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TechTalk

S E R V I N G T H E M I T C O M M U N I T Y

Three-neutrino model still rules particle physics

Anne Trafton
News Office

Physicists can rest easy—the Standard Model of Particle Physics is still in effect.

More than 100 MIT students and professors jammed into Room 35-225 on Wednesday, April 11, to hear the long-anticipated results of a particle detection experiment designed to produce evidence that would confirm or reject the model, which outlines the elements of particle physics.

MIT postdoctoral associate Jocelyn Monroe, who worked on the experiment, prolonged the suspense, revealing the

results about half an hour into her talk. The outcome? The standard model is still safe: The experiment confirms the model's prediction that there are only three types of neutrinos (tiny elementary particles that are components of atoms).

Some of the assembled crowd seemed disappointed that the foundation of particle physics had not been upended.

"This was such a big question. It would have changed everything" if they found evidence for a fourth neutrino,



Jocelyn Monroe

Monroe said last week, after her lecture.

Experiments done in the 1990s at the Liquid Scintillator Neutrino Detector (LSND) at the Los Alamos National Laboratory offered strong indirect evidence for the existence of a fourth neutrino, but the results were controversial. So another experiment, the Booster Neutrino Experiment (MinibooNE) was launched in late 2002 to try to replicate the results.

"It was very important to confirm or refute the LSND result," said Monroe, a

Pappalardo Fellow who arrived at MIT last September and worked on the MinibooNE project as a graduate student at Columbia University.

Neutrinos are generated by nuclear reactions, such as those that occur in the sun or in nuclear reactors. Most come from the sun: More than 50 trillion solar neutrinos pass through the human body every second, but they are extremely difficult to detect because they have no charge and a mass so tiny it has never been measured.

Currently scientists know that there are

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PHOTO / L. BARRY HETHERINGTON

Engine of science

The Cambridge Science Festival, which runs through Sunday, April 29, kicked off April 21 with a special event at Cambridge City Hall. Above, left to right, Harriette Crawford, Venola Bynoe, and Harriette's son, Malik Crawford, inspect a car powered by electricity. See story and list of events on page 5.

Faculty honor Virginia Tech victims, applaud Edgerton winner, in meeting

Deborah Halber
News Office Correspondent

The faculty observed a moment of silence at the April 18 faculty meeting for the victims of the tragedy at Virginia Tech, and Theresa M. Stone, MIT's executive vice president and treasurer, and representatives from Campus Police and Environmental Health and Safety (EHS) presented an overview of how news of the shootings has impacted emergency response discussions on campus.

Stone emphasized that police and EHS personnel routinely use drills and exercises to anticipate every kind of emergency.

William Van Schalkwyk, managing director of Environmental Health and Safety Programs, said an extensive communications system is in place that includes e-mail, emergency channels on cable TV

and other ways to get messages out to the community. Some faculty members requested a system for following up on students who they had referred to student services, while maintaining the students' privacy.

Edgerton Award announced

Nergis Mavalvala, associate professor of physics and Alfred P. Sloan Research Fellow, received the Edgerton Award from the award selection committee. The annual award goes to a junior non-tenured member of the MIT faculty. "It means a lot to me, and almost everything I do is because of the fantastic mentoring I get at this wonderful place," Mavalvala said.



Theresa M. Stone

Philip S. Khoury, associate provost and Ford International Professor of History, gave an update on MIT's international engagements, which include 75 projects in more

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Deborah Loeb Bohren is appointed vice president for external affairs

Deborah Loeb Bohren, currently executive vice president at the Washington, D.C., public affairs firm of Powell Tate, will join MIT as vice president for external affairs on May 21.

President Susan Hockfield announced Bohren's appointment in an e-mail letter to the Institute's faculty and staff on April 18.

In her letter, Hockfield noted that Bohren brings to her new role extensive experience in public relations, government affairs and employee communications in both the private and public sectors, and said that her work would "enhance MIT's public visibility and ensure that we continue to be recognized nationally and internationally

as the standard of excellence in our chosen fields."

Bohren herself said, "I am thrilled and honored to have the opportunity to join the MIT community in this new role. MIT is a world-renowned educational institution with an unwavering dedication to knowledge, education, research and innovation, as well as a commitment to making a positive difference in the world in which we live. I cannot imagine a more exciting or challenging place to work."

As vice president for external affairs Bohren will lead the coordina-



Deborah Loeb Bohren

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MIT linguists take on challenger to Universal Grammar.

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Two MIT Sloan students build a free web site that gives the 'buzz' on business school admissions.

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Ivan D. Dimitrov, of Sofia and Senior House, dies at 20

Sarah H. Wright
News Office

Ivan D. Dimitrov, an undergraduate from Sofia, Bulgaria, who was known among friends for his positive nature and passion for life, died on Saturday, April 21, as a result of injuries from a motorcycle crash.



Ivan D. Dimitrov

lived since coming to MIT last September.

When he arrived on campus, Dimitrov quickly immersed himself in the close-knit Bulgarian community, inspiring other students with his infectious good humor and ingenuity for pranks, said a friend and housemate, Illiya Tsekov, a junior in mechanical engineering.

He was a fan of all things Bulgarian, particularly the

Dimitrov, 20, was fatally injured at about 3:30 a.m. when he lost control of his 1998 Kawasaki 600 motorcycle on the Fenway exit ramp off Storrow Drive east in Boston, news reports said.

Dimitrov had had plans to go to New York City on Saturday night to hear Bulgarian folk music star Milko Kalaydzhev, according to friends in Senior House, where Dimitrov

music and professional soccer team CSKA, said his friend Ivan Z. Dimitrov, a sophomore in electrical engineering and computer science. The two men (no relation), who had been friends since high school in Sofia, were both members of the CSKA fan club and went to many soccer games together.

"He was very special. He was always happy. He set goals for himself and he got them: He wanted to be a croupier last summer, so he did that. He wanted to own a motorcycle, so he did that," said Dimitrov, adding, "He read all the safety manuals. He was a careful driver."

Both Tsekov and Dimitrov recalled their friend's capacity to see the potential for humor or high spirits in any situation. It was his idea, they noted, to "claim the suite for Bulgaria, complete with barricades, flags and plastic swords" as a prank on new students. He also gave everyone nicknames, they said.

While his successes in math provided him the opportunity to travel widely—he went to Mexico, Greece, Cuba and Russia, they said—his focus remained on returning to Sofia and buying property in the neighborhood where he grew up.

He "didn't want to make a lot of money—just enough to live and enjoy life," said his friends.

Dimitrov is survived by his mother, Neli, a hotel administrator, his father, Dimiter, owner of a commercial cleaning business, and his younger brother, Dani, all of Sofia.

A memorial service will be held at MIT on Saturday. The funeral will be in Sofia.

Daniel Barclay, 22, shared wit, gift for political debate

The body of Daniel Barclay, an MIT graduate student who had been missing for nearly two weeks, was found washed ashore on Cape Cod last Thursday, April 19, according to news reports. With that sad discovery, a bright light and keen wit were lost to Barclay's family and friends.



Daniel Barclay

Barclay's body was found on Scusset Beach in Sandwich, Mass.; it was identified by his family on Friday, according to the Boston Globe. The cause of death was drowning, although the medical examiner is waiting for the results of routine toxicology tests. Cape and Islands District Attorney Michael O'Keefe told the Globe that there were no indications of foul play.

A third-generation MIT student, Barclay, 22, had earned a bachelor of science degree in economics in February and was slated to get bachelor and master of science degrees in political science this June.

He had been missing since April 8 and was last seen in

his Ashdown House residence.

According to The Tech, Barclay's last known communications were a phone call to his grandmother and an instant message to some classmates.

Those same classmates, as well as friends and teachers from Barclay's high school and childhood years in Menlo Park, California, poured their sadness, affection and happy memories of the former 'Quiz Kid' onto a web site set up by Barclay's mother, 1978 MIT alumna Susan Kayton.

Richard Samuels, director of the Center for International Studies, was Barclay's freshman advisor. According to Samuels, Barclay possessed not only an "unusually attractive package of geniality and intense intelligence," but also a great sense of humor. Samuels wrote he was "grateful to him for making jokes...His playful e-mails put a smile on my face."

