



Volume 49 – Number 30  
Wednesday – June 8, 2005

## Provost Brown named president of BU

Denise Brehm  
News Office

Boston University's trustees named MIT Provost Robert A. Brown as that university's ninth president Saturday, June 4, following a long search. Brown will take the helm at BU on Sept. 1.

"This excellent news is the culmination of an intensive, nearly yearlong national search that included direct input from hundreds of faculty members, staff, students, alumni and others within the BU community," said Alan M. Leventhal, chairman of the BU Board of Trustees, in an e-mail sent to BU alumni June 4. "I am proud of the tireless devotion of the search com-

mittee... They have found a world-class scholar and innovative leader in Bob Brown."

A professor of chemical engineering who was appointed MIT's provost by former President Charles M. Vest in October 1998, Brown is widely respected, liked and admired by his colleagues at MIT.

"I will simply say that he is the best academic administrator I've ever worked with," said Vest. "He played the key academic management role at MIT during a very complex and important time. His ability to keep budgetary and administrative work



Robert Brown

focused on the most important academic objectives has served MIT well. His open, personal approach to problem-solving and consensus-building is remarkably successful. He has been a great friend and colleague, and I know that he will flourish as BU's new president and will move them to the next level. BU is fortunate indeed."

Brown, who also holds the Warren K. Lewis Professorship in chemical engineering, has spent his career thus far at MIT, joining the faculty in 1979 as an assistant professor and rising through the ranks to department head,

dean of engineering and provost. Although his move will take him just across the Charles River, he said it won't be easy to leave the Institute.

"I am incredibly excited about the wonderful opportunity to lead Boston University, but this excitement is not without some sadness brought on by the terribly difficult act of actually leaving MIT," said Brown. "MIT is a special place because of the quality of its faculty, students and staff, who are all dedicated to a common mission of excellence in everything they do. It has been an indescribable honor to serve this community as provost, dean and

See **BROWN**  
Page 3

## MIT takes on world's energy crisis

Denise Brehm  
News Office

MIT President Susan Hockfield and Provost Robert A. Brown announced today the establishment of an Energy Research Council to spearhead efforts to address the world's mounting energy problems.

The council will develop an outline for an Institute-wide response to the global energy crisis by Feb. 1.

The council will be co-chaired by Chevron Professor Robert C. Armstrong, head of the Department of Chemical Engineering, and Professor Ernest J. Moniz of physics and engineering systems and director of energy studies at the Laboratory for Energy and the Environment. Moniz was undersecretary for the U.S. Department of Energy from 1997 to 2001 during the Clinton administration.

"This is arguably the pre-eminent opportunity in the 21st century for bringing science and engineering to bear on human needs," said Moniz. "Fossil fuels make up 85 percent of the world's present energy use, and developing economies will greatly increase their use of fossil fuels to meet their economic and social goals. This need for more energy, coupled with the cumulative effects of carbon dioxide emissions from fossil fuel combustion, have the world running headlong toward climate change. By midcentury, we will have a very real problem and we cannot wait until then to find the technological answers."

Hockfield first announced a new energy initiative in her inaugural address May 6, saying that the Institute had a responsibility to address the world's energy problems. "Over the last 30 years, the words 'sustainable energy' have gotten a little tired—not from overuse but from lack of progress. I believe that the country and the world

See **ENERGY**  
Page 10



PHOTO / L. BARRY HETHERINGTON

Christopher Tsai is congratulated by a friend after receiving his bachelor of science degree in electrical engineering and computer science at MIT's Commencement on Friday, June 3.

## Thousands graduate in sun-soaked ceremony

Sarah H. Wright  
News Office

Sunny skies and warm breezes welcomed 2,308 men and women receiving 1,107 undergraduate and 1,464 graduate degrees at the 139th MIT Commencement exercises, held Friday, June 3, in Killian Court.

MIT's Hindu chaplain, Swami Tyagananda, offered an invocation in Sanskrit

and in English that reflected the large international crowd's spirit of unity and goodwill.

"May we come together for a common purpose. Common be our prayer, common our goal.

"May the one and the same Divine Reality ... lead us. May we be granted clear understanding and the courage to pursue the goals of social justice, nonviolence, harmony and peace," he said.

It was "a great day to graduate," said

Commencement speaker Irwin Jacobs, the co-founder and CEO of Qualcomm, a leader in digital wireless technology. An MIT education is "about the best possible way to prepare yourselves for this very exciting future," he said.

Offering examples from his own life, Jacobs (S.M. 1957, Sc.D. 1959) encouraged the Class of 2005 to prepare for

See **CEREMONY**  
Page 4

### NEWS

#### ROLE REVERSAL

Robert Redwine plans to step down as dean of undergraduate education.

