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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

## Campaign for Students launched

Campaign highlights MIT students' creativity, passion



**Tom Witkowski**  
Resource Development

MIT publicly launched its Campaign for Students on Oct. 3 with a goal of raising \$500 million or more for undergraduate scholarships, graduate fellowships, curriculum innovation and student life. The campaign highlights MIT students' brilliance, creativity, drive and passion — human factors that will power solutions to the world's most-challenging problems.

"The Campaign for Students will help sustain the excellence of MIT's living and learning experience and increase our ability to attract and challenge the young innovators who will be crucial to this country's global competitiveness," said MIT President Susan Hockfield.

The campaign also addresses the dual strains of rising costs and declining federal support for students in higher education. Approximately 17 percent of MIT undergraduates come from families with incomes below \$45,000, and about 90 percent of undergraduates receive aid in some form, with 60 percent receiving scholarship aid from MIT. U.S. News & World Report recently ranked MIT as one of the top five most economically diverse universities in America.

"The Campaign for Students will

greatly enhance our ability to offer an MIT education to the most qualified students regardless of their families' ability to pay," Hockfield said.

Recently, MIT increased financial aid to cover tuition and fees for a larger fraction of students. Under the new plan, families earning less than \$75,000 a year will have all tuition covered.

Edward Linde '62 and his wife Joyce announced last week that the Linde

Family Foundation will make a \$25 million gift, one of the largest pledges to undergraduate financial aid in the Institute's history. The Linde Family Foundation supports educational opportunities, particularly in the areas of mathematics and science, and the arts. The foundation has benefited MIT students in the

See photos from the launch celebration.

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past by supporting graduate students in various departments who are members of the prestigious Society of Presidential Fellows program, as well as students in the Department of Civil and Environmental Engineering who are also members of that program.

"The trustees of the Linde Family Foundation believe very deeply in MIT's dual policy of need-blind admissions and need-based financial aid," said Edward Linde. "We want to help worthy students receive the rigorous educational experience MIT offers

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### Campaign web site showcases the 'Human Factor'

The Campaign for Students connects alumni and friends with compelling, diverse student stories through web, print and video. Student narratives showcase personal passions — the Human Factors — that combine to create leaders who exemplify MIT's unique approach to problem-solving.

Prior to the campaign's public unveiling, student videos were shared with small groups of alumni and friends via e-mail and at regional events. More than 25 video vignettes are now available at <http://thehumanfactor.mit.edu>.

As the videos illustrate, students contribute energy, passion, inspiration, creativity, ambition and intelligence to academics, research and discovery. Students build more efficient and alternatively fueled cars, research spinal-cord injuries, study asteroids to learn the origin of the universe, design life-saving devices for the soldiers, and examine the effect of music on memory.

These are just a handful of the thousands of stories that show MIT students and alumni working to solve the world's complex problems.

## MIT creates Environmental Research Council

Sets stage for Institute environment initiative

MIT has announced the launch of the Environmental Research Council to elevate and expand the Institute's leadership in this critical area of study.

MIT President Susan Hockfield told the community at the recent State of the Institute Forum that the council will draw together the significant environmental work already under way in many different labs and departments to enhance their combined efforts. The goal is to create a robust Institute-wide collaboration comparable to the MIT Energy Initiative.

"The world faces increasingly urgent environmental challenges, deeply intertwined with equally complex and pressing problems in energy. Given the caliber and depth of MIT's intellectual resources on these topics, we have an obligation to lead the way in developing solutions," Hockfield said.



The council emerges directly from the recommendations of a special committee chaired by Maria Zuber, the E. A. Griswold Professor of Geophysics and head of the Department of Earth, Atmospheric and Planetary Sciences. The committee assessed the Institute's research and teaching activities related to the environment and recommended that MIT launch a research initiative focused on the development of new insights into Earth's natural systems to support science, technology, design, policy and management of interventions that advance environmental sustainability.

Dara Entekhabi, the Bacardi and Stockholm Water Foundations Professor in the Department of Civil and Environmental Engineering (CEE) and director of the Earth Systems Initiative (ESI), will serve as chair of the council. The council will engage faculty in all of MIT's five schools, particularly those in departmental programs focused on environmental research and education, and will consult with the MIT Energy Initiative on important areas of interface, including educational programs. The council's first task will be to develop a proposal, expected

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## Polling questions

MIT's Adam Berinsky breaks down the surveys

In the run-up to the Nov. 4 presidential election, the News Office has asked MIT experts to weigh in on the presidential candidates, their policy ideas and aspects of the campaign. In this installment in the series, Adam Berinsky, associate professor in the Department of Political Science, looks at the issue of polling.

**Q: Has the election process become too dominated by polling?**

**A:** Polling has been around in one form or another since the 19th century. In the 1930s, a number of firms started conducting the random sample polls we see today. Over time, the technology has changed. In the 1930s, all polls were conducted through face-to-face methods. In the 1970s, telephone polling emerged as the dominant method. And today we see Internet polls. One thing that

►Please see POLLING, PAGE 7

### EVENTS

#### Financial crisis forum tonight

MIT economics and business professors will debate what has caused the recent market strain.

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### RESEARCH

#### Finding a better route

Researchers' new technology tracks traffic patterns and uses WiFi to collect data on the road.

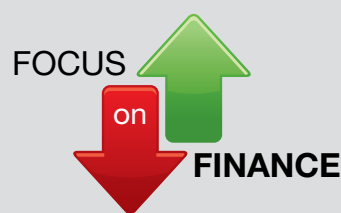
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### NEWS

#### Campaigns debate energy

Representatives of the McCain and Obama presidential campaigns discussed power at MIT.

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As the financial crunch takes new turns, MIT will be holding several events to discuss the issues surrounding the crisis and possible solutions. Currently scheduled events include:

- **Today**, "The U.S. Financial Crisis: What Happened? What's Next?" A forum including professors Ricardo Caballero (Economics), Bengt Holmstrom (Economics), Andrew Lo (MIT Sloan), James Poterba (Economics) and William Wheaton (Center for Real Estate). From 4:30-6 p.m. in 10-250, Huntington Hall.
- Oct. 15, subprime mortgage lecture. Speaker: Rachel Bratt. 12:30-2 p.m. in 3-401/403. MIT alumna Rachel Bratt will show how the subprime crisis takes us several steps away from positive movement toward a "Right to Housing."
- Oct. 28, "A Conversation with George Soros: The New Paradigm for Financial Markets" with Ricardo Caballero, head of MIT's Department of Economics. 3:30 p.m. in Kresge Auditorium.
- **Ongoing**, Simon Johnson, Ronald A. Kurtz (1954) Professor of Entrepreneurship, has launched a new weekly series on the global crisis. Tentatively entitled, "Real Time Deep Dive into the Global Crisis as it Evolves," the class will kick off in October and will draw on Johnson's experience at the IMF and his considerable contacts in Washington. He will also have a blog at <http://baselinescenario.com/>.

• **For alumni**, the Alumni Association has posted a career transition link at [http://alum.mit.edu/news/AlumniNews/Archive/career\\_transitions.jsp](http://alum.mit.edu/news/AlumniNews/Archive/career_transitions.jsp) with advice on how to whether the economic storm.

More events may be scheduled as the semester progresses, and current dates and times are subject to change.

