe: it came out well; it keeps working; it always brings pleasure.

"Comics are an architectural structuring; the stories are 'built' on the page like buildings. What I had to do in 'Maus' was find ways not to interfere with my father's storytelling and also to make the action clear.

"Using small frames bracketed inside larger frames allowed me to freeze time while my father was speaking and to compare times within his story. 'Maus' could be in both Poland and Queens," Speigelman said.

"Maus," Speigelman noted, was a product of its technological time; it was painstakingly hand drawn. Speigelman uses computer software to produce "No Towers."

A fan, a historian and a collector of comics, Speigelman offered a lineup of the cartoonists whose work had economy of text and images. Mainstream strips he liked included "Nancy," "Donald Duck," "Calvin and Hobbes" and even "Peanuts," for its "metronomic rhythm."

Speigelman singled out MAD magazine for its artistic and political impact.

"MAD inspired me; it was a big influence on 'Maus.' MAD brought us 'Mickey Rodent' to show how to question the authority of Mickey Mouse. MAD figured out how to balance satire and reporting, how to question all authority," he said.



“Comics are an architectural structuring; the stories are ‘built’ on the page like buildings. What I had to do in ‘Maus’ was find ways not to interfere with my father’s storytelling and also to make the action clear.”

Art Speigelman

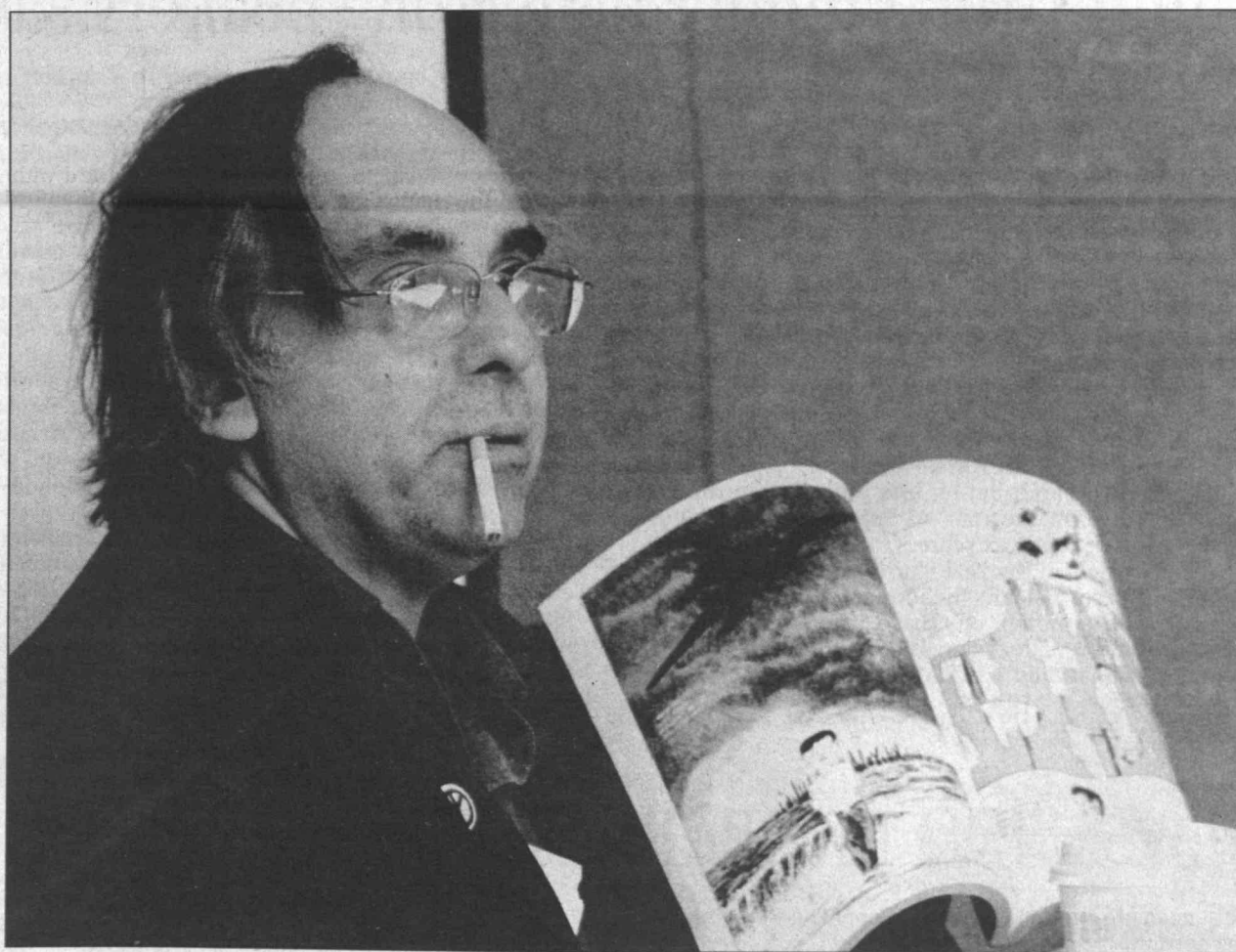


PHOTO / DONNA COVENEY

Art Speigelman makes a point by holding up one of his comics at a special session for MIT cartoonists.

IMAGE COPYRIGHT ART SPEIGELMAN

## Library administrator is a purposeful marathon participant

Greg Raposa of MIT Libraries ran the Boston Marathon on a lark a year ago, crashing the race as a "bandit" without a number.

This year he'll be running in the marathon on April 21 as a member of Team Brigham—with a number and a purpose.

"I am using this opportunity to thank Brigham and Women's Hospital for the excellent care they provided to my father during the last years of his life," said Raposa, the library system's facilities and operations administrator. "The staff of the hospital was always very accommodating and professional and I wanted to show my appreciation."

Greg's father, Frank, an MIT Facilities employee, died in 2001 at Brigham and Women's after a long battle with heart disease. He was treated for several years by the staff of the hospital.

Members of the Brigham and Women's team run to

raise money to support community health programs. Each runner has to raise \$2,500 by soliciting friends, neighbors, colleagues, strangers, lovers and anyone else they can think of to sponsor their effort. The deadline is May 15. "I need all the help I can get," said Raposa, who is from Plum Island.

Like many of his teammates, Raposa is not swift enough to earn an official number by completing a qualifying marathon in the required minimum time (at age 38 he would have to run a 26.2-mile course in 3:15). His unofficial time in last year's Marathon was 4:11. Members of charity teams receive an official number in exchange for their fund-raising efforts.

Raposa started marathon training in December with an eight-mile jog in 70 minutes. He will run 21 miles on the official course on March 29 from Framingham to Boston, which includes the hills of Newton.

"Not bad for a guy who started running to lose weight and because I didn't want to be another cardiac arrest candidate, since heart disease ran in my family," said Raposa, who is 5 feet 10 inches tall and weighs 200 pounds. Before he took to the roads in 1998, he weighed 240 pounds.

Members of the team train together Saturday mornings where the focus is the long run. Raposa runs five to six miles along the Charles River at lunch time four times a week.

During his workouts, he concentrates on breathing and form. "When I'm done, I think about eating junk food," he said. During the marathon he will think about how "thankful I am that I'm able to run and how I can get a number next year."

