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TechTalk

SERVING THE MIT COMMUNITY

A new twist on origin of species

The evolutionary split between humans and chimpanzees is much more recent — and more complicated — than previously thought, according to a new study by scientists at the Broad Institute of MIT and Harvard and colleagues.

The work was published in the May 17 online edition of Nature.

The results show that the two species split no more than 6.3 million years ago and probably less than 5.4 million years ago. This is about 1 million to 2 million years more recent than previous estimates. Moreover, the time from the beginning to the completion of divergence between the two species ranges over more than 4 million years. This range is much larger than expected.

The study also showed that the X chromosome is on average 1.2 million years "younger" than the 22 autosomal (non-sex) chromosomes. This indicates that the separation of the two species, or speciation, was unusual — possibly involving an initial split followed by later interbreeding before a final separation.

"The genome analysis revealed big surprises, with major implications for human evolution," said Eric Lander, director of the Broad Institute, co-author of the Nature paper and an MIT biology professor. "First, human-chimp speciation occurred more recently than previous estimates. Second, the speciation itself occurred in an unusual manner that left a striking impact across chromosome X. The young age of chromosome X is an evolutionary 'smoking gun.'"

Previous molecular genetic studies have focused on the average genetic difference between human and chimpanzee. By contrast, the new study exploits the information in the complete genome sequence to reveal the variation in evolutionary his-

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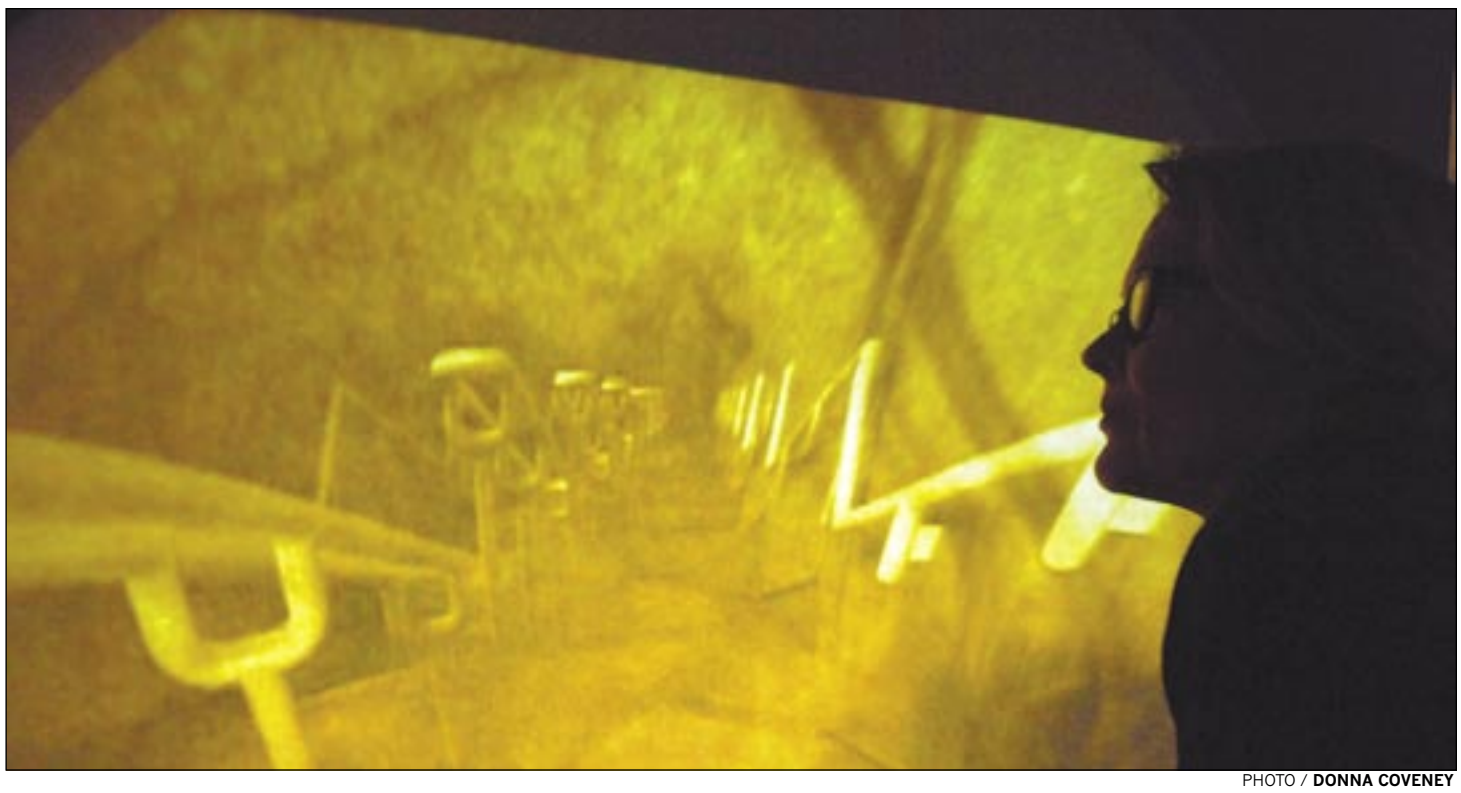

PHOTO / **DONNA COVENEY**

MIT affiliate Elizabeth Goldring looks at 'Descent,' an image she created by combining a photo she took of a subway stairwell with an image of her retina. She worked with the composite image until it resembled what she originally saw when she took the picture.

MIT poet develops 'seeing machine'

Elizabeth Thomson
News Office

An MIT poet has developed a small, relatively inexpensive "seeing machine" that can allow people who are blind, or visually challenged like her, to access the Internet, view the face of a friend, "previsit" unfamiliar buildings and more.

Recently the machine received positive feedback from 10 visually challenged people with a range of causes for their vision loss who tested it in a pilot clinical trial. The work was reported in Optometry, the journal of the American Optometric Association, earlier this year.

The work is led by Elizabeth Goldring, a senior fellow at MIT's Center for Advanced Visual Studies. She developed the machine over the last 10 years, in collaboration with more than 30 MIT students and some of her personal eye doctors. The new device costs about $4,000, low compared to the $100,000 price tag of its inspiration, a machine Goldring discovered through her eye doctor.

Goldring's adventures at the intersection of art and high technology began with a visit to her doctor, Lloyd Aiello, head of the Beetham Eye Institute of the Joslin Diabetes Center. At the time, Goldring was blind. (Surgeries have since restored vision in one eye.)

To better examine her eyes, Aiello asked her to go to the Schepens Eye Research Institute at Harvard, where technicians peered into her eyes with a diagnostic device known as a scanning laser opthalmoscope, or SLO. With the machine they projected a simple image directly onto the retina of one eye, past the hemorrhages within the eye that contributed to her blindness. The idea was to determine whether she had any healthy retina left.

It turns out that she did, and was able to see the image — a stick figure of a turtle. But the turtle wasn't very interesting, Goldring said. So she asked if they could write the word "sun" and transmit that through the SLO. "And I could see it!" she said. "That was the first time in several months that I'd seen a word, and for a poet that's an incredible feeling."

She went on to use the device for many other visual experiences. For example, she developed a "visual language" consisting of short words that incorporate graphics and symbols that convey the meaning of

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Pair automate dorm room

Sasha Brown
News Office

Little by little, freshmen Zack Anderson and R.J. Ryan, residents of East Campus, have turned an ordinary, standard-issue dorm room into something extraordinary: a fully automated pad.

Gone are the light switches and glaring fluorescent lights of a typical dorm room. Anderson and Ryan's room has several lighting schemes, remote web access, voice activation, a security system, electric blinds and more.

The two roommates were perfectly suited, according to Anderson, who had extensive mechanical experience, while Ryan had done many programming projects. Together, they created a vision for their room:

"We wanted full dorm-room automation," Anderson said. "I have always wanted to do something like this."

With the touch of one red button, their dorm room becomes a rave. The lights go out, the blinds close, the displays read, "feel the energy" as a voice repeats the same phrase over a deep bass beat.

Called party mode, the rave also features a sound-activated strobe light, laser light show, fog machine, black lights, revolving disco light and much more. Although they can only squeeze roughly 10 people in their room, Ryan and Anderson like to keep their door open during dorm social events with party mode in

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PHOTO / **DONNA COVENEY**

Freshman R.J. Ryan hits the 'emergency' button in his automatic dorm room on East Campus. The button activates 'party mode.'

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Magnet Lab researchers have developed a new material that promises to improve electronic devices.

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Machines battle it out for the top prize in the annual 2.007 robot contest.

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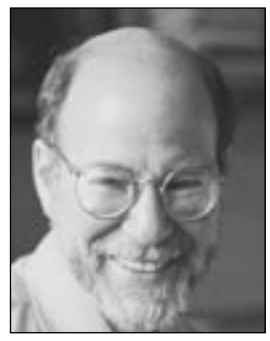
H. Robert Horvitz wins Killian Award



H. Robert Horvitz

Deborah Halber
News Office Correspondent

Nobel laureate H. Robert Horvitz, the David H. Koch Professor of Cancer Biology, is MIT's James R. Killian Jr. Faculty Achievement Award winner for 2005-2006.

Erich P. Ippen, the Elihu Thomson Professor of Electrical Engineering and a professor of physics, announced the Killian Award committee's decision at the faculty meeting on Wednesday, May 17.