Check the events calendar at [web.mit.edu/events](http://web.mit.edu/events) for more details.

## Obituaries

### Kenneth Hoffman, former math department head, 77

Former Department of Mathematics Head Kenneth Hoffman, who spent more than 40 years on MIT's faculty and made significant contributions to U.S. education and science policy, died Sept. 29 following a heart attack. He was 77.

Hoffman, who led the math department from 1971 to 1979, was instrumental in addressing mathematics in U.S. public policy. After stepping down as head of the mathematics department, he moved to Washington, where he directed the David Committee on federal support of mathematical research from 1981 to 1984. He established and ran the math community's first Washington Office of Governmental and Public Affairs from 1984 to 1989. During that time, media coverage of mathematics increased dramatically, according to the American Mathematical Society.

Born in Long Beach, Calif., Hoffman earned a bachelor's degree in mathematics from Occidental College in 1952. He later received an MA and PhD in mathematics from UCLA.

Hoffman joined the MIT Department of Mathematics as an instructor in 1956. He became a full professor in 1964 and served as chair of the Pure Mathematics Committee from 1968 to 1969. From 1969 to 1971, he directed the Commission on MIT Education, appointed by MIT President Howard Johnson to conduct a comprehensive review of education, research and governance at MIT. He retired in 1996.

Hoffman's area of research specialization was functional analysis. Along with Richard Arens and Isadore Singer, he made fundamental contributions to both complex and abstract analysis. Among them was a paper (with Singer) that answered many of the questions on commutative Banach algebras raised by I. M. Gelfand.

In 1986, the Joint Policy Board for Mathematics awarded Hoffman its first Public Service Award "for his farsighted and effective initiation of the planning and the implementation of a national mathematical science policy."

In 1990, Hoffman also received the first Award for Distinguished Public Service of the American Mathematical Society. Its citation reads in part, "Through his efforts, the awareness of the importance of mathematics and the support of mathematical research has been significantly heightened in the general public, among makers of science policy in the government, and among university administrators."

Hoffman was also a leader in national K-12 education. At the National Academy of Sciences/National Research Council he launched a series of initiatives with national impact. These included creation of both the Mathematical Sciences Education Board and the National Science Education Standards project.

In 1961, Hoffman wrote an undergraduate linear algebra textbook, co-authored with Ray Kunze, that was used for many

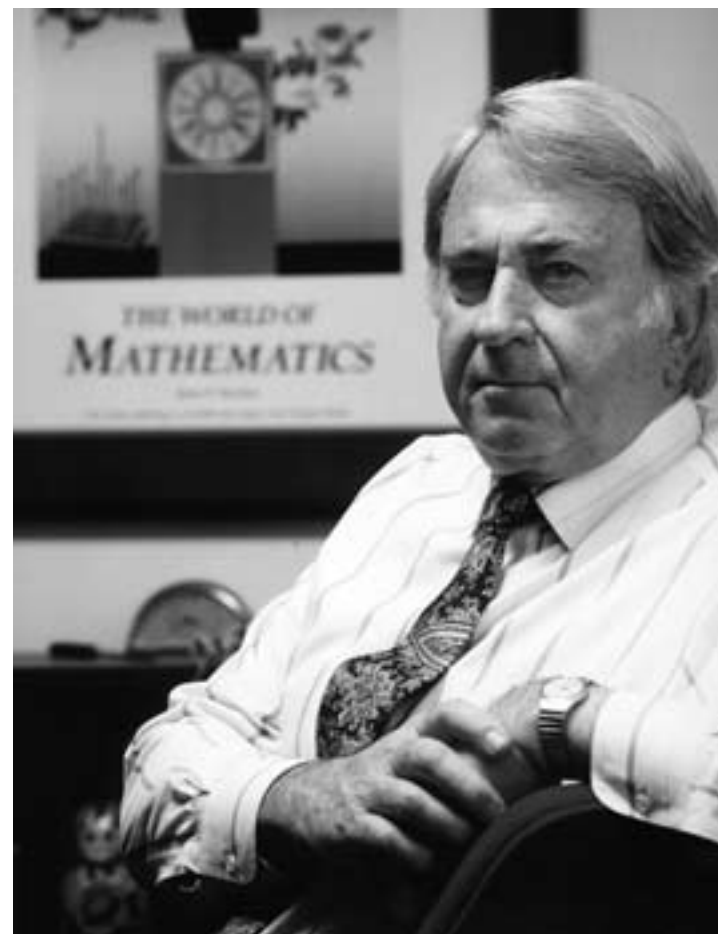


PHOTO COURTESY OF THE DEPARTMENT OF MATHEMATICS

Kenneth Hoffman

decades and became a classic in the field.

He is survived by his wife, Alicia Hoffman; former wife Patti Hoffman; a son, Robert Hoffman; two daughters, Laura Lasa and Donna Ullah; a sister, Barbara Hollis; and 14 grandchildren.

A memorial service will be held at the Curran-Bromwell Funeral Home in Cambridge, Md., on Friday, Oct. 3. Another service will be held at 11 a.m. Saturday, Oct. 25, at the Mathematical Association of America Carriage House, 1781 Church St. NW, Washington, D.C.

In lieu of flowers, gifts may be made to MIT for the Kenneth Hoffman Memorial Fund. Checks should be mailed to the attention of Bonny Kellermann, MIT Office of Memorial Gifts, 600 Memorial Drive, Room W98-500, Cambridge, MA 02139. Please include a note stating that your gift is in memory of Kenneth Hoffman.

## COUNCIL: MIT creates Environmental Research Council

Continued from Page 1

by February 15, 2009, for an Institute-wide Environmental Initiative.

"The main goal of such an initiative would be to understand how the Earth system works, so that we can approach sustaining life on Earth in a rational way," Entekhabi said. He compared such a strategy to the way the development of pharmaceuticals has evolved from trial-and-error to a rational design system that begins by targeting the exact biochemical pathway to be treated.

"We need to treat the Earth system in the same way," he said.

In addition to Entekhabi, the council is comprised of Sallie (Penny) Chisholm, the Lee and Geraldine Martin Professor of Environmental Studies and Biology in CEE; Michael Greenstone, the 3M Professor of Environmental Economics; Judith Layzer, the Edward H. and Joyce Linde Career Development Associate Professor of Environmental Policy, in the Department of Urban Studies and Planning; John C. Marshall, professor of atmospheric and oceanic sciences in EAPS and director of the Climate Modeling Initiative; Dianne K. Newman, the John & Dorothy Wilson Professor of Biology and Geobiology,

Departments of Biology and EAPS; Daniel G. Nocera, the Henry Dreyfus Professor of Energy in the Department of Chemistry; Martin F. Polz, associate professor of civil and environmental engineering; Ronald G. Prinn, TEPCO Professor of Atmospheric Chemistry in EAPS; Daniel H. Rothman, professor of geophysics in EAPS; John Stermann, the Jay W. Forrester Professor of Management Science in the MIT-Sloan School of Management and director of the System Dynamics Group; J. Phillip Thompson, associate professor of urban politics and community development in DUSP; and James Wescoat, the Aga Khan Professor of Architecture.

