



Volume 50 – Number 30
Wednesday – June 14, 2006

TechTalk

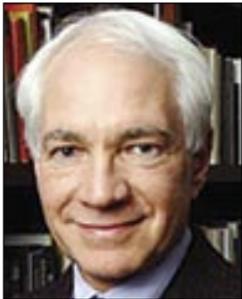
S E R V I N G T H E M I T C O M M U N I T Y

Canizares, Gibson get top posts

MIT Provost L. Rafael Reif has announced that Associate Provost Claude R. Canizares will become vice president for research and associate provost and that Professor Lorna J. Gibson will become associate provost, effective Tuesday, Aug. 1.

They will be part of an academic leadership team that includes the provost and Professor Philip S. Khoury, whose appointment as associate provost effective July 1 was announced in April.

In his new position, Canizares succeeds



Claude R. Canizares

Professor Alice Gast, who will become president of Lehigh University on Aug. 1. As vice president for research and associate provost, Canizares will have overall responsibility for research policy, as well as the Institute's research misconduct policies and process. He will have oversight of several major interdepartmental laboratories and centers and of MIT Lincoln Laboratory. Several research-related offices report to the vice president for research as



Lorna J. Gibson

well, as does the Division of Comparative Medicine.

As associate provost, Gibson will oversee academic and space planning, including chairing the Committee for the Review of Space Planning. She will be responsible for faculty affairs, including faculty development and renewal. In addition she will have oversight of the policies and process for handling faculty grievances.

In making the announcement, Reif said, "I am delighted that Professors Canizares and Gibson have agreed to take on these new responsibilities on behalf of the Institute. They each bring a depth of experience, sound and thoughtful judgment, and a strategic perspective to their respective positions that will serve our academic enterprise very well. Together with Professor Khoury, they will form an outstanding leadership team, and I look forward to working with them to support our faculty and further MIT's academic agenda."

Canizares is the Bruno Rossi Professor of Experimental Physics and has been associate provost since 2001. His primary

See **ANNOUNCE**

Page 2



PHOTO / DONNA COVENEY

Michael Zhang was the very last student to receive his degree, a Ph.D. in management, at MIT's Commencement exercises on Friday, June 9. He jumped for joy, turned around, bowed to the faculty and ran down the aisle with his hands in the air.

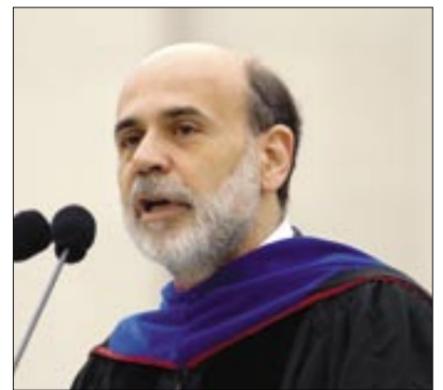


PHOTO / DONNA COVENEY

Ben S. Bernanke (Ph.D. 1979), chair of the Federal Reserve, delivers the principal address at MIT's Commencement.



PHOTO / DONNA COVENEY

MIT President Susan Hockfield gives her charge to the graduates at MIT's 140th Commencement exercises held Friday, June 9, in Killian Court.

MIT graduates Class of 2006

Ben S. Bernanke, chair of the Federal Reserve, delivers principal address

Sarah H. Wright
News Office

Days of downpours gave way to a soft, steady mist as members of the MIT Class of 2006 were urged to relish their victory and temper their ambitions with compassion and service to humanity during the Institute's 140th Commencement exercises, held Friday, June 9, in Killian Court.

During the morning-long ceremony, 2,109 undergraduates and graduate students received 1,036 bachelor's degrees, 1,048 master's degrees, 270 doctorates and nine engineer degrees.

Macroeconomist Ben S. Bernanke (Ph.D. 1979), chair of the Federal Reserve, delivered the principal address.

Bernanke assumed leadership of the Federal Reserve on Feb. 1. The head of the Federal Reserve is widely considered to be the world's most powerful economist.

Bernanke's talk provided a short history of economics at MIT, a portrait of the ways in which technology and economics mutually nourish the nation's overall vigor

and a glimpse of the future for the Class of 2006. He urged the graduates to make a "difference in the world through volunteering, civic participation, charitable activities or the type of work you choose to do."

True to the MIT Commencement tradition of honoring mentors and guides, Bernanke pointed to individual faculty members who inspired students and advanced the Institute's "outstanding reputation" among economics departments. He cited Nobel laureates on the economics faculty — Paul Samuelson (won prize in 1970), Franco Modigliani (1985) and Robert Solow (1987) — as examples of excellence and guidance.

He also noted those MIT economists who applied mathematical tools to economics and gained "leading roles in government and in the private sector, including the current heads of four central banks: those of Chile, Israel, Italy and, I might add, the United States."

Bernanke introduced the concept of the "virtuous circle" in his discussion of the mutual benefits among economics, science and technology.

"When the economics is right, scientific and technological advances promote economic development, which in turn, in a virtuous circle, may provide resources and incentives that help to foster more innovation," he said.

According to Bernanke, the United

States is in a good economic position to benefit from – and to benefit – the virtuous circle of technology, innovation and development. Global competition is one such benefit, he said.

"Competition is one of the key benefits of free and open trade; companies that are exposed to global competition tend to be much more efficient and to produce goods of higher quality than companies that are sheltered from international competition," he said.

Bernanke praised America's high-quality research universities for the role they have played in the development and commercialization of new ideas. "For example, Intel was cofounded by an MIT graduate, and MIT graduates played key roles in designing and developing the Internet," he said.

Bernanke was optimistic about the future for the 2006 graduates of MIT. "New opportunities will always arise for those who seek them. If you remain nimble in searching out new and unexpected opportunities, it will not only benefit you, but it will also benefit the economy and our society," he said.

Student speakers

Sylvain Bruni, president of the Graduate Student Council, addressed the crowd

See **GRAD**

Page 5

NEWS

ALAN KOTOK DIES

The computer pioneer and Tech Model Railroader was 64.

Page 2

JOYS IN THE HOOD

Families cheered as MIT faculty awarded 270 new doctorates on June 8.

Page 3

CORPORATION ELECTIONS

The Institute's board of trustees elects 10 members.

Page 6

CAMPUS COMMITMENT

Vice President Kathryn Willmore reflects on four decades of work and change at MIT.

Page 7

RESEARCH

PRECIOUS DROPLETS

An African beetle models capture and storage of scarce water resources.

Page 8



Alan Kotok, joystick creator, dies at 64

Sarah H. Wright
News Office

Computer pioneer Alan Kotok, an MIT alumnus who helped create both the first video game and the gaming joystick, died of a heart attack in his home in Cambridge, Mass., on Friday, May 26. A native of Philadelphia, he was 64.

Kotok (S.B. 1962) entered MIT at age 16 and became swiftly involved in developing chess-playing computer programs, designing new systems for MIT's Tech Model Railroad and, with a group of friends, coming up with their original video game, Spacewar.

Tim Berners-Lee, founder and director of the World Wide Web Consortium (W3C), which is housed in MIT's Computer Science and Artificial Intelligence Laboratory, described Kotok as "one of the early wise men of computer science."

The unflappable Kotok was "not only technically adept well beyond the norm, but also possessed a childlike delight in all things ingenious or intriguing. Wit, wisdom and sheer human warmth defined him, yet he commanded total respect," Berners-Lee said.

Kotok had been W3C associate chair since 1997. In highlighting Kotok's many contributions to the field that literally grew up with him, Berners-Lee pointed to Kotok's important programs for early Digital Equipment Corp. (DEC) and IBM com-

puters, including the well-known Kotok-McCarthy chess program at MIT, which became Kotok's S.B. thesis.