Established in 1971 as a tribute to MIT's 10th president, the Killian Award recognizes extraordinary professional accomplishment by an MIT faculty member. The winner is asked to deliver a lecture in the spring term.

Horvitz shared the 2002 Nobel Prize in Physiology or Medicine for discovering and characterizing the genes controlling cell death in the nematode *Caenorhabditis elegans,* a microscopic roundworm. Horvitz is an investigator for the Howard Hughes Medical Institute and for the McGovern Institute for Brain Research at MIT, and he is a member of the MIT Center for Cancer Research. He also holds appointments at Massachusetts General Hospital in neurology and in medicine.

"Bob is a pioneer in using the simple roundworm as an experimental organism for seminal discoveries in cell differentiation and cell death that have increased our fundamental understanding of all multicellular organisms," Ippen said. "In his 27-year tenure on the faculty, Bob has taught thousands of students the fundamentals of genetics, he has been a mentor to graduate students and postdocs, many of whom are now top-rated faculty around the country. It's an honor for me to present this award to someone so devoted not only to research but also to teaching and service to the entire Institute."

"It's been a great place to be for a long time," Horvitz said as he thanked the committee and the faculty members applauding him.

Advising and mentoring changes

Changes in the student-faculty advising system may include a smoother transition for freshmen as they enter new departments as sophomores, more meetings between advisors and students, more information for students with questions on requirements and other logistics and more information on students' rights and responsibilities.

The Committee on the Undergraduate Program, in collaboration with the Committee on Student Life, has been working on a set of guidelines for advising and mentoring students. In a follow-up to the report they submitted last year, members of the committee said at the May faculty meeting that they have been working with the dean's office on ways to bolster the current system. About half of this year's graduating seniors reported in a survey that they were dissatisfied with the quality of the mentoring they had received as undergraduates, according to Chancellor Phillip L. Clay.

"There is some excellent advising at MIT, but the system should be strengthened," said committee member Hazel L. Sive, professor of biology. "Upperclass mentoring is not a system that is broken — it has some best practices in many different departments — but it is in need of strengthening." She likened it to a "threadbare but intact fabric" into which new threads could be woven "to strengthen and change the fabric of the system."

A continuum of advising and mentoring interactions contributes to good advising and ranges from formal classroom time to less formal Undergraduate Research Opportunity Programs to informal discussions and social events, she said. The committee observed that students should have a "network of mentors" that includes deans, athletic coaches, other students and other faculty in addition to their assigned faculty advisors. Sive noted that good advising is an active process, requiring effort by both an advisor and the student advisee.

Kim Vandiver, dean for undergraduate research, said some immediate improvements have been made by the Academic Resource Center on the freshman-sophomore transition by helping students explore career options and connect with their new departments.

Some recent improvements include Independent Activities Period panels on how to choose a major and explore careers; publicity for department open houses; a new sophomore transition web site; and an online questionnaire for freshmen to give their sophomore-year advisors a better idea of who they are and what their first-year experiences were like. "We really want the freshmen to reveal as much to their sophomore advisor as they want to reveal, such as 'Did your first year meet your expectations?' 'What are your hobbies and outside interests?'" Vandiver said.

Sive described a new web-based initiative to help faculty improve their advising and to provide quickly information that students seek, such as departmental requirements. The web sites are UINFO (web.mit.edu/uinfo), the undergraduate information and advising gateway, and two resources to be accessed by e-mail,

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Corporation OKs faculty promotions

The MIT Corporation's Executive Committee has approved 23 faculty members for promotion to tenure since the beginning of the academic year. All promotions are effective July 1.

Those who received tenure, all associate professors unless otherwise noted, are Eric Klopfer and J. Phillip Thompson of urban studies and planning; Eytan H. Modiano of aeronautics and astronautics; Robert Morris and Rahul Sarpeshkar of electrical engineering and computer science; Yoel Fink and Christine Ortiz of materials science and engineering; George Barbastathis, Nicolas Hadjiconstantinou and Sang-Gook Kim of mechanical engineering; Stefan Helmreich and Christine J. Walley of anthropology; Meg Jacobs of history; Jonathan Rodden of political science; Junot Diaz of writing and humanistic studies; Jun Pan of the MIT Sloan School of Management; Christopher B. Burge of biology; Elly Nedivi (promoted from assistant professor) and Pawan Sinha of brain and cognitive sciences; Timothy F. Jamison of chemistry; Raffaele Ferrari (promoted from assistant professor) of earth, atmospheric and planetary sciences; Denis S. Auroux of mathematics; and Christoph Paus of physics.

Individual photos and profiles, including any additional members of the faculty who receive tenure before the end of the academic year, will appear in a fall issue of Tech Talk.

Additionally, the following 16 have been promoted from associate professor with tenure to full professor so far this year: Mitchel J. Resnick of media arts and sciences; David W. Miller of aeronautics and astronautics; Paula T. Hammond of chemical engineering; Franz-Joseph Ulm of civil and environmental engineering; Hari Balakrishnan, Dennis Freeman, Alexandre Megretski, Martin Rinard and Daniela Rus of electrical engineering and computer science; Michael Greenstone of economics; Elizabeth A. Wood of history; Alexander Byrne of linguistics and philosophy; Diana E. Henderson of literature; Janet Sonenberg of music and theater arts; Frank B. Gertler of biology; and Gigliola Staffilani of mathematics.

To date, 38 faculty members have been promoted from assistant professor to associate professor without tenure: Erika Naginski of architecture; Christopher Csikszentmihalyi, Judith Stefania Donath and Hugh Miller Herr of media arts and sciences; JoAnn Carmin of urban studies and planning; Raul Radovitzky of aeronautics and astronautics; Patrick Seamus Doyle of chemical engineering; Jongyoon Han of electrical engineering and computer science and biological engineering; Marc A. Baldo, Fredo Durand, Steve Gordon Massaquoi, Robert Miller, Michael Henderson Perrott, Jovan Popovic, Joel Voldman and Lizhong Zheng of electrical engineering and computer science; Olivier de Weck of the Engineering Systems Division/aeronautics; Daniel D. Frey of the Engineering Systems Division/mechanical engineering; Darrell J. Irvine of materials science and engineering and biological engineering; Martin L. Culpepper, Anette E. (Peko) Hosoi and Alexandra H. Techet of mechanical engineering; Muhamet Yildiz of economics; Ian Condry of foreign languages and literatures; Christopher Capozzola of history; M. Diane Burton, Jeremie Gallien and Fiona Murray of the MIT Sloan School of Management; David M. Sabatini of biology; Joseph Sadighi of chemistry; James A. Hansen and David Mohrig of earth, atmospheric and planetary sciences; Dmitry Panchenko, Alexander Postnikov and Jeffrey Viaclovsky of mathematics; and Scott M. Burles, Erotokritos Katsavounidis and Young S. Lee of physics.

PHOTO / **DONNA COVENEY**

Newly tenured faculty members were feted at Gray House on Tuesday, May 16. From left are Elly Nedivi of brain and cognitive sciences (BCS), who received tenure; Mriganka Sur, head of BCS; Pamela Lipson (S.M. 1993, Ph.D. 1996); her husband, Pawan Sinha, who received tenure; and L. Rafael Reif, provost.

Meeting slated on residential community

A group from MIT and Harvard working to establish a residential community close to the Institute will host a meeting tomorrow, May 25, to present plans for developing property near Kendall Square in Cambridge.

The meeting will be held in the Stata Center, Room 32-123, from noon to 1:30 p.m.

The group, University Residential Communities (URC), has been exploring the possibilities for developing a residential community for the past three years.

"We believe that we now have a chance to make this happen in a property at 303 Third Street, one block from Kendall Square. If there are indications of sufficient interest, URC will attempt to purchase a block of units that will be organized as a cooperative to insure that this housing will be available over time to MIT and Harvard affiliates," wrote Paul E. Gray, MIT president emeritus and professor of electrical engineering, in an e-mail on behalf of URC this week.

A developer will present plans for the buildings and describe the proposed living units at the meeting. All interested members of the Institute community, as well as URC subscribers, are welcome.

The proposed URC project is "fully permitted by the city of Cambridge. It includes more than 500 living units in two separate buildings. One building will be entirely for rental units and the other will contain 239 living units for purchase. The site will have underground parking, retail space on the ground floor facing Third Street, an indoor pool and a fitness center," Gray wrote.

— Sarah H. Wright

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New $100K doubles entrepreneurial prize

Infection-reducing coating technology and affordable housing for transient job seekers in developing countries took top prizes this year in the new $100K Entrepreneurship Competition at MIT.

The two grand-prize winners each secured $30,000 in start-up money during the $100K Entrepreneurship Competition awards ceremony held Thursday, May 18, in Kresge Auditorium.

In March, the well-known MIT $50K expanded its mission to become the MIT $100K Entrepreneurship Competition, now also rewarding teams focusing on improving low-income communities.

The coating technology, SteriCoat, won in the competition's original Business Venture category. SteriCoat targets the billion-dollar medical catheter market with an application designed to prevent the formation of bacterial "biofilms" on medical devices.

CentroMigrante, which won the Development Prize, combines developmental architecture with a self-help business model to offer a sustainable solution for impoverished people who leave rural hometowns for urban areas to seek employment but are unable to afford decent lodging.