Barclay is survived by his mother, his father, Michael Barclay, and his sister, Rachel, 19. A memorial service at MIT has been tentatively scheduled for Thursday, April 26, in the MIT Chapel, and a memorial will be planned in California in the coming weeks.

To read more memories of Barclay, to contribute your own, or to find out about memorial service plans, please go to www.suekayton.com/daniel.htm.

CrossTalk panelists discuss visualizations

Robin H. Ray
News Office Correspondent

CrossTalk is back. The panel discussion series, now hosted by the new Office of Educational Innovation and Technology (OEIT), reconvened on April 19 after a hiatus. The series offers a forum for MIT faculty to talk about issues at the intersection of teaching, learning and technology.

Last week's meeting focused on the topic of visualization: Are visualizations eye candy or useful educational tools? Do visualizations improve learning? Can one articulate the principles that make for good visualizations? The topic was evidently of great interest, because Room 5-217 was filled to capacity, with some late arrivals standing in the hallway.

Phillip Long, associate director of the OEIT, introduced the panel, which represented a diversity of scientific disciplines: John W. Belcher, professor of physics and Class of 1960 Faculty Fellow, who is behind the development of Technology Enabled Active Learning; Fredo Durand, associate professor of electrical engineering and computer science; and Graham Walker, American Cancer Society Research Professor of Biology. Sanjoy Mahajan, associate director of the Teaching and Learning Laboratory and EECS lecturer, acted as mod-

erator. Vijay Kumar and Violeta Ivanovna, both of OEIT, were also on hand and added to the discussion at various points.

Belcher showed the audience a computer-animated model that he built to capture concepts in plasma physics that are difficult to explain to students. "This is why I like visualizations: to show things that you normally can't see or processes that you normally can't observe."

Durand, whose expertise is in computer and 3-D graphics, spoke of the need to improve visual literacy. Students have powerful computer tools at their command, but when putting together graphics for a technical paper, they don't have any basis for deciding, for example, whether to use color or gray-scale. "None of the students have any idea which one to choose when, and I think that this will be something that any of our students should know for their professional life." Durand mentioned his association with Image and Meaning, a series of conferences and workshops held at Harvard that involves scientists, artists and writers in improving ways of communicating scientific information and concepts (www.imageandmeaning.org).

Walker explained that his interest in visualization derives directly from his research in molecular biology.

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DIGITAL TALK: WHERE IT'S AT



IT Energy@MIT table

One highlight of MIT Earth Week 2007 is the Earth Day Fair on April 26, from 10 a.m. to 3 p.m. in the Stata Center. If you come, be sure to stop by the IT energy table. IS&T staff will have a demonstration of energy use by computers and monitors. You can also introduce yourself to MIT's new IT energy coordinator, Laxmi Rao. As head of the IT Energy@MIT initiative—part of the campus energy task force—she is eager to share ideas on how to reduce the IT energy footprint at MIT, including insights gleaned from courses and research. You can also send feedback to it-energy@mit.edu.

If you can't make it to the IT energy table, visit the initiative's web page at web.mit.edu/ist/services/it-energy.

Designing interactions

Digital technology has changed the way we interact with everything from the games we play to the tools we use at work. In "Designing Interactions," from the MIT Press, author Bill Moggridge introduces us to 40 influential designers who have shaped our interaction with technology. Moggridge, designer of the first laptop computer (the GRiD Compass, 1981) and a founder of the design firm IDEO, tells these stories from an industry insider's viewpoint, tracing the evolution of ideas from inspiration to outcome. Among the innovators he interviews are Will Wright, creator of The Sims; Larry Page and Sergey Brin, the founders of Google; Doug Engelbart, Bill Atkinson and others involved in the invention and development of the mouse and the desktop; and MIT professors Hiroshi Ishii and John Maeda.

"Designing Interactions" is illustrated with more than 700 images and accompanied by a DVD with segments from all the interviews. You can also browse by chapter and view segments from the DVD at designinginteractions.com.

Expanded access to historic e-journals

The MIT Libraries recently acquired electronic access to earlier issues of journals in fields of interest across MIT. Researchers can now link to and read journal citations going back many decades without leaving their offices or labs. The expanded access includes important collections in the life sciences, neuroscience, engineering, mathematics, chemistry, economics, physics, and art and architecture, as well as major national newspapers back to the 19th century. The Libraries also plan to add historic e-journals in other subjects.

Many current and historical journals can be accessed by going directly to a journal's web site—on-campus users are automatically recognized as being from MIT and granted access. Current MIT faculty, students and staff can also gain off-campus access with certificates through Vera at libraries.mit.edu/vera.

To see some of the recently purchased collections and titles, go to libraries.mit.edu/backfiles.

Web publishing insights

If you publish on the Web and are interested in new developments, check out the MIT Webpub User Group blog at webpub.mit.edu. It announces the group's bimonthly meetings and posts presentations from the meetings. It's also a place for information sharing: find out, for example, about navigating by touch, or about Twitter, "a global community of friends and strangers answering one simple question: What are you doing?"

If you have an item you'd like to see posted on the blog, send it to webpub@mit.edu. Anyone with an MIT certificate can log into the blog to add comments to posts.

Quick Google search tip

You can focus your Google searches by putting a minus sign ("-") in front of words you want to avoid. For example, to find articles about biological viruses, but not computer viruses, type "viruses-computer" into the Google search field. For more MIT search options, visit web.mit.edu/search.html.

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HOW TO REACH US

News Office

Telephone: 617-253-2700
E-mail: newsoffice@mit.edu
<http://web.mit.edu/newsoffice>

Office of the Arts

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



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Interim News Manager Sarah H. Wright
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Engineering Editor Elizabeth Thomson
Assistant Director/Photojournalist Donna Coveney
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Reporter/Writer Sara
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Kennedy praises MIT, decries White House 'pseudo-science'

Ruth Walker
News Office Correspondent

"Truth is taking a beating," Sen. Edward Kennedy warned in a forceful attack on the science policy of the Bush administration in his delivery of the 2007 Karl Taylor Compton Lecture, held April 13 in the Stata Center's Kirsch Auditorium.

Kennedy accused the administration of "skewed thinking" that has "spread like a cancer...infesting every policy decision they make."

He continued: "Tragically—and dangerously—the administration has developed a pattern and practice of ignoring or manipulating facts to achieve a desired political result. But no matter how hard they try to create their own pseudo-science and pseudo-reality, in the long run, they will not succeed. The reality-based community is alive and well. And we're fighting back."

Kennedy, the senior senator from Massachusetts, and the second-longest-serving member of the Senate, commended MIT's role, over a century and a half, of contributing to public policy informed by science. William Barton Rogers and the other founders of the Institute "believed in what they called 'the happy influence of scientific culture on the industry and civilization of nations,'" he said.

Among the issues he touched on:

Stem cell research: Calling the administration's policy "flawed, and frankly, nonsensical," he accused the administration of paying "lip service" to the religious concerns of those who oppose such research without truly reflecting them. He added that the lack of federally funded research was putting the United States at a "serious competitive disadvantage."

Contraception: "The White House allowed a narrow minority in its right-wing base to drown out" the scientific consensus on the safety of the emergency contraceptive pill Plan B, which was not finally approved for over-the-counter sales until August 2006.

Global warming: "With the backing of its cronies in the oil and gas industry, the administration decided to create its own reality," he said. The recent Supreme Court ruling rejecting the administration's arguments for failing to regulate carbon dioxide emissions "is by no means the end of the story, but it is an enormous victory."

Kennedy also called for a return to "those good old days" when people like the founders of MIT "understood that the never-ending effort to form a more perfect union would always require a restless spirit that asks new questions and is not afraid of the answers."

Scholarship program to be expanded

MIT and Harvard plan to expand the Kennedy Scholarship program, which brings scholars from the United Kingdom to the two institutions.

They made the announcement on April 13 during celebrations of the 40th anniversary of the program, which was established in the United Kingdom to honor the memory of President John F. Kennedy and provides funding for British graduate students to study at Harvard and MIT.

To strengthen the program, MIT and Harvard have committed to raise new endowment funds for up to two additional Kennedy fellowships at each university.