For additional information, see <http://www.geocities.com/gregraposa/teambrigham.html>.

# Proof of Iraqi weapons still elusive, U.N. inspector says

Sarah H. Wright  
News Office

Iraqi officials have opened doors of sites suspected of producing biological or chemical weapons to U.N. weapons inspectors, but proof positive that such weapons do not exist on Iraqi soil remains—and will likely remain—elusive.

Rocco Casagrande, chief of the Biological Analysis Lab for the U.N. Monitoring, Verification and Inspection Commission (UNMOVIC) from December 2002 to March 2003, provided an overview of the weapons inspection process and described his own experiences working in Iraq in a talk in Room E25-111 on Friday, March 14.

"In 1995, Iraq was the land of a million locks. In 2002, we had immediate access. But permission to get into sites is not the same as disarmament. Issues remain, such as: Where are several tons of missing growth media? Why doesn't the declaration of biological agents produced match Iraq's production capacity?" said Casagrande, who received the Ph.D. in biology from MIT in 2001.

Iraq pledged to get rid of its weapons following the 1991 Gulf War. Later it admitted to having a biological weapons program, resulting in the 1995 weapons inspections. These ended in 1998 and resumed in 2002.

Despite the slow pace and other frustrations, the inspectors provided a "benefit by their presence. It contains and inhibits Saddam's programs and it serves as deter-

rent to others who may be planning a biological weapons program," Casagrande said.

Casagrande used PowerPoint and color slides, a level tone and vivid analogies to bring to life his three months working among UNMOVIC scientists in and around Baghdad.

By analogy, the process is "like disproving the existence of unicorns. It's easy to do in this room. It's not so easy in California, where the trees hide everything and the Californians won't talk," he said.

On the likelihood that Iraq had destroyed its entire weapons-of-mass-destruction program, Casagrande said, "We need a robust paper trail. It's a decision inconsistent with their previous behavior."

Typically, an UNMOVIC inspection took between one and six hours, with tasks including interviews of facility supervisors and rigorous inventories of activities, equipment and reagents. Strategies for detecting weapons-of-mass-destruction activities ranged from sophisticated analyses of microscopic amounts of media to basic police work, such as "checking to see if the paper shredder was warm or the autoclaves had been used," Casagrande said.

Casagrande used Iraq's breweries to illustrate the challenges UNMOVIC teams faced, since the ingredients and processes used in beer-making could be utilized insidiously. A site could make "both beer and anthrax," he said.

"We looked for evidence that the site did what the Iraqis claimed: Did the brew-

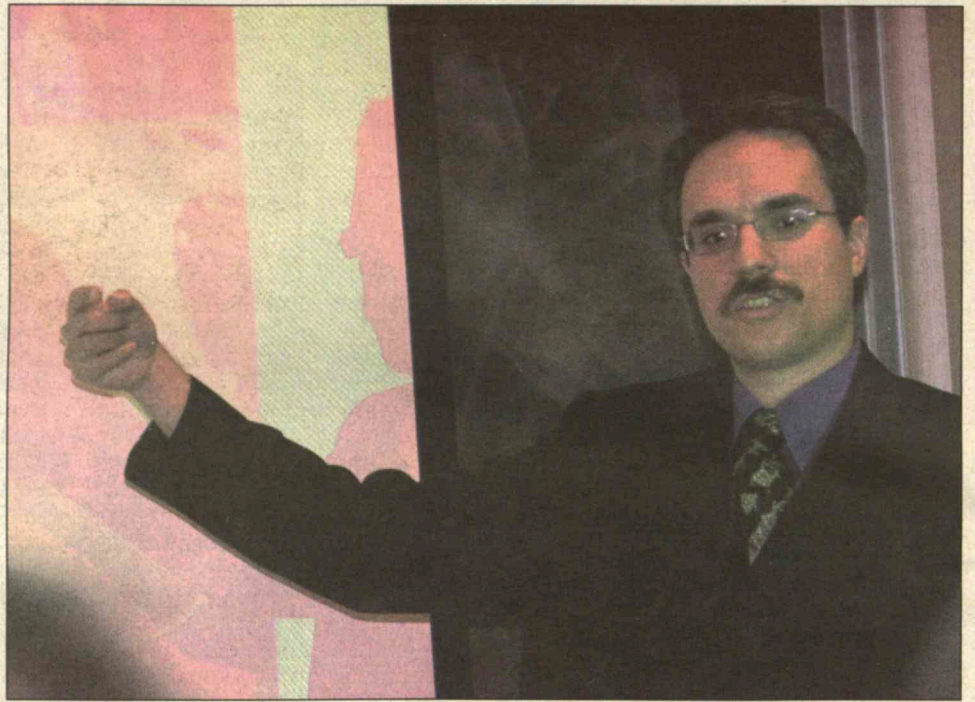


PHOTO / DONNA COVENEY

Iraqi leaders' claim that they have gotten rid of all of their weapons of mass destruction would be "inconsistent with their previous behavior," U.N. weapons inspector Rocco Casagrande said.

ery really make beer? If the equipment had a dual purpose, was it documented? Was the configuration of equipment consistent with beer-making? Most significantly, did the brewery or other site have the capacity to participate in a biological weapons program?" he said.

Among Casagrande's photographs from Iraq, his image of a cluster bomb

brought a gasp from the audience.

Casagrande himself wrote reports of UNMOVIC findings, transmitting them daily to the United Nations Security Council in New York. He emphasized he had no connection to the U.N. now and did not represent its views in his MIT talk, sponsored by the Center for International Studies Starr Forum.

# Research publication limits won't hinder bioterror, speakers say

Deborah Halber  
News Office

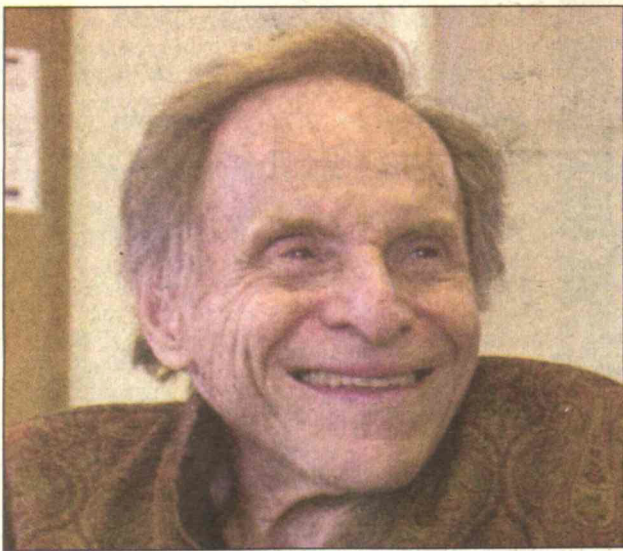


PHOTO / DONNA COVENEY

Institute Professor Emeritus Philip Morrison received the Hans Bethe Science in Public Service Award at a March 12 symposium.

As an experiment in obtaining the ingredients for chemical warfare, the staff of Scientific American had all the components of nerve gas delivered to their offices in midtown Manhattan.