The business plan competition remains an economic barometer on what new ideas are being funded by venture capitalists. Since the $50K launched in 1989, more than 85 companies have been formed from teams that have competed. These companies, in turn, have employed more than 1,600 people and have a valuation of more than $7 billion.

New this year was the launch of the Development Prize, which focuses on business plans that serve low-income communities in emerging and Third World markets. The Business Venture Prize continues to fund high-technology projects targeting specific markets.

"The need for the new Development Prize became increasingly apparent when we looked at the research on campus that targets the developing world," said Karina Drees, MIT $100K lead organizer and an MBA student at MIT Sloan School of Management. "We also saw a steady increase in the number of social and global business ideas in our fall warm-up competition. The MIT $100K aims to help bring MIT technologies to the world — all parts of the world."

Two runners-up in both categories each received $10,000 in start-up money.

Experts discuss MySpace issues

Sarah H. Wright
News Office

MySpace, with more than 78 million registered accounts, is but one of numerous social networking web sites and chat rooms that would be affected by proposed federal legislation to restrict access to such sites.

The new bill, an amendment of the 1934 Communications Act, would require all schools and libraries that receive federal funds to restrict access to these digital tools and online communities.

Henry Jenkins, co-director of the comparative media studies program, and danah boyd (S.M. 2002), a Ph.D. student at the University of California at Berkeley and a leading researcher on MySpace.com, recently discussed the role of social networking sites for youth, the forces fuelling the new restrictions and the effects of limiting participation in new media.

Jenkins's current research, commissioned by the MacArthur Foundation, seeks to identify the core social skills and cultural competencies young people need in order to become full participants in the cultural, political, economic and social life of the 21st century. His new book, "Convergence Culture: Where Old and New Media Collide," will be published this summer.

Funded by the MacArthur Foundation, boyd investigates how youth participation in digital publics, like MySpace, affects identity formation and socialization. Her work explores the nature of informal learning and cultural engagement by youth.

What is MySpace and what is the controversy over it?

Boyd: Structurally, social network sites are a cross between a yearbook and a community web site. MySpace is a social network site where individuals create digital profiles and link to others ("friends") within the system — similar to sharing home pages.

While MySpace allows 14- and 15-year-old users to restrict who can see their page and contact them, most users opt to make their profiles public. The primary concern is that this openness puts youth at risk, making them particularly vulnerable to predators.

Jenkins: More broadly, teens and adults have developed different notions of privacy: Young people feel relatively comfortable sharing aspects of their lives (for example, their sexual identities). In some cases, teens do not fully understand the risks of making certain information public.

What do "social networking software programs" provide participants?

Boyd: By giving youth access to a public of their peers, MySpace provides a fertile ground for identity development and cultural integration. Youth view MySpace as a place where they can be who they are, joke around with friends and make certain to stay in the loop about everything that is going on around them.

How do MySpace skills fit into adult culture?

Jenkins: Just as youth in a hunting society play with bows and arrows, youth in an information society play with information and social networks. Over the past decade or so, adults have been learning how to interact across multiple communities and negotiate with diverse norms. Social networking services are more and more being deployed as professional tools, extending the sets of contacts that people can tap in their work lives. It is thus not surprising that such tools are also part of the social lives of our teens.

What would be the effect of the proposed legislation on youth?

Boyd: This legislation is targeting MySpace, but it would also block blogging tools, mailing lists, video and

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PHOTO / **DANIEL BERSAK**

Bridge work

Civil engineering design students celebrate the success of their bridge, built to support 2,000 pounds. The demonstration took place earlier this month in Lobby 7. Students are, from left, Thaddeus Wozniak, Luis Loya, Sala McGuire, Brittany Montgomery and Constantine Tsoucalas.

Students float Caribbean Museum Boat

Sasha Brown
News Office

Many Caribbean islands can only dream about having their own science and technology museum. So, MIT senior Solomon Hsiang is hoping they may eventually be able to share one.

Two years ago, Hsiang helped found the Caribbean Museum Boat Project team to develop a traveling museum to serve many communities.

The museum boat envisioned by the team would be an independent, nonprofit museum barge that could travel to different ports on different islands, allowing schoolchildren and families to explore science and technology exhibits hands on.

Still in the very early stages, the project was one of 28 entered in the annual IDEAS Competition, an annual event featuring ideas that could make a positive impact in the world. Participants work in teams to develop designs, plans, strategies, materials and mechanisms that benefit communities locally, nationally or internationally.

Although the Caribbean Museum Boat team did not win the competition, the idea was very well received and won for best poster in the competition's poster session, said Alison Hynd, IDEAS Competition and fellowships coordinator.

"They are a great team with a really ambitious project that I think they can pull off if they can gather enough support," Hynd said.

The idea was born in the summer of 2004 when Hsiang went with a small group of students from MIT and elsewhere to work for a think tank in the Dominican Republic. Margarita Cedeño de Fernandez, who was about to become the country's first lady, said she wanted the Dominican Republic to have a science and technology museum, so the group took up the challenge.

But all of the existing museums visited by team members were being neglected, Hsiang said. "It was pretty obvious they would not be able to support the museum we wanted to build."

Instead, his team envisioned a shared museum that might make more sense in countries that did not have the resources to support a museum on their own. "We were working on our final draft by candlelight," Hsiang said, describing the lack of resources.

Once he returned from the island, Hsiang took his idea further and received support from the Terrascope program, which challenges freshmen to confront complex, real-world problems through interdisciplinary teamwork.

Hsiang had become part of the Terrascope community as a freshman and then worked as an undergraduate teaching fellow his sophomore year, said lecturer Ari Epstein of Terrascope and the Earth System Initiative.

When Hsiang approached Epstein, he immediately liked the idea and agreed to serve as team advisor. "For places that do not have the population or resources to keep a museum going, this seemed like a potential solution," Epstein said.

The barge would offer roughly 60,000 square feet of exhibit space. A few times a year, the boat would be towed to a new port. "The goal is to have some staff travel with the museum and some be local," Epstein said.

The museum would have "interactive exhibits," said sophomore team member Lisa Song. Topics covered would include astronomy, natural history, physics, chemistry and the environment. The museum would have a particular focus on issues relevant to island life, Song said. "We will have exhibits on hurricanes and ocean life in general," she said. Government officials in Jamaica and the Dominican Republic have expressed interest in the project, but there is also potential for growth into the U.S. Virgin Islands, Turks and Caicos and others.

For now, the boat would only dock at the largest cities, although travel to different ports on the same island has not been ruled out, Hsiang said.

For the team, the next step is to find further funding, both from local government and from businesses.

Several members of the team will spend their summer in the Caribbean, where they hope to make local contacts, develop support and better adapt the project to fit specific needs. Senior Josef Miler and junior Holly Owens are going to the Dominican Republic, while Hsiang will spend time both in the Dominican and in Jamaica. Sophomore member Tai Dacosta will be back in Jamaica, where he lives.

The other four team members will be at work in the United States, including Song, who will spend her summer touring science and technology museums around the country, gathering ideas to bring back to the group.

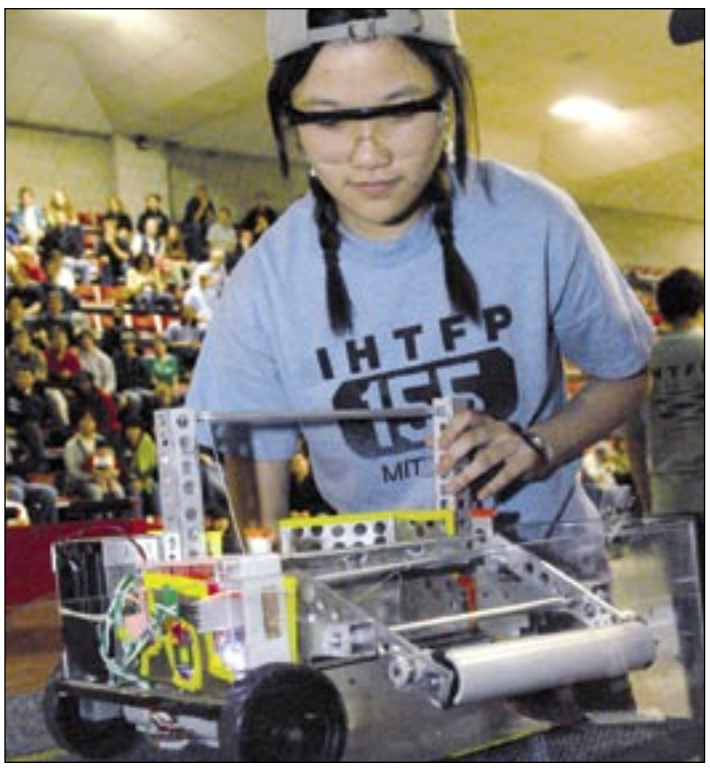

PHOTO / **L. BARRY HETHERINGTON**

Sophomore Jean Chang readies her side-roller ball-scooper machine for Wednesday's final rounds of 'IHTFP.'

PHOTO / **L. BARRY HETHERINGTON**

Second-place winner sophomore Orian Welling drives his machine towards the high-scoring 'A' bins as an opponent threatens.

2.007 robots face off in finals

Sarah H. Wright
News Office

The final rounds of "I Have to Fantastically Place" (IHTFP), this year's iteration of the annual robot contest put on by students in mechanical engineering course 2.007 (Design and Manufacturing I), boiled down to a machine named Charlie and a simple plan for victory by Gregory Schroll, a sophomore in mechanical engineering.