Kotok spent 34 years with DEC in numerous leadership roles, retiring in 1996. He served as technical director for product strategy and development groups in telecommunications, storage and Internet.

While at DEC, he was chief architect of the PDP-10 family of computers and a logic designer for the early DEC PDP-6 computer. Later, he became chief architect on the influential DECsystem-10 timesharing computer system and a senior consultant to Digital's Alta Vista project, an early Internet search engine.

Gordon Bell, senior researcher in Microsoft's Media Presence Research Group, worked with Kotok at DEC in the 1960s. Kotok was "calm, constant and unflappable with a wonderful sense of humor. He loved telephony and probably knew more about it than anyone in the company."

Kotok also provided leadership as a member of the Corporate Strategy Group, which advocated early adoption and integration of Internet and Web-based technologies.

Kotok, whose daughter Leah affectionately called him "King Nerd," had a lifelong interest in all things mechanical.

His love of trains, which surged into passion at MIT, arose in childhood: His father owned a New Jersey hardware store that sold toy trains at Christmas, and Kotok set up the annual train displays.

As for electronics, a family legend tells



Alan Kotok

how Kotok, then 5, stuck a metal screwdriver into an electric outlet and was tossed across a room. Kotok himself recalled this with characteristic understatement — "I was always interested in electrical engineering!" — in a 2004 interview.

In the same interview, Kotok described his 1956 encounter with a "giant thinking machine" on a school field trip to the Mobil Research Lab in New Jersey as the "spark that triggered me. We went through a programming exercise, punched up the cards, put them into the machine and the printer clank-clanked and we got the answers. I said, 'Computers! This is it!'"

Kotok married Judith McCoy in 1977; she died in 2005.

Kotok is survived by two daughters, Leah Beth Kotok of Ashburnham, Mass., and Frederica Beck of Prescott, Ariz.; a son and daughter-in-law, Daryl and Shelly Beck of Greenfield, Mass.; and two grandsons.

The funeral was private. A memorial service is being planned for the fall.

For donation information, visit web.mit.edu/newsoffice/2006/obit-kotok.html.

ANNOUNCE

Continued from Page 1

roles include responsibility for campus space and capital planning, oversight of MIT Lincoln Laboratory and assistance with federal agency relations.

Canizares' main research interests are high-resolution X-ray spectroscopy of galactic and extragalactic objects and observational cosmology. He is a principal investigator on the Chandra X-ray Observatory and has also worked on several other space astronomy missions.

Commenting on his appointment, Canizares said, "I am enormously grateful for the opportunity to help foster the research enterprise across the campus and at Lincoln Laboratory. There are so many exciting activities under way or planned, and while there are also challenges, I am confident that MIT will continue to strengthen its position as a premier research university."

Gibson is the Matoula S. Salapatras Professor in the Department of Materials Science and Engineering, where her research interests focus on the mechanical behavior of materials with a porous, cellular structure, such as foams.

"It has been an honor and a pleasure to serve as chair of the faculty over the past year," Gibson said. "I have appreciated learning from my colleagues, among both the faculty and the administration, and from our remarkable staff and students. I look forward with excitement to working with President (Susan) Hockfield, Provost Reif and other senior officers on planning for the future of MIT and on strengthening our efforts on faculty development."

The provost said that he will be consulting with the officers of the faculty and the faculty Committee on Nominations regarding the selection of a new chair of the faculty. Professor Bishwapriya Sanyal is chair-elect, with a term to begin in July 2007.

For further text, please visit web.mit.edu/newsoffice/2006/announce-provost.html.



PHOTO / AMANDA GRAHAM

Solar sprint

Nelson Thomas, Andrew Davis and Andre Gibson, from left, pose with their 'shoe car,' which won for speed at the Junior Solar Sprint held at MIT on May 20.

MISTI helps bring iLabs to Chinese universities

Undergraduates are at the forefront of MIT's latest efforts to share educational technology with China.

On Tuesday, June 13, students joined MIT faculty at the first Asian MIT-iCampus Conference in Beijing, an unprecedented effort to introduce China's top universities to iLabs, MIT's free online remote laboratory initiative.

iLabs allows students and educators anywhere to access MIT equipment to conduct science and engineering experiments.

"Universities can share what would ordinarily be extraordinarily expensive equipment, just using the Internet," said Hal Abelson, codirector of the MIT-Microsoft Research Alliance for Educational Technology and professor of electrical engineering and computer science at MIT.

Thousands of students in Europe, Asia, Africa and the Middle East have used iLabs in their studies, using such equipment as a heat exchanger (which is important in the chemical engineering curriculum) and a shake table (which engineering students can use to study earthquakes).

At the Beijing conference, the MIT faculty who invented iLabs demonstrated how the shared online laboratories can be integrated in the classroom, and representatives from the MIT-China Program (one of the eight work and study abroad programs organized by MISTI, the MIT International Science and Technology Initiatives) explained the key role MIT students play in internationalizing iLabs.

A two-day technical workshop follows for the Chinese universities that want to

Errata

Due to an editing error, the following department awards did not appear in the Institute Awards pullout published on June 7. Tech Talk regrets the error.

Department of Biology

Gene M. Brown Award

Melanie Worley 2006, Towson, MD

John L. Asinari Award

Joe Daniele 2006, La Jolla, CA
Lori Neal 2006, Omaha, NE

Merck Prize

Alejandro Ochoa 2006, El Paso, TX

Ned Holt Prize

Xiaonan (Cecelie) Lin 2006, Mendota Heights, MN

Salvador E. Luria Prize

Alicia Zhou 2006, Chicago, IL

Susan Hockfield Prize in Life Sciences

Lori Huberman 2007, Raleigh, NC

Undergraduate Research Symposium Award

Adriana Tajonar 2006, Mexico City, Mexico
Johanna Varner 2006, Salt Lake City, UT
Xiaonan (Cecelie) Lin 2006, Mendota Heights, MN

Whitehead Prize in Biology

Adriana Tajonar 2006, Mexico City, Mexico

Department of Urban Studies and Planning

Silberberg Travel Grant for Social Justice and Design

Sharlene Leurig G, Washington, DC

Engineering Systems Division

Junior Bose Award for Excellence in Teaching

Daniel Frey, mechanical engineering and Engineering Systems Division

TPP Leadership Award

Technology and Policy Student Society and all of the TPP students who have participated in many efforts that make a difference to the lives of all TPP students

Outstanding MLOG Thesis Award

Mike Mulqueen G, Ijamsville, MD
Honorable mentions: Daniel Ford G; Anne Davidson G; Tony Craig G; Dimitrios Andritsos G

employ the iLab technology and design their own experiments.

Last summer, a team of undergraduates worked with Chinese students at Tsinghua University in Beijing through MISTI, demonstrating how to set up and access MIT's free online computer science courses, experiments and labs. The team also gathered feedback from the participants about how well the initiative worked within China's educational system.

"It's about introducing people to the technology so they can adopt it and use it themselves," said Scot Frank, a computer science student from Salt Lake City. "There are different teaching methodologies between the two countries but we really learn from each other. It's really collaboration."