Page 3

#### EPA HONOR

An MIT student design project wins a sustainability award from the U.S. Environmental Protection Agency.

Page 10

### RESEARCH

#### AIDS CLINICS

An MIT architecture professor designs care centers for African children with HIV/AIDS.

Page 11

#### STEM CELL ADVANCE

Researchers find a mechanism that may make it possible to exploit the therapeutic potential of adult stem cells.

Page 12

### PEOPLE

#### READY FOR OFFICE

The MIT Corporation elects one life member and nine term members, to take office July 1.

Page 8

#### 'BROTHER'S KEEPER'

A popular book and other media coverage focus attention on Stephen Heywood's battle with Lou Gehrig's disease.

Page 10

# Wogan wins \$250,000 Mott prize

Elizabeth Thomson  
News Office

Gerald N. Wogan, the Underwood-PreScott Professor of Toxicology emeritus and professor of chemistry emeritus, has been awarded the 2005 Charles S. Mott Prize, one of three awards given annually by the General Motors Cancer Research Foundation. The \$250,000 prize recognizes the most outstanding recent contribution to the cause or prevention of cancer.

Wogan was cited for his studies related to aflatoxin, a common food contaminant, which is produced by certain fungi of the *Aspergillus* genus. It is now widely accepted that aflatoxin in association with hepatitis viruses causes liver cancer in humans.

Liver cancer kills 500,000 people a year and is one of the five leading causes of cancer deaths worldwide. It is especially common in third-world countries, particularly in Asia and Africa, where aflatoxin contamination of food supplies, such as corn and peanuts, persists.

Wogan has had a distinguished career in the study of the toxicology and chemistry of aflatoxins. In the 1960s, his research group successfully purified aflatoxin B1, B2 and G and determined their structure-activity relationship and relevant toxicities. He hypothesized that the high incidence of liver cancer in the developing world could be the result of exposure to aflatoxins.

Wogan's work on aflatoxin and liver cancer is widely cited as a paradigm for



Gerald N. Wogan

molecular toxicology and epidemiology. Collectively, his studies have had a direct impact on world public health. Food contamination in certain parts of Asia and Africa is especially difficult to control, and Wogan has been keenly interested in developing methods of risk identification and remediation.

Wogan received his bachelor of science degree in biology from Juniata College in Huntingdon, Pa., in 1951. He later earned his master of science and Ph.D. degree in physiology from the University of Illinois at Urbana-Champaign. In 1961 he accepted a position at the Massachusetts Institute of Technology, and he has been here ever since.

## Dibner names fellows

The Dibner Institute for the History of Science and Technology has announced the appointment of eight senior, six postdoctoral, one science writer and seven graduate student fellows for 2005-06.

Senior fellows and their research topics are:

**Bruno Belhoste**, professeur d'histoire contemporaine, University Paris X-Nanterre, will study the effects of labs, institutions, schools and major local scientific figures on the scientific activity in Paris at the end of the 18th and beginning of the 19th centuries.

**Karine Chemla**, directrice de recherche at the French National Center for Scientific Research, will work on a book in English examining Chinese mathematics of 2,000 years ago.

**David Friedman**, professor in the history, theory and criticism section of MIT's Department of Architecture, plans a book on the early methods of geometric survey, the development of maps of urban design, and the accuracy of the instruments used.

**Ben Marsden**, lecturer in cultural history, University of Aberdeen, Scotland, will work on "W. J. Macquorn Rankine and the Making of Engineering Science."

**Giovanni Paoloni**, professor of studies on cultural heritage at University La Tuscia in Viterbo, Italy, will work on "Vito Volterra and his American Correspondents."

**Carl Posy**, a philosophy professor at Hebrew University, will work on "Kantian Mathematical Themes: A Pair of Chapters in 18th and 19th Century Mathematics."

**Glen Van Brummelen**, a mathematics professor at Bennington College, plans to write a scientific history of trigonometry from Hipparchus to Fourier.

**David Wilson**, a history professor at Iowa State University, will conduct research for a biography of William Whewell.

Postdoctoral fellows and their research topics are:

**Sandro Caparrini**, mathematics professor at the University of Turin, will write about the direct influence of mechanics and geometry on the development of vector calculus.

**Matthew Harpster** is finishing his dissertation at Texas A&M University; he plans to examine five ancient shipwrecks and trace the development of design methods as recorded in two 15th century Italian treatises.