Schroll triumphed in the last few seconds of Wednesday night's final round of 2.007 over Orian Welling, also a sophomore in mechanical engineering.

"It feels nice to win, although the congratulations are a little overwhelming. Orian was my most formidable opponent; I was lucky not to face him till the end," Schroll said.

Gregory Schroll

The students' robots, all designed and built during the spring semester, had to collect balls of various weights and colors, representing various MIT courses, then drive them down an awkward, slanted table and dump them into bins, worth various "grades," or points. Graduate-level courses in engineering were worth the most points; humanities, fewer. Each round lasted 45 seconds, with 64 finalists competing on Wednesday, May 17.

Schroll described Charlie as a "robust four-wheel-drive car with a rubber roller on the front for sucking up and spitting out balls, a large inside cavity for carrying balls, and a set of three impellers inside the cavity to help push the balls out."

As for that innocent-sounding name, it was part of Schroll's competitive strategy: Opponents might see Charlie as "harmless, only to learn he's a merciless scoring machine," he said.

Third place in IHTFP went to Gina Angelosanto, a sophomore in mechanical engineering, and fourth to Shane Colton, a junior in mechanical engineering.

PHOTO / **L. BARRY HETHERINGTON**

Abby Carey, a sophomore, celebrated a victorious round with sophomores Gina Angelosanto and Laura Martini. Carey built an extendo-arm-of-doom machine.

Angelosanto also went for the roller in front to spin and roll balls into a pan, but she added a circuit (so the pan could be raised and lowered to make driving easier) and an extending arm that blocked some of the balls from her opponent's machine. The "extendo-arm of doom" is a big crowd pleaser every year — always greeted with a roar — but two on a table tend to block each other, which led to Angelosanto's defeat.

Colton's machine was named Occam, after Occam's Razor, a principle that emphasizes the simplest solution. Occam featured tank treads with a motor controlling each side, giving it an insistent, if lumbering, maneuverability over the table terrain.

A Campus Preview Weekend visit to the 2.007 lab inspired fifth-placer Howard Kellogg, a sophomore in mechanical engineering, to come to MIT and take the course, which he described as the best he would "ever take in his life."

Kellogg took a "huge gamble" in his robot design: He went for a two-wheeled robot, sleek and single-minded, that would pick up balls and drive straight to the high-scoring "A" bin. He had his good moments — the wheels "worked beautifully" — and his bad, as when his machine tipped off the side of a ramp and fell over. "The table itself was my biggest opponent," he said.

Adrianne Ho, winner for most creative machine design, built something very MIT — a front-wheel-drive machine encased in a molded beaver that was engineered to perform bodily functions as it traversed the IHTFP table.

The beaver-machine "eats by means of a one-way gate which allows balls in but not out. The balls are held in a tunnel in the center of the beaver, and there is a pooping mechanism composed of a pair of flaps. I thought eating and pooping balls would be a good metaphor for digesting class materials," Ho said.

Sur elected fellow of Royal Society

Mriganka Sur, the Sherman Fairchild Professor of Neuroscience and head of the Department of Brain and Cognitive Sciences, has been elected a fellow of the Royal Society.

The Royal Society, the United Kingdom's national academy of science, is one of the world's most prestigious scientific societies. Its origins date to 1660, and it counts among its elected fellows Isaac Newton, Charles Darwin, Francis Crick and Stephen Hawking.

Sur studies the brain's cerebral cortex, the outer mantle or grey matter of the brain, which processes sensations, actions, emotions, language and higher cognitive functions. His research has shaped the field of brain plasticity, now recognized as one of the most remarkable features of the human brain.

Sur is one of only 41 scientists of Indian origin who have been elected to the Royal Society. The list includes scientists such as S. Ramanujan, J.C. Bose, M.N. Saha and the Nobel Prize-winning physicists C.V. Raman and S. Chandrasekhar.

Mriganka Sur

CHIMP

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tory across the human genome.

The previous estimate that humans and chimpanzees split 6.5 million to 7.4 million years ago is based on the famous Toumaï hominid fossil, which has features thought to be distinctive to the human lineage.

"It is possible that the Toumaï fossil is more recent than previously thought," said Nick Patterson, a senior research scientist and statistician at the Broad Institute and first author of the Nature paper. "But if the dating is correct, the Toumaï fossil would precede the human-chimp split. The fact that it has humanlike features suggest that human-chimp speciation may have occurred over a long period with episodes of hybridization between the emerging species."

The possibility of "hybridization" — that is, initial separation of the two species, followed by interbreeding and then final separation — would also explain the strange phenomenon seen on chromosome X. Interbreeding is known to place strong selective pressures on sex chromosomes, which could translate to a very young age for chromosome X.

Hybridization is commonly observed to play a role in speciation in plants, but evolutionary biologists do not generally view it as an important way to produce a new animal species.

"A hybridization event between human and chimpanzee ancestors could help explain both the wide range of divergence times seen across our genomes, as well as the relatively similar X chromosomes," said David Reich, senior author of the Nature paper, an associate member of the Broad Institute and assistant professor at Harvard Medical School's Department of Genetics.

"That such evolutionary events have not been seen more often in animal species may simply be due to the fact that we have not been looking for them," he said.

As the researchers note in the Nature paper, it should be possible to refine the timeline of speciation and test the possible explanations based on complete genome sequencing of the gorilla and other primates, which is already under way at several centers, including the Broad Institute.

This work was funded in part by the National Institutes of Health, the National Human Genome Research Institute and the Burroughs Wellcome Fund.

NEWS YOU CAN USE

Stowe reception

A reception will be held to honor Barbara Stowe, retiring vice president for resource development, on Wednesday, May 31, in the atrium of the Brain and Cognitive Sciences Complex.

Stowe, who announced her retirement in November, has been at MIT for 25 years. For more information, visit web.mit.edu/newsoffice/2005/stowe.html.

The MIT community is invited to attend the reception, which will be held from 4 to 6 p.m.

Plant swap

The MIT Gardeners' Group will hold its annual plant swap on Friday, June 16, from noon to 1:30 p.m. on the sidewalk near the MIT Chapel.

Participants should bring well-rooted and potted annuals, and perennials that have spread and need to be divided. The group asks that no houseplants or invasive species (including violets) be brought to the swap.

Plant swap participants receive vouchers in exchange for the plants they bring. Plants are not for sale during this event — only swapping is allowed.

Participants should drop off plants and pick up vouchers between 8:30 and 11 a.m. on Friday, June 16, near the MIT Chapel. Please label plants with the name, color, and as much detailed care information as possible.

Leftover plants will be given away at the end of the swap.

The event will be held rain or shine.

New material puts its own spin on electronics

Researchers at MIT's Francis Bitter Magnet Lab have developed a novel magnetic semiconductor that may greatly increase the computing power and flexibility of future electronic devices while dramatically reducing their power consumption.

The work was reported in the April issue of Nature Materials.

The new material is a significant step forward in the field of spin-based electronics — or "spintronics" — where the spin state of electrons is exploited to carry, manipulate and store information. Conventional electronic circuits use only the charge state (current on or off) of an electron, but these tiny particles also have a spin direction (up or down).

Devices such as laptops and iPods already employ spintronics to store information in their super-high-capacity magnetic hard drives, but using electron spin states to process information through circuits would be a dramatic advance in computing.

"We can carry information in two ways at once, and this will allow us to further reduce the size of electronic circuits," says Jagadeesh Moodera, a senior research scientist at the Magnet Lab and leader of the research team. Today's circuits carry information by varying the on/off state of current passed through electrons. Those same electrons could carry additional information through their spin orientation.

The magnetic semiconductor material created by Moodera's team is indium oxide with a small amount of chromium added. It sits on top of a conventional silicon semiconductor, where it injects electrons of a given spin orientation into the semiconductor. The spin-polarized electrons then travel through the semiconductor and are read by a spin detector at the other end of the circuit.

Although the new material is promising in itself, Moodera says the real breakthrough is their demonstration that the material's magnetic behavior depends on defects, or missing atoms (vacancies), in a periodic arrangement of atoms. This cause-and-effect relationship was uncertain before, but Moodera's team was able to tune the material's magnetic behavior over a wide range by controlling defects at the atomic level.