"It is an honor to be able to play a role in preserving the strength of the Kennedy Trust Scholarship Program, and I am confident that these

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MIT Medical director outlines improvements in care, access for Institute community

Kettyle likens task force report to 'annual physical'

Deborah Halber
News Office Correspondent

MIT Medical's 389 staff members handle 130,000 patient visits a year from students, staff, faculty, alumni and their family members. These patients, who range from newborns to the elderly, see primary care clinicians and a host of specialists or are referred to world-class teaching hospitals such as Mt. Auburn, Massachusetts General, Children's and Dana Farber Cancer Institute.

In 2004, then-President Charles Vest created the Task Force on Medical Care for the MIT Community, charging it with examining the cost and quality of medical services and health insurance coverage provided by MIT to its students, employees, retirees and post-docs. In November 2005, the task force concluded that the existing MIT model for providing health care and health insurance has performed well historically, that the MIT community is generally highly satisfied with it and that it can continue to serve MIT well in the future. A working group led by then-Executive Vice President and Treasurer Sherwin Greenblatt reviewed the task force's 41 recommendations and issued a progress report last month.

Dr. William M. Kettyle, medical director of MIT Medical, provides an overview of the task force process and what MIT Medical patients can expect as the recommendations are implemented.

Q: You've seen a lot in your 15 years at MIT Medical, the last seven as the department's medical director. How has health care at the Institute changed during your tenure?

A: MIT Medical has provided over 100 years of care for students and faculty and staff, so we have a very long tradition of providing convenient on-site care, and that won't change. We're a multispecialty practice providing care across the continuum of ages from preconception to conception to geriatrics. It's like providing care for an entire extended family, albeit one with a huge number of children in the 17-to-21 age range. We're not just a student health service or just a company doctor—we're all those things and more.

The task force process allowed us to

take a thorough and careful look at the medical care needs of the community and how we were meeting those needs. We also looked at our insurance programs with a renewed interest in making sure their fiscal foundations are robust.

The task force pointed out areas in which we needed to enhance our services and underscored a real need to administer benefits differently. MIT Human Resources is making a number of changes



PHOTO / MARK OSTOW

William M. Kettyle

in medical benefits, and we are undertaking a number of changes that will enhance availability of care.

A recent trend is that patients have become much more involved in their own diagnosis and treatment options. Medical care is now more of a partnership between the patient and the provider, which is a good thing.

Q: One of the recommendations of the task force was to add resources and improve the access to care. How is MIT Medical working toward these goals?

A: Our goal is an overall improvement in access to care, as well as improvement in access to care in specific specialties and to new clinicians. We now have a full complement of five triage nurses. This means that we will be able to get people to the

right level of care and the right caregiver in a timely fashion by phone, e-mail or in person.

We also are hiring two new additional female internists. We want to be sure we have comfortable care for all members of our community, and we saw a need for more female, primary care practitioners. Both of these new internists are highly experienced, mid-career physicians. In addition, we have improved access to Dermatology, the Eye Service and Neurology through partnerships with key medical institutions.

We evaluated our dental services and decided that on-site, convenient, high-quality dental care with a full range of services from checkups to implants makes a lot of sense for the community. To put the Dental Service on a more robust fiscal footing, we have increased the hours of service and increased the efficiency of scheduling so we now have more appointments available and can serve more people.

We have expanded our mental health services for students and staff and continue to look carefully at our outreach programs as we explore more ways to connect with the community, especially regarding the effects of stress and overwork.

We have made huge strides in the technology of our information systems as well. We are one of the few major medical practices with completely electronic and secure patient-data recording. Patients can request appointments and ask questions online while their privacy is completely protected. Soon, all medical records will be online, and patients will be able to access their test results online.

Q: One of the current trends is a focus on wellness, healthy lifestyles and preventive medicine. What is MIT Medical doing about these issues?

A: We have a number of initiatives in place and are developing more ways for people to be proactive about their own health. Getfit@MIT, for instance, is a team-based exercise-focused program, this year involving almost 2,300 people.

Our Center for Health Promotion and Wellness works to help members of the community get the information they need

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MIT community shares sorrow, support for Virginia Tech

Anne Trafton
News Office

Members of the MIT community gathered April 18 at the MIT Chapel to share their sorrow over the shootings at Virginia Tech and to draw strength from one another.

"We need to try to take comfort in the presence of one another as we deal with a tragedy that is beyond our imagination," Institute Chaplain Robert Randolph told

more than 60 people who attended the interfaith service.

Many in attendance wore Virginia Tech sweatshirts or T-shirts. As Randolph read each victim's name, members of the audience came forward to light a candle in memory of each of the 33 people killed, including the gunman.

Virginia Tech student Cho Seung-Hui shot and killed 32 students and professors at the school on Monday before turning the gun on himself, in what was the worst mass shooting in U.S. modern history.



PHOTO / DONNA COVENEY

At an interfaith service in commemoration of the victims of the Virginia Tech shootings, 33 candles were lit to represent each of those who died. The ceremony, held April 18, was organized by MIT's chaplains.

Randolph asked mourners to take inspiration from the actions of Virginia Tech professor Liviu Librescu, a 76-year-old Holocaust survivor who blocked the door of his classroom while students jumped out the windows to escape.

"We begin (to heal) by remembering what Liviu Librescu did when he gave his life that his students might live, and we celebrate life," Randolph said. "When we leave, I hope you go forward with hope and reflect anew on the gift of life that we share together."

Larry Benedict, dean of student life, described what he experienced while he was a dean at Johns Hopkins University in 1996 when a student there shot and killed another student.

"Suddenly our peace, our sense of security and our sense of personal safety and invulnerability had been shattered by a single gun blast," he recalled, adding that the recent shootings have brought back all the emotions he experienced then.

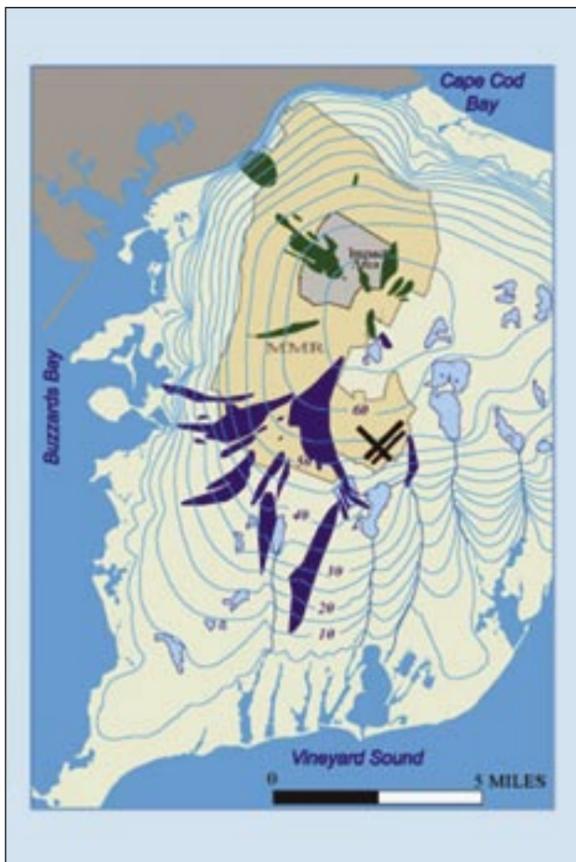
Benedict offered hope and encouragement to those dealing with the Virginia Tech tragedy.

"Did we get through it? Yes, we did, and so will our colleagues and friends at Virginia Tech," Benedict said. "We took comfort and drew strength from one another."

During the service, prayers were offered for the victims, their families, the Virginia Tech community, and state and police leaders assisting in dealing with the aftermath of the shootings.

Randolph encouraged all those who attended the service to sign cards to be sent to Virginia Tech on behalf of MIT and displayed on the Virginia Tech campus.

Costly Cape Cod cleanup has advanced groundwater hydrology research



GRAPHIC COURTESY / USGS

In this illustration of the 'shoulder' of the Cape, the Cape Cod Canal is visible at the top. If the land is viewed as a clock, Bourne is at 11, Sandwich at 12:15, Barnstable at 3 and Mashpee at 5:30. Falmouth is in the bottom left corner.