HOW TO REACH US

News Office

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

Office of the Arts

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



Printed on recycled paper

News Office Staff

Interim Director Pamela Dumas Serfes
News Manager/Editor Kathryn O'Neill
Senior Communications Officer Patti Richards
Assistant Director/
Science and Engineering News Elizabeth Thomson
Assistant Director/Photojournalist Donna Coveney
Senior Writer Sarah Wright
Web Developer/Editor Lisa Damtoft
Reporter/Writer Sasha Brown
Operations/Financial Administrator Myles Crowley
Administrative Assistant II Mary Anne Hansen
Administrative Assistant II Patti Foley
Computer Support Assistant Roger Donaghy
Communications Assistant Heather Manning
Editorial/Production Assistant Anne Trafton

Editor

Kathryn O'Neill

Photojournalist

Donna Coveney

Production

Anne Trafton

Tech Talk is published by the News Office on Wednesdays during term time except for most Monday holiday weeks. See Production Schedule at <http://web.mit.edu/newsoffice/techtalk-info.html>. The News Office is in Room 11-400, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139-4307.

Postmaster: Send address changes to Mail Services, Building WW15, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139-4307.

Subscribers may call 617-252-1550 or send e-mail to mailsvc@mit.edu.

Tech Talk is distributed free to faculty and staff offices and residence halls. It is also available free in the News Office and the Information Center.

Domestic mail subscriptions are \$25 per year, nonrefundable. Checks should be made payable to MIT and mailed to Business Manager, Room 11-400, MIT, 77 Massachusetts Avenue, Cambridge, MA 02139-4307.

Periodical postage paid at Boston, MA. Permission is granted to excerpt or reprint any material originated in Tech Talk.



PHOTO / DONNA COVENEY

New mechanical engineering Ph.D. Anton Thomas receives his doctoral hood at MIT on Thursday, June 8, at Rockwell Cage.



PHOTO / DONNA COVENEY

Hilleken Grawert straightens her son Felix's mortarboard at the hooding ceremony held in Rockwell Cage. Felix J. Grawert received his Ph.D. in electrical engineering.

Joyous grads receive doctoral hoods

Sarah H. Wright
News Office

MIT graduates receiving the Ph.D. or Sc.D. degree were invested with their long velvet-lined hoods in the Institute's traditional family-friendly hooding ceremony on Thursday, June 8, in Rockwell Cage.

President Susan Hockfield welcomed the 270 new doctorates, their families and friends to the event on behalf of the MIT faculty and Corporation.

"The central requirement for the doctoral degree is the creation of new knowledge; it is among the hardest of intellectual tasks. Each of you has ventured successfully into that new land: You have expanded the base of human knowledge, each in your own fields, as scholars before you have done for centuries. In doing so, you have prepared yourselves for lives and careers of discovery," Hockfield said.

"Make no mistake in understanding the potential of your hard-won new skills, because the world needs you as never before," she said.

Chancellor Phillip L. Clay greeted the standing-room-only crowd, complete with baby strollers in the back, small children playing tag among the chairs, and older parents and grandparents beaming with pride.

Following the MIT tradition of honoring the substance over the style of doctoral regalia, Clay offered a swift decoding of the robe-and-hood ensemble, whose roots run deep into the Middle Ages, when scholars' robes were needed for warmth and hoods were used to catch and store the meager coins their students tossed them. Today's regalia have little practical value but immense symbolic power: They are the international gold standard for denoting high academic achievement.

Clay served as the investor of hoods along with a faculty representative from each department or program. The names of the recipients were read by Isaac Colbert, dean for graduate students; Alice P. Gast, associate provost and vice president for research; and Samuel J. Keyser, professor emeritus in the department of linguistics and philosophy.

MIT community

Applause and shouts of glee erupted



PHOTO / DONNA COVENEY

Gymnastics team member David Hu, who did an impromptu flip after receiving his doctoral hood from MIT, re-creates the move after the ceremony. Hu was awarded a doctorate in mathematics.

about the room as the recipients crossed the stage. But families gathered on Thursday spoke of more than their soaring pride in these graduates' achievements. They described a sense of community on campus they would be sorry to lose.

Seemeen Saadat, wife of Bilal Zia, Ph.D. in economics, held their daughter Imaan, 2 and a half, by the hand as they waited to hear Zia's name and degree announced. Zia has a job with the World Bank; the family, originally from Pakistan, will move

to Washington, D.C.

"We loved living at Westgate. We had friends here," she said. A specialist in economic development, Saadat had a "wonderful experience working with Spouses and Partners @ MIT," she said.

For Elizabeth Boudreau, whose husband, Kevin Boudreau, received the Ph.D. in management from the MIT Sloan School, it was "wonderful to be part of this community. We had lots of friends and so much fun socially," she said. The Boudreaus' 1-year-old daughter, Amelia, wiggled in her stroller as her mother strained to hear daddy's name. The family will move to France, where Boudreau has a job at HEC School of Management, outside Paris.

As Marek Pycia worked toward the Ph.D. degree in economics, his wife, art historian Anna Pycia, enjoyed their five years living in Westgate, she said.



Make no mistake in understanding the potential of your hard-won new skills, because the world needs you as never before.

Susan Hockfield
MIT President

"The MIT community is very friendly. I was very happy that as the spouse of a student I could borrow books from the libraries here. My favorite is Rotch. We were treated very well," she said. Natives of Warsaw, Poland, the Pycias will move to State College, Pa.; Marek has a job there.

Michael Zhang, a new Ph.D. in management, will be a professor at Hong Kong University of Science and Technology next fall, so he and his wife and their two daughters, Alantha, 4, and Ashley, 4 months, will move to Hong Kong after six years at MIT.

The Zhang family shared their fellow graduates' affection for life at MIT. "Eastgate was a great community for us," Zhang said.

Reunion classes give more than \$46 million to MIT

Nancy DuVergne Smith
MIT Alumni Association

More than 3,300 alumni and guests — from 106-year-old Charles Yardley Chittick (S.B. 1922) to the youngest Class of 2006 members — gathered last weekend to celebrate their MIT connections and give back to the Institute. Alumni gifts to MIT, reported at the annual Tech Day luncheon at the Johnson Athletic Center on Saturday, June

10, totaled \$46,511,164.

The Class of 1956, which honored the 40-year-old tradition of donning red blazers at their 50th reunion, added to their class history of philanthropy with a five-year giving total of \$12,353,460. Reunion gift co-chair Harris Weinstein (S.B. 1956, S.M. 1958) noted that the class, which previously established a faculty chair and a scholarship fund, this year inaugurated a student life fund.

The senior class, spurred by a challenge grant from outgoing MIT Alumni

Association President Scott Marks, reported 50 percent participation for the Class of 2006 total gift of \$31,614.

"This 50 percent participation rate set a new Institute record, but even more important, it set a new standard for class giving going forward," said President Susan Hockfield.

The giving reports include a dollar record for the 10th reunion class, 1996, which raised \$136,515 from 22.6 percent of alumni. The Class of 1966 posted a 75 percent participation rate, breaking the

record for a 40th reunion class, with gifts totaling \$6,491,165. The 25th reunion class, 1981, turned in a \$3,172,728 gift with 66.5 percent participation.

Three people were named honorary members of the MIT Alumni Association, a tradition since 1897. Dean for Graduate Students Ike Colbert, aeronautics and astronautics head Wesley L. Harris, and New House housemaster Liba Mikic earned the honor for their outstanding service to the association and the Institute.

President Hockfield's charge to the graduates

Below is the text of MIT President Susan Hockfield's charge to the graduates, delivered at MIT's 140th Commencement held June 9, 2006.

You, our graduates, are truly exceptional individuals. Even before you arrived here at MIT, you had already demonstrated your great talents and your willingness to work hard. But at MIT we raise the bar for ourselves and for one another. We challenge every member of our community to reach farther and to dream larger than ever before. Fortunately, along with MIT's challenge come its inspiring teachers and guides: a brilliant faculty and, just as important, brilliant students.