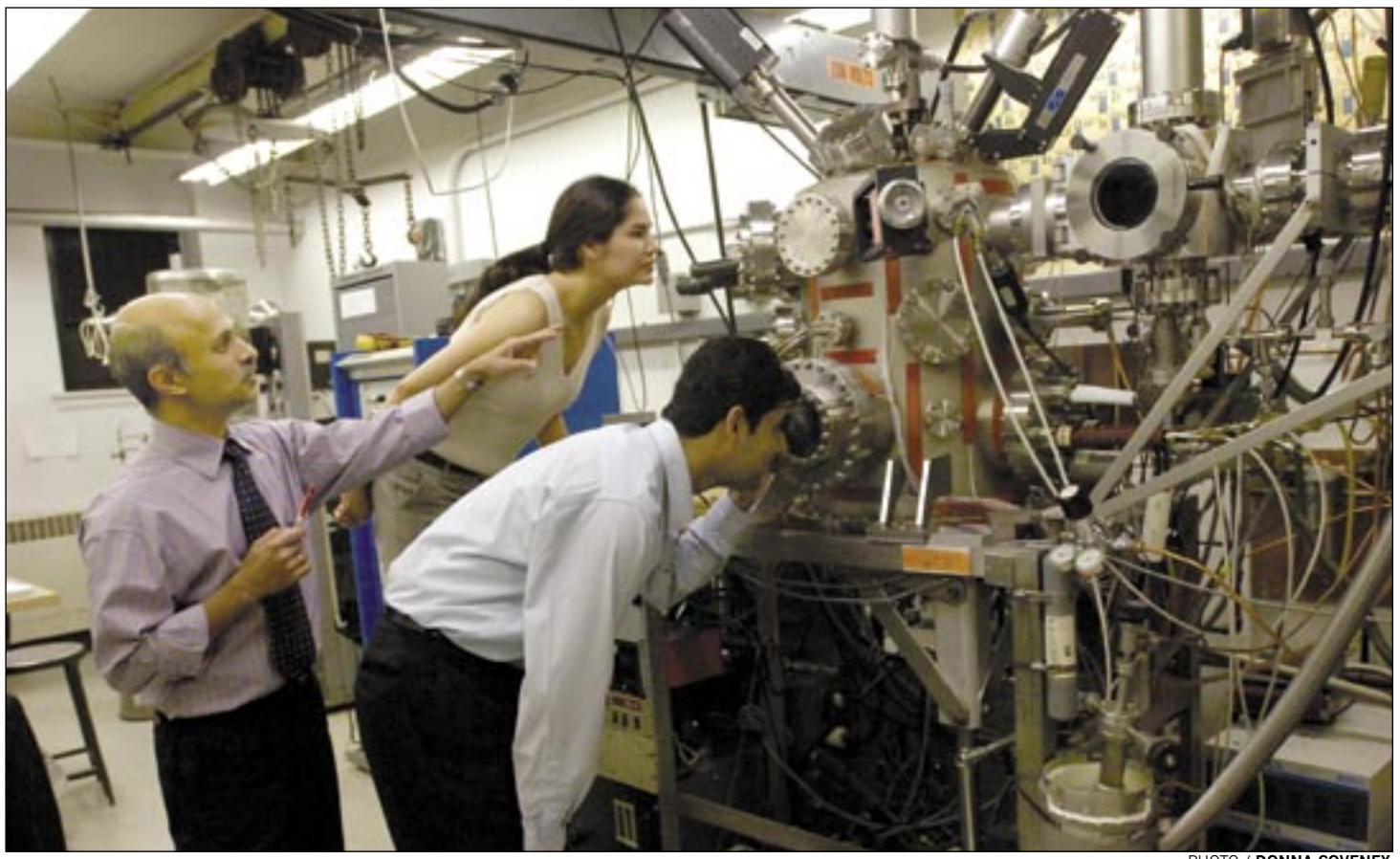


PHOTO / **DONNA COVENEY**

Senior research scientist Jagadeesh Moodera, left, points to the molecular beam epitaxy setup he uses in his research. With him are Tiffany Santos, graduate student in materials science and engineering, and postdoctoral associate John Philip.

"This is what has been missing all along," he says. "The beauty of it is that our work not only shows this magnetic semiconductor is real, but also technologically very useful."

The new material's ability to inject spin at room temperature and its compatibility with silicon make it particularly useful. Its optical transparency means it also could find applications in solar cells and touch panel circuitry, according to Moodera.

In addition to reducing circuit size, spintronics could create more versatile devices because electron spins can be changed reversibly (from up to down and vice versa) along circuits using an electrode gate. "We currently have multifunctional cellphones, for example, that act as phones, cameras and music players," says Moodera. "Spintronics could create even greater multifunctionality in the future."

Spintronics may also reduce the power consumption of information devices. Spin states are considered "nonvolatile," meaning they retain stored information even when the power is switched off — this is why magnetic hard drives hold information without power. Spin electronics could create circuits that operate similarly, storing and passing information without the need for a continuous current to retain the data. "In such a system, we can transmit spin information without moving charges," says Moodera. "It's like creating a ripple in a pond — it travels all the way across without adding more energy."

Among those assisting in the research are postdoctoral associate John Philip of the Magnet Lab and Tiffany Santos, a graduate student in the Department of Materials Science and Engineering. The research is a collaborative effort among MIT, Boise State University (Idaho) and the Korea Institute of Science and Technology (KIST), supported by the KIST-MIT project, the National Science Foundation and the Office of Naval Research. The work originally began under the Cambridge-MIT Institute.

SEEING

Continued from Page 1

words and make them easier to see and read.

But although the SLO held promise as more than a diagnostic device, it had serious drawbacks. In addition to the prohibitive cost, the SLO is large and bulky. Goldring determined to develop a more practical machine for the broader blind public.

She did so by collaborating over the past several years with Rob Webb, the machine's inventor and a senior scientist at the Schepens Eye Research Institute; Aiello; Dr. Jerry Cavallerano, an optometrist at Joslin; William Mitchell, former dean of MIT's School of Architecture and Planning and now a professor in the Program in Media Arts and Sciences; the late Steve Benton, an acclaimed optical physicist and MIT professor; and former MIT affiliate James Cain.

She has also worked with dozens of MIT graduate students and undergraduates, including Sylvia Gonzalez (S.B. 2003) and Shima Rayej (S.B. 2004), who helped design and construct the seeing machine.

"We essentially made the new machine from scratch," Goldring said. While still allowing the projection of images, video and more onto a person's retina, the new desktop device costs much less than its predecessor, in part because it doesn't include the diagnostic feedback of the SLO. The new seeing machine also replaces the laser of the SLO with light-emitting diodes, another source of high-intensity light that is much cheaper. Like its inspiration, the seeing machine is designed to be used by one eye.

The pilot clinical trial of the seeing machine involved visually impaired people recruited from the Beetham Eye Institute. All participants had a visual acuity of 20/70 or less in the better-seeing eye. A person with 20/70 vision can see nothing smaller than the third line from the top of most eye charts. Most participants, however, had vision that was considered legally blind, meaning they could see nothing smaller than the "big E" on a standard eye chart.

With her weak eye, Goldring can distinguish between light and dark, and she can see hand movement, although not individual fingers. She cannot recognize faces or read.

Subjects "had a wide range of cause for vision loss, including diabetic retinopathy, macular degeneration (the fastest growing cause of blindness) and visual field loss," said Cavallerano, a coauthor of the paper and another of Goldring's doctors.

Participants used the machine to view 10 examples of Goldring's visual language. A majority — six — interpreted all 10 "word-images" correctly. "They responded really well to the visual language," Goldring said. "One woman told me she would love to see recipes written that way."

They also used the machine to navigate through a virtual environment, raising the potential for "previewing" unfamiliar buildings a person wants to visit.

PHOTO / **DONNA COVENEY**

Elizabeth Goldring, foreground, looks into a 'seeing machine' to take a virtual tour of a gallery using a joystick. Her assistant, Jackie McConnell, is at her right.

Goldring explained that visually challenged people are often terrified of going to new places. "There's a fear of missing simple visual cues, steps and not being able to decipher elevator buttons." (She noted that less than 10 percent of the blind read Braille.) Further, bystanders who aim to help — "There are five steps there"; "It's the third door on the left" — are often wrong, especially people with good vision, Goldring said. "If you are visually challenged, if you see something once using the machine, you remember."

Participants explored the virtual environment — which represented the inside of an MIT building — via a joystick that allowed them to move forward, backward and sideways.

All of the participants reported that the machine "may have the potential to assist their mobility in unfamiliar environments," according to the Optometry article. Concluded Goldring: "A couple of them said they'd tried every seeing aid available (magnifying devices, etc.), and this was by far the best, even in this rough, rough shape."

Goldring and colleagues are now working toward a large-scale clinical trial of a color seeing machine (the device tested in the pilot trial was black and white). With the color version, participants can explore a museum gallery containing some of Goldring's art. When a person gets close enough to a piece, the work is explained in Goldring's voice.

This work was supported by NASA and by MIT's School of Architecture and Planning, Center for Advanced Visual Studies, Undergraduate Research Opportunities Program and Council for the Arts.

AWARDS AND HONORS

Shuguang Zhang, associate director of the Center for Biomedical Engineering, has been granted a Guggenheim Fellowship for 2006. He is one of 187 people selected for the 2006 fellowships, which are given "on the basis of distinguished achievement in the past and exceptional promise for future accomplishment." His research focuses on developing a biosolar nanodevice for direct harvest of solar energy. Zhang also recently was named a recipient of the Wilhelm Exner Medal, which is awarded by the Austrian Gewerbeverein (Industrial Association) for groundbreaking research that has particular importance for industry.

Tod Machover, composer, inventor and professor of media arts and sciences, has been appointed visiting professor of composition at London's Royal Academy of Music (RAM). Head of the Media Lab's Hyperinstruments/Opera of the Future group, Machover has composed five operas and leads the group that invented Hyperinstruments, a technology that uses smart computers to augment virtuosity. "The RAM appointment will give me access to some of the world's best musicians and a way to get a lot of our work — especially Hyperinstruments for virtuosi — out to the musical mainstream," said Machover, who is currently working on a robotic opera with a libretto by poet Robert Pinsky. Other current visiting professors at RAM include composer Peter Maxwell Davies and violinist Joshua Bell.