**Jeremiah James** is completing his Ph.D. at Harvard University. He will work on his dissertation on Linus Pauling and begin work on the history of X-ray crystallography.

**Martin Niss**, who will receive his Ph.D. this spring in the history of physics from the University of Roskilde, Denmark. The title of his proposed project is "Mathematics as a Constraint and the Impact of New Techniques on Modeling Practices in Solid State Physics."

There are two second year postdoctoral fellows. **Claire Calcagno** received her Ph.D. in archaeology from Oxford University and was recently a Visiting Scholar in MIT's Program in Science, Technology and Society. Her research focuses on Harold Edgerton's contributions to maritime archaeology. **Takashi Nishiyama** received his Ph.D. from The Ohio State University in 2004. He is exploring the technology transfer from aeronautics to the high-speed bullet train in post-World War II Japan.

The science writer fellow is **Deborah Cramer**, who is working on "Cholera: The New Face of an Old Disease."

The graduate student fellows are: **Alexander Brown**, a student in MIT's Program in Science, Technology and Society; **Dimitri Constant**, a Ph.D. candidate at Boston University; **Jean François Gauvin**, a doctoral candidate at Harvard University; **Peter Shulman**, a student in MIT's Program in Science, Technology and Society; **Jenny Leigh Smith**, a student in MIT's Program in Science, Technology and Society; **Ely Truitt**, a doctoral candidate at Harvard University; and **Anya Zilberstein**, a student in MIT's Program in Science, Technology and Society.

For more information, visit [dibinst.mit.edu](http://dibinst.mit.edu).



PHOTO / TALITHA FABRICIUS

### High hopes

An oak tree is lifted into a lofty position atop the Stata Center for spring planting on the sixth-floor terrace.

## MIT celebrates Cambridge First Day

The Cambridge Food Pantry Network's contributions to the health and dignity of the residents of the City of Cambridge were celebrated at the 13th annual Cambridge First Day at MIT, held yesterday in the Stratton Student Center.

The MIT Office of Government and Community Relations and the City of Cambridge Department of Human Service Programs jointly hosted the event.

National Hunger Awareness Day is a day set aside to encourage individuals to work together to fight hunger in their communities.

Chairman of the MIT Corporation Dana G. Mead presented a check for \$6,500 from MIT to the Cambridge Economic Opportunity Committee, which oversees the Cambridge Food Pantry Network, to be

distributed among the 13 honorees.

Network members are: Cambridge Economic Opportunity Committee Inc. Food Pantry; Cambridge Senior Center Food Pantry; CommonCare, a ministry of Saint Peter's Episcopal Church; East End House Inc.; Food for Free Committee Inc.; Haitian American Cultural Center Food Pantry; The Harvest Food Pantry at Cambridgeport Baptist Church; Helping Hand Food Pantry at St. James Episcopal Church; Margaret Fuller Neighborhood House Food Pantry; Massachusetts Avenue Baptist Church Food Pantry (Elderly, Parents, Infant and Children program); St. Paul African Methodist Episcopal Church Food Pantry; Western Avenue Baptist Church Food Pantry; and Zinberg Clinic Food Pantry of Cambridge.

## Construction update

The summer brings with it a wave of campus construction projects, including the start of work for the Physics, Department of Materials Science and Engineering, Spectroscopy Lab Infrastructure (PDSI). In addition, the first floor men's restroom at the intersection of Buildings 6 and 8 will be renovated into a women's restroom. For details on these and other projects, visit [web.mit.edu/facilities/construction/updates.shtml](http://web.mit.edu/facilities/construction/updates.shtml).

## Tech Talk schedule for 2005-06

This is the last Tech Talk issue of the 2004-05 academic year. For news and updates throughout the summer, please visit the MIT News Office web site at [web.mit.edu/newsoffice](http://web.mit.edu/newsoffice). The paper's production schedule for 2005-06 follows.

Please note: Institute holidays and events are listed in italics. Tech Talk is generally not published during holiday weeks.

- Sept. 14
- Sept. 21
- Sept. 28
- Oct. 5
- Oct. 10: *Columbus Day*
- Oct. 19
- Oct. 26
- Nov. 2
- Nov. 9
- Nov. 11: *Veterans Day*
- Nov. 16
- Nov. 24: *Thanksgiving Day*
- Nov. 30
- Dec. 7
- Dec. 14
- Dec. 21
- Dec. 23: *Winter vacation begins*
- Jan. 16: *Martin Luther King Jr. Day*
- Jan. 9-Feb. 3: *Independent Activities Period*
- Jan. 25
- Feb. 1
- Feb. 8
- Feb. 15
- Feb. 20: *Presidents Day*
- March 1
- March 8
- March 15
- March 22
- March 27-31: *Spring Break*
- April 5
- April 12
- April 17: *Patriots Day*
- April 26
- May 3
- May 10
- May 17
- May 24
- May 29: *Memorial Day*
- June 7
- June 9: *Commencement*
- June 14

