MIT to graduate first class of biological engineering majors

by Anne Trafton, News Office

When Alice MacDonald arrived at MIT four years ago, the biological engineering major did not exist. But this Friday, MacDonald and 22 other ambitious MIT students will become the Institute’s first graduates from the new biological engineering program.

“I kind of lucked into it,” said MacDonald, who originally planned to study biology. “It turned out to be even more interesting than I thought it would be.”

Trying out a brand new major might have scared off some students, but MacDonald and her classmates welcomed the chance to be part of something new and help shape the direction of the program.

“That’s one of the great things about having a new major,” said senior Michael Yee. “The curriculum’s fluid. It’s not set in stone, so you can have a voice in what you’re learning.”

MIT has had a PhD program in biological engineering (BE) for 10 years, but the undergraduate degree program was approved just three years ago, making it the first new major course of study at MIT in 39 years.

Faculty and student interest in an engineering program underpinned by biology has been growing for many years, said Linda Griffith, chair of the BE Undergraduate Programs Committee, who spearheaded the efforts to develop the undergraduate major.

The undergraduate BE minor, established in 1995, quickly became the most popular minor at the Institute, and students clamored for it to become a major.

Eradicating TB with … cell phone minutes?

Anne Trafton
News Office

One of the biggest challenges in fighting tuberculosis is simply getting patients to take their medicine. MIT students have come up with a possible solution: A new testing and reporting system that is easy for patients to use and offers economic incentives such as free cell phone minutes.

Tuberculosis kills an estimated two million people every year, and treating the disease requires a strict six-month regimen of antibiotics. If patients abandon the treatment early, the TB bacteria survive and can become resistant to frontline antibiotics.

“TB is a massive problem, and it’s exacerbated by the fact that people have a lot of trouble staying on their meds,” says Elizabeth Leschen, an MIT sophomore.

“TB is a massive problem, and it’s exacerbated by the fact that people have a lot of trouble staying on their meds,” says Elizabeth Leschen, an MIT sophomore.

Howard Hughes Medical Institute

5 MIT scientists named HHMI investigators

Elizabeth Thomson
News Office

Five MIT faculty have been named Howard Hughes Medical Institute investigators, bringing the total number of current MIT professors holding the distinction to 19.

With the new additions, MIT now has more active investigators than any other single institution, according to an HHMI official.

“This is an enormous honor for these individuals and a powerful expression of the concentration of talent and creativity at MIT. That their groundbreaking work crosses so fluidly between science and engineering is a hallmark of the Institute,” said President Susan Hockfield.

HHMI investigators remain at their original institutions, but HHMI pays their salaries and funds the bulk of their research. As a result, HHMI investigators have the freedom to explore and, if necessary, to change direction in their research. Moreover, they have support to follow their ideas through to fruition—even if that process takes many years.

Red Coats Return

Tech Reunions 2008 will bring more than 3,240 alumni and guests from 44 states and 44 countries to campus this weekend. The legendary red coats, worn by alumni beginning at their 50th reunions, will be in great profusion as the 50th reunion class leads faculty and students into Commencement on Friday.

Last year’s class, including Ray Stata, right, are pictured during their walk down Memorial Drive. Weekend festivities for alumni include more than 56 Alumni Association events, from Tech-Night at the Pops to Technology Day, and 97 class activities. Find out more at http://alum.mit.edu.

Howard Hughes Medical Institute

5 MIT scientists named HHMI investigators

Elizabeth Thomson
News Office

Five MIT faculty have been named Howard Hughes Medical Institute investigators, bringing the total number of current MIT professors holding the distinction to 19.

With the new additions, MIT now has more active investigators than any other single institution, according to an HHMI official.

“This is an enormous honor for these individuals and a powerful expression of the concentration of talent and creativity at MIT. That their groundbreaking work crosses so fluidly between science and engineering is a hallmark of the Institute,” said President Susan Hockfield.

HHMI investigators remain at their original institutions, but HHMI pays their salaries and funds the bulk of their research. As a result, HHMI investigators have the freedom to explore and, if necessary, to change direction in their research. Moreover, they have support to follow their ideas through to fruition—even if that process takes many years.

EAPS celebrates its birthday

Twenty-five years ago MIT combined the Earth and the sky to form the Department of Earth, Atmospheric and Planetary Sciences.

People

Lehman named vice chancellor

Dean for Graduate Education Steven R. Lehman, ’72, SM ’73, PhD ’75, will become the Institute’s vice chancellor on July 1.

News

EAPS celebrates its birthday

Twenty-five years ago MIT combined the Earth and the sky to form the Department of Earth, Atmospheric and Planetary Sciences.
BIOLOGICAL ENGINEERING: first class of Course 20 students will graduate on Friday
Continued from Page 1
"I think there is a significant student demand," said Griffith. Unlike biomedical engineering programs at other schools, which focus on applying engineering to medicine, MIT's program applies engineering analysis and design to the molecular and cellular building blocks of life, he said, to create blueprints for how to build new things from biology. The program fuses molecular biology with engineering to create a new discipline that has applications in not just medicine but also environmental, ocean ecology and other fields.