James DiCarlo, assistant professor of brain and cognitive sciences, has been selected to receive a 2006 McKnight Scholar Award. The McKnight Endowment Fund for Neuroscience is an independent charitable organization that supports young and established neuroscientists and encourages interdisciplinary collaboration. The award is $75,000 per year for three years.

DORM

Continued from **Page 1**

full swing.

The party mode function is so popular that when Anderson posted a video of the room on YouTube.com, a video-sharing web site open to the general public, there were more than 120,000 views from around the country.

Anderson and Ryan call their system a "Multifunction In-Dorm Automation System" (MIDAS). Everything in the room can be controlled with just the touch of a button or a couple of voice commands, from the window shade to the closet light and stereo.

Anderson and Ryan had more than parties in mind when they designed their room. During relax mode, soft music plays and the lights dim. During sleep mode, the lights shut down completely while soft music plays. Study mode brings the lights back up and plays music that will not distract.

The loft beds have a direct view of the small black-and-white televisions that show views of the hallways.

A camera hidden inside an empty can above the entrance to Ryan and Anderson's room serves as a security system so the two always know who is at the door. But they did not stop there.

The room also has a custom alarm system with motion detectors, a fingerprint scanner for deactivation and a revolving siren light. If the siren and light are activated, Anderson receives a text message. "It prevents break-ins," Anderson said.

All of the room's controls can be tweaked remotely from a computer with Internet access. Cameras in the room allow both Anderson and Ryan to monitor the room when they are away. "We could be in China and still see what is happening in this room," Anderson said.

Asked if their neighbors mind, Ryan said with a laugh, "They are actually happy with it. This is the perfect dorm for a project like this."

The two roommates will be parting ways next year, so they are planning to disassemble the room and divide their work. Although no college students have hired them yet to build something similar in their dorm rooms, they have had some interesting offers.

PHOTO / **DONNA COVENEY**

Freshman Zack Anderson can check the weather at the monitor by the sink in his fully automated dorm room.

"People have asked if they could buy the whole system," Anderson said.

For more information, visit web.mit.edu/zacka/www/midas.html.

FACULTY

Continued from **Page 2**

interact@MIT and newadvising@mit.

In addition, some departments, including biology, have developed course information brochures and brochures on how to be a good advisor, while separately, student committees are developing informational materials on "how to be advised."

Next steps may include adding a midterm advising period; opportunities for student-advisor meetings besides the harried registration day meeting; exploring faculty incentives and rewards for added advising duties; seeking institutional resources to support these efforts; and exploring "an articulated set of core values" around advising.

"What do we think as a faculty about advising? This will be an interesting challenge for next year," Sive said.

Underrepresented minorities

Provost L. Rafael Reif said MIT is working toward its goal of significantly increasing the participation of underrepresented minority faculty and underrepresented minority graduate students.

In an update on a May 2004 resolution, Reif referred to figures gathered in October 2005. In the future, he said, he would like to present diversity updates in the fall to take advantage of the latest numbers, gathered annually in October.

In the 2006 count, completed in October 2005, 181 of the 992 MIT faculty were women. Since then, MIT has hired 37 new faculty members, 15 of whom are women. Five of those new faculty members — four women and one man — are underrepresented minorities.

"It looks like the preliminary numbers for the present academic year are much better than previous years," Reif said.

Underrepresented minority faculty and graduate students currently make up about 5 percent of the total group, Reif noted.

MYSPACE

Continued from **Page 3**

podcast sites, photo-sharing sites and educational sites like NeoPets. So it would extend current regulations — such as the Deleting Online Predators Act — that require all federally funded schools and libraries to deploy Internet filters. The law is so broadly defined that it would limit access to any commercial site that allows users to create a profile and communicate with strangers.

What about the deterrent effect on predators?

Boyd: Unfortunately, predators lurk wherever youth hang out. Since youth are on MySpace, there are bound to be predators on MySpace. Yet, fewer than .01 percent of all youth abductions nationwide are stranger abductions: Youth are at far greater risk of abuse in their own homes and in the homes of their friends than they ever are in digital or physical publics. Also, police currently patrol MySpace, just as they patrol other areas where youth hang out. Many are thankful to know where youth go online because it helps them do their job.

How might the new legislation relate to the "digital divide"?

Jenkins: The early discussion of the digital divide assumed that the most important concern was ensuring access to information, as if the web were simply a data bank. But the web's power comes through participation within its social networks. What a kid can do at home with unlimited access is very different from what a kid can do in a public library with 10 or 15 minutes of access at a time and with no capacity to store and upload information.

You have previously compared virtual socializing to the unfettered play in the backyards of the 1950s. Have new media changed the nature of play?

Jenkins: What teens are doing online is no better and no worse than what previous generations of teens did when their parents weren't looking. The difference is that as these activities are being digitized, they are also being brought into public view. Parents are experiencing this as a loss of control, but in fact, adults have greater control over these aspects of their children's lives than ever before.

One of the biggest risks of these digital technologies is not the ways that they allow teens to escape adult control but rather the permanent traces left behind of their transgressive conduct.

Boyd: While integrating into cultural life is critical during these years, the actual process is not always smooth or pleasant. Bullying, sexual teasing and other peer-to-peer harassment are rampant among teenagers. MySpace did not create teenage bullying but it has made it more visible to many adults. This visibility can provide a window through which teen mentors can help combat this issue.

Could you offer a political framework for considering MySpace and laws to limit access to it?

Jenkins: Right now, MySpace and the other social network tools are being read as threats to the civic order, as encouraging antisocial behaviors. But we can easily turn this around and see them as the training ground for future citizens and political leaders. Young people are assuming public roles at earlier and earlier ages. They are interacting with larger communities of their peers and beginning to develop their own styles of leadership.

We further exaggerate this participation gap when we restrict the ability of these youth to use social networks via school and library computers.

To read the full text of the proposed legislation, visit tinyurl.com/z8vu3.

CLASSIFIED ADS

Classified ads appear in Tech Talk every other week. Members of the MIT community may submit one classified ad each issue. Ads can be resubmitted, but not two weeks in a row. Ads should be 30 words maximum; they will be edited. Submit by e-mail to ttads@mit.edu or mail to Classifieds, Rm 11-400. Deadline is noon Wednesday the week before publication.

FOR SALE

Frigidaire elec dryer. 3 temp, end-of-cycle signal. 4yrs old, but used it for 2. Knob is broken but easily replaceable. $100 or B/O, I have pics. llewis@mit.edu.

White Maytag heavy duty washing machine, 2 speed, super capacity, 9 cycles, excellent condition - $150. Captain-style queen waterbed frame w/ bookcase headboard & mirrored canopy - $250/bst. Call Cheryl at 617-258-5673.

Nintendo Gamecube w/ 3 controllers, 2 memory cards, 5 games (Zelda Anthology, Metroid Prime, Mario Kart Double Dash, Zelda Wind Water, Smash Brothers). Like new. $250 takes all. meinbres@mit.edu, 617-452-2390.

MIT rocker, still in box. Will deliver to MIT. $250. Call 603-887-8231.

HOUSING

Bedford near Lexington: Beautiful new 1450 sq ft. 2BR, 2 bath, w/d, hdwd flrs, a/c, cable, utilities included, nr conservation & Minuteman Trail, Middlesex College, bus. $1650. Contact Beth 781-687-9672, bamarcus@alum.mit.edu.

Female summer law intern seeks single apartment/sublet in MIT area w/ private bath, 6/1 through 8/1 or 8/5. Non-smoker, no pets. Internet access req. Desired rent: $600/mo+/-. Contact He Shan at walnuthe@hotmail.com.

East Cambridge 2BR, close to Lechmere & Kendall T. Bedrooms adjoin, great for couple. Laundry & heat incl. First, last, deposit $1275/month. No pets/smokers. Street parking. Avail. June 23. Call 617-253-8241.

269K perfect starter home. 2B PH in South Boston w/ beautiful views. Available furnished. Roof rights, laundry onsite, walk to Andrew Sq. T station. Contact Elizabeth Parr at eaparr@mit.edu for details/showing.

Brighton: 2BR apt. located off Western Ave. Close to Charles River Bike Trail, Harvard Business School, stores & bus line. A/C, balcony, d/w, w/w. Washer/dryer in common area, $1,695 incl heat & hot water. Avail. July. Call 617-312-7287 for appt.

Sunny 1BR Cambridge. Avail. June 1—August, could be extended. Fully furnished, fully equipped. Walk to MIT, Red line, Green line & river. Enclosed yard. Laundry. Safe, quiet. Utilities incl. $1300. johnnatale@verizon.net.

Wakefield: 2BR apartment, close to commuter rail, off-street parking for one car, w/d hookup in basement, no pets, no smoking, no utilities. Call Mary at 781-245-8875.

For sale: Melrose/ 7 miles/Cambridge - charming English Colonial, 6 rm, 3 season porch, French doors, closets galore, modern kitchen, 1.5 baths, new roof, commrail/MBTA. $495K. Contact Pat at 781-662-5368 or pmbmelrose@comcast.net.

Paris home available for exchange in July/August. 2BR, Seine River view, nr Metro, 15 min. drive to Versailles, free phone & computer use (w/ high speed Internet). Contact florak@mit.edu.

2 BR/1 bath, Harvard Lawn, Belmont. Living rm, study, dining rm, porch, eat-in-kitchen, dishwasher. Washer/dryer hookups, yard, 2-car parking. Nr park, playground, public transportation. Owner-occupied, no smoking, no pets. $1500/month. July 1. E-mail csnyder@mit.edu.