Every part of the Institute — from lecture hall to residence hall, from problem sets to athletics, from the Public Service Center to the music practice rooms — has provided opportunities for your education: an education that embraces not just the subjects you have studied, but the lessons of how to work together for the common good and — probably the most important of all — how to live a life of learning.

You will draw on all these lessons after you leave here, because the world looks to you — the graduates of MIT — to take the lead in answering its most pressing challenges. And at times in the years ahead when a choice of direction presents itself, I hope you will ask yourselves, "Where can I do the most good? How can I make the greatest difference in the world?"

During your years here, your passion and ideas have already changed the world. You have tutored students in Cambridge Public Schools. You have brought your design and planning expertise to the Gulf Coast in the wake of Katrina. You have launched promising startup ventures. And you have participated in path-breaking research with faculty all across the Institute.

In the years ahead, you will help the world meet its need for sustainable energy. You will use the converging tools of the life sciences and engineering to cure, and even to prevent, disease. You will develop ways to accommodate urban growth without urban sprawl. You will bring the benefits of economic growth to developing economies. And you will answer fundamental questions about nature and society.

And even as you take up the world's challenges, you will remain part of this community. At the close of this morning's ceremony, Scott Marks, the president of the Alumni Association, will formally welcome you into the association's membership. We hope that even after you leave campus, your lives will be enriched by an ongoing connection with the Institute.

It is my fervent hope that you will transmit the values that define this community to the other communities you will now join. I hope that you will see leadership as an opportunity to serve the common good. I hope that you will make integrity the touchstone of your judgments. That you will exemplify the pursuit of truth and an unwavering drive for excellence. And that you will continue to demonstrate the value of good, old-fashioned hard work.

Finally, and perhaps most crucially: I ask you to inspire your own generation and the generations to come with a renewed sense of possibility and optimism for the future. Here at MIT, we see up close the myriad ways in which science and technology promise to benefit humankind. If we are to realize that promise, we need to kindle in others the same love and passion for truth and discovery, for creativity and problem-solving, that brought all of us here. I hope that each of you will embrace this challenge as your own.

I would not set you this charge if I did not think you could meet it. I have tremendous faith in you. Your intelligence, dedication and creativity have inspired us during your time here. And I know that in the years ahead you will do even more — you will surprise and delight us with your further achievements.

For your accomplishments on this campus, I offer my congratulations, graduates of MIT!



PHOTO / L. BARRY HETHERINGTON

Chief Marshal Scott P. Marks, president of the Association of Alumni and Alumnae, leads the academic procession down Massachusetts Avenue en route to MIT's 140th Commencement exercises in Killian Court on Friday, June 9. Just behind him is MIT President Susan Hockfield.



PHOTO / L. BARRY HETHERINGTON

Timothy Shabanowitz, M.Eng. in civil and environmental engineering, shows the caps on his cap.



PHOTO / L. BARRY HETHERINGTON



PHOTO / DONNA COVENEY

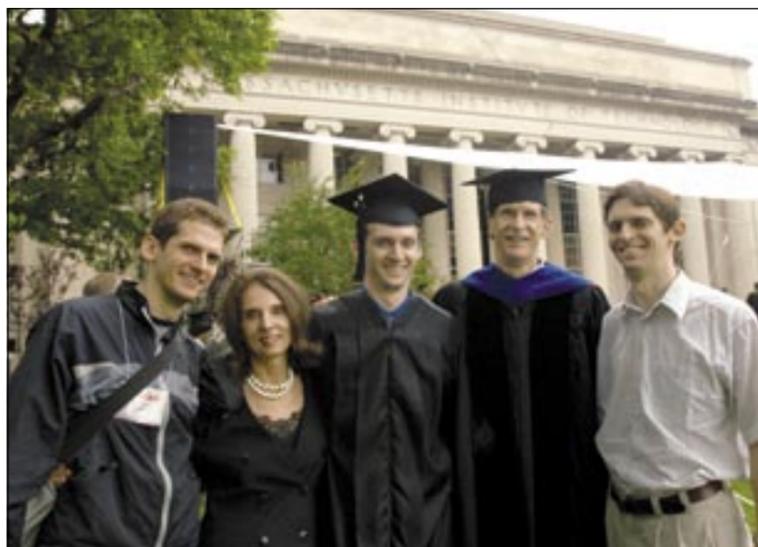


PHOTO / DONNA COVENEY

MIT Commencement is a family affair for the Hemonds. From left are graduate student Brian Hemond; his mother, Carol Thomson; his brother Christopher Hemond, who received the S.B. in brain and cognitive sciences; their father, Professor Harold F. Hemond; and brother Michael Hemond, also a graduate student.

Families weather ceremony with s

Sasha Brown
News Office

The crowd gathered on Killian Court managed to keep the mood sunny despite the clouds hanging in the sky over MIT's 140th Commencement exercises, held Friday, June 9.

The threat of rain had many in the crowd sporting MIT ponchos, which were handed out at the doors. But the rain mostly held off for the ceremony — there was just a light mist that many in the crowd did not seem to mind.

"It could have been uncomfortable if it had rained like yesterday," said Dottie Ferrara, who was in Boston from Crete, Ill., to watch her daughter, Aimee Vessell, get her M.B.A. from the MIT Sloan School of Management.

Wearing a gold coat and sparkly jewelry, Ferrara brought her two sisters along to celebrate the event. All three had also been present at Vessell's last graduation, when she earned her bachelor's degree from Northwestern.

"She told me last night that she could not wait to see us because that would mean it was all over," said Judy Kennedy, Vessell's aunt from Indiana. A third aunt from Wisconsin also made the journey to see Vessell graduate.

MIT Sloan School graduate Malia Schoch-Rodriguez's family also trav-

eled far to see her graduate. Coming in from a city in California, she was delayed that the trip took 25 hours in total, a record for her mother, Fay Schoch. Still, they said they would have made the journey.

"We have been excited for her all the time," said her father. "This was her heart's dream."

Each member of the Schoch party — including her mother, close family friends — wore one of the floral leis that were flown from Hawaii last week.

Schoch-Rodriguez herself wore a special lei made of fragrant jasmine flowers and long green vines. "It was the honored person," her mother said.

Many graduates were creative in their headgear, particularly when it came to headgear. One graduate, a senior who earned her S.B. in mechanical engineering, wore a good use by constructing a series of small structures on top her mortarboard.

Another graduate wore a giant carrot on top of her mortarboard, easily visible amid the sea of black. But it was the graduate that had fun with headwear. David Gold, a member of the reunion Class of 1956, wore a red beanie. "It was the perfect match to his reunion red jacket," he said.

It was all in the spirit of the day, said Ferrara. She had a tour with her daughter later in the afternoon. "This has been a wonderful day," she said.

Left: exercise; Above: President Tom...



PHOTO / DONNA COVENEY

Civil engineering graduate Sala McGuire gives her mom, Helen, a big smooch after Commencement. She and her family are from American Samoa.



PHOTO / DONNA COVENEY

Corporation member David Ho congratulates his daughter, Kathryn Ho, on her master's in business administration from the MIT Sloan School.



PHOTO / DAN BERSAK

New MIT graduate and naval officer Piko A. Neal salutes the flag during the ROTC commissioning ceremony held Friday, June 9, at the U.S. Coast Guard Station in Boston.



DAN BERSAK



PHOTO / L. BARRY HETHERINGTON

Above, Seema Pandya celebrates receiving her MBA from the MIT Sloan School of Management at Commencement.

Left, Rear Adm. (Select) Tom Eccles hands Ensign David Legault his Navy commission on Friday, June 9. Earlier in the day, Legault received his S.B. in nuclear science and engineering.