"We've really started thinking about biology in an engineering sense," said Griffith. "We know a lot about cells and tissues but how they work together as machines?"

Many of the faculty who teach core BE classes have joint appointments in other departments, including chemical engineering, mechanical engineering and computer science.

"You get a taste of a lot of different disciplines and really get to see the connections between them," said Yee. In the first year, students major in civil engineering, in their second year in chemical engineering, and in their third year in mechanical engineering, with some 50 students each in this year's junior and sophomore classes.

"It's a great group of students and they've allowed us to have a great deal of interaction with faculty," said Garvin. "We can take classes with such a small group and really get to know everyone," said Griffith.

About a third of this year's 23 graduates are going to graduate school: two are pursuing a PhD at the Harvard-MIT Health Sciences and Technology, Yee, who will study biomedical engineering at the University of Pennsylvania, and MacDonald, who is heading to the University of Pennsylvania to earn a PhD in bioengineering.

Other graduates will be going to medical school, while some have accepted jobs at biotechnology companies or consulting firms. Garvin said the seniors with help to make the new program a success.

"They knew going into this that it was an experiment," she said. "They really rose to the occasion, went with the flow and helped make the program better."

MIT economist Olivier Blanchard has been appointed chairman of the International Monetary Fund, effective Sept. 1.

A macroeconomist specializing in monetary policy, global imbalances, labor market performance and speculative bubbles, Blanchard PhD 1982, has taught at MIT since 1982, chair of the MIT economics department, described Blanchard as one of world's leading macroeconomists.

Olivier Blanchard

"He is completely comfortable discussing both practical policy recommendations and the latest conceptual frameworks. He brings to the IMF an extraordinary record of excellence in teaching, in conducting sensible and effective policies and a commitment to use economic analysis to improve economic performance around the world. He is a superb choice for this very important policy position," Potter said.

In addition to teaching at MIT, Blanchard, 59, serves on economic panels for the Federal Reserve Banks of New York and Boston and he has served as member of the French Economic Advisory Council to the French Prime minister.

Blanchard said he is looking forward to the challenge of his new role.

"The world is a complex place and the IMF is in a unique position to follow and analyze events, and provide expert advice," he noted.

A French citizen, Blanchard is the author of numerous books and articles in French and in English. His textbook on macroeconomics, first published in 1997, has been reprinted four times and translated into 11 languages, including Chinese, Greek, Japanese and Spanish.

Blanchard will succeed Simon John- son, the Ronald A. Kurtz Professor of Entrepreneurship at the MIT Sloan School of Management, for two years.

As CEO of the MIT Alumni Association, Garvin restructured the organization to enhance alumni activities, communications, fundraising and to maximize association resources, while remaining dedicated to its original mission "to further the well-being of the Institute and its graduates by increasing the interest of members in the school and in each other." In the last year, the MIT Alumni Board recognized her as an Honorary Member of the Alumni Association, the highest award given to non-alumni at MIT.

Jensen added that a search commit- tee for the new executive vice president of the MIT Alumni Association is being formed, and that Scott Marks '68, who is president of the Alumni Association for two years, has agreed to chair the panel.

Garvin named vice president for institutional engagement at RISD

Elizabeth A. Garvin, executive vice president and CEO of the MIT Alumni Association, has been appointed vice president for institutional engagement at the Rhode Island School of Design (RISD). She will assume her new responsibilities there Aug. 1.

"It has been anextraordi- nary privilege to serve MIT for so many years. The Insti- tute is a rare and wonderful place, and I will greatly miss all of my students and colleagues. I am grateful to the Alumni Association and across MIT who have made my work here so gratifying," said Garvin.

Harbo Jensen PhD '74, president of the MIT Alumni Association Board of Directors, said "It was really fun having these wonderful leaders, who have been central to all of our work here, end up applying, and with some addition of teaching resources, the BE faculty welcomed all of those students.

Since then, with the addition of more lab space and rearranging of course schedules, the major has roughly doubled in size and now offers space for more than 50 students each in this year's junior and sophomore classes.

"This year's graduating seniors say it was really fun having these wonderful leaders, who have been central to all of our work here, end up applying, and with some addition of teaching resources, the BE faculty welcomed all of those students."

Spring 2008 Tech Talk © 2008 Massachusetts Institute of Technology. All rights reserved.
Lerman to become MIT’s vice chancellor

Rafael Bras, a professor of civil and environmental engineering who pioneered the field of hydrologic science, is MIT’s James R. Killian Jr. Faculty Achievement Award winner for 2008-2009.

The award was announced at the Wednesday, May 21, faculty meeting.

Bras “is an internationally acclaimed researcher in surface hydrology and hydro-meteorology whose work encompasses many aspects of the Earth’s water cycle,” said Wanda Orikiowski, chair of the Killian Award selection committee, reading from the award citation.

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.

“The Killian Award is, for me, a culmination of a wonderful career and a very happy life at MIT,” said Bras, the Edward A. Dojnun-Nur Professor in the Departments of Civil and Environmental Engineering and Earth, Atmospheric and Planetary Sciences.