Denise Brehm

Civil and Environmental Engineering

The tale of the Cape Cod cleanup has all the elements of an epic novel: It's long. It offers intrigue, heroes and plot twists. And, of course, it changes the world.

Denis LeBlanc, who has spent much of his career studying the hydrology of western Cape Cod, described in a talk on April 9 how the investigation into a single "plume" or tongue of contaminated water underground became a 25-year gold mine of hydrology research and fueled an ongoing effort to rid the Cape's groundwater of pollutants.

"This is a very complicated and very expensive project involving hundreds of people. I'm going to tell one part of the story: how our understanding of the groundwater hydrology in Western Cape Cod has been shaped by this work," said LeBlanc, an MIT alumnus (S.M. 2001) and hydrologist with the U.S. Geological Survey, who presented the 2007 Freeman Lecture, hosted annually by the Department of Civil and Environmental Engineering (CEE).

Peter Shanahan, a senior lecturer in CEE who introduced LeBlanc, said that researchers working on the site have produced 126 journal articles, 140 USGS studies and 50 theses and dissertations from 15 universities, "including one fundamental paper that changed the way people think about dispersion in groundwater systems."

The USGS began studying the hydrology of the Massachusetts Military Reservation (MMR) wastewater treatment facility near Ashumet Pond in 1983. At about the same time, the Department of Defense began the process of cleaning up environmental damage at military installations. The USGS pointed the DOD to a single plume of treated wastewater, with the assumption that toxins from the military base were likely to be found. Nobody realized at that point that the plume and the process would balloon into a decades-long, billion-dollar project.

"I think if we had known the real history of waste

disposal at the MMR, we'd have known the plumes were much greater in extent. But that is hindsight," LeBlanc told the audience of civil and environmental engineers in Wong Auditorium.

The military reservation has a distinguished history over the past century, serving as a staging area during World War II for troops heading to Europe and as Otis Air Force Base during the Cold War. Today the area is home to the Army National Guard, the Coast Guard, the Air National Guard, a military cemetery and a number of environmental programs.

Researchers began following the plume, which they soon learned was several plumes, by drilling and sampling. As work progressed, the scope of the cleanup had to be changed, and changed again with the discovery of new plumes that traveled further than anticipated, the finding of different contaminants and the growing understanding of the Cape's hydrology.

One very important hydrological discovery arising from the research is that underground plumes don't dead-end at lakes and disperse into the reservoirs of freshwater. Instead, a plume can change course to flow under a lake and continue on an altered path.

The scope of work now includes an Army National Guard training range covering 14,000 acres, one of the largest undeveloped areas in eastern Massachusetts. Plumes from this area contain chemicals from munitions such as explosive compounds and perchlorate, a propellant. The source of one perchlorate plume, discovered in December 2003, has been traced to the launch site of a nearby town's annual fireworks display. That plume originates along the trail where fireworks' debris falls and eventually soaks into the ground with rainwater.

By the end of 2007, the cleanup will have cost \$925

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NEUTRINO

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three types, or "flavors," of neutrinos—electron neutrinos, muon neutrinos and tau neutrinos. Experiments have shown that these neutrinos can oscillate from one flavor to another. However, the LSND experiments offered evidence for a fourth flavor, a "sterile" neutrino, which would call the Standard Model of Particle Physics into question.

The model, developed in the 1970s, is based on Einstein's theory of relativity and outlines the 16 types of subatomic particles (including the three neutrinos) that physicists have identified.

"The Standard Model is the periodic table of particle physics," Monroe said. "If the MinibooNE experiment found that extra particles needed to go into that, it would have been very, very exciting."

The MinibooNE experiment, conducted at the Fermi National Accelerator Laboratory outside Chicago, was designed to detect the energy traces left behind when a neutrino collides with the nucleus of a carbon atom. The detection takes place in a massive tank filled with 250,000 gallons of purified mineral oil.

Researchers generated neutrinos by firing a beam of protons at a target made of beryllium (a lightweight metal). When the beam hits the target, the protons produce particles that decay into neutrinos and other elementary particles.

During the three years that the researchers collected data, they sent 5.5 x 10²⁰ (more than a billion billion) protons into the target, but expected to measure only 400 electron neutrinos.

"That tells you how difficult it is to measure neutrino oscillations," Monroe said.

The researchers analyzed some of the data as they went along, but they waited until the end of March to look at the last one percent of their data—in the range where evidence for the fourth neutrino would be found—to ensure no bias in interpreting the results.

The team finally looked at the critical results on March 26, during a six-hour meeting at Fermilab.

"It was such a dramatic moment," Monroe recalled. "Everyone was so tense. There were people on MinibooNE who have been studying these questions for 17 years."

Once the team started looking at the data, it soon became apparent that there were no energy oscillations in the range where they would have been expected if a fourth type of neutrino existed, Monroe said.

"I had mixed feelings," she said. "My first reaction was that I was happy with the results. We predicted the background and we got it right. My second reaction was that I was so disappointed that we didn't find the 17th particle in the standard model. It would have changed everything."

The MinibooNE team involved about 70 researchers from 14 institutions, and was funded by the U.S. Department of Energy and the National Science Foundation.

The MinibooNE experiment is now running a three-year study of antineutrinos, and Monroe is continuing her neutrino oscillation studies at MIT with assistant professor of physics Joseph Formaggio. She's also working with MIT physics professor Peter Fisher to come up with ways to detect dark matter, which is even more difficult to observe than neutrinos. Dark matter accounts for the vast majority of mass in the universe but has never been observed.



PHOTO / DONNA COVENEY

Lives of a cell

Kathy Vandiver, far right, takes students from the Adventure Science Center in Nashville, Tenn., through the new cell exhibit at the MIT Museum. Vandiver developed the exhibition in conjunction with the museum. The students—from left, Ben Almassi, Devonte Duff and Thuy Trieu—were winners of a science writing essay contest.

Finkelstein will give Sigma Xi Lecture

Amy Finkelstein, assistant professor of economics, will deliver the 2007 Sigma Xi Lecture, titled "Researching the Impact of Universal Health Insurance: Lessons from Medicare," at 8:30 p.m. on Thursday, April 26, at the MIT Faculty Club, Building E26. Each year, the MIT chapter of Sigma Xi, the national scientific research society, honors an outstanding junior faculty member with the opportunity to present his or her research to the MIT community. Linn Hobbs, professor of materials science and nuclear engineering, is president of the MIT chapter.

Recent honorees include Angelika Amon, associate professor of biology; Angela Belcher, professor of biological engineering and materials science and engineering; Yoel Fink, associate professor of materials science and engineering; Linda Griffith, professor of biological engineering; Seth Lloyd, professor of mechanical engineering; and Franz-Josef Ulm, professor of civil and environmental engineering.

Finkelstein graduated from Harvard University summa cum laude in government in 1995 and won a Marshall Scholarship to Oxford University. From 1997 to 1998 she worked as a staff economist for the Council of Economic Advisers. She received her Ph.D. in economics from MIT in 2001. She joined the MIT faculty in 2005. Finkelstein is associate editor of the *Journal of Public Economics* and is a faculty research fellow of the National Bureau of Economic Research.

Finkelstein's research focuses on two main areas—market failures and government intervention in insurance markets and the impact of public policy on the health care sector, particularly on the development and diffusion of medical technology.

The annual lecture, open to the public, will be preceded by the Sigma Xi dinner for new initiates. Those wishing to attend the dinner at 6:30 p.m. should contact Hobbs at x3-6835 or hobbs@mit.edu.

Supply chain event focuses on energy efficiency

The MIT Center for Transportation and Logistics and the Council of Supply Chain Management Professionals (CSCMP) will host a one-day conference, Achieving the Energy-Efficient Supply Chain, on April 30 in Wong Auditorium.

The conference will present experts from academia and industry who will explain the business implications of higher energy costs and what companies can do to build energy efficiency into their supply chains.

Historically, supply chain design and management have been predicated on the easy availability of cheap energy—even as globalization has stretched product pipelines thousands of miles from remote manufacturing centers to end markets. This is now changing, according to MIT-CTL Director Yossi Sheffi.



Yossi Sheffi

“Rising fuel costs and the increasing volatility of energy markets mean that companies can no longer afford to ignore these costs. They need to reevaluate their supply chain strategies and network design to take into account the soaring cost of energy,” Sheffi said.