"The recommendations in the Zuber committee report point out the breadth of interdisciplinary activities that already exist across all five schools," said MIT Provost L. Rafael Reif. "The council will help frame and advance a focused research program that builds on the core strengths identified by the Zuber report and that will lead us to the frontier of important new opportunities for discovery."

MIT has robust research programs in a number of interrelated areas — for example, water, climate change and energy — each with compelling leadership and

considerable momentum. The Environmental Research Council is charged with consulting and engaging faculty in all complementary areas so synergies can be achieved, duplication avoided and environmental goals maximized.

Chancellor Phillip Clay said the council includes faculty from more than a half dozen departments, highlighting the tremendous impact MIT research can have on addressing a wide array of environmental problems — and engaging a broad segment of students.

The council will also engage various student organizations interested in the environment, both from the point of view of education and research. "The research generated by this initiative will greatly reinforce our educational programs," Clay said. "Students in every department are interested in the environment, and will welcome a robust research program that connects their passions to their education."

The Zuber committee report, "Creating a Sustainable Earth: An MIT Research, Teaching, and Public Service Initiative for Understanding, Restoring and Managing the Environment," can be found at <http://web.mit.edu/provost/letters/letter05052008.html>.

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# Conference to take hard look at Electoral College

As election nears, experts to debate changing controversial system

Stephanie Schorow

News Office correspondent

MIT is well known for a “fix-it” approach to problems, be it in engineering, software or science. On Oct. 17, a group of experts will convene at MIT to examine what may be the most vexing issue in the American election process — the Electoral College.

Some may argue for change; others may conclude that this is one “problem” that needs no fixing.

The day-long conference “To Keep or Not to Keep the Electoral College” will be chaired by Arnold I. Barnett, the George Eastman Professor of Management Science in the MIT Sloan School of Management. The chair of the conference’s Steering Committee is Alexander S. Belenky, visiting scholar in the Center for Engineering Systems Fundamentals. A group of 11 experts will present their views, debate the issue and engage in extended dialogue with the audience.

“Since its creation in 1787, the Electoral College has remained the most mysterious mechanism for electing a president of a country,” Belenky wrote on the conference’s web site. “There is no consensus among mathematicians, systems scientists and political scientists studying the Electoral College on whether it can satisfactorily serve the United States in the 21st century, especially after two close elections in 2000 and in 2004.”

Indeed, the 2008 presidential election

may raise the issue anew, particularly if one candidate wins the popular vote while the other gains more electoral votes (as occurred in 2000). And there is a real possibility, Barnett said, that candidates Barack Obama and John McCain could tie with 269 electoral votes apiece, throwing the presidential election into the House of Representatives, where each state delegation has one vote.

“As we get closer to the election, as people start working the numbers, then there might really be much more hunger to think, ‘What’s going on? What’s this mechanism? Can we do something differently?’” Barnett said.

While many voters — and even many in the media — lack an understanding of exactly how the Electoral College actually works, efforts to change it can set up fierce opposition, Barnett said. Many argue that the Electoral College should be replaced by nationwide majority rule. But smaller states argue they would lose influence if presidents were chosen by popular vote.

“The small states don’t want the end of the Electoral College because they fear oblivion,” Barnett said. “However, the present arrangements also make most of the large states irrelevant. California is viewed as a done deal, for example. The Democrats are going to carry it so neither candidate is spending much time there.”

In a series of panel discussions, the MIT conference, which is organized by Sloan and the Center for Engineering Systems Fundamentals, will try to examine the

Electoral College objectively, in conversation stripped of political ideology, Barnett said. Several participants will defend the existing system, while several others will call for moving to a national popular vote that, some will argue, could be achieved without a constitutional amendment.

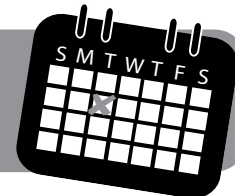
Still, “I think there will be very vigorous discussion,” Barnett said. “These are people who have thought about the issues a lot. They have reasons they believe one thing and not the other.” Barnett himself has co-authored a paper outlining a proposed change in the Electoral College, which would use weighted averages of each candidate’s election showing.

Ample time will be set for audience participation and give-and-take. Barnett said the conference would be in keeping with the MIT spirit of “Let’s fix it — if it’s broken.”

“It may be good to have MIT people in the audience looking at the issue, because they may be able to shape the compromises” in future debates, Barnett said. He noted that three of the MIT participants in the conference — himself, Belenky and Alexander Natapoff, research scientist in the Department of Aeronautics and Astronautics — will each propose a new set of election rules that might largely meet the concerns of both the “preservationists” and the advocates of a “one person/one vote” election rule.

For more information, visit the conference’s web site at <http://cesf.mit.edu/electoral/conference.html>.

Events  
at MIT



## Today

- **The Fire Safety Investigation of the World Trade Center Disaster.** Speaker: Dr. S. Shyam Sunder, Director Building and Fire Research Laboratory, National Institute of Standards and Technology, United States Department of Commerce. 4-5:30 p.m. 3-270.

## Thursday, Oct. 9

- **MIT Libraries’ Booksale.** 10 a.m.-3 p.m. in 10-105. Selection of materials including biology, computer science, economics, earth science, engineering, history, philosophy, miscellaneous science, political science and social science. Proceeds benefit the Libraries’ Preservation Fund. Open to the MIT community only; dealers and their representatives by appointment only.

- **MIT Sloan Dean’s Innovative Leader Series.** Speaker: Ron Williams SM ’84, Chairman and CEO, Aetna. Noon-1 p.m. in E51-Wong Auditorium.

- **Lecture on Honda’s FCX Clarity Hydrogen fuel cell vehicle.** Speaker: Ryan Harty and David Cun from Honda R&D America. 7-8 p.m. E51-315.

## Friday, Oct. 10

- **MIT Energy Night 2008.** 5:30-8:30 p.m. N51, MIT Museum. The MIT Energy Night is the MIT Energy Club’s flagship event for the fall and it seeks to showcase the most exciting energy research, education and entrepreneurship at MIT. The event will be held at the MIT Museum and will include drinks, hors d’oeuvres and live music.

## CAMPAIGN: MIT launches its \$500 million Campaign for Students

Continued from Page 1

producing leaders in math, science, engineering and business who will, quite literally, change the world.”

The quiet phase of the Campaign for Students, which began in December 2006, has already raised more than half of the \$500 million goal. Major supporters of the campaign during the quiet phase have included Rebecca and Arthur Samberg ’62; Virginia and Richard Simmons ’53; Sophia and Bernard Gordon ’48, SM ’49; Pamela and Arunas Chesonis ’84; Joan and Irwin M. Jacobs ’57, ScD ’59; and Muriel and Norman B. Leventhal ’38.

Friday’s launch brought hundreds of MIT supporters to campus for a full day of symposia highlighting the accomplishments of undergraduate and graduate students for whom scholarships and fellowships have been crucial. A reception and dinner capped the day’s events.

Chancellor Phillip L. Clay PhD ’75 leads the campaign, working closely with Vice President for Resource Development Jeffrey L. Newton and Director of the Campaign for Students Philip Murphy.

Campaign co-chairs are Lawrence Fish; Thomas Gerrity, ’63, SM ’64, PhD ’70; Mark Gorenberg ’76; Martin Tang SM ’72; and Barrie Zesiger HM.