VACATION

Moody Beach, Maine: 2BR, 1 bath house. Fireplace living room, open kitchen & sunroom, rear deck. Additional outside shower. Short walk to public beach. $1000 per week. Contact pmotroni@plant.mit.edu or 617-293-8270.

Charming 3BR cottage, Lake Winnipesaukee nr Wolfeboro, NH. Sleeps 6, large screened porch; fireplace; sandy beach is 2 min. walk. No smoking; well-behaved pets ok. Avail. June 24-Sept 10, $825/week. Contact Judy at jrauch@mit.edu or 781-648-9442.

VEHICLES

2000 Focus, great shape, new tires, 106K miles, $3500. Contact Earle at 781-981-3744 or earlew@ll.mit.edu or ekag@aol.com.

1998 Subaru Forester. Excellent condition, 96K. Automatic, all wheel drive, a/c, fabric seats, clean. $5900. Contact glatt@wi.mit.edu.

1996 windstar LX 114K. Drivable (as is) or could be repaired or used for parts. Call to find out what it needs. Driven daily. Priced for quick sale $1,250. 617-258-3458 days or 978-535-0270 nights.

MISCELLANEOUS

Wanted: Danish Modern, Scandinavian, & Eames style Teak or Rosewood furniture from 1950s-1980s. Will give your furniture a good home. Contact Aaron at 617-547-4459 or adschwartz@alum.mit.edu.

Wanted to buy: pottery, china, dinnerware, kitchenware, glassware: single pieces, sets, vintage (pre-1980) & newer good quality. I love Mikasa. Don't hesitate: gmonahan@mit.edu (manufacturer, pattern info great, not essential).

STUDENT EMPLOYMENT

Intern at Nuestra Culinary Ventures: Student needed to help develop overall program vision, strategy & logistics. Assist in marketing to entrepreneurs, fundraising, providing technical assistance to program participants, training services, direct community outreach, update web site, www.ncvkitchen.org, etc. Qualifications: Strong people skills, ability & desire to work w/ people of different cultural, ethnic & socio-economic backgrounds, self motivated w/ ability to work independently, language skills in Spanish a plus, understanding of Word, Excel & accounting principles also a plus. $10/hr. Contact Cary Wheaton at (617) 522-7900.

Tutoring opportunity: The Media and Technology Charter High School (MATCH) seeks committed, caring & enthusiastic individuals to tutor in our Summer Academy. English, math, science & history tutors needed. Organization is changing lives & reversing underachievement in inner-city teens. Summer Academy runs from July 17 to Aug. 17. Mandatory training, one full day & one three-hour session, prior to start of Academy. Summer Academy is 4 days/week, Monday-Thursday, 7:45 a.m. - 1 p.m. $17/hr. Contact Bob Hill at (617) 232-0300.

PHOTO / **ROSY SACKSTEIN**

Senior Matthew Roitstein will compete in an international flute competition in Denmark.

Senior heads to flute competition

Lynn Heinemann
Office of the Arts

While his fellow students are receiving their diplomas at MIT's Commencement ceremonies on Friday, June 9, senior Matthew Roitstein will be in Odense, Denmark, as one of only three Americans competing in the prestigious Carl Nielsen International Flute Competition.

Roitstein, who is working toward dual degrees in architecture and music at MIT, was one of 191 entrants for the competition, which runs from May 31 to June 9. Forty-eight entrants representing 21 nationalities were chosen by jury to compete in the contest, which is open to flutists under the age of 30.

Originally from Valencia, Calif., Roitstein began studying flute at age 8 with his mother, Rosy Sackstein. "I enjoyed the sound the flute created, and I definitely wanted to play some of the wonderful repertoire that I heard coming out of my mom's studio," he said. He received numerous honors in high school, and in the summer of 2001 he was a featured soloist, with his twin brother, Andrew, who plays bass cello, on the public radio program, "From the Top."

Since coming to MIT four years ago he has studied with Seta Der Honannesian through MIT's Emerson Scholars Program.

The Nielsen Flute Competition consists of four rounds, each with two different required works. Winners will be announced on June 9. Seven different prizes will be awarded, ranging from approximately $1,700 to $21,500. Winners will also be offered performing engagements at a number of upcoming international music festivals.

Principal flutist in the MIT Symphony Orchestra since 2002, Roitstein says that one of the things that drew him to MIT was the availability and accessibility of the music programs. "I can be as involved in music as I want without even having to major in it," he said, though he said he plans to complete both a music major and an architecture degree in spring 2007.

"I've been just as active a musician as conservatory students I meet at festivals like Aspen, but I also get to study architecture," he said.

Midcareer program launched

Science and technology fields move fast, and professionals who leave their jobs for a few years often face barriers when they try to return. This summer, the Professional Education Programs office is launching a new program to help MIT alumni and other accomplished professionals relaunch their scientific or technical careers.

The new Midcareer Acceleration Program (MAP) incorporates career and personal development, a technical skills refresher, a semester-long MIT course and an internship or research project. Students will complete the 10-month, part-time program with either a job or a strategic plan to find a professional job that matches their abilities and ambitions.

Associate Dean of Engineering Dick K.P. Yue, who serves as MAP's faculty director, said the program is designed for women and men who have left their jobs because of personal reasons, such as caring for children, or professional interruptions, such as a job loss related to company closures or mergers.

"The professional environment is changing rapidly, but that problem is compounded when there is a disruption in employment," Yue said. "Several of my own advisees, who have been very successful at MIT and at their companies, are having difficulty going back into the workplace. It's scary to jump onto a moving train from a standstill."

The program brings participants up to date with new technologies, key discoveries and fresh learning strategies, beginning with an August orientation that introduces them to fresh perspectives and tools. Participants gain new technical skills by enrolling in a regular MIT course in the fall. In the spring, an internship with a nearby company or a research project working with MIT faculty will provide practical skills that align with career goals.

Career development skills are also included in the program. Sharpened communication and presentation skills, for example, will help participants demonstrate their capabilities in job interviews and later on the job.

"MIT's educational mission does not mean just the four, six, or eight or more years needed for a bachelor's, master's or Ph.D. degree," Yue said. "Learning is a lifelong engagement and MIT has a tremendous ability — and obligation — to provide the education needed throughout a professional's career."

The deadline for entry to the inaugural Midcareer Acceleration Program is Saturday, July 15. Students need the academic and professional background to succeed in MIT-level work and are admitted based on the overall quality of their applications. To learn more, visit midcareer.mit.edu.

Audience to participate in 'Peter and the Wolf'

Daniel Goodman

A visiting scientist at MIT's Plasma Science and Fusion Center will showcase his musical talents in a seldom-heard original arrangement of Prokofiev's well-loved classic, "Peter and the Wolf," for piano and narrator this Sunday, June 4, at 1:30 p.m. in Killian Hall.

The concert celebrates the 70th anniversary of the premiere of the piece.

The event will be the 10th "participatory piano concert" at MIT presented by Daniel Goodman (Ph.D. 1989) since he introduced the concept in 1983. These concerts combine classical piano music with improvisations, allowing the audience to suggest and select which themes will be used.

The performance will also include piano music by Mozart and Chopin and improvisations on themes suggested by the audience to be performed in classical, folk and jazz styles.

The narrator for "Peter and the Wolf" will be singer and instrumentalist Jack McCreless, who has performed international music and jazz with Goodman for almost 20 years. The two appeared together in the 1991 Universal Pictures film, "Once Around," which starred Richard Dreyfuss and Holly Hunter.

Co-sponsored by MIT Hillel and the MIT Plasma Science and Fusion Center, the concert will benefit organizations that provide food assistance. The suggested donation is $15 for general admission and $5 for students.

For more information, visit www.dgconcert.org or call (781) 674-2440.

Provost presents update on investigation

MIT Provost L. Rafael Reif recently updated the faculty on the Institute's ongoing efforts regarding an allegation of research misconduct concerning members of the technical staff at MIT Lincoln Laboratory.

The U.S. Department of Defense's investigation into the questions left open by MIT's inquiry into the allegation is now fully under way, Reif wrote in a letter sent to faculty and Lincoln Laboratory staff on Friday, May 19.

Reif also informed the faculty that the ad hoc panel appointed in October 2005 to examine the factors that have delayed resolution of this matter has submitted its report. The report identifies 16 factors that complicated the resolution of this allegation, and it presents findings and recommendations.

The report is available to the community online at http://mit.edu/provost/reports/AdHocReport_5_18_06.pdf.

PHOTO COURTESY/ **FRANCES BREER**

This photo of Alex Hay and Lucinda Childs preparing for the 1966 performance series '9 Evenings' is part of a List Visual Arts Center exhibit examining the series.

Art, technology linked at List

Lauren Maurand
Office of the Arts

Art and technology are woven together in a complementary set of works now on view in separate exhibitions at the List Visual Arts Center.

"Choreographic Turn," curated by Bill Arning, uses the medium of dance captured on film to show the interplay of art and technology in different ways.

"9 Evenings Reconsidered," curated by Catherine Morris, presents a look at a momentous historical event that brought art and technology together in the mid-1960s.

"The two shows together address some of the issues of the relationship between art and technology," said Arning, who will give a gallery talk on the current exhibitions at the List Center at 12:30 p.m. today.