Strategic re-evaluation is a major challenge for most organizations as the economics of energy consumption influence every facet of supply chain management, from sourcing to final delivery.

Topics to be discussed will include how supply chains have evolved on the basis of cheap energy, measuring the carbon footprint, sourcing, manufacturing and distribution network design, and transportation and packaging.

Session leaders will include Mark Buckley, vice president for environmental affairs at Staples; Ernest Moniz, MIT professor of physics and director of the MIT Energy Initiative; Tracey L. Rosser, vice president for corporate traffic at Wal-Mart; and Kevin P. Wrenn, senior vice president for operations and quality at Fujitsu Computer Systems.

For more information, visit www.supplychainenergy.org.

MIT innovations fuel festival

Presented by the MIT Museum, events from April 26-29 include:

April 26, 4-7 p.m.

The MIT Entrepreneurial Tour

An insider's tour of the MIT campus shows where discoveries occurred and what famous companies are MIT spinoffs.

April 26, 5-7:30 p.m.

Kids' night at MITERS

Take things apart, fool around with gizmos and gadgets with the folks at MITERS.

April 26, 7-9 p.m.

One Laptop Per Child, Tang Center

A review of the \$100 laptop technology.

April 28 and 29, 12-5 p.m.

Real Kids: Real Science Stars!

Join in a science experiment on the set of DragonflyTV, the PBS kids show.

April 28, 2-4 p.m.

SciPro Awards

See the results of 8th and 9th graders working with MIT student mentors on Student Street at the Stata Center.

April 28, 2-5 p.m. and 7-10 p.m.

Not Your Grandpa's Model Railroad

See MIT's 800-linear-foot model railroad with scale models of MIT buildings.

For more events and locations, visit www.cambridgesciencefestival.com.

Research team finds neurons may 'know' glossy from grainy surfaces

Anne Trafton
News Office

Imagine looking at a pool of spilled milk. Your brain knows that it's milk and not another white substance like sugar or cottage cheese, but how does it know?

MIT researchers and colleagues investigating how the brain interprets the appearance of surfaces think they have an answer. They have found that the perception of reflectance and gloss are correlated with certain statistical properties of the image. These properties could be coded by neurons that respond differentially to light and dark spots.

The research team, a collaboration between MIT and the NTT Communication Science Labs in Japan, reported its findings in the April 18 online issue of *Nature*.

Studying how the brain analyzes surface appearance is not only important to understanding the workings of the human brain, but could also help scientists develop better visual systems for robots.

“We know a lot about the perception of objects, but much less about the perception of the materials that the objects are made of,” said Edward Adelson, an author of the paper and professor of visual science in the Department of Brain and Cognitive Sciences at MIT. “Our studies show that statistical skewness, which quantifies an asymmetry between light and dark patterns, has a strong influence on the way a material is perceived.”

Analyzing visual attributes such as color, texture and gloss is critical in everyday tasks such as deciding whether a patch of pavement is icy, whether a pancake is cooked, or whether skin is healthy, according to the researchers.

In their experiments, the research team asked subjects to rate the lightness and glossiness of natural materials such as stucco or fabric. The surfaces have a mix of dark shadows and bright highlights, giving rise to distinctive visual patterns.

“Natural surfaces are complicated,” said Adelson. “They have bumps and dips, and the light reflects in complex ways, producing characteristic statistical patterns.” These patterns serve as signatures both for the shape and the material composing the surface.

The researchers quantified the images

in terms of “luminance histograms,” which plot the distribution of pixel values. They also estimated the histograms of responses of neurons that respond to light and dark spots in an image. In both cases, they found that the “skewness” of the histogram, which measures its asymmetry, was correlated with the subject's perceptions of surface qualities. Positive skewness led to darker and glossier surface appearance.

The researchers also found that they could manipulate subjects' perceptions of glossiness by digitally manipulating the skewness of the images, said study author

Lavanya Sharan, an MIT graduate student at the Computer Science and Artificial Intelligence Lab.

Technology based on this research could also be useful for autonomous vehicles, said Sharan.

“You want to know what kind of surface you're on—is the road dry or wet or icy? Are you on a dirt road? A machine vision system needs to make these judgments based on the surface appearance,” she said.

See **NEURONS**

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PHOTO / DONNA COVENEY

Professor Edward Adelson, right, and his MIT co-author, graduate student Lavanya Sharan, with some of the surfaces they use to measure subjects' descriptions of their perception of texture, glossiness, etc., in the lab.

First Cambridge Science Festival starts with a bang

Ruth Walker
News Office Correspondent

Let there be no doubt about it: The spirit of Rube Goldberg is alive and well at MIT.

The Cambridge Science Festival—billed as the first of its kind in the nation—started off quite literally with a bang Satur-

day at noon.

The bang was provided by a group of MIT undergrads who assembled an official “kickoff” contraption in the council chamber at Cambridge City Hall.

A capacity crowd, including many families with young children, packed into the room to witness the scene. Cambridge City Manager Bob Healey quipped, “I haven't seen a crowd this big in the coun-

cil chamber since the end of rent control.”

MIT President Susan Hockfield hailed it as “an absolutely great day” and stressed how “enormously excited” MIT is to be working with the City of Cambridge on the festival.

“I keep hearing this wonderful phrase, ‘Cambridge is a science city’—I like that,” she said. “We are really the epicenter of science and technology innovation today.”

Referring to the children in the audience, she said, “I'm delighted to see all you young people, our future inventors and scientists, our future engineers.”

The “contraption” took months of brainstorming and weeks of construction. The engineers had to reconcile, as one of them put it, “unbounded creativity with the construction materials readily available in a short period of time.”

After a fanfare from the MIT Marching Band, playing in the upstairs gallery, and a countdown from Hockfield and John Durant, director of the MIT Museum, Sadie Scheffer '10 set the machinery in motion by stepping into a giant “hamster wheel,” eight feet across.

Within a few seconds, in the final phase of the contraption, an airbag had inflated, leading to the unfurling of the Cambridge Science Festival banner.

It worked—almost perfectly, with just a couple of quick assists from the engineers. As the photographers gathered to immortalize the contraption before it was disassembled, the engineers celebrated with hugs and high-fives all around.

The Cambridge Science Festival had been launched.



PHOTO / L. BARRY HETHERINGTON

John Durant, director of the MIT Museum, speaks at the April 21 kickoff event for the Cambridge Science Festival.

MEETING

Continued from Page 1

than 35 countries. While 2,000 students now participate in either a summer or semester abroad, the goal is to increase international educational experiences for students and to increase the 6 percent of sponsored research and 9 percent of cash gifts that come from foreign sources in 2006.

Khoury told the faculty that, at a time when research funding for the physical and biological sciences is decreasing domestically, MIT should develop an international strategy to pursue students, research updates and funding sources.

Suzanne Berger, professor of political science, agreed, noting that MIT graduates will function best as sophisticated contributors to their fields if they have the ability to create and access knowledge outside of their home society.

Daniel Roos, associate dean of engineering for engineering systems, gave an overview of the new MIT Portugal Program funded by the Portugal Ministry of Science, Technology and Higher Education. The program, involving seven universities, 15 research centers and a government laboratory, aims to help the Portuguese generate new knowledge-based industries and raise the education level of its workforce.

Margery Resnick, associate professor of foreign languages and literature, presented data from the previous two years of work by the Committee on Discipline. In 2005-06, the committee heard 23 cases that resulted in sanctions ranging from letters of apology and restitution to suspension and expulsion. Several cases were resolved through mediation. During the last academic year, panels heard several cases in lieu of the full committee when warranted and an academic integrity handbook was created and distributed to MIT community.

In other business, MIT President Susan Hockfield said that more than 1,000 people watched Sen. Edward Kennedy deliver the Compton Lecture on April 13. The lecture series will be expanded to include two to four lectures in the coming year as well as smaller format events for students to interact with speakers. Hockfield said she welcomes suggestions for future speakers.

In two votes on motions entertained at the March meeting, the faculty voted to disband the Committee on Faculty-Administration, folding its duties into the Faculty Policy Committee, and to accept minor wording changes to the rules and regulations of the faculty.