Institute leaders for the campaign are Dean for Student Life Costantino “Chris” Colombo; Dean for Undergraduate Education Daniel Hastings, SM ’78, PhD ’80; Associate Provost Philip Khoury HM ’08; Vice Chancellor and Dean for Graduate Education Steven Lerman ’72, SM ’73, PhD ’75.

The Campaign for Students will conclude in 2011, to coincide with celebration of the 150th anniversary of MIT’s founding.

For more information about the Campaign for Students, visit <http://thehumanfactor.mit.edu>.



PHOTOS / NOAH KUHN

A dinner following the launch of MIT’s Campaign for Students brought together alumni with those who would benefit from the initiative. ABOVE: Ned Brush ’63, SM ’65, ’66, ScD ’67 talks with senior Kathryn Schumacher. BELOW: Jonathan Borschow ’72 chats with senior Matt Gethers.



## Three MIT scientists share Buckley prize

Three MIT scientists from the Francis Bitter Magnet Laboratory (FBML) have been awarded the 2009 Oliver E. Buckley Condensed Matter Prize from the American Physical Society.

Jagadeesh Moodera, a senior research scientist; Paul Tedrow, a retired scientist; and Robert Meserve, a visiting scientist at the FBML, will share the \$10,000 prize with Terunobu Miyazaki from Tohoku University in Japan. The four were cited for “pioneering work in the field of spin-dependent tunneling and for the application of these phenomena to the field of magnetoelectronics.”

The prize was endowed in 1952 to recognize and encourage outstanding theoretical or experimental contributions to condensed matter physics. It is named in memory of Oliver E. Buckley, an influential president of Bell Labs.



Robert Meserve



Jagadeesh Moodera



Paul Tedrow

# CarTel personalizes commutes by using WiFi to network cars

On-board sensors aim to reduce drive times, detect engine woes

Elizabeth Thomson  
News Office

Dozens of cars in the Boston area are testing the latest generation of an MIT mobile-sensor network for traffic analysis that could help drivers cut their commuting time, alert them to potential engine problems and more.

In the CarTel project, Professor Hari Balakrishnan and Associate Professor Samuel Madden of MIT's Department of Electrical Engineering and Computer Science use automobiles to monitor their environment by sending data from an onboard computer — which is about the size of a cell phone — to a web server where the data can be visualized and browsed. They do so via pre-existing WiFi networks passed during a trip.

The resulting data, accessible from the web or a cell phone, not only helps a driver track conditions specific to their own car, but when combined with everyone else's can indicate historical and real-time traffic conditions at different times of the day. "Everybody's data is contributing to collective views of what congestion looks like," Madden said.

"Our goal," Balakrishnan said, "is to make the data behind CarTel available to help you plan and organize your commute and drives. We want to minimize the amount of time spent in your car."

For example, the current system, deployed since January on 50 Boston-area cars — including 40 taxis — tracks traffic by monitoring each vehicle's speed at different points during a trip. Unlike other route-planning systems, "CarTel understands where traffic delays are and recommends routes to avoid them," Madden said.

The system has already cut Balakrishnan's commute to MIT by 25 percent. It recommended a new route that, although a few miles longer than the approach suggested by some mapping web sites, is considerably faster in practice.

CarTel is also linked to a vehicle's onboard diagnostics system (available in all cars sold since 1996), so a driver can check various parameters key to maintenance and be alerted to potential problems.

There are two principal research efforts behind the system. First, Balakrishnan, Madden and Jacob Eriksson (now at the University of Illinois, Chicago) developed a way to connect to WiFi networks that is 35 times faster than other systems. "It can take about 15 seconds to connect using a regular system, so in a car you are already past the WiFi location by the time you get the signal," Madden explained. QuickWiFi can connect in 360 milliseconds. "It's the difference between whether you can use WiFi with a car or not."



The majority of the work, however, is focused on managing the huge amounts of data key to the system. Depending on the sensors in use, CarTel can receive more

than 600 data points a second. So the team has developed two generations of software "to synthesize all that data into interesting uses," Madden said.

One such use is new algorithms for traffic-aware routing, or obtaining directions between two locations that take historical and current traffic conditions into account. Balakrishnan and Madden have developed these algorithms with graduate student Sejoon Lim and Professor Daniela Rus, both of the Department of Electrical Engineering and Computer Science.

"CarTel makes it easy to collect, process, deliver and visualize data from a collection of remote, mobile and intermittently connected nodes," the researchers concluded in one of several technical articles and conference presentations on the work. Most recently, they described the research at the Association for Computing Machinery's Conference on Mobile Computing and Networking (MobiCom) in September 2008.

This work is funded by the National Science Foundation and the T-Party Project, a joint research program between MIT and Quanta Computer Inc. For more information visit [cartel.csail.mit.edu](http://cartel.csail.mit.edu).



## MIT's energy projects on display

Museum event showcases the cream of the energy crop

MIT Energy Night, to be held 5:30-8 p.m. on Friday, Oct. 10, at the MIT Museum, will highlight more than 40 projects, groups and start-up businesses in and around MIT at the cutting edge of energy research.

The annual event, organized by the MIT Energy Club and the Sloan Energy and Environment Club, is an informal way to get a quick overview of the range of work going on around the campus while munching on hors d'oeuvres and listening to live music.

Representatives for student groups

including the MIT Electric Vehicle Team, Biodiesel@MIT and the Solar Decathlon will be on hand, as well as representatives for faculty-directed research on such topics as spinach-powered solar cells, advanced nuclear reactors, ultracapacitors based on nanotubes and alternative fuels for transportation. Other presenters are from companies that originated from MIT research, including A123 Systems (battery technology), C3 BioEnergy (making propane from plants) and GreenFuel Technologies (making fuel from algae).

Energy Club co-president Lara Pierpoint says Energy Night is "a chance for people from all over campus to look across disciplines and see what's going on in research, in student organizations, and in emergent MIT spinoff companies. It's about talking, engaging and, most importantly, it's about partying and celebrating the achievements we've made and the enthusiasm we have for tackling the challenges ahead."

The MIT Museum is in Building N52 at 265 Mass. Ave. More details on Energy Night can be found at [www.mitenergyclub.org/flagship-events/energy-night](http://www.mitenergyclub.org/flagship-events/energy-night).