"This was enough to kill thousands," said Scientific American editor-in-chief John Rennie. "It was all delivered and not one question was asked along the way."

Rennie and other speakers at a March 12 symposium at MIT said that limiting the publication of biomedical research to thwart would-be terrorists may not help because terrorism to date has not relied on advanced research but on less high-tech means such as airplanes, in the case of Sept. 11, and the postal system in the anthrax scare.

"Terrorists in the real world are not Dr. No with a lab in secret volcano headquarters, but more like lunatics in a garage or a cave," Rennie said. Kumar Patel, former vice-chancellor of research at UCLA, and chairman and CEO of Pranalytica, Inc., agreed:

"The danger comes not from science, but at the engineering and technology level."

The symposium addressed the question: What limits should be placed on biomedical research in response to security concerns?

Although editors of 32 research publications announced recently that they will "self-police" their own publications to make sure they are not printing information of use to terrorists, the speakers felt that this self-censorship was probably intended to head off government censorship rather than protect the public from a real terrorist threat.

At the symposium sponsored by the Federation of American Scientists and the MIT physics department, Institute Professor Emeritus Philip Morrison, distinguished physicist and science educator, was awarded the first annual Hans Bethe Science in Public Service Award.

For more than half a century, Morrison has been a leader in physics, national security policy and science education. A Manhattan Project physicist, he is a co-founder of the Federation of American Scientists, which conducts analysis and advocacy on science, technology and public policy.

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dialogue may make some people uncomfortable or even fearful about how open or welcoming our community is in fact.

"Therefore, we urge faculty to take the appropriate opportunities to address international issues and conflict in classes, open forums and other settings."

The letter emphasized the Institute's commitment to balancing the "interests and rights of all members of our community."

Their goal in writing the letter was to "convey our expectations on behavior and conduct with respect to classes and other academic exercises." The letter stated, "Disruptions in academic or work settings are never appropriate." The letter also called for civility and tolerance in campus residential communities.

Guidelines for students and faculty focused on being "mindful of the values we share as an academic community."

Students who participate in walkouts or protests remain responsible for keeping up with the work in their classes. "The process should be no different from what

happens under normal circumstances when a student needs to be absent," the letter said.

Faculty members are expected to be "reasonable and understanding. Given the extraordinary circumstances we may face with a war, we ask faculty to reflect on our overall educational mission and the welfare of our students."

The letter suggested that faculty "remind students about their expectations regarding attendance, assignments and exams, as well as to discuss possible contingencies in light of impending events." Should faculty elect to cancel classes for their own reasons, they should schedule and announce make-up classes. For "process guidance," faculty were referred to <http://www.crlt.umich.edu/tragedydiscussion.html>.

In describing the role of the MIT Police, the letter said, "While some officers will be on hand in the event of large demonstrations or similar activities, their focus is on public safety."

The entire letter may be accessed at <http://www.crlt.umich.edu/tragedydiscussion.html>.

## PREPARATION

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workers are available for individual and group counseling.

Housemasters, graduate resident tutors and residential life associates can provide advice and support for students as well as recommend other campus resources.

The Department of Facilities and the Office of Environmental Health and Safety team also have increased their emergency readiness.

In a message posted on its web site, the Committee on Community urged all members of the community to be prepared as well. "We encourage everyone to set up and keep with you an individual emergency plan, including phone numbers of family and close friends, important e-mail addresses and other concrete ways to contact them. Knowing schedules and likely locations of family and friends is an important element of such a plan," the panel said.

For additional information, see <http://web.mit.edu/community/participate/respond.html>.

## Students plan walkout

MIT students are organizing a campus-wide walkout from classes and offices to protest the war. Anne M. Pollock, a graduate student in the Program in Science, Technology and Society, is a member of a group of undergraduate and graduate students planning the walkout, which is to begin at 11:30 a.m. on the day after war begins. "It's our ethical obligation," said Pollock of the walkout, which is planned to last one hour.

A memo from the MIT Anti-War Coalition stated that more than 800 students, faculty and staff have signed a pledge committing to the midday walkout.

Student organizers said the walkout will be followed by a rally on the steps of the Stratton Student Center; a solidarity march to Boston with Harvard, Wellesley and Tufts students; and a mass demonstration in Government Center. For more information, see <http://nowar.mit.edu>.

United Trauma Relief will be fund-raising for the humanitarian relief efforts in Iraq in Lobby 10 and in the Stratton Student Center for the rest of this week and after spring break.

# Hawaii trek blends hydrology, native culture

Elizabeth A. Thomson  
News Office

What do hydrology research and the cultivation of taro plants have in common? Both were part of an MIT expedition to Hawaii that mixed science with a liberal dose of native culture.

A team of 20 MIT researchers, including 15 undergraduates, traveled to the state in January for the fourth annual TREX (Traveling Research Environmental Xperience). The trip was organized and led by Sheila Frankel, assistant director of the Parsons Lab in the Department of Civil and Environmental Engineering. Another key participant: Professor Harry Hemond, director of the lab, whose skill as a commercial pilot came in handy.

In Hawaii the team collected data from land, sea and air in work that could have an impact on the state's management of fresh water. They also presented papers to state park officials and others on the herbicides used to control invasive species.

"Taking students into the field is a great way to get them excited about research and expose them to what field research is really like"—including setbacks, said Frankel. In Hawaii, for example, rough seas canceled deployment of one instrument for tracking current direction and speed.

In the hydrology research, the team joined forces with alumnus Kao Duarte (Ph.D. 2002), a native Hawaiian who is now a professor at the University of Hawaii. The goal is to calculate the amount and distribution of groundwater flowing into coastal waters. Groundwater is key to any island, as it's a major source of fresh water.

"If you know how much groundwater is flowing into the ocean, you can then estimate how much fresh water is available and develop strategies for sustainable management of groundwater use," Frankel said.

But while the state has models to gauge rough averages of groundwater flow, no one has ever determined the exact source and quantities of the groundwater coming into the ocean. If it works, the MIT technique could do so. Regardless, the data will contribute to Duarte's research into groundwater usage on the dry western coast of Hawaii's big island.

In one part of the work, the undergraduates, led by Frankel and Associate Professor Bettina Voelker, took salinity measurements in traditional fishponds and in adjoining coastal waters with instruments including GPS receivers and radios and the aid of kayaks and a motor boat. Areas of lower salinity would correspond to influxes of groundwater.

In the air above them were Frankel's husband, Donald (Ph.D. 1974), a chemical physicist, and Hemond. The two made overflights in a Cessna 172 with a FLIR (forward-looking infrared) camera to map temperature changes along the shore. They hope to prove that cold spots in the images indicate groundwater intrusions.

"The infrared images will be compared with the ground [salinity] measurements to see if it is possible to [correlate the two]," said Hemond, the Leonhard Professor of Civil and Environmental Engineering. If so, this would allow researchers to "conduct such studies over larger reaches of coastline from the air."

The team was also exposed firsthand to native culture, thanks in large part to Frankel's creativity. She volunteered everyone to weed invasive plants for the Kokee Resource Conservation Program in return for four days of free lodging at an original Civilian



MIT students weed a taro field at the farm of Kia Fronde (standing at left rear), who introduced them to native culture and agriculture as well as hydrology.