Dean for Graduate Education Steven R. Lerman ’72, SM ’73, PhD ’75 will become MIT’s vice chancellor, effective July 1. Chancellor Philip L. Clay announced last week.

In his role as vice chancellor, Lerman will serve as a full deputy in support of the chancellor on operational issues across all student and education areas through which the chancellor is responsible. Lerman will also continue as dean for graduate education.

“Steve’s leadership and support will be invaluable as we seek to enhance operations and engage faculty and staff in all areas of education and student life,” Clay said. “His contagious enthusiasm will also be a tremendous asset in our collaborations with students and in our outreach to alumni and supporters of MIT.”

“I am honored to take this new position in the Killian administration,” Lerman said. “I look forward to working closely with the Chancellor to advance MIT’s goal of integrating student life and learning for all of our students.”

Lerman, the Class of 1922 Professor of Civil and Environmental Engineering and a member of the MIT faculty since 1975, brings considerable experience and deep knowledge of MIT culture and the range of issues of student life and learning. Beyond specific initiatives that he will undertake, Lerman will work directly with the DUE and DSL on a variety of areas, Clay said.

Lerman has been a leader in educational innovation for many years—from pioneering leadership in Protect Aaron to his current leadership of the Center for Educational Computing Initiatives, to chairing the committee on MIT OpenCourseWare. Clay noted that Lerman has brought a wealth of technical, knowledge, skillful management and great prowess in pulling various stakeholders together to advance MIT goals.

“This background will be invaluable as MIT seeks to build on its strength and face new opportunities in student life and education,” Clay said.

Lerman has authored more than 50 publications, including two books. He has held several chairs at MIT and has been recognized with awards for his teaching, including the chair he now holds. His department and the Killian Award Committee have both honored him for excellence in teaching.

MIT prepares for 142nd Commencement

Nobel winner and microlending pioneer Yunus to speak

Muhammad Yunus, winner of the 2006 Nobel Peace Prize, will deliver the principal address at MIT’s 142nd Commencement exercises at 10 a.m., Friday, June 2, in Killian Court.

Yunus won the Nobel Prize for pioneering the microlending movement, which seeks to improve the lives of the poor by offering credit without collateral. The bank he founded, Grameen Bank, has provided credit to millions of poor people in villages in Bangladesh.

Yunus will also speak at the event’s commencement exercises for ticketed guests begins at 7:30 a.m. Graduates will be seated on the main floor of Johnson Athletic Center beginning at 7:30 a.m. Following the exercises, a reception will be held for graduates and their guests on the Kreps Green.

In all, 983 undergraduate students and 1,352 graduate students are scheduled to receive 1,140 bachelor’s degrees, 916 master’s degrees, 407 doctorates and 110 postdoctoral degrees.

A special baccalaureate ceremony for PhD recipients will take place at 11 a.m. on Thursday, June 1, in Rockwell Cage.

For guests attending the Commencement exercises on Friday, complimentary parking will be available in the Albany Garage, the N10 Annex Lot and the Longfellow Garage. Parkers with North Area permits are urged to use alternate modes of transportation on the day of Commencement.

For those who must drive, parking will be available in the 158 Main Ave. Lot, N4 and Pacific St. Lot, 65 Waverly St. Lot and the West Lot.

In the event the Commencement exercises in Killian Court are canceled due to severe weather conditions, the speeches will be held in Rockwell Cage for the stage assembly and graduates only. Guests may view the speeches on closed-circuit television in viewing locations throughout the campus.


Communitech

Helping MIT neighbors cross the ‘digital divide’

Even though close to half of all Americans have broadband access in their home, the digital divide—the gap between those who have access to information technologies and those who do not—continues to grow both at home and abroad.

A group of MIT volunteers hopes to close that gap through Communitech, a program that started in 2000 by focusing on refurbishing older donated computers and giving them to economically disadvantaged people in the area. Since its inception, however, it has broadened its goals to teach the recipients of its computers how to use the technology comfortably.

Today, Communitech has two branches: The MIT Used Computer Exchange (UCE), coordinates, recruits and electrically engineer computer science professor Henry Wu, which refurbishes donated computers; and Families, Accessing Computer Technology (FACT), coordi- nated by management sophomore Randall Shults, which handles the software-training side. Each year since 2000, more than 20 MIT community members have donated their time to the program.

The UCE is always looking for computer donations—PCs only, with Pentium IV processors or better. Flat-screen LCD monitors in full-working order are also welcome. Those interested in donating a computer can do so by filling out a form available at http://imara.csail.mit.edu/.

MIT departments can also donate used comput- ers. Contact MIT Property Manager Michael McGa- rry—so that he can deinstall the computers and keep a record of the donation—at cmarry@mit.edu or 617-253-2779. UCF has placed more than 200 computers in local homes since 2001. About half of the recipients sign up for Internet service (56K dialup). The connections are provided at the significantly discounted price of $5 per month beginning.

The FACT course portion of Communitech covers hardware basics and word processing, spreadsheet, web and email. Each volunteer is matched with a client and works with him or her for two hours on Saturday mornings over six weeks. Shults, the FACT coordinator, recounts the difference in the local community: “I was given an amazing opportunity when MIT accepted me. This is my way of giving back and using the skills I’ve acquired to help others improve their lives.”