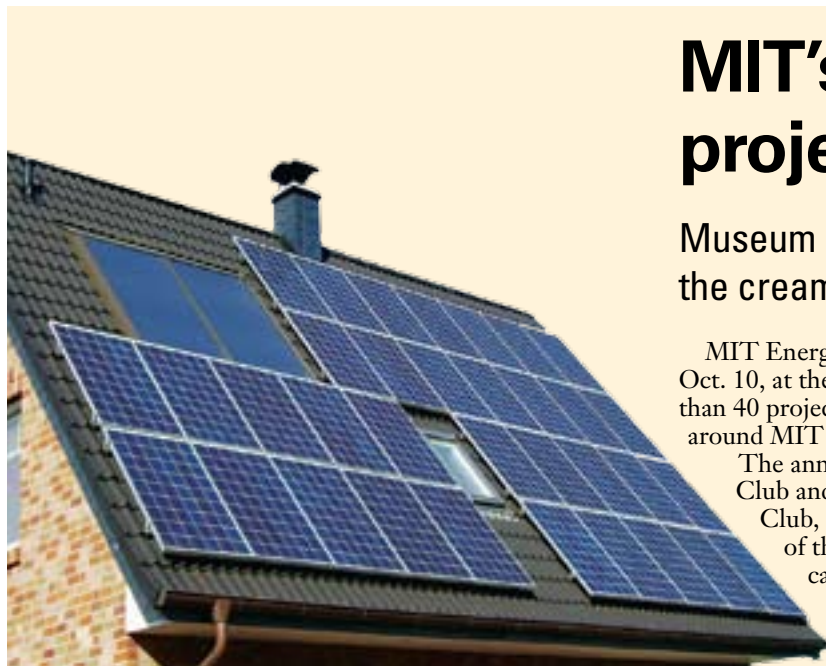




PHOTO / BRIAN HEMOND

Representatives from the two presidential campaigns, R. James Woolsey for Sen. John McCain, and Jason Grumet for Sen. Barack Obama, face off in a debate on energy policy held Monday night in Kresge Auditorium.

## Debating the U.S. energy future

McCain favors states' control, Obama calls for federal investment

David Chandler  
News Office

In a spirited but friendly debate Monday night in a packed Kresge Auditorium, representatives of the John McCain and Barack Obama presidential campaigns detailed the differences between their candidates' approaches to solving the nation's energy problems.

Although they agreed on some key points, the debaters delineated clear distinctions between the candidates' plans, most notably that McCain favors leaving most decisions on energy choices up to the states, while Obama calls for significant regulations and investment in research at the federal level.

The 90-minute debate, organized by the student-run MIT Energy Club and the MIT Energy Initiative, featured James Woolsey, former CIA director and an advisor on energy to Republican candidate McCain, and Jason Grumet, head of the National Commission on Energy Policy and an energy advisor to Democratic candidate Obama. Tom Ashbrook, host of the NPR program, "On Point," was the moderator; questions were asked by two journalists and a panel of four MIT students.

The two campaign representatives made it clear at the outset that they have been longtime friends and have worked together on energy projects, setting an amicable and often jocular tone for the debate in which they clearly outlined their candidates' views.

Woolsey stressed that McCain favors an emphasis on local control over energy choices, rather than too much federal control over "picking and choosing" the winners and losers among the many proposed energy alternatives. He also stressed McCain's "willingness to take the lead in opening up offshore oil reserves."

Grumet said that Obama believes it

► Please see DEBATE, PAGE 7

# Team takes first atomic-scale compositional images of fuel-cell nanoparticles

Work could lead to better catalysts for eco-friendly energy storage devices

Elizabeth Thomson  
News Office

In a step toward developing better fuel cells for electric cars and more, engineers at MIT and two other institutions have taken the first images of individual atoms on and near the surface of nanoparticles key to the eco-friendly energy storage devices.

Nanoparticles made of platinum and cobalt are known to catalyze some of the chemical reactions behind fuel cells, making those reactions run up to four times faster than if platinum alone is used as the catalyst.

No one, however, understands exactly why. That's because "little is known about the nanoparticles' surface atomic structure and chemistry," which are key to the particles' activity, said Yang Shao-Horn, an associate professor in the Department of Mechanical Engineering and Department of Materials Science and Engineering and director of the Electrochemical Energy Laboratory at MIT.

Using a new technique known as aberration-corrected Scanning Transmission

Electron Microscopy, Shao-Horn's team, in collaboration with Professor Paulo Ferreira of the University of Texas at Austin and Larry Allard of Oak Ridge National Laboratory, identified specific atomic structures near the surface of such a catalyst. That information in hand, the researchers propose a theory for why the material is so active. Perhaps most importantly, "knowing the surface composition will help us design even better catalysts," Shao-Horn said.

The work was reported in the Sept. 24 online issue of the *Journal of the American Chemical Society*.

The researchers analyzed platinum and cobalt nanoparticles that were either treated with acid, or treated with acid then subjected to high heat. Nanoparticles produced both ways are known to be more active than platinum alone. Shao-Horn and colleagues found that each, in turn, also had slightly different surface structures.

For example, in the nanoparticles subjected to heat treatments, the platinum and cobalt atoms formed a "sandwich-like" structure. Platinum atoms covered most of the surface, while the next layer down was composed primarily of cobalt. Successive

layers contained mixtures of the two.

The team proposes that these particular nanoparticles are up to four times more active than platinum alone because the platinum atoms on the surface are constrained by the cobalt atoms underneath.

"This modifies the interatomic distances between the platinum atoms on the nanoparticle surface," making them more effective in chemical reactions key to fuel cells, Shao-Horn said.

She further noted that "this work bridges the gap between our understanding of

electrocatalysis in bulk materials and at the nanoscale."

In addition to Shao-Horn, Allard, and Ferreira, who is also an MIT research affiliate, other members of the research team are Shuo Chen, first author of the paper and a postdoctoral associate in mechanical engineering; Wenchao Sheng, a graduate student in chemistry; and Naoaki Yabuuchi, a research affiliate in mechanical engineering.

The Department of Energy and the National Science Foundation, through its Materials Research Science and Engineering Center program, funded the work.

“Knowing the surface composition will help us design even better catalysts.”

Yang Shao-Horn  
associate professor

## Report debunks China energy myth

The problem isn't in the technology, it's the operations

David Chandler  
News Office

A detailed analysis of power plants in China by MIT researchers debunks the widespread notion that outmoded energy technology or the utter absence of government regulation is to blame for that country's notorious air-pollution problems. The real issue, the study found, involves complicated interactions between new market forces, new commercial pressures and new types of governmental regulation. China's power sector has been expanding at a rate roughly equivalent to three to four new coal-fired, 500 megawatt plants coming on line every week, said Edward S. Steinfeld, associate professor of political science at MIT.

After detailed survey and field research involving dozens of managers at 85 power plants across 14 Chinese provinces, Steinfeld and his co-authors, Richard Lester (professor, nuclear science and engineering and director of the MIT Industrial Performance Center) and Edward Cunningham (doctoral candidate, political science) found that in fact most of the new plants have been built to very high technical standards, using some of the most modern technologies available. The problem has to do with the way that energy infrastructure is being operated and the types of coals being burned.

New market pressures encourage plant managers to buy the cheapest, lowest quality and most-polluting coal available, while at the same time keep idle expensive-to-operate smokestack scrubbers or other cleanup technologies. The physical infrastructure is advanced, but the emissions performance ends up decidedly retrograde.

Understanding the realities of China's energy infrastructure and management is crucial, Steinfeld said, for gaining leverage over the whole gamut of global energy-related challenges. China's electric power sector is vast — second only to America's in size — and globally unparalleled in terms of the speed of its growth. "To a significant degree, our planet's energy and environmental future is now being written



in China," he and his two co-authors wrote in a recent MIT Industrial Performance Center working paper (available online at <http://web.mit.edu/ipc/publications/papers.html>). Findings from the research have also recently been published in *The China Economic Quarterly* and an additional paper is currently under review at *Energy Policy*.