Conservation Corps camp in Kokee State Park on Kauai. The students also presented papers on herbicides to a rapt audience of Conservation Program volunteers and state park officials.

And then, of course, came the taro fields. After hiking an hour down a steep trail and through a shallow river, the team reached the farm of Kia Fronde in Waipio Valley, Hawaii ("I never would have done it if I'd known

“  
If you know how much groundwater is flowing into the ocean, you can then estimate how much fresh water is available and develop strategies for sustainable management of groundwater use.

Sheila Frankel

Assistant director of the Parsons Lab

it would be that hard," said Frankel). Once there, they cultivated the fields, which involved a morning in the knee-deep mud in which the plants thrive. Their reward? A lesson in native hydrology from Kia and a feast that



Students Amanda Sorenson, Amber Jaycocks, Barbara Southworth and Andrew Yip calibrate a hydrolab before going out on kayaks to take water quality data.

included French-fried taro chips.

The expedition was sponsored by the Northeast Educational Foundation, the Alumni Fund of MIT and Dean of Engineering educational funding.

# Screen for protein developed at CCR revolutionizes proteomics

Deborah Halber  
News Office

Now that the human genome has been mapped, researchers are looking at protein kinases—protein-modifying enzymes involved in cell division—to understand how cells regulate protein activity in normal and disease states and help analyze the genome. MIT researchers at the Center for Cancer Research (CCR) have created a screen for proteins that has been described as a revolution in proteomics.

The screen, reported recently in *Science*, identifies mechanisms by which protein kinases work and provides new targets for drug design. The work is funded by the National Institutes of Health.

"A single screen generates three pieces of information simultaneously," says author Michael B. Yaffe, assistant professor of biology at the CCR. "It identifies new modular domains involved in cell signaling; it reveals the sequence motif recognized by the domain, allowing cell signaling pathways to be constructed using bioinformatics; and provides lead compounds for drug design."

Members of the polo subfamily of protein kinases, polo kinases appear to play pivotal roles in cell division and proliferation.

"While the screen revealed a new domain in polo kinases,

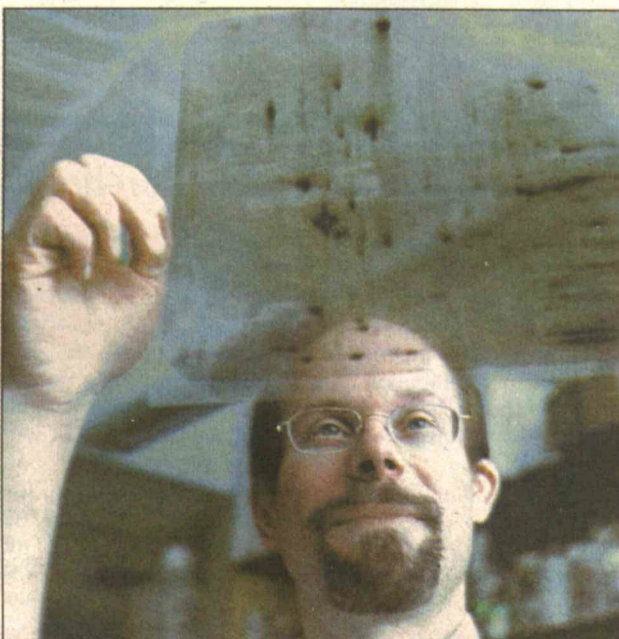


PHOTO / DONNA COVENEY

Professor Michael Yaffe surveys a gel in his lab at the Center for Cancer Research.

es, it is now being applied to reveal a host of other, as-yet-unknown domains that control cell signaling," Yaffe said. Co-authors include Andrew E. H. Elia, a graduate student in the MIT-Harvard Division of Health Sciences and

Why are polo kinases important? They are one of the most critical kinases that control cell proliferation, and they are up-regulated in almost every type of cancer.

Technology, and Lewis C. Cantley of Harvard.

Why are polo kinases important? They are one of the most critical kinases that control cell proliferation, and they are up-regulated in almost every type of cancer. "At least five major pharmaceutical companies have projects focusing on developing polo kinase inhibitors, so our new domain is likely to emerge as an excellent target," Yaffe said. "This screen could help design small molecules that target regulatory protein kinases."

# Deep-sea pioneer dives into history

Dehise Brehm  
News Office

Sounding like a true adventurer, Don Walsh, the Navy commander who piloted the first submersible in its dive to the deepest spot in the ocean four decades ago, spoke at MIT Friday evening, March 14.

Almost immediately after being introduced, Walsh apologized for limping, explaining that he had bruised his leg while chasing Hooker's sea lions in Antarctica recently, during one of his 18 Antarctic expeditions on a Russian nuclear icebreaker. You could hear a collective chuckle escape from the audience as people realized that Walsh was the real McCoy, sort of an Indiana Jones of the sea with a near-perfect sense of comic timing.

"I am a senior citizen," he said, "but I don't usually limp this badly." Walsh, who wore slacks and a short-sleeve shirt with a zip-up fleece vest, didn't particularly look like a pioneer, but he sure sounded like one. Nowadays, he's working on a plan to sell seats to tourists who want to ride a submersible on a dive at the North Pole. The "real" North Pole is at the bottom of the sea, he said.

Even his interest in Hooker's sea lions seems a perfect fit. Like Walsh, the Hooker is an adventurer, it takes deeper dives than any other sea lion or seal.

Walsh piloted the Trieste on January 23, 1960, the day the bathyscaphe slowly dropped 35,800 feet—nearly seven miles—to softly touch the bottom of the ocean at Challenger Deep, the lowest spot in the ocean. (Challenger Deep is named after the British survey ship that measured it, just off the Marianas Islands in the Pacific Ocean near Guam.)

The trip down took four and a half hours. They traveled slowly so they wouldn't hit bottom with a crash. Walsh said they were expecting the dive to be 35,800 feet, but "finally found the bottom 2,000 feet deeper" at 37,800 feet. It wasn't until later he discovered the gauge used to take the original measurements had been calibrated for fresh water, explaining the 2,000-foot discrepancy.

Walsh, who has a Ph.D. in oceanography and an M.S. in political science, and the Swiss scientist Jacques Piccard stayed on the bottom just 20 minutes before beginning the three-hour trip to the surface by releasing iron-shot bal-

last from the submersible, which used tanks full of 22,500 gallons of gasoline for buoyancy. He showed a photo of the himself and Piccard inside the 17-cubic-foot cabin "about the size and temperature of the average household refrigerator," he said.

Both men ate chocolate during the eight-hour trip, Walsh said. Piccard preferred Nestle while Walsh munched on Hershey bars.

The talk in Room 66-110 was hosted by MIT's Deep Sea Archeology research group, led by Professor David Mindell of the Program in Science, Technology and Society.