For more information on how to get involved with the Communitech program, contact CSAIL staff members Karla Munari and Jason Dorfman at communitech-staff@mit.edu, or drop by Room 32-268 in the Stata Center. DARA, the organization in CSAIL, that sponsors Communitech, strives to empower underserved communities through sustainable technology and education.
MIT scientists develop a ‘paper towel’ for oil spills

Nanowire mesh can absorb up to 20 times its weight in oil

Elizabeth Thomson

A mat of nanowires with the touch and feel of paper could be an important new tool in the cleanup of oil and other organic pollutants. MIT researchers and colleagues report in the May 30 online issue of Nature Nanotechnology that they have created a membrane that can absorb up to 20 times its weight in oil, and can be recycled many times for future use. The oil itself can also be recovered. Some 200,000 tons of oil have already been spilled at sea since the start of the decade.

“What we found is that we can make ‘paper’ from an interwoven mesh of nanowires that is able to selectively absorb hydrophobic liquids—oil-like liquids—from water,” said Francesco Stellacci, an associate professor in the Department of Materials Science and Engineering and leader of the work. In addition to its environmental applications, the nanowire paper could also impact filtering and the purification of water, said Jing Kong, an assistant professor of electrical engineering in the Department of Electrical Engineering and Computer Science (EECS) and one of Stellacci’s colleagues on the work. She noted that it could also be inexpensive to produce because the nanowires of which it is composed can be fabricated in larger quantities than other nanomaterials.

Stellacci explained that there are other materials that can absorb oils from water, “but their selectivity is not as high as ours.” In other words, conventional materials still absorb some water, making them less efficient at capturing the contaminant. The new material appears to be completely impervious to water. “Our material can be left in water a month or two, and when you take it out it’s still dry,” Stellacci said. “But at the same time, if that water contains some hydrophobic contaminants, they will get absorbed.”

Made of potassium manganese oxide, the nanowires are stable at high temperatures. As a result, oil within a loaded membrane can be removed by heating above the boiling point of oil. The oil evaporates, and can be condensed back into a liquid. The membrane—and oil—can be used again.

Two key properties make the system work. First, the nanowires form a spaghetti-like mat with many tiny pores that make for good capillarity, or the ability to absorb liquids. Second, the membrane is created by the same proprietary, or the ability to absorb liquids. Second, the membrane is created by the same general technique as its low-tech cousin, a water-repelling coating keeps water from penetrating into the membrane. Oil, however, isn’t affected, and seeps into the membrane.

“The membrane is created by the same general technique as its low-tech cousin, a water-repelling coating keeps water from penetrating into the membrane. Oil, however, isn’t affected, and seeps into the membrane.”

MIT confirms link between inflammation, cancer

Chronic inflammation of the intestine or stomach can damage DNA, increasing the risk of cancer, MIT scientists have discovered.

The researchers published evidence of the long-suspected link in the June 2 online issue of the Journal of Clinical Investigation.

In two studies, the researchers found that chronic inflammation accelerated tumor formation in mice lacking an enzyme that repairs DNA damage.

“It’s something that was expected but it was never formally proven,” said Lianzhe Metra, research scientist in MIT’s Center for Environmental Health Sciences and lead author of the paper.

“The results of this work suggest that people with decreased ability to repair DNA damage might be more susceptible to developing cancer associated with chronic inflammation such as ulcerative colitis, Metra said.

Embryonic pathway delivers stem-cell traits

Studies of how cancer cells spread have led to a surprising discovery about the creation of cells with adult stem-cell characteristics, offering potentially major implications for regenerative medicine and for cancer treatment.

Some cancer cells acquire the ability to migrate through the body by re-activating biological programs that have lain dormant since the embryo stage, as the lab of Whitfield Institute for Biomedical Research Member Robert Weinberg has helped to demonstrate in recent years. Now scientists in the Weinberg lab have shown that both normal and cancer cells that are induced to follow one of these pathways may gain properties of adult stem cells, including the ability to self-renew.

In a paper published online by Cell on May 15, former postdoctoral researcher Sendurai Mani and his colleagues demonstrated in mice and in human cells that cells that have undergone an “epithelial-to-mesenchymal” (EMT) transition acquire several important characteristics of stem cells.

Epithelial cells, which make up most of the human body, bind together in sheet-like structures. In embryonic development, the EMT process breaks up cell-cell adhesion in the epithelial layer, and converts epithelial cells into more loosely associated mesenchymal cells. During cancer development, some cancer cells within a primary cancer may undergo an EMT, migrate through the body to their end destination, and there resume their epithelial form through a reverse process (the mesenchymal-to-epithelial transition).

Joshua Angrist

Teacher tests underlying U.S. schooling? Study sees licensing as deterrent to talented individuals

Teacher certification tests may be undermining American public education by deterring higher-quality candidates from applying for teaching jobs, according to a study by MIT labor economist Joshua Angrist and Jonathan Guryan of the University of Chicago Graduate School of Business.