Steinfeld, who has been working in China since the late 1980s and has been carrying out this research project there since 2005, said that, at present, the Chinese government lacks reliable data on how the nation's power plants are built and

operated. Officially available data tend to be collected haphazardly and often by local authorities who have a vested interest in the outcomes. The survey work conducted by Steinfeld and his colleagues represents a first-of-its-kind effort by outsiders to collect unbiased, objective data of this sort at a national level.

One of the most surprising findings was that "the kinds of technology currently being adopted in China are not cheap. They're not buying junk, and in some cases the plants are employing state-of-the-art technology."

The findings suggest that emissions levels from Chinese power plants, he said, "depend almost entirely on the quality of the coal they use. When they're hit by price spikes, they buy low-grade coal." Lower-grade coal, which produces high levels of sulfur emissions, can be obtained locally, whereas the highest-grade anthracite comes mostly from China's northwest and must travel long distances to the plants, adding greatly to its cost. Contrary to what many outsiders believe, the Chinese state has substantially improved its ability to implement and enforce rules on technology standards. It has been slower, however, to develop such abilities for monitoring the day-to-day operations of energy producers.

In some respects, the situation is more amenable to change than many people had assumed, Steinfeld said. With expanding regulatory capacity and increasingly sophisticated efforts to regulate through market-friendly pricing mechanisms, reformers could achieve change relatively quickly, he said. "At least the technology — the physical infrastructure of China's energy system — is not an impediment," he said. Indeed, it can ultimately prove a key asset for achieving better environmental outcomes.

Since coal quality is one important leverage point, "some new regulatory efforts probably need to be focused on the mines and coal markets," Steinfeld suggested. "That's the kind of question that this research begins to allow you to address."

The three co-authors of the study are members of the Industrial Performance Center's China Energy Group. The research was supported by Shell, the MIT Energy Initiative, and the MIT Sloan School of Management China Program.

## News in brief

## Bustani seminars focus on Mideast

The Emile Bustani Middle East Seminar at MIT will celebrate its 23rd anniversary with two lectures this fall on contemporary Middle Eastern affairs. On Oct. 21, Dr. Nilüfer Göle, professor of sociology at the Ecole des Hautes Etudes en Sciences Sociales, Paris, will give a lecture entitled "Islam and Europe: The Changing Face of Public Culture." On Nov. 4, Dalia Mogahed, senior analyst and executive director of the Gallup Center for Muslim Studies, will lecture on "Who Speaks for Islam?"

The seminar is funded by the Bustani family of Beirut, Lebanon, in memory of the late Emile M. Bustani '33.

The sessions will begin at 4:30 p.m. in E51-095 at 70 Memorial Drive. Both sessions are open to the public. For further information on the Bustani Middle East Seminar, contact Pardis Parsa at 617-252-1888.

## MITSO kicks off new season

To kick off the 2008-2009 season, the MIT Symphony Orchestra (MITSO), under the direction of Adam Boyles, will present "Celebrate!" a concert of celebratory works — two of which will showcase the talents of MIT students and faculty.

The concert, which starts at 8 p.m. Friday, Oct. 10, in Kresge Auditorium, will begin with Dvorak's fiery Carnival Overture, a work that depicts the festive time prior to Lent in Roman Catholicism.

Carnival will set the stage for the celebration of two MIT musicians featured in this concert: Professor of Music Peter Child and senior Matthew Serna.

Just in time for October's Halloween festivities, MITSO will perform Child's Punkie Night, a work he says refers to a "hallow'en-like custom in parts of England." According to Child, the music is wrought with "goolies' ... wailing, cavorting and carrying on."

Serna, a senior studying brain and cognitive science, will be the featured guest soloist for Prokofiev's Piano Concerto No. 3.

The evening will culminate with a performance of Joaquin Turina's masterpiece Sinfonia Sevillana. The final movement of this important Spanish work from 1920 entitled Fiesta en San Juan de Aznalfarache, is an explosion of colorful harmonies and rhythms that will usher in MITSO's new season with a bang.

The concert is open to the public, and admission is \$5 at the door.

## MIT conference on systems thinking to be held Oct. 23-24

Global industry leaders and MIT faculty will speak on the importance of using a systems approach to solving complex problems, such as sustainability and the environment, product design and technology strategy, at MIT's Systems Thinking conference. The event, sponsored by the System Design and Management (SDM) program, will be held on the MIT campus Oct. 23-24.

Senior executives will offer insights into best practices for applying systems thinking at their companies, which include Microsoft, IDEO, Herman Miller, Agilent, eClinicalWorks, Capgemini and HubSpot. MIT experts Yossi Sheffi, Peter Senge, Nancy Leveson, Olivier de Weck, Annalisa Weigel and Patrick Hale will provide information on the emerging field of engineering systems and how to apply several new methodologies to address complex challenges.

This conference is open to all. Registration information is at <http://sdm.mit.edu/conf08>. Preregistration is requested by Oct. 9.

## Sea Grant symposium to focus on endangered whales

What can North Atlantic whales tell us about our oceans and climate? How can science, law, government and policy help protect these endangered mammals?

A two-day symposium, co-hosted by the MIT Sea Grant College Program and the Boston College Environmental Affairs Law Review, will address these questions on Oct. 15-16.

"20-Ton Canaries: The Great Whales of the North Atlantic" begins with the 2008 MIT Sea Grant Lecture at 7 p.m. on Wednesday, Oct. 15, at MIT's Stata Center. The keynote speaker will be Eric Jay Dolin, author of "Leviathan: A History of Whaling in America." The lecture will be followed by a panel discussion of experts on the causes of — and possible solutions to — whale endangerments, ship strikes and other present-day risks.

Those experts will include Michael Moore, Woods Hole Oceanographic Institution; Jeremy Firestone, University of Delaware; Robin Craig, Florida State University College of Law; Richard Max Strahan, Whale Safe USA; Wil Burns, Journal of International Wildlife and Policy; and Don Anton, Australian National University. Doug Fraser, a writer for the Cape Cod Times who has covered marine issues for more than a decade, will moderate.

A Q&A session and reception will follow.

From 1-6 p.m. on Thursday, Oct. 16, at Boston College Law School, the expert panelists will discuss in greater depth the failures of current approaches to protecting whales and potential technological and legal solutions. This portion of the event will take place at Boston College Law School, Lecture Hall East Wing 120, 885 Centre St., Newton, MA.

For more information, contact Andrea Cohen, MIT Sea Grant, at 617-253-3461 or [alcohen@mit.edu](mailto:alcohen@mit.edu).

All events are free and open to the public.



PHOTO / MICHAEL CARPENTER

Dean of Engineering Subra Suresh, alumnus Irwin Jacobs and Professors Robert Armstrong and Arvind at the NAE induction ceremony last Friday.

## National Academy of Engineering welcomes two from MIT

Two MIT faculty are among the 65 new members of the National Academy of Engineering. This year the NAE also installed alumnus Irwin Jacobs, '57 MS, '59 ScD, as the new chairman of the academy.

Charles Vest, MIT's 15th president, has been president of the NAE since 2007.

The new members are:

Arvind, the Johnson Professor of Computer Science and Engineering and a member of the Computer Science and Artificial Intelligence Laboratory, who is being recognized for "contributions to data flow and multi-thread computing and the development of tools for the high-level synthesis of hardware."

Robert Armstrong, the Chevron Professor of Chemical Engineering and the deputy director of the MIT Energy Initiative, for "conducting outstanding research on non-Newtonian fluid mechanics, co-authoring landmark textbooks, and providing leadership in chemical engineering education."