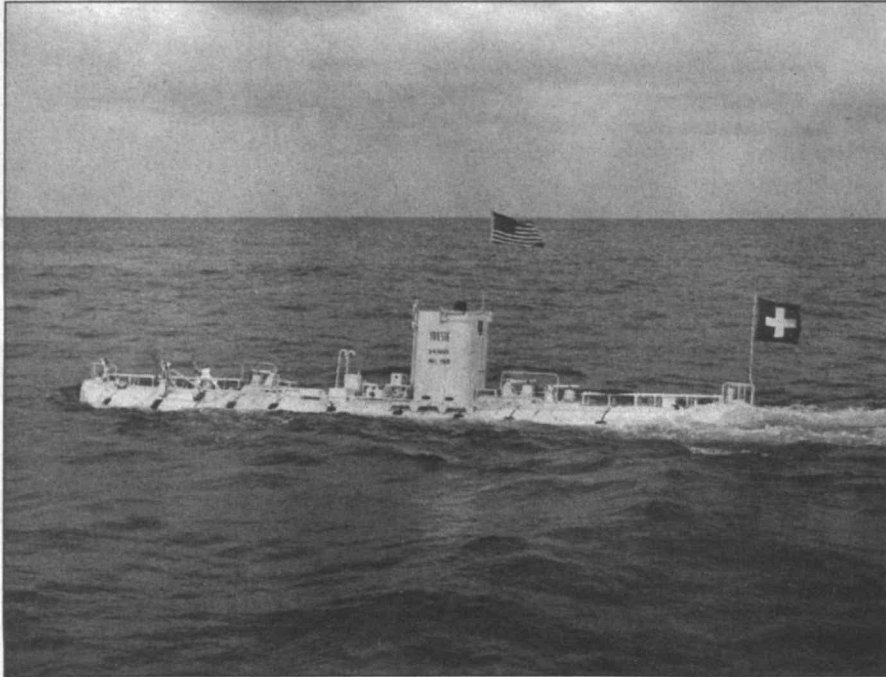


PHOTO / U.S. NAVAL HISTORICAL CENTER

The U.S. Navy bathyscaphe Trieste under tow, en route to a deep water dive in the Pacific on Sept. 15, 1959. Commander Walsh said the vessel flew both the American and Swiss flags to symbolize the joint venture.

## Institute Professor John Deutch betting on fuel cells

Deborah Halber  
News Office

While fuel cells may hold promise as a source of energy in the future, much needs to be accomplished before their potential is realized.

Institute Professor John Deutch made that point on Wednesday, March 12, in a talk on "Fuel Cell Applications" in Wong Auditorium. The session was sponsored by the Laboratory for Energy and the Environment.

"I believe fuel cells will become an important part of the energy picture of the United States, but it will be a technological challenge to make it so," Deutch said. "Each problem [facing fuel cells] requires a half-dozen innovative MIT students to solve it."

A fuel cell is like a battery that never needs recharging. It consists of two electrodes sandwiched around an elec-

trolyte. Oxygen passes over one electrode and hydrogen over the other, generating electricity, water and heat. There are several types of fuel cells, but only the alkaline fuel cell—used as a power source in space—is practical and cost-effective.

A fuel cell for a car can use hydrogen produced from any hydrocarbon fuel, but no cars have been designed with on-board reformers to make their own hydrogen. The hydrogen has to be supplied from methane, natural gas or petroleum, but because the fuel cell relies on chemistry and not combustion, emissions from this type of a system would still be much smaller than emissions from the cleanest fuel combustion processes.

While fuel cells are more efficient, simpler, cleaner and quieter than other energy sources, they are not yet cost-effective and their reliability for use in transportation has not been proven in the long term.

At the moment, advanced internal combustion engines have an edge in efficiency over fuel cells, Deutch said. If everyone switched to a hybrid vehicle such as the Toyota Prius, Americans could significantly cut their consumption of petroleum products.

The solid oxide fuel cell, which operates at elevated temperatures, is most promising for future use, Deutch said. He believes this system, which would be a large-scale, stationary power source for buildings, could be economically attractive. Producing advances in fuel cell technology requires expertise from fields including chemistry, mechanical and electrical engineering, materials science, economics, system design, and modeling and simulation, Deutch said.

Because the problems fuel cells present are so interdisciplinary, Deutch said, they are a perfect teaching tool. "More research on fuel cells should be going on at MIT," he said.

### NEWS YOU CAN USE

#### Award nomination deadline looms

Nominations are still being accepted for Institute awards to be presented at the annual Awards Convocation on May 13. The deadline for most nominations is Friday, March 21. Nominating procedures and deadlines vary for different awards, and some also have online nomination forms. For full descriptions of the awards and procedures, go to <http://web.mit.edu/awards>. Nominating letters may also be sent to the Awards Committee in Room W20-549.

#### Undergrad essay and traveler prizes

The deadline for submission of essays for the I. Austin Kelly III Essay Prizes and fellowship applications for Kelly-Douglas Traveling Fellowships is Wednesday, April 16 at 5 p.m. The two best historical, analytical or sociological essays of 15 to 30 pages written by full-time undergraduates will win \$800. The number of \$1,000 to \$1,500 traveling fellowships awarded to MIT juniors will depend on the number of applicants who are committed to a worthy project in the humanities or arts that requires travel, preferably during the summer of 2003.

Guidelines for both competitions are available in the music and theater arts office in Room 4-246 and at <http://web.mit.edu/mta/www/music/resources/kellyprize.html> and <http://web.mit.edu/mta/www/music/resources/kellytraveling.html>.

#### Airport shuttle rides offered

The Parking and Transportation Office will once again provide airport shuttle service for spring break. Shuttles will leave from Kresge lot every 30 minutes on Friday, March 21 from 10 a.m. to 5 p.m. and Saturday, March 22 from 9 a.m. to 4 p.m. Reservations are required; see the web site at <http://web.mit.edu/parking> for details and shuttle availability.

#### Library hours change for spring break

The MIT Libraries will have reduced hours during the spring vacation from March 22–30. Each library's opening times can be found at <http://libraries.mit.edu/about/hours.html>.

#### Quarter Century Club induction lunch

The MIT Quarter Century Club Induction Ceremony and Luncheon for new members will be held on Tuesday, April 1 at the Faculty Club (E52-6th floor) beginning at 11:45 a.m. New membership in the club is offered to the faculty, and administrative, research, support and service staff who will complete 25 years of service with the Institute by June 30. Those who believe they are eligible for membership but have not yet received an invitation to attend the Induction Luncheon may call the Community Services Office at 253-7914.

#### New Toastmasters chapter forms

A new chapter of Toastmasters International, open to all members of the MIT community, will meet Tuesdays from 6 to 7 p.m. in Room 2-131. Toastmasters International helps people improve their public speaking skills. MIT hosts three other chapters that meet afternoons and on Saturday. For information, contact Ruth Levitsky at [levitsky@mit.edu](mailto:levitsky@mit.edu) or 253-3399, or visit <http://web.mit.edu/personnel/toastmasters>.

## Obituaries

### James Petroni

James Petroni of Melrose, a former houseman in the Housing Office, died on Feb. 19 at the age of 79. He retired in 1986 after 20 years at MIT. He is survived by a sister, Helena Melville of Malden; a brother, Albert J. of Somerville; and several nieces and nephews. A graveside service was held at Wyoming Cemetery in Melrose on Feb. 25. Gifts in his memory may be made to St. Jude Research Hospital, Box 6818, Memphis, TN 38101.