There are two works in "Choreographic Turn." One consists of the huge wall-sized projections of sculptor Peter Weltz's video collaboration with choreographer William Forsythe.

Forsythe's movements were recorded in a nondescript room with five cameras, including two attached to his wrists. The resulting footage, taken from five angles, is projected simultaneously on the gallery walls to produce "whenever on on on nohow on/airdrawing" (2004).

This work has a high-profile destination after MIT: "I think this is the first time we've ever shown an artist whose next show will be the Louvre," Arning said.

The other work in "Choreographic Turn" is Daria Martin's "Soft Materials" (2004), which uses 16 mm film to capture dancers interacting with robots. The dancers are naked and the gears of the robots are exposed, making them similar in some ways. Arning called it "a very sensual film … with a kind of innocence to it."

The series of 1966 performance events examined in "9 Evenings Reconsidered" was a significant turning point for the art world and heightened awareness of the implications that advancements in technology could have for art.

Orchestrated by Bell Laboratories engineer Billy Klüver in 1966, "9 Evenings" paired Bell Labs performance engineers with New York avante-garde artists to create new works over a series of days. Artists included dancer/choreographer Lucinda Childs, painter/choreographer Robert Rauschenberg and composer John Cage. Engineers included Per Biorn, Cecil Coker and Herb Schneider (S.B., S.M. 1948). "It was a great event at the time," said Arning, who said 10,000 people witnessed the events at the 69th Regiment Armory in New York.

The List Center show consists of source materials and artifacts from the original performances that illustrate how the event deepened the dialogue between artists and engineers. As composer John Cage wrote to Klüver, the "father of electronic art," in one of the letters on display, "Art and Science are inextricably connected."

Also today: "Early Dance Videos at WGBH," a lecture by Susan Dowling, cofounder of Art 21 and former executive producer of New Television Workshop. Stata Center Room 144, 6:30 p.m.

Toy designers make brushing teeth fun

Anne Trafton
News Office

Getting kids to brush their teeth can be hard work, but MIT students in a toy design class took on the challenge this semester by creating toys that make dental hygiene fun.

From a "Flosszilla" monster that dispenses floss from its tail to a mini R2-D2 that shoots a toothbrush from the top of its head, lightsaber-style, the students played to children's love of characters to encourage them to take good care of their teeth.

Students worked with mentors from toy company Hasbro and with dental hygienist Wendy Westford of MIT Medical to develop their toys. They also visited students at the Fletcher Maynard Academy in Cambridge to get feedback on their preliminary designs.

Designs that incorporated popular characters like Harry Potter and Batman were a hit among the second-graders that make up the toys' target audience.

"A lot of the successful toys are extensions of popular properties. Star Wars is big for that age group. Superheroes are huge, and Harry Potter is big for all age groups," said Barry Kudrowitz, a Ph.D. student in mechanical engineering, who teaches Toy Product Design, a Public Service Design Seminar offered at the Edgerton Center each spring.

Students worked on their projects in teams of four to six. One of the teams developed a toy that allows children to mix different flavors of toothpaste into whatever combination they want.

"We all had flavors of toothpaste we didn't like as a child, so we thought it would be more fun if you could mix your own," said freshman Karlen Ruleman, a member of the team that designed "Flava-Rama."

Each toothpaste tube in the prototype is decorated with different themed stickers — Mickey Mouse, butterflies or trains. But the students envision that children could decorate their own dispensers.

"We left room for the kids to design their own. We thought it would give them a sense of ownership of their toothpaste," Ruleman said.

"Flosszilla" team members molded their toy from silicon rubber, painted with latex. Toothpaste squirts out from the dinosaur's mouth, floss is dispensed from his tail, and he holds a toothbrush in his arms.

Another team designed a magnetic "Bat Cave," where dental tools — toothbrush, toothpaste, floss and cup — are magnetized so they can hang from the ceiling of the cave. A Harry Potter-themed toy features a toothbrush that levitates in midair.

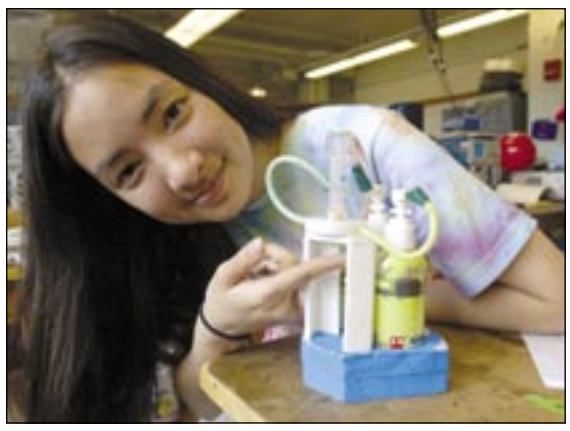


PHOTO / **DONNA COVENEY**

Freshman Karlen Ruleman shows her team's dental-hygiene creation, 'Flava-Rama,' which lets children mix toothpastes.

At the beginning of this semester, each team came up with three sketch models, then selected two for mockup designs. Each team then took one of its ideas all the way to completion and presented it to elementary school students and Hasbro engineers and artists on Thursday, May 18, and Friday, May 19.

The toy design class, which is offered as part of the Public Service Design Seminars and is based on mechanical engineering design principles and media studies, draws students from a wide range of majors.

"We want to try to introduce them to some of the fun things you can do with mechanical engineering," said Kudrowitz, who wrote his master's thesis on toy design.

Students in the course learn all the basic skills needed for product design — CAD, drawing and shop — but with an emphasis on making things that are fun as well as functional.

"We're trying to teach more than toy design — we're teaching how to design for entertainment," Kudrowitz said.

To see photos of the toy designs, visit web.mit.edu/sp.778/www.

PHOTO / **DONNA COVENEY**

'Flosszilla,' created in Toy Product Design seminar, squirts toothpaste from its mouth and dispenses floss from its tail.

MIT EVENT HIGHLIGHTS MAY 24-28

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

WEDNESDAY May 24

Gallery Talk
Talk by Bill Arning, curator of the List Visual Arts Center, presented in conjunction with "9 Evenings." 12:30 p.m. List Visual Arts Center. 253-4400.

"Early Video Dance from WGBH"
Talk and video screening by television producer Susan Dowling. 6:30 p.m. Room 32-144. 253-4400.

Tech Model Railroad Club Meeting
Informal meeting to design and build train layout and run trains. 7-10 p.m. Room N52-118.

THURSDAY May 25

TSMC Day at MIT
This event is designed to promote interaction between MIT and Taiwan Semiconductor Manufacturing Company (TSMC). 3-6:15 p.m. Room 34-401B.

Karaoke Night at the Thirsty Ear
Must be 21+. ID required. 8 p.m. The Thirsty Ear Pub. 258-9754.

European Club End of Semester BBQ
Freshly grilled steaks, chicken, sausages, fruits, drinks and desserts. 5:30-8 p.m. Kresge barbecue pits.

FRIDAY May 26

"The Council for the Arts at MIT: Its History, Mission and Projects"
Talk by Susan Cohen, director of the Council for the Arts at MIT. $12, reservations required. Noon. Room 10-340. 253-3656.

MIT Anime Club Weekly Showing
7 p.m. Room 6-120.

EAPS Department Lecture Series
Professor Mick Follows of earth, atmospheric and planetary sciences speaks on "Natural Selection in a Model Ocean." 4-5 p.m. Room 54-915.

SATURDAY May 27

hiLaRiUm @ Thirsty Ear Pub
Must be 21+. ID required. 8 p.m. Thirsty Ear Pub. 258-9754.

SUNDAY May 28

International Folk Dancing
8 p.m. Student Center, 2nd floor. 253-FOLK.

EDITOR'S CHOICE

AUTHORS @MIT — *May 24*

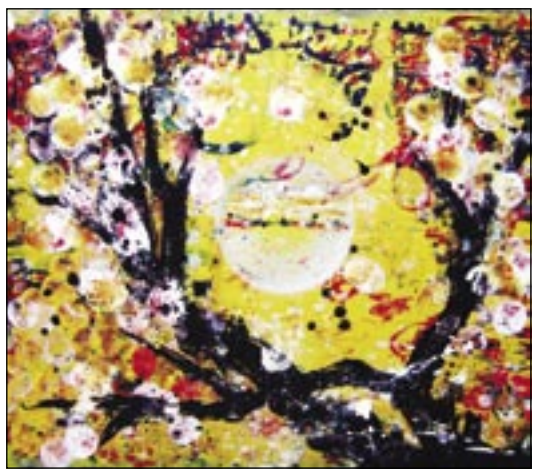
Talk by Robert Buderi and Gregory Huang on "Guanxi: Microsoft, China and Bill Gates's Plan to Win the Road Ahead."

Room 32-155
6-7 p.m.

TSUNAMI EXHIBIT — *May 24*

MIT freshmen create an interactive and informative museum exhibit on tsunami response and effects. Through May 25.

Lobby 13
10 a.m.-6 p.m.



A tree grows in Stata

Junior Rene Chen won the 2006 Student Mural Competition with 'The Tree,' a 10-by-7-foot mural created with acrylic on wood panel. '"The Tree" compiles my experience, lifestyle, feelings and growth along with the MIT community,' Chen said. The mural is now on view in the Stata Center.

Go Online! For complete events listings, see the MIT Events Calendar at: http://events.mit.edu.
Go Online! Office of the Arts web site at: http://web.mit.edu/arts/office.