"I am delighted to welcome Arvind and Bob to the highly accomplished cohort of MIT colleagues who belong to the National Academy of Engineering," said Subra Suresh, dean of engineering and an NAE member since 2002. The two were inducted at a ceremony in Washington, D.C., on Oct. 5.

Election to the NAE is among the highest distinctions accorded to engineers. Academy membership honors those who have made outstanding contributions to "engineering research, practice or education, including, where appropriate, signifi-

cant contributions to the engineering literature," and to the "pioneering of new and developing fields of technology, making major advancements in traditional fields of engineering or developing/implementing innovative approaches to engineering education."

MIT has had deep connections with the NAE since its inception in 1964. Of the Academy's original 25 founding members, nearly a third were trained at the Institute. They include MIT's eleventh president, Julius Stratton, and Thomas Sherwood, dean of engineering from 1946 to 1952.

The Institute's relationship with the NAE has persisted. In each of the last 36 consecutive years, at least one member of the faculty or research staff has been elected to the NAE, and MIT has more NAE members among its faculty than any other institution in the world. Since 1964, MIT has seen 151 of its faculty, researchers, instructors and associates elected to the NAE's ranks. Of those, 109 remain actively engaged in the intellectual life of MIT today.

MIT has also had a strong presence among winners of the NAE's Charles Stark Draper Prize. Named for one of MIT's most prolific and celebrated engineers, and widely regarded as the most distinguished award in engineering, the \$500,000 prize has been awarded 14 times and had 31 recipients — seven of them with strong MIT connections, including Institute Professor Robert Langer, 3Com Founders Professor of Engineering Tim Berners-Lee, and Leonard Kleinrock, MIT PhD '63.

## MIT Medical launches new, upgraded web site

Alice Waugh  
MIT Medical

The MIT Medical Department has relaunched its web site with a new address — <http://medweb.mit.edu> — as well as clearer navigation, patient-specific guides and an improved clinician directory.

Research showed that users wanted clear steps for completing specific tasks such as finding a clinician or making an appointment, as well as easy-to-find information on the MIT health plans, billing and health education topics. Accordingly, the new site has a prominent section called "How Do I...?" and a clinician directory that can now be sorted and searched by name, clinical service and health topic.

Although the old site had a clinician directory, "it was basically a list of names. Now it's much more interactive," said William Kettle, medical director at MIT Medical. "Even the directory photos have been updated, which has been a little disconcerting to those of us who looked 10 years younger on the old site."

The redesigned site contains guides for specific patient audiences, including international students, parents of students, retirees, undergraduates and graduate students. The old site's health and wellness information has also been augmented with a "micro-



site" for MIT Medical's Center for Health Promotion and Wellness (CHPW) and the Mental Health Service. This area offers quick online access to resources for mental health and stress management, nutrition and fitness, and sex and sexuality as well as details on classes, workshops, lectures and consultations on a wide variety of health and wellness topics offered by MIT Medical's health educators and mental-health clinicians.

Another service offered on the MIT Medical web site is Patient Online, which lets patients view their medication records and some of their health history (immunizations, past appointments, allergies, insurance, etc.), order prescription refills, make appointment requests, and exchange secure e-mail with their health care providers.

"It's easier to find what you're looking for on our new web site, which is an important part of our commitment to the health and wellness of all members of the MIT community," Kettle said.

## DEBATE: Representatives from Obama, McCain camps lay out energy policies

Continued from Page 5

is essential “to have comprehensive energy policies,” and compared his candidate’s very detailed proposals to what he called McCain’s “two-and-a-half-page memo” on energy policy that is really just “an enumeration of slogans.” And he chastised McCain for saying he would put vice-presidential candidate Sarah Palin in charge of energy policy, saying that by contrast Obama “will make this a personal priority.”

Both debaters agreed on the importance of reducing the nation’s dependence on

imported oil, but emphasized differences on how to achieve that goal. In addition to increasing domestic production, Woolsey said, McCain favors strong development of alternative fuels, but without prescribing which fuels or production methods would get support, leaving the market to pick the best options. Grumet said Obama’s plan emphasizes a strong federal policy of requiring improvements in the fuel efficiency of cars and trucks, something he said Obama has already pushed hard for,

helping to pass the first increases in federal mileage standards in 30 years.

Moving toward technology for capturing and storing the carbon emissions from power plants is an approach that both candidates favor, the debaters said. Grumet called developing such technologies a crucial need, saying that if a cost-effective system could be developed that could be retrofitted on existing fossil-fuel power plants “that would be the most important breakthrough we could have.” To achieve that, he said, Obama has committed to spending \$15 billion a year for 10 years for research on such technologies.

Woolsey agreed on the importance of the technology, saying McCain supports an initial \$2 billion a year commitment, which would grow over time using revenues from selling licenses under a proposed cap-and-trade system. The latter could generate “something in the ballpark of \$10 to \$20 billion a year,” much of which could be used for such research.

The two also differed on plans for

nuclear power. Woolsey said McCain supports a federal push to build 45 new nuclear plants over the next 20 years, because in terms of baseload power production that produces no operating carbon emissions, “it’s about the only thing we’ve got going for us.” Grumet responded by citing an MIT study of nuclear power’s potential that found it was “not cost effective” without large federal subsidies, but added that Obama had voted for funding research that would “keep the door open” for new nuclear power, which McCain had opposed.

Grumet said that while the two candidates’ energy plans are “theoretically quite similar,” it’s important to look at their voting records, which show that Sen. McCain “voted 20 times against renewable energy and efficiency standards.” Woolsey responded that McCain has a “strong aversion to mandating specific choices” in energy systems, and instead “is in favor of generic encouragement of new technologies.”



PHOTO / BRIAN HEMOND

Representatives from the two presidential campaigns, R. James Woolsey, for Sen. John McCain, and Jason Grumet for Sen. Barack Obama, face off in a debate on energy policy held Monday night in Kresge Auditorium.

## POLLING: MIT weighs in on the election

Continued from Page 1

has changed is that it is easier and cheaper today to conduct polls than ever before, so we have seen a proliferation of polls. So there may be more polls today, but polls — and the dominance of polls as a means of predicting elections — have been around for a while.

**Q: How can the general public better understand polling? What questions should we ask ourselves when we look at a poll?**

A: You want to look at a few things. First, look at how the poll was conducted. Some pollsters — most notably Zogby — use Internet panels where people choose to respond to surveys. This is a poor way to conduct Internet surveys, and the Zogby polling shows it. Polls in which people “self-select” into surveys completely subvert the process of random sampling that is the basis for polling. These polls are essentially like the call-in polls you sometimes see on TV. People who are interested in a topic respond and they may be very different than the average American. I should note, however, that some Internet polls can be useful.

You also want to look at who is being surveyed. Now that we are close to the election, many firms are surveying “likely voters” — those people they think are most likely to turn out — rather than the full population. Since every firm uses a different standard to determine “likely voters,” some of the polls are different. But the important thing is to contrast the results to those of the full public, or “registered voters.”

Finally, take a look at how pollsters word their questions. The general presidential choice question is straightforward, but once you start asking about issues or characteristics of the candidates, small differences in the wording of questions can have large effects on the answers you get.