### HOW TO REACH US

#### News Office

Telephone: 617-253-2700  
E-mail: [newsoffice@mit.edu](mailto:newsoffice@mit.edu)  
<http://web.mit.edu/newsoffice>

#### Office of the Arts

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



Printed on recycled paper

#### News Office Staff

Director ..... Arthur Jones  
Senior Communications Officer/  
Science Writer ..... Denise Brehm  
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

#### Publisher

Arthur Jones

#### Editor

Kathryn O'Neill

#### Photojournalist

Donna Coveney

#### Production

Roger Donaghy

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](mailto:mailsvc@mit.edu).

TechTalk 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, non-refundable. 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.

# Robert Redwine stepping down as dean

After five years as dean of undergraduate education, Professor Robert Redwine of physics has chosen to step down at the end of the fall term to devote himself to teaching and research.

"For the last five years, Bob Redwine has brought to his work as dean for undergraduate education the same leadership and commitment to excellence that had previously marked his research and teaching in the Department of Physics," President Susan Hockfield said. "He played a critical role, creating a new office and steering its course. His wisdom and tireless efforts over this time have built a strong educational enterprise that benefits all MIT undergraduates."

As dean of undergraduate education, Redwine was responsible for a host of functions in his 230-person operation—admissions, financial aid, academic services, the Office of Minority Education, the Careers Office, the Edgerton Center, the Teaching and Learning Laboratory and the registrar, among others. Redwine also led the student exchange component of The Cambridge-MIT Institute.

"I was honored and delighted to have the opportunity to play an important role in supporting the education of our remark-

able students as well as in shaping MIT's undergraduate education for years to come," said Redwine, who was appointed to the post in 2000. "It was clear to me that this was a critical transition period for MIT, with the increasing diversity of our students' backgrounds and interests."

Chancellor Phillip Clay said, "In addition to stewarding critical academic services, Bob has also played a leadership role managing initiatives to implement of the report of the Task Force on Student Life and Learning. Throughout his tenure, he has been a vigorous advocate for minority students and for advancing teaching as a part of professional development for junior faculty."

Hockfield added, "In important ways, he laid the groundwork that has permitted our faculty to undertake a comprehensive review of the educational experience. I know he joins me in looking forward eagerly to the report of the Task Force on the Undergraduate Educational Commons, and to the educational initiatives it will spark."



Robert Redwine

Born in Raleigh, N.C., Redwine received his bachelor's degree in physics from Cornell University in 1969 and the Ph.D. in physics from Northwestern University in 1973. He joined the MIT faculty in 1979 as an assistant professor of physics.

He has served on many national and international physics advisory committees, is a fellow of the American Physical Society and the American Association for the Advancement of Science. He was the director of the Laboratory for Nuclear Science from 1992 to 2000. He is married to Professor Jacqueline N. Hewitt of the Department of Physics; they live in Winchester with their two sons.

Although Redwine is looking forward to returning to full-time faculty, it is bittersweet. "I know I will miss the interactions with so many dedicated members of our community who care deeply about education," he said.

"One of the most gratifying aspects of the last five years has been the chance to work with student leaders who are

involved in MIT in such productive ways," Redwine said. "I also have had the chance to work closely with a number of administrative and support staff members who are frankly the unsung heroes in making MIT the amazing place it is. Most faculty do not have the opportunity to appreciate the range of contributions our staff make to MIT, and I consider myself very lucky to have been able to work with so many staff members."

As he moves on within the Institute, Redwine said he is confident about the state of MIT. "We continue to attract the best students in the world with strong interests in science, engineering, and technology, and these students want to leave MIT with a superb technical education as well as the perspectives and skills to change the world in important ways," he said.

"With the work of the Task Force on the Undergraduate Educational Commons and related efforts in Schools and Departments, we are well on our way to redefining an MIT education for the future," Redwine said. "This continues to be a truly exciting time for education at MIT."

Clay will appoint a committee soon to select a successor for Redwine.

## BROWN

Continued from Page 1

department head."

"The faculty, staff and students of Boston University cannot yet know how fortunate they are to have Bob as their new president, but they soon will come to recognize in him all the qualities that have made him such a great leader at MIT," said MIT President Susan Hockfield. "His ability to grasp and convey the essence of complex issues is extraordinary, as is his ability to bring people together to forge new endeavors, whether academic or organizational. I will miss his steady hand here, but look forward to working with him as a presidential colleague."