PHOTO / DONNA COVENEY

Killian Court fills with graduates as MIT's 140th Commencement exercises get under way on Friday, June 9.

Above, Mika Tomczak, with her carrot top, gets her diploma from President Susan Hockfield at Commencement on Friday, June 9. Tomczak majored in mechanical engineering.



PHOTO / DONNA COVENEY

From the decoration on her mortarboard, it should come as no surprise that Laura Nichols received her S.B. in mechanical engineering.

miles

from Hawaii, their flight was so according to Shoch-Rodriguez's could not have missed the day. way through this," Fay said.

her parents, husband and two coral leis that were air-shipped

pecial lei, a necklace made of vines. "It is the lei of choice for

fashion choices Friday morn- r. Laura Nichols, a graduating l engineering, put her degree small wire sculptures that sat

on her cap, which made her wasn't only the Class of 2006 lman, a member of the 50th with a silver propeller on top cket.

Ferrara, who planned to take a on and go to a concert in the " she said.



PHOTO / L. BARRY HETHERINGTON

MIT Sloan School graduate Malia Schoch-Rodriguez poses with her parents, Fay and Robert Schoch, following Commencement on Friday, June 9.



PHOTO / L. BARRY HETHERINGTON

David Goldman (S.B. 1956, S.M. 1957) celebrates his 50th reunion with quirky headgear.

GRAD

Continued from Page 1

on Killian Court, exhorting them to "remember this day as a grand one."

"You are now part of MIT history. You have entered a lifelong contract that binds you to use your leadership skills and abilities. Strive for greatness! You set the bar high in entering MIT, and you are setting it higher by graduating from it," he said.

Kimberly Wu, president of the Class of 2006, praised the class for its commitment to public service, noting its record-setting level of participation in donating to the annual class gift, and praising their involvement in hurricane relief, Habitat for Humanity, local tutoring and health-care programs.

Wu presented President Susan Hockfield with the senior class gift, a check for \$31,000 to fund student life scholarships. She then led her peers in the "turning of the Brass Rat," a ritual in which the MIT class ring is reversed on the finger to denote alumni/ae status.

Making a difference

In her charge to the graduates, Hockfield emphasized the leadership roles MIT graduates could take. "At times in the years ahead when a choice of direction presents itself, I hope you will ask your-



You set the bar high in entering MIT, and you are setting it higher by graduating from it.

Sylvain Bruni

Graduate Student Council president

selves, "Where can I do the most good? How can I make the greatest difference in the world?"

Hockfield also asked the Class of 2006 to "inspire your own generation and the generations to come with a renewed sense of possibility and optimism for the future. Here at MIT, we see up close the myriad ways in which science and technology promise to benefit humankind. If we are to realize that promise, we need to kindle in others the same love and passion for truth and discovery, for creativity and problem-solving, that brought us all here."

Miriam Rosenblum, MIT Jewish chaplain, delivered the invocation. She opened by citing, in Hebrew and in English, the very values each of the subsequent speakers stressed — love of learning, service and acts of loving kindness — and urged the graduating class to "use learning as a force for good."

Hockfield presented the following degrees: bachelor of science; bachelor of science/master of science; bachelor of science/master of engineering; and advanced degrees in the School of Science, the Woods Hole Oceanographic Institution and the Whitaker College of Health Sciences and Technology.

Provost L. Rafael Reif awarded advanced degrees in the Schools of Architecture and Planning; Engineering; Humanities, Arts and Social Sciences; and in the MIT Sloan School of Management.

For the full text of Bernanke's Commencement address, visit web.mit.edu/newsoffice/2006/comm-bernanke.html.



David A. Berry

Principal, Flagship Ventures
Term: Five years (Recent Classes nominee)
Education: S.B. 2000 (MIT), Ph.D. 2005 (MIT), M.D. 2006 (Harvard)
Current MIT activities: BioMatrix Mentorship Program
MIT honors: Lemelson-MIT Student Prize (2005), William L. Stewart Jr. Award (2004)



Thomas P. Gerrity

Professor of management, Wharton School
Term: Five years (Corporation member since 2001)
Education: S.B. 1963 (MIT), S.M. 1964 (MIT), Ph.D. 1970 (MIT Sloan School)
Current MIT activities: Visiting committees for athletics, physical education and recreation (chair since 2002) and student life; Sloan Alumni Activity Building
MIT honors: Life Sustaining Fellow (1979)



Mark P. Gorenberg

Partner, Hummer Winblad Venture Partners
Term: Five years (Corporation member since 2001)
Education: S.B. 1976 (MIT), M.S. 1979 (University of Minnesota), M.S. 1984 (Stanford)
Current MIT activities: Visiting committees for linguistics and philosophy (chair since 2002) and aeronautics and astronautics
MIT honors: Marshall B. Dalton '15 Award (2005), Henry B. Kane '24 Award (2001)



James A. Lash

First selectman, Greenwich, Conn.
Term: Five years (Alumni Association nominee)
Education: S.B. 1966 (MIT), M.B.A. 1969 (Tulane)
Current MIT activities: Visiting committee for mathematics
MIT honors: Bronze Beaver Award (2003), Harold E. Lobdell '17 Distinguished Service Award (1999), Henry B. Kane '24 Award (1996), Life Sustaining Fellow (1979)



Paul F. Levy

President, CEO, Beth Israel Deaconess Medical Center
Term: Five years (Alumni Association nominee)
Education: S.B. 1974 (MIT)
Current MIT activities: Visiting committee for urban studies and planning

Corporation names new members

The MIT Corporation, the Institute's board of trustees, elected 10 term members at its quarterly meeting on Friday, June 9. Dana G. Mead, chair of the Corporation, announced the election results. All memberships are effective July 1. At that point, the Corporation will consist of

74 distinguished leaders in education, science, engineering and industry; of those, 22 are life members and eight are ex officio. An additional 29 individuals are life members emeritus, participating in meetings but without a vote. It was also announced at the meeting

that Martin Y. Tang has been named the 2006-2007 president of the Association of Alumni and Alumnae of MIT. As such, he becomes an ex officio member of the Corporation. Tang serves on the Corporation's visiting committees for undergraduate education, humanities and the

MIT Sloan School of Management. He earned a bachelor's degree from Cornell University before attending MIT's Sloan School, where he earned an M.S. in management in 1972. He will be the first internationally based Alumni Association president.



Scott P. Marks Jr.

Private investor
Term: Five years (Corporation member since 2001, Alumni Association nominee)
Education: S.B., M.S. 1969 (MIT)
Current MIT activities: Corporation Development Committee; Audit Committee; visiting committees for chemical engineering and mechanical engineering
MIT honors: Henry B. Kane '24 Award (2003), Harold E. Lobdell '17 Distinguished Service Award (2000), president of the Alumni Association, 2005-2006



Megan J. Smith

Director for new business development, Google
Term: Five years
Education: S.B. 1986 (MIT), S.M. 1988 (MIT)
Current MIT activities: Visiting committees for athletics, physical education and recreation, and Media Lab/media arts and sciences
MIT honors: Admiral DeFlores Design and Innovation Award, Carroll L. Wilson Award (1988), MIT Athletic Association Gold Award (1987)



Henri A. Termeer

Chair, president, CEO, Genzyme
Term: Five years
Education: Erasmus University, the Netherlands, M.B.A. 1973 (University of Virginia)
Current MIT activities: Board member, Whitehead Institute



Chiquita V. White

Section head of product development, Procter & Gamble
Term: Four years
Education: S.B. 1985 (MIT), M.S. 1987 (University of Pennsylvania)
Current MIT activities: Visiting committee for student life; vice president, Alumni Association board of directors; class agent, Class of 1985; member, Alpha Kappa Alpha sorority



Marjorie M.T. Yang

Chair, Esquel Group of Companies
Term: Five years (Corporation member since 2001)
Education: S.B. 1974 (MIT), M.B.A. 1976 (Harvard)
Current MIT activities: Visiting committees for architecture, mathematics, MIT Sloan School; member, dean's advisory council, MIT Sloan School; member, advisory board, MIT/China International Management Education Project

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

Necchi sewing machine w/ cabinet, needs some repair, \$85. Small wood desk, v. good condition, \$50. Birch sliding door cabinet, v. good condition, \$85. Nine drawer clothes chest, v. good condition, \$75. Four drawer file cabinet, like new, \$75. Antique mahogany 2 door cabinet w/ one drawer, \$105. Call 617-731-9142.