“States are using increasingly strict licensing provisions to identify and hire those most qualified to teach. But our results show that testing has acted more as a barrier to entry into teaching than as a quality screen,” Angrist says.

One bright note among the researchers’ findings is that teachers may be pleasantly surprised with their wages when—or if—they are hired, Angrist notes, since testing is associated with increases in teachers’ wages.

“That’s because barriers to entry reduce the labor supply, which in turn increases labor costs in the profession,” Angrist says.

Scientists reveal the lifestyle evolution of wild marine bacteria

Marine bacteria in the wild organize into professions or lifestyle groups that partition many resources, rather than competing for them, so that microbes with one lifestyle, such as free-floating cells, flourish in proximity with closely related microbes that may spend life attached to zooplankton or algae.

This new information about microbial groups and the methodology behind it could change the way scientists approach the classification of microbes by making it possible to determine on a large scale, relatively speaking, the genetic basis for ecological niches. Microbes drive almost all chemical reactions in the ocean, it’s important to identify the specific professions held by different groups.

“‘This is the first method to accurately differentiate the ecological niche or profession among large groups of microbes in the ocean,’” said Professor Martin Polz, a microbiologist in MIT’s Department of Civil and Environmental Engineering. He and colleague Professor Eric Alm, a computational biologist, published a paper describing their research in the May 23 issue of Science.

To read more about these and other MIT research advances, please visit http://web.mit.edu/newsoffice/research.html.
Harnessing the Tibetan sun

Student project aims to reduce deforestation and lung disease

In many villages throughout Tibet, there are two ways to cook a meal. There’s the traditional open fire, fueled by yak dung or the region’s increasingly scarce wood. And then there are solar cookers, concentrating mirrors made of two-inch-thick concrete and covered with a mosaic of small glass mirrors.

In a major new project that could help set the agenda for policymakers, researchers and industry leaders, a team of MIT faculty members has begun a comprehensive study of the technology and the economics of a variety of approaches to harnessing the power of the sun.

The MIT Future of Solar Energy Study will be the third in a series of broad studies of energy options, joining earlier studies on the future of coal and the future of nuclear power. “Once again, we’re going to do a study on a big energy area,” says Deutch. “We’re looking for it to be both widely read and influential.”

Harnessing the particular strengths of this institution, he says, the report will be “MIT speaking in a way only MIT can—with an interdisciplinary focus, addressing in depth an area of energy.” The report will have “a breath of focus that encompasses technology, economics and policy, and looks at how these need to work together.”

The team will have an advisory panel, including specialists in chemistry, mechanical engineering, electrical engineering and computer science, materials science and engineering, physics, economics and management.

The objective is to carry out a study on solar energy to help develop the country, and the report will be publicly available free on the Internet. While the intent is to work on the study for about 18 months, Deutch says, there is no set time limit. “It’s very important that we get this right,” he says. “The world is changing rapidly, and we have to come in every day to check if the study is going in the right direction.”
The Earth below, the sky above

Trend-setting EAPS turns 25

David Chandler
The News Office

Twenty-five years ago, MIT decided to bring together the Earth and the sky in the years that followed, many others did the same. Until 1983, MIT, like most universities, had separate departments for geology (Earth and planetary science) and oceanography, but in that year they were brought together to form the present Department of Earth, Atmospheric, and Planetary Sciences (EAPS). Soon after, many other institutions followed suit in bringing these interrelated disciplines together.

“In many universities, those are still separate today,” says Marza Arbab, a planetary scientist who has been the chair of EAPS for the last five years. “But if you think about it, so many of the interesting questions about the Earth, about energy, about the environment, about climate, require that you have some aspects of these different parts of the Earth system. We were able to do things others weren’t, because we had these people co-located.”

For example, Zuber, the E.A. Griswold Professor of Geophysics, cites an ongoing study “on the effects of climatic changes on the growth and erosion of mountain belts. We’ve had a very successful study of this in Tibet, which has been going on for decades.” And the connections between what were once disparate fields have only increased over the years, she adds. “Now, we’re even studying the atmospheres of extrasolar planets. Who’d have thought!”

The creation of that united department was quickly influential. “By virtue of the fact that we’re MIT, people watch what we do,” Zuber says. “Now, everybody appreciates and realizes how multidisciplinary Earth science is. But even with that realization, it’s not easy to make these changes anywhere. But it’s easier at MIT than at a lot of institutions.”

One common aspect of many of the disciplines encompassed by the department, Zuber says, is analysis of fluid dynamics. While fluid processes obviously apply to both oceanography and atmospheric science, she says, it turns out the same principles also apply to the semi-solid processes taking place in the Earth’s crust and mantle.

The department, which has 19 faculty positions and currently and 160 graduate students, “covers a lot of intellectual ground,” Zuber says. And like the planets themselves, the department is always evolving. “One of the things we’re very excited about in the department is a new emphasis on geobiology,” she says. “It’s something we’ve wanted to get into for some time.” For example, now “we have people looking at the biota of the early Earth, at how the proliferation of life affected the atmosphere.”