NEURONS

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The exact neural mechanism for detecting image skewness is unknown, but the researchers have offered a tentative model.

In the retina and brain, there are cells that are preferentially sensitive to either bright patterns or dark ones. After pooling responses within each cell population, the brain could compare the balance between very bright and very dark patterns. This balance determines the skewness.

"We don't know what the underlying physiology is, but what we do know is that the computation of skewness is something that could be done very easily with the hardware that does exist in the early parts of the brain's visual system," said Adelson.

The researcher's skewness model is supported by experiments with visual aftereffects, which showed that the human visual system can adapt to skewness. Similar to what happens when you stare at an image of a certain color and then see an after-image, staring at patterns with a high degree of positive skewness will cause the next pattern you look at to appear negatively skewed, which causes the material to appear lighter and less glossy.

The lead author on the Nature paper is Isamu Motoyoshi of the Human and Information Science Lab at NTT Communication Science Labs in Japan. Shin'ya Nishida of NTT is also an author on the paper.

The research was funded by NTT (Nippon Telegraph and Telephone Corporation) and the National Science Foundation.

BOHREN

Continued from Page 1

tion of MIT's communications with external constituencies and audiences, including government and the media. Hockfield said that MIT's relationships with government, the media and the broader public are "critical to advancing sound policies and practices for education and research" as well as to the Institute's own role as "a beacon of inspiration for the importance of science and technology."

The MIT News Office and the Office of Government and Community Relations will report to Bohren, who will also work closely with the MIT Washington Office in the development and implementation of MIT's strategy for federal relations. More broadly, she will serve as the senior adviser to the Institute's academic and administrative leadership on public affairs and external communications.

At Powell Tate, Bohren has been responsible for the design, development and implementation of strategic communications and public affairs for healthcare organizations in the corporate, nonprofit and government sectors. Prior to joining Powell Tate, she spent a decade at WellChoice, the parent of Empire Blue Cross and Blue Shield, including four years as senior vice president for communications.

At WellChoice, Bohren designed, executed and oversaw a comprehensive public relations program; served as primary company spokesperson with the media; developed an investor relations program that built investor confidence in the company after its initial public offering; coordinated government affairs activities at the federal, state and local levels; and provided strategic counsel on public affairs to the chief executive officer and senior management team.

Bohren began her career in Washington, D.C., where she specialized in labor relations with the federal government and employee organizations. Before joining WellChoice, she held positions in public relations and as director of the district office of Rep. Nita M. Lowey of New York. She holds a degree in political science from Arizona State University and a master's degree in public administration from the John F. Kennedy School of Government at Harvard University.

In announcing the appointment, Hockfield thanked the faculty and staff who assisted in the search process: Elizabeth A. Garvin, executive vice president of the MIT Alumni Association; Professor Steven R. Lerman of the Department of Civil and Environmental Engineering; Suzana Lisanti, publisher of the MIT home page; Dean of Admissions Marilee Jones; Dean of the Sloan School of Management Richard Schmalensee; and Pamela Dumas Serfes, executive director of news and communications.

CAPE COD

Continued from Page 4

million, with \$460 million more budgeted, bringing the projected cost to \$1.4 billion. More than 6,000 sampling wells have been drilled. The U.S. Air Force, U.S. Army, Massachusetts National Guard and USGS are working together on the project.

Much progress has been made on the 11 plumes that contain solvents and fuels, the first contaminants discovered. At present, 53 extraction wells pump out 17.5 million gallons of water each day, which, after treatment, is pumped back into the ground to maintain the water table. Work on the explosives and perchlorate, "the contaminant du jour," is just getting under way, LeBlanc said.

He predicts the tale will not end entirely, but the damage will have been mitigated. "The plumes will remain, but be dilute and patchy. The focus will change to plume management in the context of water supply," said LeBlanc.

The Freeman Lecture is presented annually by CEE and the Boston Society of Civil Engineers to honor the late John R. Freeman, a CEE alumnus who designed the original Charles River Dam.

CROSSTALK

Continued from Page 2

Because proteins have 3-D structures, "our students have a terrible time looking at a static two-dimensional representation of a protein and getting any sense of what it's like and what its properties are." The problem in his field, he reports, is that the advanced modeling software lacks crucial student-friendly features, such as a "back" button. It's been difficult to find tools that strike a balance between technological sophistication and practicality for the classroom.

The panel opened the floor to questions. The audience proved to represent a broad cross-section of the MIT community, including teachers and researchers in civil and environmental engineering, the Center for Educational Computing Initiatives, aeronautics and astronautics and

many others. Some expressed frustration at the time involved in creating the sort of sophisticated animations and models that a generation of students raised on Xbox has come to expect. Others discussed the pedagogic value of hands-on models, the vast differences in students' learning styles and 3-D visualization ability, and the power of metaphor in communicating ideas to others, whether professional audiences or students. There was a lengthy debate about whether polished graphics can actually be misleading.

Kathy Vandiver, director of community outreach and education programs at the Center for Environmental Health Sciences, encouraged everyone to visit the LEGO model of a protein molecule, a highly successful visualization of a very complex structure that is now on display at the MIT Museum.

KENNEDY

Continued from Page 3

actions are a significant step toward ensuring the Trust's continued vitality," said Harvard President Derek Bok, who



PHOTO / DONNA COVENEY

Edward M. Kennedy

participated in the April 13 celebrations. MIT President Susan Hockfield noted, "The Kennedy Scholarships offer exceptional students unique opportunities to broaden their intellectual and personal horizons, in ways that are more important than ever in an era defined by global interaction."

All Kennedy Scholars, including those to be supported by the new funds, are chosen in a highly competitive selection process, and admitted to Harvard or MIT. The selection process in the United Kingdom is undertaken by the Kennedy Memorial Trust, which is chaired by British economic historian Emma Rothschild, herself a former Kennedy Scholar at MIT.

"This will ensure that some of the very best British graduate students will continue to come to Boston and, like their predecessors, contribute to the

intellectual life of MIT and Harvard and to the further strengthening of transatlantic ties in their future careers," said Richard Lester, MIT trustee of the Kennedy Memorial Trust. Harvard's representative on the board is Roderick MacFarquhar.

Since September 1966, when the first Kennedy Scholars enrolled at Harvard and MIT, 432 students have been awarded Kennedy Scholarships. Many have gone on to distinguish themselves in academia, public service, politics, business and the media. Prominent former Kennedy Scholars include David Miliband, the U.K. environment minister, and Mervyn King, governor of the Bank of England.

Four current members of MIT's faculty first came to MIT on Kennedy Scholarships: Lester, professor of nuclear science and engineering and director of MIT's Industrial Performance Center; Barbara Imperiali, professor of biology and chemistry; Gareth McKinley, professor of mechanical engineering; and Andrew Whittle, professor of civil and environmental engineering.

The Kennedy Scholarship program is Britain's living national memorial to President Kennedy. At the time of its creation, Sen. Edward Kennedy called it the most ambitious of all the memorials to his brother. A meadowland memorial was also established at Runnymede, on the banks of the Thames where King John sealed the Magna Carta in 1215.

The senator, who participated in the 40th anniversary celebrations and delivered the Karl Taylor Compton Lecture at MIT, remains a passionate supporter of the Kennedy Scholarships and hosts the scholars each year in Boston and Washington.

The Kennedy Memorial Trust will continue to fund the existing scholarships, in addition to the new fellowships to be funded by Harvard and MIT.

For more information on the Kennedy Scholarships, visit the Kennedy Trust web site at www.kennedytrust.org.uk.

KETTYLE

Continued from Page 3

to make healthy lifestyle choices. Their outreach efforts include workshops and classes on specific topics like nutrition, fitness and stress management.

We are also continuing to increase our role in environmental safety and natural disaster, pandemic flu and severe storm preparedness. This is an important area of involvement for us.

Q: Do you have any final thoughts on the task force process?

A: I like saying that the task force evaluation can be compared to one's annual physical. It is something you should do on a regular basis to make sure that you are healthy and fit. It's a source of valuable information you can use to stay healthy or become healthier. So at MIT Medical, we want to make sure that our organization is also healthy and vital. It is our mission to continue to serve the Institute, in this way, by promoting wellness and providing care in support of effective learning and research.