### Jethro Williams

Jethro Williams of Dorchester, a former custodian at Lincoln Laboratory, died on Feb. 20 at the age of 76. He was hired in 1972 and retired in 1991. Survivors include his wife, Rosa Lee Williams.

### Lawrence Ryan

Lawrence Ryan of Daytona Beach, Fla., died on March 6 at the age of 90. He began working at MIT in 1936 and was a senior technical staff member in the Research Laboratory of Electronics when he retired in 1974. Information on survivors was unavailable.

### ▶ HERE AND THERE

#### Environmental negotiation book

For 14 years, scholars from MIT, Harvard and Tufts have taught a graduate-level seminar sponsored by the Inter-University Program on Negotiation at Harvard Law School. Each year, graduate students in "International Environmental Negotiation" selected a particular environmental negotiation case to analyze and present. The best of the papers were included in an annual series published by the program; now, a collection of the "best-of-the-best" from that series is available in a new book, "Transboundary Environmental Negotiation: New Approaches to Global Cooperation" (Jossey-Bass, 2002). The seminar is co-taught by Lawrence E. Susskind, the Ford Professor of Urban and Environmental Studies at MIT and a co-founder of the Program on Negotiation.

Scholars in the seminar have analyzed how global issues including ozone depletion, climate change, deforestation, acid rain, ocean dumping and expansion of the world's deserts can be addressed through transbound-

ary negotiation. The book is available directly from the publisher (<http://www.josseybass.com>) or from the clearinghouse of the Program on Negotiation (<http://www.pon.org>).

#### Tissue scaffolding a bright idea

Biodegradable organ tissue scaffolding, invented by Robert Langer and Jay Vacanti in 1986, was placed in the company of Tupperware, the paper bag and the telephone last month in Boston magazine's list of the Commonwealth's brightest ideas, displayed under the heading "Revenge of the Nerds." The list was on the same page as an article about the Eureka Club, a suburban support group for inventors. Other items on the eclectic list were the sewing machine, coffee percolator, carbon-filament light bulb, basketball, frozen food, rocket, chocolate chip cookie and the bar code. Langer is the Germeshausen Professor of Chemical and Biomedical Engineering, and a winner of the Draper Prize for engineering.

# Chorallaries move up in a cappella competition

Lynn Helnemann  
Office of the Arts

March madness is in full throttle and the Chorallaries of MIT are vying for the cappella national crown. After winning the quarter-finals of the international championships, the singing group will compete in the semi-finals on Saturday, March 22 at 8 p.m. in Kresge Auditorium.

"We're incredibly excited to be singing at home in Kresge," said group director Emily Vincent, a junior in electrical engineering and computer science. "We also feel we have a leg up because we've sung in Kresge and know the auditorium."

The 15-member (eight men and seven women) ensemble, earned its spot in the semi-finals by beating five other Northeast teams at the ICCA quarter-finals March 1 in Chicopee, Mass.

As required by contest rules, they'll perform the same three songs that won March 1, each of which also won an individual award. Junior Bo Kim took best solo for "1000 Oceans" (originally by Tori Amos). "Wherever You Will Go" (originally by The Calling) won best arrangement, and sophomores Leah Premo and Emily Vincent won a judges' discretionary award for best duet for The Weather Girls' "It's

Raining Men." In addition, the entire group got a discretionary award for "best transitions" for the skits between songs. (In an earlier round, graduate student Mike Stevens of the MIT/Wellesley Toons, won the award for Best Vocal Percussion.)

The Chorallaries will compete against Brandeis, Northeastern, two Boston University groups and Amherst College.

"They're all fantastic," said Dan Bersak, who was awarded the S.B. in humanities and engineering last month. He hopes for a large turnout of MIT fans, hoping to influence the judges with a powerful audience reaction. "Packing the house with fans would give us a greater chance of being able to represent MIT at the national level in New York," said Bersak.

Group members postponed their spring break vacations in exchange for a rigorous rehearsal schedule—three hours each night, Sundays to Thursdays since the end of February. The extra rehearsals "represent a huge effort and a tangible hit to most of our GPAs," said Bersak.

The finals for the grand championship will be held in New York on April 26.

Tickets for the March 22 event are \$8 (\$5 for students) and are available through <http://www.varsityvocals.com/icca/shows.html> or at the door.



PHOTO / JON HYDE

Freshman Alexander Del Nido and junior Emily Vincent perform a special bonus presentation of the "Engineers' Drinking Song" at the March 1 quarter-final competition.

## Harbison fulfills 'secret desire' to conduct MITSO after 34 years on music faculty

Institute Professor John Harbison, who has been on the music faculty since 1969, will make his debut as a guest conductor with the MIT Symphony Orchestra (MITSO) on Thursday, March 20.

"I've always harbored a secret desire to conduct MITSO," he said. "Every time I

work with MIT students I realize what an interesting, exhilarating group of people they are to work with. They have a sort of hurdle-jumping mentality."

The orchestra will perform Brahms' Violin Concerto, with Harbison's wife, Rose Mary, as the soloist. The concert

also will feature a piece by Assistant Professor Brian Robison called "Imagined Corners."

"Brian's piece is very colorful and fascinating to hear," Harbison said. "It's based on real-world sources, from the sounds of chimps in a jungle to an Irish folk song. It's also a very difficult piece. I tried to make a few suggestions to make things easier for the orchestra, but the students wanted no part of it. They wanted to play it as it was meant to be played."

That's the MIT scientific mentality, he said—"not doing things the easy way, and doing it thoroughly in the way that it has to be done."

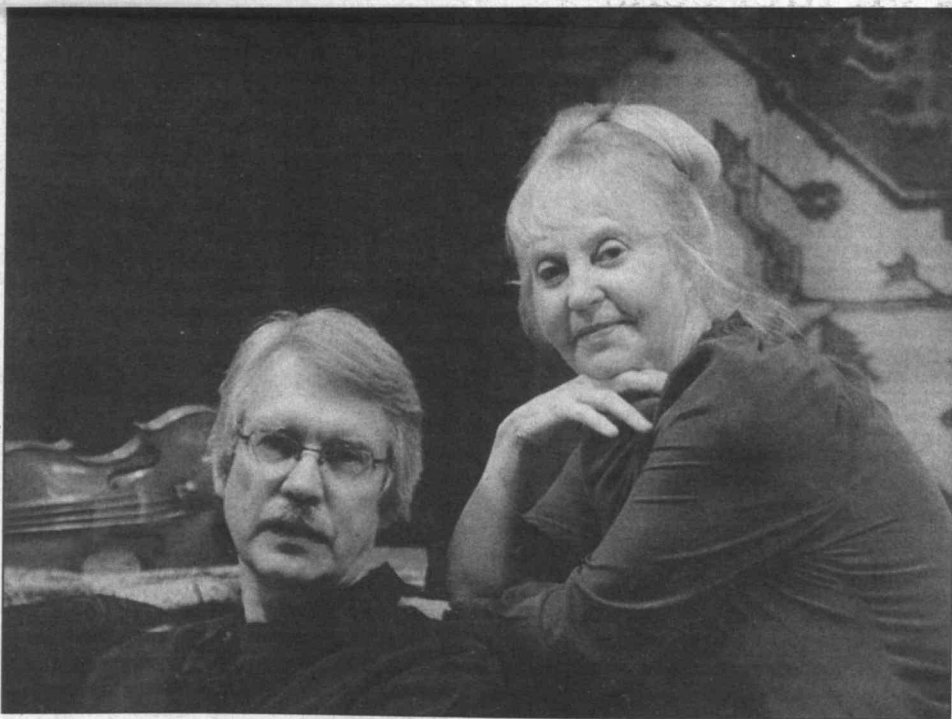
The March 20 concert will also include Brahms' "Violin Concerto" with John's wife, Rose Mary Harbison as soloist.