To celebrate the anniversary of the department’s creation, EAPS is holding a daylong symposium on Wednesday, June 4, which will include talks on some of the most interesting and cutting-edge research in the field, including whether a sudden flooding of the Black Sea was the basis for the biblical flood story, and whether the uncertainties in climate-change projections are growing or shrinking. Details on the symposium are at: http://eapsweb.mit.edu/people/alumni/html

CLASSIFIED ADS

Members of the MIT community may submit one ad each issue. Ads should be 30 words or maximum, three words will be edited. Submit by e-mail to Classifieds@mit.edu or mail to Classifieds, Rm 11-400. Deadline is noon Wednesday the week before publication.

FOR SALE

Air Conditioner, Portable, with remote control. $900 OTB or “Sears” $500 OTB. Used one season, $60 paid $594.99 new. Call Ron, 617-452-2327.

Smoked glass doors for sale $200. 82” H x 24” W. Lovely cherry entertainment center with sliding doors, alloy wheels, CD & cassette, roof window, TV stand, 49” planked floor. Cabin of passive solar design facing Green Mountain National Forest. Comes with 91.6(+/-) acres of beautiful Vermont highland benefiting Rutland and Manchester across from the Green Mountain National Forest. Comes with a very old farm house built for summer use and white-walled cabin with electric and wooded for those ski weekends. House fronted by majestic maples has four bedrooms, 1 1/2 baths and a large sleeping loft over workshop and woodshed. Huge stone fireplace, original wide-planked floors. Cabin of passive solar design features tucked corner tub with on demand hot water. Offers various house sites for possible future sales. Waddington, VT (Rutland County). Lisa 802-295-4063 farm.westhill@gmail.com; Virtual tour http://1948westhill.wordpress.com. $450,000

HHMI: 5 MIT scientists named investigators

Continued from Page 1

This year, HHMI chose 56 new investigators from among 1,070 applications. It currently employs approximately 100 investigators in the United States, along with more than 2,000 of its scientific staff.

The new HHMI investigators at MIT are Sangeeta N. Bhatia, Catherine L. Drennan, Darrell J. Irvine, Dianne K. Newman and David M. Sabatini.

Sangeeta N. Bhatia

Professor of electrical engineering and health science and technology, member of the Koch Institute for Integrative Cancer Research at MIT

A biomedical engineer, one of Bhatia’s long-term goals is to generate a complete implantable liver. She and her colleagues have already created tiny colonies of human liver cells that model aspects of the full-size human organ.

Another major effort in Bhatia’s lab is the development of nanoparticles designed to diagnose and treat cancer. One strategy makes use of nanoparticles that can sneak into blood vessels that feed tumors and then merge in clumps large enough to be detected by magnetic resonance imaging scans and reveal fast-growing cancer “hot spots.”

David M. Sabatini

Associate professor of biology and member of the Whitehead Institute for Biomedical Research

Sabatini’s research revolves around how cells, organs and living creatures grow. “I think it’s one of the most interesting questions out there,” he says. “You look at the vast world around you and find you see such tremendous diversity in size. Yet we actually know relatively little about how size is regulated.”

As a graduate student, Sabatini identified a protein complex in mammalian cells known as mTOR that anchors a master growth-regulating pathway in mammals. “I decided to study it further, and in essence I haven’t stopped since,” Bhatia says. “It has led into a number of new and surprising areas.”

Catherine L. Drennan

Associate professor of chemistry and biology

Drennan revels in sorting out the architecture and function of metalloproteins—those proteins whose structure contains one or more metal ions. Blending metal with amino acids, she notes, is nature’s way of managing difficult but critical reactions, including things such as photosynthesis. “The most fundamental, simple reactions require the most complex metalloproteins,” she explains. “Anything that is really hard often has a metal-containing protein. And the hard ones are really the fun ones, where there is the most to learn.”

In 2006, Drennan was chosen as one of 20 HHMI professors, a $1 million award to help young researchers—she is the first HHMI professor ever to be named an HHMI investigator.

Dianne K. Newman

John and Dorothy Wilson Professor of Biology and Geobiology

Newman has learned to think big and small at the same time, with good reason—her research focuses on the rocks on this huge planet and the tiny microbes that constantly explore and change them.

“We’re interested in the coevolution of life and Earth,” she explains. “We’re trying to discover when particular types of bacteria first appeared and when the major forms of metabolism evolved, because these events had a profound effect on the Earth. She hopes to use her knowledge of bacterial evolution to understand how vaccines and antibiotics have adapted to thrive in the human body.

Beige 2000 Honda Odyssey EX minivan, 64,000 miles $9,500. Power remote controlled sliding doors, alloy wheels, CD & cassette, roof rack, original owner, very good condition. Call 617-253-6848.

Sony digital camcorder DCR-TR82/30 GB HDD used once. 40X Optical/2000X Digital Zoom $240 or BO 617-306-6456 ameelot@mit.edu

Kenwood HIFI Stello Tuner, CD player, cassette player, Jensen speakers, $200.