PHOTO / DONNA COVENEY

Sugar magnolia

The sweetest signs of spring are sometimes the smallest. These delicate yet hardy magnolia blossoms appeared near Building 26 on Monday—symbols of serenity in a tumultuous time.

Pritzker-winner Hadid discusses fluidity in architecture, accessories

Robin H. Ray
News Office Correspondent

World-renowned architect Zaha Hadid presented an overview of her astonishing body of work to a capacity crowd in Room 10-250 on April 10. Her talk, entitled "Total Fluidity on All Scales," was the 19th annual Arthur H. Schein Memorial Lecture, given in memory of an honored MIT architecture alumnus who died in 1983.

Visiting associate professor of architecture Sanford Kwinter, who introduced the speaker, called Hadid "one of the world's most distinguished architects," whose work reflects "a universe not of grids but of vortexes."

"Hadid's work both transposes and displaces the very horizon that serves as our orientation point in the world. Her curves careen across the canvas or page, as if to mock the straight lines that they partly portray," he said.



Zaha Hadid

The Baghdad-born Hadid, currently the Eero Saarinen Visiting Professor of Architecture at Yale University, is the only woman to have won the Pritzker Architectural Prize, the field's highest honor. She studied in the 1970s at London's Architectural Association before establishing her own practice in that city. Zaha Hadid Architects currently employs some 200 architects and executes projects, large and small, all over the world. The Guggenheim Museum in New York exhibited a retrospective of her work, including a number of her paintings, in the fall of 2006.

Fluidity on every scale was the theme of Hadid's presentation at MIT, as it is the hallmark of her work. Starting with her smallest-scale projects, she showed the audience slides of the streamlined cutlery she designed for WMF, one of Europe's largest cutlery manufacturers. (The limited-production five-piece set retails for \$250.) The scale moved up from there, through chandeliers and handbags to furnishings, cars, hotel rooms, private homes, civic and commercial buildings, right through to skyscrapers and entire urban fabrics. She showed a series of seamless, sculptural shelves that, as she put it, are "almost like calligraphy or dancing figures on a wall."

Although some, as Kwinter noted, have criticized her work as "paper architecture"—that is, unbuildable—the dozens of executed projects Hadid presented over the course of her lecture constitute an answer to these critics. From the sweeping Bergisel Ski Jump in Innsbruck, Austria, to the Ordrupgaard Museum Extension in Copenhagen, her extant works playfully defy common geometry and even gravity while paying close attention to the needs and motivations of the clients.

Her airy design for the BMW central plant in Leipzig, Germany, completed in 2006, broke down physical and psychological barriers between manufacturing and management with a "mix of blue- and white-collar workers." Manufacturing, management and design are now all under one roof, with the cars shuttling (quietly) between painting and storage right past executives' offices. One cafeteria now serves everyone, from the cleaning staff to the top management.

The scale of Hadid's projects has extended beyond individual buildings to rethinking entire urban regions. Currently on track is a master plan for Zorrozaurre, a neglected and ill-connected island in Bilbao, Spain. Hadid's dynamic, curving lines of development—bending streets but also constructing numerous bridges to connect the island with the rest of the city—will change a stagnated grid-plan into a dynamic urban mix of residential, commercial and open space and working infrastructure.

Free site gives the 'buzz' on business school admissions

Amy MacMillan
MIT Sloan Educational Services

A free web site dedicated to M.B.A. applicants will mitigate the long and stressful process of applying to business schools and will help applicants determine their chances of getting into the school of their choice.

Inspired by their own experiences of applying to business school, M.B.A. '07 students Tom Duterme and Jose Almirall have created MBA Buzz (www.mbabuzz.com) to ease the pain for others.

"The (admission) process was veiled in rumors. I was in China when I was applying, and it was hard to connect with the schools," Duterme says.

Almirall says the two of them, along with a few other students, started brainstorming the idea back in 2005 as an idea for the MIT \$100K Entrepreneurship Competition, but the idea never really got off the ground. Then, Almirall and Duterme decided to collaborate on their own. They scheduled a dinner meeting in December 2005, but that night, Duterme was on his bike and was hit by two cars. Dazed, he escaped with a few cuts and bruises, but their meeting was postponed.

Despite that inauspicious start, Almirall and Duterme launched their web site on Feb. 14, 2006, as a way to make the business school application process more transparent. Business school applicants from all over can register at the free site to create a user profile. Each registrant has a private e-mail box and a list of buzzmates to keep track of friends and other applicants. The site features a graphical interface plotting application that allows you to see where all of the applicants are, as well as a predictor tool that allows applicants to assess the probability of getting an interview and even getting in. More than 1,000 business school applicants have registered in the past year, according to Duterme.

One of the most interesting aspects of the site is the plotter. Business school applicants enter basic statistical information



PHOTO / AMY MacMILLAN

MIT Sloan M.B.A. students Jose Almirall, left, and Tom Duterme created mbabuzz.com to reduce anxiety among business school applicants.

and can update the status of their school applications. Visitors to the site can plot applicants by business school and then analyze them further—by round, status, age, GPA, GMAT score and other statistics.

The site is a labor of love for Almirall and Duterme, both of whom have poured countless hours into it. Having gone through the admissions process themselves, they knew just what kind of information they would have liked to have had as an applicant. Through MBA Buzz, they enjoy bringing a new level of "transparency" to applications, providing applicants with a wide range of valuable data to consider as they plot their admissions strategies.

What's the buzz about MBA Buzz? The site has received positive feedback from its users and from bloggers. Charles Hudson, a member of Google's New Business Development team, recently described

MBA Buzz as an "interesting (and potentially addictive) web site, especially as the amount of data in the system continues to grow. Definitely worth checking out."

As their time at MIT Sloan comes to an end, Almirall and Duterme are content to watch the site grow as new users register every day. While they may expand the site further in the future, for now they're enjoying the final few months of a whirlwind business school experience. Duterme has accepted a full-time position with Google and Almirall will go work for IBM.

Is business school admission random? "No, it's predictable," said Duterme. "It's a mix of art and science." From the rapid growth of the site and the value it provides to anxious applicants, it's clear that Almirall and Duterme have found a winning combination.

Alexander Slawsky (M.B.A. '07) contributed to this article.

Linguists doubt exception to Universal Grammar

Robin H. Ray
News Office Correspondent

Controversies in the field of linguistics seldom make headlines, which is why the current imbroglio over an alleged counterexample to Universal Grammar (UG), made famous in the 1960s by Noam Chomsky, MIT professor of linguistics, is so unusual.

On one side is Daniel L. Everett, a linguist at Illinois State University, who has spent several decades studying Pirahã, a language spoken by roughly 350 indigenous hunter-gatherers in the Amazon rainforest. On the other are a number of linguists, including MIT linguistics professor David Pesetsky, who have thrown doubt upon many of Everett's claims, both cultural and linguistic, about the Pirahã.

In a telephone interview, Pesetsky said, "What we tried to do in our response was to highlight the ways in which we are trying to unravel the system that unites all the languages in the world," including Pirahã. The attributes that Everett claims are unique to that language are in fact extant in other well-documented languages, such as Bengali and even German.

Linguistics began to focus attention on UG several decades ago in an attempt to move their study from the particularization of philology—the detailed description of individual languages and language families, with which the field was preoccupied for centuries—to an understanding of the remarkable wealth of features that all languages share, and thence to an understanding of the human mind.

The current contretemps began with Everett's 2005 paper in *Cultural Anthropology*, "Cultural Constraints on Grammar and Cognition in Pirahã: Another Look at the Design Features of Human Language," which described a number of "gaps" in

Pirahã morphosyntax (the relationships between words and how their elements convey meaning).

As a culture, says Everett, Pirahã speakers lack any sense of the past beyond what living individuals have personally experienced, and they have no creation myths or fiction, no sense of numbers or counting, and no art. Constraints of culture, Everett believes, in turn impoverish the language, which has no tenses, no names for colors and other allegedly unique paucities.

The language constraints, he claims, indicate "some of the components of so-called core grammar are subject to cultural constraints, something that is predicted



PHOTO / DONNA COVENEY

Noam Chomsky

not to occur" by Chomsky's universal-grammar model.

Everett's article and his colorful field career have been taken up in the popular press, including the *Independent*, *Der Spiegel* and the *New Yorker*.