Later this spring, on May 9, MITSO will perform Harbison's "Piano Concerto" with soloist Judith Gordon and guest conductor David Alan Miller.

"That they'll engage with a piece of mine is giving me a huge kick," Harbison said. "I hope they'll like my concerto, but what's important is that they engage with it." The concerto won the Kennedy Center Friedheim First Prize in 1980.

"During my time at MIT, since I haven't had any big pieces played by MITSO; it's been hard for people to figure out what I do," he said. "It seems like this semester what I do is finally connected to the community. It's the most enjoyable term I ever spent at MIT—a very gratifying, exciting term."

—Mary Haller, Office of the Arts



Institute Professor John Harbison (left) will conduct the MIT Symphony Orchestra on March 20 while his wife, Rose Mary, performs as a soloist in Brahms' Violin Concerto.

### ▶ ARTS NEWS

#### Modern Orchestra premieres work by MIT lecturer

Music and theater arts lecturer Elena Ruehr's "Ladder to the Moon," premiered by The Boston Modern Orchestra Project on March 7, won a glowing review from the Boston Herald. "Inspired by a Georgia O'Keeffe painting, Ruehr beautifully captured the combination of spaciousness and unseen dread that fills much of that artist's work," wrote T.J. Medrek. "Underneath the music's surface serenity, in which short phrases were passed around the orchestra in a jazz-like manner, was a primal energy that built to a powerful climax both thrilling and disturbing—rather like life itself."

#### Deveau concert well received

Senior lecturer David Deveau's performance of works by Professor Peter Child at the Steinway artists gala at Symphony Hall March 15 was singled out in a Boston Globe review of the event. "David Deveau deserved applause for presenting three of Child's ingenious pieces from 'Doubles,' and for playing them so deliciously."

#### Role reversal

A March 12 Tech Talk article about Shakespeare Ensemble's production of "Antony and Cleopatra" incorrectly stated that Matthew Lehar was playing messengers and a soothsayer in addition to Octavius Caesar. In fact, senior Jennifer Martinez is playing the roles of messengers to Antony, Caesar and Cleopatra; a Soothsayer; Varrius; Soldier of Antony; and Dolabella. Lehar is portraying Octavius Caesar.

### CLASSIFIED ADS

Members of the MIT community may submit one classified ad each issue. Ads can be resubmitted, but not two weeks in a row. Ads should be 30 words maximum; they will be edited. TechTalk ads are posted on the Internet. Submit by e-mail to [ttads@mit.edu](mailto:ttads@mit.edu) or mail to Classifieds, Rm 11-400. Deadline is noon Wednesday the week before publication.

#### FOR SALE

Power/hand tools. Delta 10" UniSaw 3HP motor, 110/220 volts, \$300. Porter-Cable 4x24 belt sander, \$50. Hand router, \$20. Two power planners, \$25. Prices neg. David Wilson, 617-361-6608.

Tiffany style ceiling light w/globe bulb. Purchased at Wolfers Lighting, shades of violet, magenta, green and olive green, like new, vry pretty, \$75. Elaine, 781-643-4176 (lv msg).

Blue Rowe couch. Bought at Jordan's Furniture, gd cond, 3 back/3 seat/2 side cushions, 84"Lx40"Dx30"H. Orig paperwork, Scotchguard

plan, non-smkg/pet hsehold. \$450. 617-521-9279.

Bike. Looks gd, runs well, gd price, \$40. 19" Zenith color TV w/remote and manual, exc set, \$50. 781-893-3377 or [k1cei@arrl.net](mailto:k1cei@arrl.net).

Tekronix 485, two channel analog 350 MHz oscilloscope. Refurbished and re-calibrated, \$450/bst. Paul Lindsay, 617-244-4328 or [paul@lindsay.com](mailto:paul@lindsay.com).

Queen-sz futon frame and mattress. Plain, unbleached wood frame. Mattress in gd cond, \$75. [Weis@ll.mit.edu](mailto:Weis@ll.mit.edu) or 781-662-1580 (eves).

#### HOUSING

Cambridge: Two 1BR apartments; both completely furn w/gd stuff. Walk to MIT and Kendall Sq. One is a loft w/roof deck, \$1,200/mo. Other is larger, w/yard, \$1,400/mo. [johnnatale@aol.com](mailto:johnnatale@aol.com) or 781-729-7725.

Somerville: 2BR apt, hdwd flrs, mod kitchen, porch, skylights, prkg, mins to buses/Davis Sq,

\$1,400/mo. 617-666-5805, [dekow@psfc.mit.edu](mailto:dekow@psfc.mit.edu) or <http://mywebpages.comcast.net/gdekow>

Woburn: 3BR duplex, hdwd flrs, bsmnt, w/d hookup, lrg yard, off-stret prkg, quiet location, \$1,450/mo. John, 617-969-2129.

Arlington: Lrg 3BR apt in 2-fam hse. Hdwd flrs, w/d hook-up, storage, 1 prkg place. Easy T/bus/bike path access. Non-smokers. Avail 4/12, \$1,750/mo. [mittim7@aol.com](mailto:mittim7@aol.com) or 781-646-9699.

Belmont: Fully-furn bedrm study (single) in prvt home. Share bath, light kitchen privileges, on transportation. Visiting scholars, non-smokers, intl guests welcome. For dates and availability, Mrs. Wolf, 617-484-6455.

#### VACATION

White Mountains, NH: 3BR, 2b twnhse, sleeps 8, nr Waterville/Loon/Cannon/Tenney mtns. Panoramic views, athletic ctr, htd pools, hot tub, saunas, fitness ctr. No smoking/pets. Avail wknd or wkly. [snowood\\_view@attbi.com](mailto:snowood_view@attbi.com)

Old Orchard Beach, ME: 4BR cottage, 100 yds to beautiful 7-mile beach, nr coastal marshes/biking/arcades. South of Portland. \$1,600/wk in July and Aug, \$1,500/wk in June or Sept. 617 298-5460.

#### WANTED

Visiting faculty member seeks 2-3BR rental for 2003-04 academic yr. 2 parents and 2 children (ages 2 and 5). Prefer family friendly area w/gd public school system. Carol Horton, 773-975-7764 or [chorton@erikson.edu](mailto:chorton@erikson.edu).

Rm or apt needed for visiting faculty member for the mos of July, Aug and Sept. Cindy, 253-7545 or [cindy@nano.mit.edu](mailto:cindy@nano.mit.edu).

#### MISCELLANEOUS

Experienced editor/proofreader/writer will assist you w/résumé/cover letter/research paper/thesis writing. Professional, timely, affordable. [e\\_diting@hotmail.com](mailto:e_diting@hotmail.com).