Lovely cherry entertainment center with sliding smoked glass doors for sale $100. 82” H x 24” W. Adjustable shelves and two sliding
Research affiliate envisions towering Katrina memorial

Anne Treton
News Office

After Hurricane Katrina left its trail of destruction along the Gulf coast, MIT research affiliate Joe Davis decided to do something to memorialize the hurricane victims and inspire the survivors. His idea: Build a tower that will capture laser beams into the sky. Davis, a 57-year-old biology researcher and artist, has worked at MIT for more than 25 years. He spent most of his childhood and adolescence in Mississippi and still has family there. “Many members of my extended family lost their homes and livelihoods in Katrina,” Davis said. “Everything within a mile of the coast was utterly destroyed.”

He says the tower—which he hopes to build on an island or peninsula on Mississippi’s Gulf coast—will be not only a beacon of inspiration, but a scientific tool that could gather meteorological data for research projects. “I want this to impact technology and research as well as tourism and the arts. I want it to help with the economic and technological and scientific recovery of the coast,” he said.

Davis, whose work has been exhibited at international events such as Ars Electronica, was recently awarded a $35,000 Rockefeller fellowship—a 109-foot tower that will capture laser beams into the sky. He recently won a Rockefeller fellowship for the project.

Call Me Ishmael. He has gotten additional technical and financial support from private donors.

The Mississippi Gulf coast has one of the highest lightning incidence rates in the United States, and Davis hopes that studies involving his sculpture may help to resolve the mysterious electrodynamics of natural storms. The 106-foot tower would be similar to a lightning rod but would differ in several important ways. When lightning strikes the tower, its three vertical aluminum masts will form the electrodes of a resonant cavity that would electrically break down nitrogen in the air and trigger an ultraviolet laser discharge that sends beams back into the sky.

According to Davis, these beams may in turn trigger powerful secondary lightning discharges, as a consequence, enormously powerful secondary laser discharges will also be produced. Davis points out that solar sail researchers await such powerful lasers to propel solar sails beyond the inner solar system.

Davis has already had some contact with officers of the Mississippi Arts Commission about his ideas for the project and has been invited to present his plans to community arts groups in South Mississippi.

Davis says he is saddened by the destruction caused by Katrina and the failure to rehabilitate the Gulf region. Shagbark recovery efforts there are “a source of national shame,” he says.

Four from MIT win coveted Gates scholarships

Sarah H. Wright
News Office

Four MIT students preparing for careers in affordable energy, public health, mathematics and biotechnology have been awarded full scholarships for graduate study at the University of Cambridge, England, by the Gates Cambridge Trust.

MIT students have won 14 of the prestigious scholarships since the program was established in 2000 by the Bill & Melinda Gates Foundation; the four scholarships this year represent the most MIT has received in a single year. The scholarships cover tuition, room, board, travel and stipend for study at Cambridge.

MIT’s four Gates Trust winners for 2008 are Talia Gershon, a senior majoring in materials science and engineering; Naveen Krishnan ’07, Marcelo Alvisio, a senior in mathematics, and Chawita “Jelly” Netirojanakul, a senior in chemistry.

A fifth MIT student, Ingrid Lawhorn ’06, applied through her graduate school program at Pace University and was accepted.

Gershon, a leading MIT rugby player, is particularly interested in low-cost photovoltaics, fuel cells and low-energy lighting and hopes to participate in the Cambridge Environmental Initiative. “Sustainability will be one of the biggest challenges of our generation and I believe these are the fields to which I can contribute most as a materials scientist,” says Gershon, of East Meadow, N.Y.

As an MIT student, Krishnan, of Del Mar, Calif., studied treatments for Huntington’s Disease, played on the varsity tennis team, and founded a nonprofit organization to aid wounded soldiers from Iraq and Afghanistan. At Cambridge, he will work toward a master’s degree in public health. Krishnan’s goal is to become a surgeon.

MIT seniors Marcelo Alvisio of Argentina and Chawita “Jelly” Netirojanakul of Thailand won Gates Cambridge Trust international scholarships for 2008-2009. A theoretical mathematics major, Alvisio plans to read for the Certificate of Advanced Study in Mathematics at Cambridge then return to the U.S. to begin a doctoral program at the University of Chicago. Alvisio, who completed his senior year with a perfect GPA, is also an avid painter and linguist: He speaks his native Spanish and English, German, Latin, Italian and French.

Netirojanakul, a chemistry major, will study technology policy at Cambridge before entering a doctoral program in chemistry in the United States. Netirojanakul says she hopes to bring her advanced degrees to facilitate scientific advancement in Thailand. She also hopes to start her own biotech company there. Prestigious Marshall and Rhodes Scholarships were also awarded to two MIT seniors for 2008-2009. Both are preparing for careers in medicine.

Marshall Scholarship winner Ali Abbasani of Boston will study at the University of London’s School of Hygiene and Tropical Medicine, and Rhodes Scholar winner Melis Anahtar of Bethesda, Md., will study at Oxford University.