File cabinet, wood, three drawers, \$100. File cabinet w/ drawers & shelves, \$75. 2 antique arm chairs, \$150 each. Mahogany highboy, old, \$250. Mahogany bachelor's chest, new cond./

Cabot House, \$275, misc. Orientals: \$150 - \$1500. Best offers. Contact rgunder@mit.edu or 617-332-8251.

1/5 share in 1978 Piper Arrow III. Very recent Lycoming factory overhaul, Garmin 430 GPS, King KX-170B, Strikefinder, standby vacuum, 4-place intercom. Based Hanscom AFB. Checkout available. 978-897-4666.

VEHICLES

VW 2000 Passat GLX V6 wagon, 5 speed, loaded, 70K miles, green, \$9499. One owner, runs great. VW 1999 Beetle GLS turbo, blue, loaded, 5 speed, 31K. Like new, one owner. \$8499. Call Tom at x3-2104 or 781-728-1353.

HOUSING

Near Harvard Sq, charming, private, two-room

suite in my Victorian home, w/ private entrance. Fully furnished, mini-kitchen, enclosed patio, A/C, high-speed internet, phone, all utilities. \$1350/month or \$550/week, starting July 1st, no lease, no fee. Call 617-251-6207, 9am to 9pm only, or email rsimpson@mit.edu.

BillERICA: spacious Colonial. Approx. 20 min to Lincoln Lab. 3BR, 1.5BA, lg lot w/ fenced bkdy. Convenient to schools, shopping, town center. Hdwd flrs, new roof, new side deck, finished bsmt. Easy access to RT3, 128, 495. \$459,900. Call Chris at 978-663-0664.

VACATION

2BR/2BA AC Victorian, Orleans, MA. 1.5 miles to Nauset Beach, walk to bike path, town & E. village. Avail. weekly, June 3-July \$800/wk., July & Aug. \$1200/wk. Call 617-840-5599.

Martha's Vineyard. Indian Hill (West Tisbury) Secluded 3BR house. Access to beach. Deck,

outdoor shower. July and 1st week Aug., \$1500/week, 2 week min. No pets, no smoking. 617-945-6088, sbromber@mit.edu.

Martha's Vineyard, Oak Bluffs - 2 BR/1.5BA; wraparound deck, outdoor shower, barbecue, sunny open interior. Near lagoon, tennis & bike trails. Avail. September. Reasonable. Nina at ninad@mit.edu or view <http://home.comcast.net/~ndomenico/marthasvineyard/index.htm>.

Northeast Vermont: 2-3BR fully equipped cabins provide scenic views, ideal hiking, biking, fishing & hunting. 56 private acres, surrounded by 10,000+ acres of state wildlife area. 802-563-2033 or 781-893-5224.

MISCELLANEOUS

Looking for someone to develop a web site. Please contact Rachel Kelly for info. rgkelly@mit.edu or 617-460-5369.

Kathryn Willmore recalls 40 years at MIT

Kathryn Willmore, vice president and secretary of the Corporation, will retire at the end of June, after more than 40 years at MIT. Willmore has worked closely with every MIT president from Howard Johnson to Susan Hockfield and has been the public face of communications at the Institute for more than two decades.

Recently, Willmore reflected on her time at MIT with Patti Richards, senior communications officer in the MIT News Office. Excerpts are below. For the full text, visit web.mit.edu/newsoffice/2006/willmore-qa.html.

Q. *When you graduated from Mount Holyoke College, you came directly to MIT?*

A. Yes. And I've stayed here because the times and the issues have always been interesting, and the people have been the best. MIT is always changing; there is tremendous energy here and I learn something new every day; and I can't imagine having a better group of colleagues — staff, faculty and students — to work with. And there's the sense of being part of an institution that really makes a difference in the world. That's been extraordinarily fulfilling to me.

Q. *Is there a particular period of time that you remember fondly?*

A. In the late '60s and early '70s ... campuses everywhere were in turmoil because of the Vietnam War. At MIT, everyone — faculty, students, staff and alumni — was deeply concerned about the Institute's place in this. At the same time that you had demonstrations in the streets, you found many of the same people sitting down ... talking about their visions for MIT. So even though people were arguing and fighting with each other, it was because they were so passionate about this place. There was an extraordinary sense of community at that time.

Q. *What are some of the changes to the MIT culture that you've noticed in your time here?*

A. Well, the demographics are really different, for one thing. When I came to MIT maybe 3 percent of the students were women, and 2 percent of the faculty. And there were almost no women on the administrative staff. MIT today is a very different place. We're not where we should be in all respects, but we're a far cry from those days.

Also, at that time, there were even fewer people of color than there were women. We may be somewhat richer in terms of racial and cultural diversity, but this is one of the great challenges before us still.

In terms of our intellectual map, there have been pro-



PHOTO / RICK FRIEDMAN

Kathryn Willmore, vice president and secretary of the Corporation, will retire at the end of June after more than 40 years at MIT.

found changes. I don't think most of us could have imagined the implications of the early developments in molecular biology and computation, for example, on our research and teaching today. Or that 'arts' would be incorporated into the name of one of our schools. Or that the world would look to MIT as the leader in brain sciences as well as linguistics and economics. Or that we would be using the Internet to share our teaching materials for free with the world.

Q. *You helped found the feminist publication Sojourner while at MIT.*

A. In the early '70s there was a very strong women's community here, and Sojourner was an outgrowth of the Women's Forum ... After about a year, Sojourner expanded beyond MIT and became an important national forum on feminist issues.

Over those years, I increasingly found my center within the women's community. The trick was in trying to hold my center, as I became more involved in feminist and lesbian culture, even as I advanced in my career here. But I've been very lucky to have had the support of a wonderful group of colleagues all along. And as I've said on other occasions, I've found that the more open I am as a person

and as a lesbian, the easier it has been to hold the center in myself, to claim my place at MIT and to make a difference in MIT.

Q. *How has communications at MIT changed over the years?*

A. It's faster, it's richer, and a lot more complex. In the old days all the administrative announcements and news were conveyed in a gazillion gray interoffice envelopes mailed around the campus.

Tech Talk began as an eight-and-a-half-by-11 newsletter intended to do away with all the gray envelopes, and eventually evolved into a newspaper. Press releases were typed up and sent to newspapers via snail mail or, if we were in a hurry, by bicycle or cab.

Today, MIT news appears daily on the News Office web site and there are about one million (no kidding) web pages at MIT. E-mail is ubiquitous. The admissions office uses blogs to reach prospective students. We videocast and podcast all sorts of stuff. We send our course materials all over the world via OCW (OpenCourseWare). These days, there is not a single "MIT" voice, not that there ever was — it's just much easier for all those voices to be out there.