MIT EVENT HIGHLIGHTS MARCH 19 - 23

-  Science/Technology
-  Performance
-  Architecture/Planning
-  Humanities
-  Music
-  Exhibit
-  Reading
-  Special Interest
-  Business/Money
-  Film
-  Sports
-  Featured Event




**WEDNESDAY**  
March 19

 **Solar Power: Trends, Technologies and Innovations**  
Three perspectives: by former U.S. Secretary of Energy Dan Reicher, research engineer Edward Kern and Prof. Emanuel Sachs. 4:30-6:30pm. Rm 34-101. More info: 452-3270.

 **Student Recital**  
Ole Nielsen, flute; Karen Harvey, piano. Works by Copland, Jolivet and others. 5pm. Killian Hall. 253-2906.


 **"Suppose a form ..."**  
Opening reception. Abstract monotypes and paintings by Kathleen Cammarata. 5-7pm. Dean's Gallery, Rm E52-466. 253-9455.

 **"Wigstock"**  
Musicians perform alongside drag queens in this documentary about an annual festival. Sponsored by History, Theory and Criticism of Architecture and Art. 7:30pm. Rm 3-133.


**"XOXO"**  
by Kathleen Cammarata, at the Dean's Gallery through April 24.

**THURSDAY**  
March 20

 **Glori-Collver Jacobson and Sharon Wayne**  
Spanish and Latin American guitar music. Noon, MIT Chapel. 253-2906.

 **Ageless Quest**  
Professor Lenny Guarente on his book about the quest for a cure for aging. authors@mit. Noon. Rm E25-111. 253-5249.

 **Managing Diversity in Boston Public Housing**  
4-6pm. Rotch Library. 253-2024.


 **X-Ray Astronomy: The Early Pioneering Years**  
Walter Lewin. 4:15-5:30pm. Rm 10-250. 253-6259.

 **Counter-Architectures: Squatting, Surfing and Marcel Duchamp**  
Simon Leung. HTC Forum. 6-8pm. Rm 3-133. 258-8438.

 **"Dancer in the Dark"**  
International Film Club. 8-10pm. Rm 4-237. ifilm@mit.edu.

**FRIDAY**  
March 21

 **Examples of Innovation in Engineering Courses at Sydney University**  
Judy Raper, Univ of Sydney. Sponsored by Aero/astro. 2-3pm. Rm 33-116. More info: 253-1564.

 **"Ninja Training," "Would-be Terminators" and "A Magical Quest"**  
Sponsored by Anime Club. 7pm. Rm 6-120. More info: anime-inquiry@mit.edu.

 **The Winning Hand**  
Images from the Rad-Lab Negative Collection. Ongoing, MIT Museum. Free with MIT ID. 10am-5pm. 253-4444.

 **"Frida"**  
LSC. 7 and 10pm. \$3. Rm 26-100. More info: 258-8881.

**SATURDAY**  
March 22

 **Intercollegiate Figure Skating Competition**  
9am-9pm. Johnson Skating Rink.

 **Men's Heavyweight Crew vs. Boston College**  
Charles River. More info: 253-7946.

**SUNDAY**  
March 23

 **"Paul Pfeiffer" Gallery Talk**  
Hiroko Kikuchi. 2pm. List Visual Arts Center. More info: 253-4680.

 **"Rapid Eye Movement"**  
A short film by Runa Islam. Noon-6pm. List Visual Arts Center.



**Spanish Guitar Concert**

Glori-Collver Jacobson and Sharon Wayne will perform Spanish and Latin American guitar music at noon March 20 in the MIT Chapel.

Go Online! For complete events listings, see the MIT Events Calendar at: <http://events.mit.edu>.

Go Online! Office of the Arts website at: <http://web.mit.edu/arts/office>.

EDITOR'S CHOICE

MIT SYMPHONY ORCHESTRA

John Harbison, guest conductor. Rose Mary Harbison, soloist. Music by Brian Robison, Brahms, Haydn, Webern.

*March 20*

Kresge Auditorium  
8 p.m.

"ANTONY AND CLEOPATRA"

Shakespeare Ensemble performs this play of politics, love and betrayal. Presented in the round. March 20-22.

*March 22*

La Sala de Puerto Rico  
8 p.m.

NEW FRONTIERS IN BRAIN SCIENCE

The Picower-Riken Symposium will feature many of the world's leading neuroscientists. March 26-28.

*March 26*


Wong Auditorium  
7 p.m.

MIT EVENT HIGHLIGHTS MARCH 24 - 30

**MONDAY**  
March 24

 **Natural Killer Cells: An Unexpected Discovery (met first as an annoying phenomenon)**  
Eva Klein, Karolinska Institute, Stockholm. Noon-1pm. Rm 68-180. shuguang@mit.edu.

**TUESDAY**  
March 25

 **"Namaste: Pictures of India"**  
Photographs by graduate student Nadya Direkova. Through March 28. Wiesner Student Art Gallery (2nd flr Student Ctr).

**"Namaste"**

**WEDNESDAY**  
March 26

 **How to Post Your Events Online**  
A how-to class for the MIT Events Calendar. Noon-1pm. Rm N42. More info: 253-7685.


**THURSDAY**  
March 27


 **How the Battle to Control the Internet is Being Shaped by Government and Corporate Interests**  
Seth Finkelstein. Sponsored by Media Lab. 7-8:15pm. Bartos Theater. More info: reilly@media.mit.edu.

**FRIDAY**  
March 28

 **The New Web of History: Crafting History of Science and Technology Online**  
Sponsored by Dibner Institute. 8:45am-6pm. March 28-29. Rm E56-100. Reservations required: 253-8721.


 **Writers Group**  
Share a piece of your writing with other writers. Meets Fridays, noon-1pm. Rm 14N-417. More info: 253-4459.

 **National Gay and Lesbian Athletic Conference**  
Sponsored by lbgt@MIT and DAPER. 1-6pm. March 28-30. Register on the 3rd flr of the Student Ctr. More info: 258-5490.


 **Men's Gymnastics Championships**  
7pm. du Pont Gymnasium. More info: 253-7946.

**SATURDAY**  
March 29

 **Men's Lightweight Crew: Joy Cup vs. Yale**  
7:30am. Charles River. More info: 253-7946.

 **Women's Crew vs. Dartmouth, UNH and Smith.**  
10am. Charles River. More info: 253-7946.

 **Baseball vs. U.S. Coast Guard**  
Noon. Briggs Field. More info: 253-7946.

 **Women's Lacrosse vs. Springfield College**  
1pm. Jack Barry Turf. More info: 253-7946.

 **Chinese Choral Society Spring Concert**  
Shubert's "Mass in G major" with orchestra, and Chinese folk songs and dances. 7:30pm. Kresge Auditorium.

**SUNDAY**  
March 30

 **Family Adventures in Science & Technology**  
"Water, Water Everywhere." MIT-Woods Hole researchers talk about their research and help visitors learn by doing to better understand the sea. MIT Museum. Free with MIT ID. 2-4pm. 253-4444



**Duchamp**

Simon Leung will speak on "Counter-Architectures: Squatting, Surfing and Marcel Duchamp" March 20. Above: detail from Duchamp's "Bride."