CLASSIFIED ADS, continued

drawers for CDs, DVDs, etc. Easly disassemble for moving. snipes@psfc.mit.edu

20” General Electric Color TV for sale $75. Remote control allowed switching from standard television to Cable TV, VCR, or DVD inputs. Works great! Philips VCR. High quality system with on screen displays in English or Spanish. Remote controlled. Works great! Only $30. snipes@psfc.mit.edu

Region-free DVD player. Automatically plays NTSC or PAL format DVDs for all DVD regions. Also plays CDs and MP3 music discs. Remote control. Only $75. snipes@psfc.mit.edu

dome tents, 7’9” sq., 10’6” sq. mummy down sleeping bag, gas camping stove, metal Coleman cooler, $500 for all. Call 781-635-2234.

4 bdrm, 2bth lakefront home on beautiful, clear, spring-fed, NH lake. 30 min. southwest of Sudbury. Available in June or July 1. Lease. Call 603-766-3051 or chorover@mit.edu.

Marcelo Alvisio

PHOTO / MIT NEWS OFFICE

Chawita “Jelly” Netirojanakul

Talia Gershon

PHOTOS / NUTFHAN SORUNGAM AND JUNIADER ECHONGSARIAT
MIT students weigh in on hope for AMERICA

"Pay Attention to the Urbanization of Major Population Centers"
Angelica G. Weiner '09 (Course 11)

We are reaching a pivotal point in history when, for the first time, the majority of the population is expected to live in urban areas. Globally, more than 75% of future urban growth is expected to occur in already crowded slums. According to a 2003 United Nations HABITAT report, slums are sites of extreme inequality, places where people cannot secure key necessities such as water, durable housing, even a nearby toilet. This problem does not only afflict the developing world; American communities are experiencing the pressures of crowding, poverty, and diminishing green space.

If the future of our planet is indeed an urban one, we need to see greater leadership from scholars and politicians in the field. Those who are responsible for shaping our built environment and city infrastructure have not been as innovative as they can be, a reality that is costing communities extra tax dollars and causing them great environmental harm. With rising carbon dioxide emissions and shrinking freshwater reservoirs, the option of designing environmentally sustainable cities to manage a population of over 6.6 billion is no longer a luxury.

Domestically, we need to adopt progressive legislation and pay greater attention to urban issues. Internationally, the United States Agency for International Development should take a more aggressive approach in addressing urban issues via leadership and information sharing, as opposed to its current stance of providing "catalyst funding" to outside groups.

Americans should care about rapid urbanization because it involves human rights, because slums are breeding grounds for crime and terrorism, and because it is the source of environmental degradation via pollution, depleted water tables, and deforestation. The future of our cities, as with many phenomena, presents both a challenge and an opportunity.

Angelica G. Weiner is an Executive Member of Engineers without Borders and an active member of the Urban Studies Student Council.

Ali Wyne, a senior in management and political science, recalls how four years ago he couldn’t get anyone to talk politics. Virtually none of his friends took an interest in the 2004 presidential election.

But this year, those same friends are attending rallies, working for campaigns, starting organizations, writing blogs and making their voices heard—a transformation catalyzed by Democratic Sen. Barack Obama’s candidacy, Wyne says.

A prolific opinion writer for The Tech and vice president of MIT’s Undergraduate Association, Wyne is showcasing his fellow students’ new political energy in “America in the World: MIT Speaks,” a booklet of 25 essays published by Forum on American Progress, which Wyne founded in his freshman year.

To produce the booklet, Wyne invited a diverse group of student leaders to describe what they thought the United States must do to make the world a better place in 2008. The question that he posed, modeled closely on the one asked of global leaders at the 2008 World Economic Forum, elicited bold, lively proposals—no surprise, Wyne says.

“MIT students approach problems in an objective, analytical manner; they’re also willing to take risks to advance bold ideas. Almost by definition, they’re best suited to driving change,” he says.

“America in the World” urges the United States to participate in addressing and solving global problems.

Essay titles include “Consider the Nexus of Law and Food Security in Africa” by Raja H.R. Bobbili, a senior in electrical engineering and computer science, “Build Schools to Inhibit the Taliban’s Recruitment Efforts” by Adnan Elias, a sophomore in mechanical engineering and management, and “Acknowledge the Deficiencies of the Microcredit System” by Reshmaan Hussam, a junior in economics.

The “America” authors comprise 13 women and 12 men who represent 15 majors and all four undergraduate classes. Their parents are from Zambia, Lebanon, Pakistan and other countries. They are involved in student government, public service, research, athletics, business and arts.

“Selecting a diverse group of authors was critically important. A publication with the subtitle ‘MIT Speaks’ must make every effort to represent the tremendous diversity of MIT students,” Wyne says.

Wyne, who hopes to enter politics himself one day, intends to submit the booklet to whichever candidate prevails this November, he says.

Next fall, as the presidential race concludes, Wyne will be a 2008-09 Junior Fellow at the Carnegie Endowment for International Peace (CEIP), working under the director of CEIP’s China Program.

As for “America in the World,” Wyne hopes the booklet will serve as a model for other schools and for future projects that demonstrate the ability of youth to effect change on a global scale.

“America in the World,” the first publication of its kind at the Institute, received support from 12 different MIT departments and centers including the Office of the Dean for Undergraduate Education, Technology and Culture Forum, The Center for International Studies, the School of Humanities, Arts, and Social Sciences, and the Public Service Center.