Q. *What are your hopes for MIT going forward?*

A. This country and this world are going to depend more and more on a deep understanding of science and technology and their implications. We have to make sure that we draw the best students to MIT — including students who may not be born thinking they're going to be chemists or bioengineers. Or who have the interest and the talent but may not have seen MIT as a place for them. In the same vein, we also need to bring and keep the best faculty. That's how we'll have our best impact on the world.

And I hope MIT will play an even greater role in helping the larger society to understand the importance of science, technology and related fields to our collective future. In the '60s and '70s and even the '80s, I don't think that there was such a strong sense that we needed to educate the world about these things. But it's really critical that we do, and that — as communicators — we continue to work with the faculty so that not only their accomplishments but also their passion for what they do comes through.

We'll always be a leader in defining new fields. I hope that in five or 10 years MIT will be synonymous with the most important discoveries and approaches in energy, bioengineering and related fields. And I hope we will be synonymous with discoveries and fields that we don't yet imagine.

NEWS YOU CAN USE

GoGreen Awards

MIT is one of several Cambridge institutions that were presented with GoGreen Business Awards by the City of Cambridge on Thursday, June 8.

MIT was honored in the recycling and waste reduction category. MIT has more than tripled its recycling rate since 2000, reaching 40 percent in 2005 and placing third in the country for the amount of paper recycled during the 10-week Recyclemania collegiate contest.

Salsa social

The First Annual MIT Salsa Social, hosted by the MIT Salsa Club, will be held Saturday, June 17. DJ D. Martinez will keep the place moving, while Camino Real will serve Colombian food for \$1 per plate. Free salsa lessons for beginner and intermediate dancers begin at 8 p.m.

The social runs from 8 p.m. to 1 a.m. at Walker Memorial, Morss Hall, and tickets cost \$5 at the door. For more information, visit web.mit.edu/salsaclub/www/social.shtml.

Invention exhibit

Eighteen Lemelson-MIT InvenTeams, composed of high school students, teachers and mentors, will showcase their invention prototypes at MIT's Kresge Auditorium on Thursday, June 15, from 10:30 a.m.-12:30 p.m.

See InvenTeams and their inventions at web.mit.edu/inventteams/currentinventteams.html.

Tech Talk schedule

This is the last issue of the 2005-2006 academic year. For news and updates throughout the summer, please visit the MIT News Office web site at web.mit.edu/newsoffice. For the 2006-2007 schedule, please visit web.mit.edu/newsoffice/tech-talk-pubsked.html.



PHOTO / DONNA COVENEY

Fair-weather work

In one of the year's final projects, Introduction to Civil and Environmental Engineering students measured wind speed and direction using their own creations. Working on the 'Best Buoy Ever' are Gwen Johnson, Crystal Law (hidden), Zheng Gong and Jonathan Benezry.

Simmons gift to enhance Vassar Street

Sarah H. Wright
News Office

A major new gift from the Richard P. Simmons family will enable MIT landscape architects and planners to realize their design for a bicycle-friendly, pedestrian-scale Vassar Streetscape west of Massachusetts Avenue, President Susan Hockfield announced to the MIT Corporation on Friday, June 9.

"We are grateful to the Simmons family for their important, generous and timely gift. Completing the Vassar Streetscape will do more than unify the MIT campus architecturally; it will also enhance the quality of student life by encouraging members of the Institute community to walk or bike beneath the new trees on Vassar Street," said Hockfield.

Vassar Street East, connecting Main Street to Massachusetts Avenue, now features a cycle track, new light fixtures and new young trees.

Vassar Street West, running from Massachusetts Avenue to Audrey Street, will offer a cycle track, new light fixtures, new Lace Bark Elm trees, chosen for their "canopy" effect once grown, and a crosswalk, complete with a speed table, in front of Simmons Hall. The West Garage and Annex will be maintained for parking. Construction of the new streetscape will take about two years.

Richard P. Simmons (S.B. 1953) and his family have previously provided major gifts in support of student life and learning initiatives at the Institute. In recognition of their generosity, MIT named the student residence on Vassar Street, built in 2002, in honor of Simmons' late wife and philanthropy partner, Dorothy Simmons.

Beetle spawns new material

Anne Trafton
News Office

The Namib Desert, one of the driest regions in the world, gets less than half an inch of rain per year. But early in the morning, a light fog drifts over the desert, offering the plants and animals living in that harsh environment their only chance for a life-sustaining drink.

When that fog rolls in, the Namib Desert beetle is ready with a moisture-collection system exquisitely adapted to its desert habitat. Inspired by this dime-sized beetle, MIT researchers have produced a new material that can capture and control tiny amounts of water.

The material combines a superhydrophobic (water-repelling) surface with superhydrophilic (water-attracting) bumps that trap water droplets and control water flow. The work was published in the online version of *Nano Letters* on Tuesday, May 2.

Potential applications for the new material include harvesting water, making a lab on a chip (for diagnostics and DNA screening) and creating microfluidic devices and cooling devices, according to lead researchers Robert Cohen, the St. Laurent Professor of Chemical Engineering, and Michael Rubner, the TDK Professor of Polymer Materials Science and Engineering.

The U.S. military has also expressed interest in using the material as a self-decontaminating surface that could channel and collect harmful substances.

The researchers got their inspiration after reading a 2001 article in *Nature* describing the Namib Desert beetle's moisture-collection strategy. Scientists had already learned to copy the water-repellent lotus leaf, and the desert beetle shell seemed like another good candidate for "bio-mimicry."

"If you sat at your desk and tried to just think of ways to do things, it would take a very long time," Cohen said. "Once you see these things in action, it's obvious what you have to do."