**Q: Does polling indicate that negative campaigning works in terms of how the electorate will actually vote?**

A: The research evidence on this is mixed. Some say that negative campaigns turn off voters, but others have argued that negative campaigns help mobilize a candi-

date’s supporters. The jury is still out.

**Q: Since the system of the Electoral College determines the president, do national polls have real significance? Shouldn’t state-by-state polls be considered more significant?**

A: The nice thing about the 2000 election is that it showed us that presidential elections turn on state-level results. So there has been a lot of state-level polling conducted in the last two presidential elections. True state polls matter most, but often these polls have smaller sample sizes and are conducted less often than national-level polls.

The national polls can give us a sense of the larger dynamics in the race. After this year’s Republican convention, for example, McCain had a large bump in the national polls. The different states reacted differently — some traditionally Republican states became more pro-McCain and some traditionally Democratic states held steady — but in general, McCain’s bounce was felt across the nation. The national polls gave us a window into the overall change in the race faster than the state-level polls. So it’s important to look at both sets of polls.

**Q: Why are polls sometimes wrong?**

A: Well, they are right more than they are wrong. There are two issues here. First, any individual poll could be wrong and sometimes a host of polls is wrong (in the New Hampshire Democratic primary this year, for example) but often if we look at the results of a number of polls together, we get the right answer. Pollster.com and realclearpolitics.com both present the full range of polls with averages. In 2004 and 2006, the average of the polls near the election was pretty much spot on. Second, the polls today tell us how people would vote if the election was today, but we’re not voting until November. Once we get closer to Election Day, after the candidates have finished their debates and the campaign has played out, the polls will be more predictive. But just because polls taken in August and September sometimes fail to predict the winner doesn’t mean they are wrong; they still give us a sense of where the race stands today.

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- > Maximum award: \$15,000

Massachusetts Institute of Technology

MIT International Science and Technology Initiatives

# Analyzing the 'sponge'

Book details Simmons Hall competition

Jen Hirsch  
News Office

Ever since its opening in 2002, Simmons Hall — or more affectionately, the “sponge” — has been, among other things, one of MIT’s most unique buildings. Now it is the focus of a book documenting an MIT student competition that analyzed communications and the use of space within the building.

Designed by architect Steven Holl, the building’s exterior contains more than 5,500 small square windows, but its uniqueness doesn’t just involve its façade. Though architects came from far and wide to tour Simmons, its residents soon identified problems with the building. For example, the terraces were small and difficult to make use of, and, given the perforated elements key to much of the interior walls of the building, there was no place to hang bulletin boards, a key method of communication in college dorms.

Carlo Ratti, Associate Professor of the Practice in the Department of Urban Studies and Planning, had been living in the building for about a year when a student resident approached him about the problems. Instead of tackling them on his own, from his perspective as an architect Ratti proposed that the students themselves address them in the form of a competition.

“The great thing is to have input and feedback from users,” Ratti said of the competition. “Letting students speak out was an important part of the dialogue.”

The competition, chaired by Robert Campbell, the Pulitzer Prize-winning architecture critic for the Boston Globe, had a jury of students, faculty and administration. Ten teams of various sizes participated. The teams were to address the problems of terrace use and building communications, but could also suggest other changes to the building or its furnishings.

The results ranged from practical to

outrageous. One team proposed that the level 8 terrace be converted into a glassed-in movie theatre with stadium seating. Another simply proposed building a “clone” of Simmons across the street so that students would not be disturbed by visiting architects. Yet another team suggested extending certain walls and covering them with chalk-friendly paint.

Although it’s not yet certain whether the students’ suggestions will be implemented in the building itself, their results were so unique and interesting that they were put on display at an exhibition organized by the Canadian Center for Architecture in Montreal. Further, “Inside the Sponge: Students Take On MIT Simmons Hall,” a book documenting the competition and its results, was published this month by the Canadian Center for Architecture.

PHOTOS / DONNA COVENEY



## MIT marks 25 years of international initiatives at MISTI

The Institute celebrated 25 years of international engagement through the MIT International Science and Technology Initiatives (MISTI) at an Oct. 2 dinner hosted by Dana Mead, chairman of the MIT Corporation, and Deborah Fitzgerald, Kenan Sahin Dean of the School of Humanities, Arts, and Social Sciences.

MIT’s largest international program, MISTI is a pioneer in the field of applied international studies. It prepares MIT students to participate in the global economy by connecting them to hands-on professional internships and research opportunities across the globe.

MISTI began in the early 1980s with the creation of the MIT-Japan Program. By 1991, more than 60 MIT interns each year were working in Japan. Today, MISTI prepares and sends more than 300 MIT interns annually to nine countries: China, France, Germany, India, Israel, Italy, Japan, Mexico and Spain.

“From the path that MISTI has broken, we are now paving the way to a whole new avenue for education at MIT,” President Susan Hockfield said at the dinner. “The reason I’m convinced that global exposure makes an MIT education even better for our students is that we have been very careful in designing those experiences. MISTI is the premier example.”

MISTI students prepare for their internships through immersion in the language, history and politics of their host country. Working with leading companies, research institutes, universities and nongovernmental organizations around the world, MISTI individually matches each student with a project.

MIT senior Wendi Zhang told dinner attendees how MISTI gave substance and new direction to her MIT

education: “I came to MIT wanting to do something international and business-related and exciting and new — and thanks to MISTI, I have found that something.” Zhang researched mobile-gaming trends and investment opportunities during her internship last summer with a U.S.-China joint venture capital firm in Shanghai. “This was my first close look at the intersection between technology and international business and I found it absolutely fascinating,” Zhang said. “I really hope that MISTI will become a significant and stimulating part of every MIT student’s experience, as it has been for me.”



PHOTO / JUSTIN KNIGHT

Department of Electrical Engineering and Computer Science Head Eric Grimson speaks during the MISTI 25th anniversary celebration recently as SHASS Dean Deborah Fitzgerald and senior Wendi Zhang look on.

MISTI alumnus Jake Seid (’96, MEng ’98), now managing director of Lightspeed Venture Partners, described how vital the ability to connect to innovation around the world has become. In the past, he said, “start-ups happened when a group of people set up shop in a garage. That’s not the case anymore. A friend and fellow MIT alum has a two-person start-up: one founder is in China and one is in the U.S. The garage is virtual now.”

MISTI has partnered with MIT’s Department of Electrical Engineering and Computer Science (EECS) to increase global opportunities for EECS students. Eric Grimson, Bernard Gordon Professor of Medical Engineering and head of EECS, underscored the importance of international experience: “Current students understand that to compete in today’s world, they also have to appreciate global perspectives: global markets, different cultures, national priorities, nuances of communication in different languages, even the impact of social and religious norms on commercial and technological behavior. MISTI has been the leader in this meta-education of our students.”

MISTI aspires to be a part of the MIT experience for every student. The program has created new initiatives such as the OpenCourseWare/Highlights for High Schools projects, and student workshops abroad with leading international companies. This fall, MISTI launched the MISTI Global Seed Funds to help MIT faculty begin new projects anywhere in the world, with additional funds to involve students. MISTI also plans to expand to more countries around the world. Potential new host countries include Brazil, South Africa and the United Kingdom.