His critics—Pesetsky, Andrew Nevins

of Harvard and Cilene Rodrigues of the Universidade Estadual de Campinas in Brazil—fired back in March of this year with a paper titled "Pirahã Exceptionality: A Reassessment," taking issue with virtually every claim to Pirahã's uniqueness that Everett advanced. Everett hastily answered (also in March) with "Cultural Constraints on Grammar in Pirahã: A Reply to Nevins, Pesetsky, and Rodrigues (2007)." (Those two papers may be viewed at the LingBuzz linguistics archive site, ling.auf.net/lingbuzz, where they head the "Top Recent Downloads" list.)

Pesetsky marvels at the interest this debate has sparked, not only within the field but in the world at large. As of April 12, he noted in an e-mail, "Our paper has been downloaded 1,300 times and (Everett's) reply has been downloaded 910 times—astonishing figures for the site and for a field like linguistics."

While linguists at MIT pay a lot of attention to theoretical questions, such as the universal properties of sound systems, speech perception and speech production, field linguistics is far from moribund here. Linguistics grad student Seth Cable is heading off soon to Alaska on a National Science Foundation dissertation grant to study the syntax and semantics of questions in Tlingit, a language spoken by an indigenous people of the Pacific Northwest. One of the great figures in field linguistics, the late Kenneth Hale, was an esteemed member of the MIT faculty until his retirement in 1999; in his long career, he worked on languages as diverse as Hopi, Tohono O'odham (of the Sonoran desert region) and Warlpiri. His fluency in the latter, an indigenous language of Australia, was such that he was able to keep his sons, Ezra and Caleb, fluent in the language even after they had moved back to the United States. "He was a linguist's linguist," as Pesetsky put it.

Mel King Fellow's advocacy opens doors for low-income community

Deborah Halber
News Office Correspondent

Sometimes, a door is more than just a door.

When Lee Farrow was a community organizer in New York City, she worked with formerly homeless people whose city-owned housing wasn't much better than living outdoors. Their windows were broken, their walls were cracked, their ceilings leaked. And the building's front door was missing.

Farrow, a 2006-07 Mel King Fellow with the Center for Reflective Community Practice (CRCP) at MIT, helped the tenants navigate the municipal bureaucracy. They called, wrote, cajoled and complained until the door was replaced.

Farrow said the process was about more than a door. "A building entrance door is the gateway for societal ills coming into your dwelling. People mobilized around that. New York City can be a very isolating place when you are living in marginalized conditions with very little hope of those conditions changing. To witness and be a part of an effort to get a door changed generates so much aspiration among people after realizing they were able to do that. It was about empowering people with the resources and knowledge to achieve change."

Many of the residents went on to change other aspects of their lives. Farrow moved on, knocking on doors building by building, block by block. For 32 years, Farrow, who grew up in North Carolina, worked in some of New York's most devastated neighborhoods, engaging with neighborhood leaders and other community-change agents to bring about transformation in the neighborhoods and their residents. She spent her last 11 years in New York developing and implementing the Community Pride Program at the Harlem Children's Zone.

While working with Ceasar L. McDowell, MIT professor of the practice of community development in the Department of Urban Studies and Planning, and Dayna Cunningham, executive director of CRCP, Farrow is reflecting on, chronicling and analyzing her work to pinpoint lessons to share with the MIT community and the community-building field. Farrow also is completing a Boston neighborhood-learning project as a model for how communi-



PHOTO / DONNA COVENEY

Mel King Fellow Lee Farrow, above, helped produce the upcoming Community Innovation Spring Symposium, to be held May 4-5 at MIT.

ties learn together from their work. The Mel King Community Practitioner Fellowship provides a yearlong opportunity for extraordinary community practitioners to reflect on and document key areas of their practice.

One of the outcomes of Farrow's work is the Community Innovation Spring Symposium, a seminar series that aims to share and build knowledge from academics, local practitioners, policy-makers and philanthropists. The series will take place May 4-5.

"As a veteran organizer, I've done a lot of work in the course of my career to help people improve their lives and their living conditions," she said. "Over time, you get really tired, but you realize there is something about the core of this work

and the human spirit of community that never leaves you." Her goal now is to identify what she has learned about the most effective ways of bringing people together and helping change their conditions. Most important, she wants to help people identify the knowledge they've gained from their work to help solve community problems.

Farrow saw that the process of taking ownership of their living conditions mimicked the changes in their personal lives. "People had been feeling defeated. Organizing with their peer tenants and going through the process of change to improve their living conditions gave them the ability to see they have an impact and a voice. Coming together around common conditions motivated them to do more about their own personal development," she

said.

Tenant organizations have helped formerly homeless people raise the capital to buy their buildings from the city and manage them as low-income co-ops. They have also led people to become involved in establishing block associations and engaging in public activities that support neighborhood stabilization.

Living in Boston since 2004, Farrow goes back to New York occasionally. "To meet with the folks I worked with years ago and to witness the new feelings about their neighborhoods—it is quite amazing to see and witness how the human spirit can be moved from a place of hopelessness and helplessness to a place of accomplishment." All starting, she said, with people trying to get their building a door.



PHOTO / RENE R. CHEN

Pot heads

The humble pot, updated, personalized and generally given new life, will be among the one-of-a-kind student artworks for sale at the upcoming Student Art Association pottery sale, held on May 10 and 11 in Lobby 10. The event, which runs from 9 a.m. to 4:30 p.m. on both days, features innovative and traditional versions of the ancient vessel-makers' art.

Alum 'zaps' MOS

Composer Christine Southworth (S.B. 2002), at right, rehearses "Zap!," a composition in which the Van de Graaff generator provides static and flashing lights for her musical composition with flutes, guitar, cello, bass, piano, robots and human voices.

"Zap!" will be performed at the Museum of Science's Theater of Electricity (Science Park, Boston) on Friday, April 27 at 7 p.m. and 8:30 p.m. as part of the Cambridge Science Festival. Tickets cost \$10; for more information, see cambridge-sciencefestival.org/.

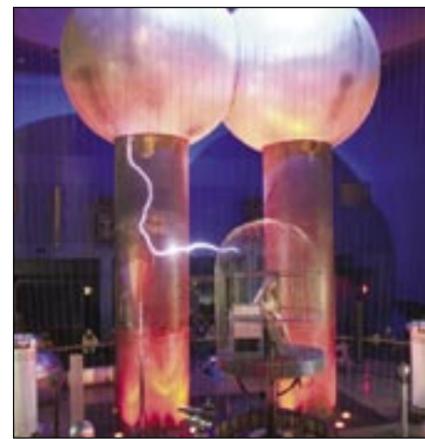


PHOTO / BILL SOUTHWORTH

MIT, Goethe-Institut examine history of video art in Germany

MIT's Visual Arts Program (part of the Department of Architecture) and the Goethe-Institut Boston are partnering to present "40 Years of Video Art in Germany," a series of events supported by the German Federal Cultural Foundation aimed at saving, maintaining and mediating the cultural heritage of video art, which has become one of the most influential art forms of the 20th century.

The events, which run from Tuesday, May 1 to Thursday, May 3, will feature a vast collection of outstanding video shorts from 1963 to 2003 and panels of local experts examining each decade of the project. Speakers will include Ute Meta Bauer, director of the Visual Arts Program, who will moderate the final panel discussion with all participants.

The program is presented in conjunction with the fifth Boston Cyberarts Festival (April 28 through May 6).

For more information, call x3-5229 or 617-262-6050, or e-mail program@boston.goethe.org.

Schedule:

May 1: "The Sixties and Seventies." Judith Barry, director of the M.F.A. program in visual arts at the Art Institute of Boston/Lesley University, and Roy Grundmann, director of the film studies program at Boston University. 6:30 p.m., the Goethe-Institut (170 Beacon St., Boston).

May 2: "The Eighties and Nineties." Michael Rush, director of the Rose Art Museum at Brandeis University, and Ute Meta Bauer, director of MIT's Visual Arts Program. 6:30 p.m., the Goethe-Institut.

May 3: Panel discussion featuring all participants, moderated by Ute Meta Bauer. 6:30 p.m., Broad Institute Auditorium (Room NE30-1154).