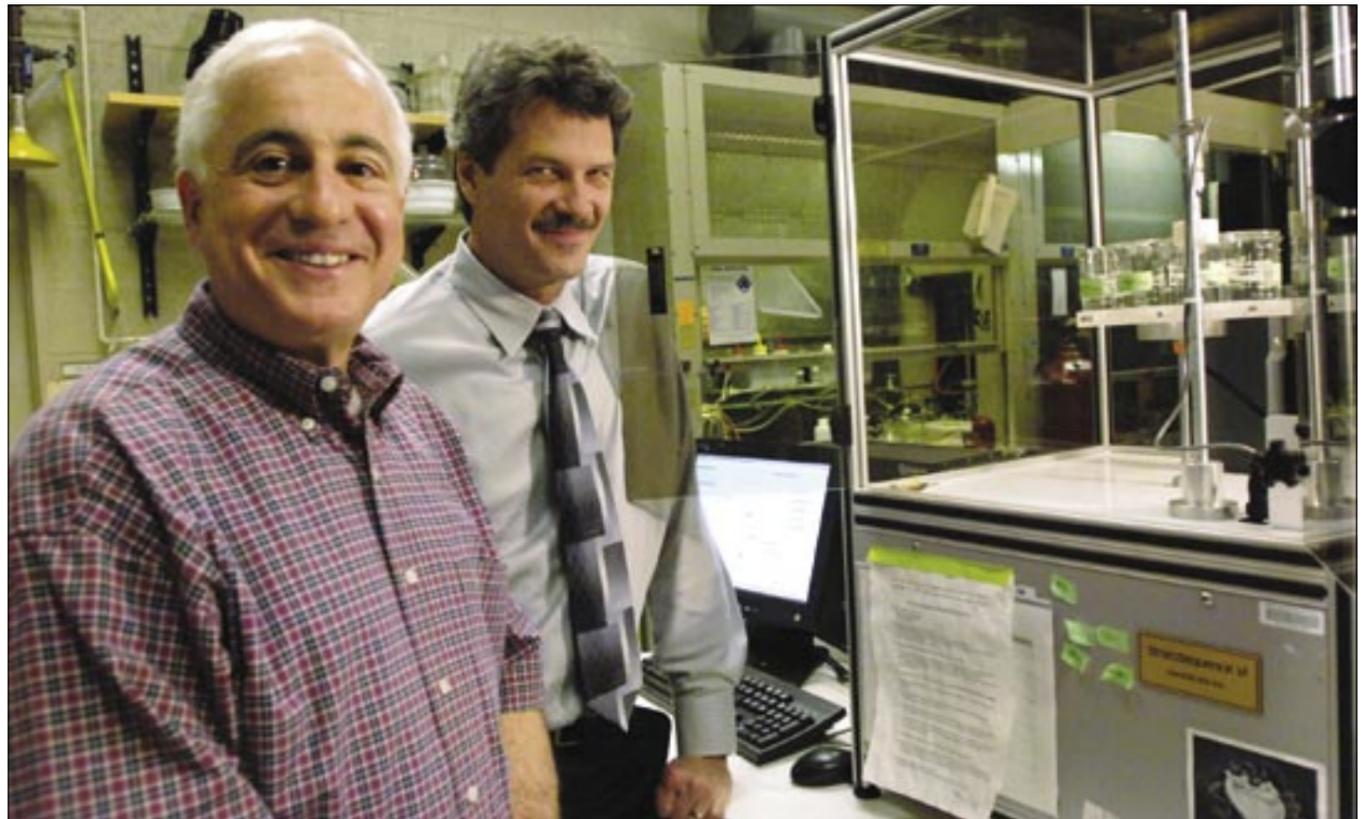


PHOTO / DONNA COVENEY

Professors Robert Cohen and Michael Rubner pose in Rubner's lab with equipment they use to try to mimic the watermaking abilities of the Namib Desert beetle, below.



PHOTO COURTESY/ ANDREW PARKER

The desert beetle has evolved to take perfect advantage of the tiny amount of water available in the desert. The fog that drifts over the Namib Desert is so light

that normal condensation can't take place, so "you need something specially designed to hold and collect that condensation," Rubner said.

When fog blows horizontally across the surface of the beetle's back, tiny water droplets, 15 to 20 microns, or millionths of a meter, in diameter, start to accumulate on top of bumps on its back.

The bumps, which attract water, are surrounded by waxy water-repelling channels. "That allows small amounts of moisture in the air to start to collect on the tops of the hydrophilic bumps, and it grows into bigger and bigger droplets," Rubner said. "When it gets large, it overcomes the pinning force that holds it and rolls down into the beetle's mouth for a fresh drink of water."

To create a material with the same abilities, the researchers manipulated two characteristics — roughness and nanoporosity (spongelike capability on a nanometer, or billionths of a meter, scale).

By repeatedly dipping glass or plastic substrates into solutions of charged polymer chains dissolved in water, the

researchers can control the surface texture of the material. Each time the substrate is dipped into solution, another layer of charged polymer coats the surface, adding texture and making the material more porous. Silica nanoparticles are then added to create an even rougher texture that helps trap water droplets.

The material is then coated with a Teflon-like substance, making it superhydrophobic. Once that water-repellent layer is laid down, layers of charged polymers and nanoparticles can be added in certain areas, using a properly formulated water/alcohol solvent mixture, thereby creating a superhydrophilic pattern. The researchers can manipulate the technique to create any kind of pattern they want.

"I think this is the factory of the future, or the chemical plant of the future," Cohen said. "I think there could be a lot of (applications) we haven't even thought of yet that might come out of this."

The research is funded by the Defense Advanced Research Projects Agency and the National Science Foundation.

Student summit set on vehicle design

Deborah Halber
News Office Correspondent

Seventy-three students from 21 universities around the world will gather at MIT this summer to design and build between five and 10 commuter vehicles that exploit human power, biofuels, solar technologies and fuel cells to travel at least 500 miles per gallon of fuel.

By the end of the MIT Vehicle Design Summit, the cars created by the students, who have previously designed solar racecars for the World Solar Challenge (WSC) and super-mileage vehicles for the European Shell Eco-Marathon, will tour the country to bring attention to the social and technological issues surrounding alternative-powered vehicles.

An added goal for the June 13-Aug. 13 program is to lay a foundation for ongoing multidisciplinary transportation research involving all five MIT schools. "We hope to create a project-based, socially conscious engineering curriculum for the '06-'07 academic year," said Anna S. Jaffe, a junior in civil and environmental engineering and one of the summit student organizers.

Green transportation

The summit also could set the stage for an international consortium focused on green transportation for India, China and other countries with rapidly expanding transportation infrastructures.

The students will work with industry and academia speakers and mentors to create the vehicles. Through a partnership with the MIT Media Lab's Fab Lab, additional cars will be designed to be built at Fab Labs in Norway, Costa Rica, India, Ghana and South Africa.

The Fab Lab program, part of MIT's Center for Bits and Atoms, explores how information relates to physical representation. The Fab Lab's partner organizations around the world are geared toward allowing ordinary people to design machines to improve the quality of their lives.

For decades, universities and corporations have fielded



IMAGE / MITCHELL JOACHIM

This sketch of a concept solar car was created for the MIT Vehicle Design Summit, a gathering of students who will work on alternative transportation ideas this summer.

teams to compete in the WSC, a solar-powered car race spanning 3,021 kilometers through central Australia from Darwin to Adelaide.

The competition's organizers hoped it would spawn solar vehicles that might one day be mass produced, but the cars, optimized to race across the outback, have been too specialized for commuter use. Encouraged by WSC organizers to design a new rule set, the MIT Solar Electric Vehicle Team decided to bring together participants for the intensive nine-week design summit aimed at in-depth exploration of alternative transportation technologies.

"We hope to have an impact on not only the field of solar racing but the energy debate as well," said co-organizer Robyn Allen, a senior in the Department of Aeronautics and Astronautics. "Exploring both the socio political and technical aspects of this work, we are excited to provide a space for students to lend a new voice to the global energy discussion."

Forum participant and MIT alumnus Tom Magliozzi, of the NPR radio show "Car Talk," said he believes automotive innovation won't come from Detroit. "If it's going to happen, it's going to happen here," he said.

The participants will publish a technical manual at the conclusion of the summit and distribute their findings in the public domain.

Joannopoulos to lead ISN

Elizabeth Thomson
News Office

John Joannopoulos, the Francis Wright Davis Professor of Physics, has been appointed director of the Institute for Soldier Nanotechnologies (ISN) effective Saturday, July 1.

"Professor Joannopoulos is an exceptional researcher of international standing whose leadership in condensed matter physics will be a tremendous asset to ISN," said Alice P. Gast, vice president for research and associate provost, who announced the appointment.

"Joannopoulos has an exciting vision for enhancing ISN visibility and integration with the MIT campus and for promoting long-term visionary research," she said.

Gast also thanked the search committee members, Timothy Swager, Mary Boyce and Michael Rubner, for their effective work in the selection process.

Commenting on his new position, Joannopoulos said, "I am truly honored to be taking on the leadership of a major laboratory whose focus is on developing cutting-edge science and technology to enhance the survivability of our men and women in the service."

Joannopoulos succeeds the ISN's founding director, Professor Edwin L. Thomas, who has assumed the position of head of the Department of Materials Science and Engineering.

In her announcement, Gast recognized Thomas' "outstanding leadership and vision" for ISN. "We are extremely grateful to Ned for his tireless service bringing ISN to MIT and helping it to thrive here."

The ISN, a \$50 million research collaboration between the U.S. Army and MIT, aims to enhance the protection and survival of soldiers using nanotechnology.



Joannopoulos