As provost, Brown plays a major role in managing the Institute's \$2.1 billion budget. In a recent interview with the Boston Globe's business section, Brown said: "The challenges of planning, executing and structuring your assets are every way the same as a for-profit entity. I think in some metrics, they're actually more difficult."

Brown has served as provost during an unusual seven-year period for the Institute, when an economic downturn caused the endowment to drop right in the midst of a major campus building campaign. About 90 staff were laid off, 140 positions eliminated, and a yearlong salary freeze was put into place for FY 2005. Thanks to these measures, today the Institute is on sound financial footing and work continues on improving the campus infrastructure.

During his tenure as provost, the Eli and Edythe L. Broad Institute, a partnership among MIT, Harvard and its affiliated hospitals and the Whitehead Institute for Biomedical Research, was established with the mission to create tools for genomic medicine and to pioneer their application to the treatment of disease. Brown also oversaw the Cambridge-MIT Institute, the Dupont-MIT Alliance for biotechnology research, the Singapore-MIT Alliance and many other successful collaborations with industry and universities worldwide.

Recognition for some of the success of the Institute-wide initiative to recruit and retain superb women faculty also goes to Brown, who has been co-chair with Professor of Biology Nancy Hopkins of the Council on Faculty Diversity. Hopkins credits Brown's engineering perspective and creativity as keys to the success of the initiative, saying that by looking at the methodology of institutional processes such as faculty leaves, career development and the faculty search process, Brown was able to identify where problems occurred and introduce solutions. Since 1990, MIT has increased the number of women faculty members from 10 percent to 18 percent.

"I am just in awe of this guy," said Hopkins. "I learned to love and respect engineers by working with Bob Brown. I hadn't really understood how much creativity and also courage is involved in being a great administrator. When he speaks, everyone



PHOTO / DONNA COVENY

Provost Robert A. Brown, left, enjoys a surprise party held Monday, June 6, to congratulate him on his appointment to the presidency of Boston University. He is chatting with Lawrence S. Bacow, the former chancellor of MIT who now serves as president of Tufts University.

## Provost joins presidential line

Provost Robert Brown is not the only person recently chosen from MIT's ranks to become president of another university.

Robert Birgeneau, who served as dean of science at MIT, became president of the University of Toronto in July 2000. He went on to become chancellor of the University of California at Berkeley in July 2004.

Chancellor Lawrence Bacow left MIT to become president of Tufts University

stops and listens to him."

Chevron Professor Robert Armstrong, head of the Department of Chemical Engineering, recalls a bit about hiring Brown as an assistant professor in 1979.

"He interviewed in March as I recall, right after a spring snowstorm," said Armstrong. "Back then the nearest hotel was the Hyatt, so we put him up there for his visit. To get to the department he had to walk down the sidewalk along Memorial Drive. Of course, with the big snowbanks and melting, the sidewalk was more like a water trough than a sidewalk. Bob said he thought this was a test to see if he could walk on water in order to get a job at MIT. The rest is history."

In a letter to chemical engineering fac-

ulty and staff, Armstrong said Brown "has had a profound impact on almost every aspect of the department and Institute. He set exceptionally high standards for teaching and research, as is evident from the numerous teaching awards he won, as well as from the external awards for research that he won: the Colburn Award, the Professional Progress Award and election to both the National Academy of Engineering and the National Academy of Sciences, to name a few. As executive officer and then department head, Bob played a leading role in bringing many of our current faculty to MIT and in ratcheting up the already high standards of the department.

"Bob is a gifted leader," said Alice Gast, vice president for research and associate

provost at MIT. "His legacy includes greatly enhancing the research environment at MIT, including the building of the Stata Center and the launch of the Broad Institute and the Computational and Systems Biology Initiative," Gast said.

"He is also a great family man and very mindful of the need to balance work and family life," she said.

Brown and his wife, Beverly, live in Winchester. Their oldest son works in lighting and sound design in Miami. Their younger son will be a senior in physics at MIT next year.

"Bob will make a wonderful president of Boston University," MIT Chancellor Phillip Clay said. "Besides being experienced and very smart, he has a ready ear and a commitment to process that will benefit the university greatly. He cares deeply about quality and rigor, and he cares about fairness and quality of life. He is a wonderful community builder."

Choosing the new provost is the responsibility of President Susan Hockfield, who has invited the MIT community to send her ideas regarding the provost position and possible candidates, as well as thoughts on the key issues that the next provost will need to address. Letters may be sent to her confidentially either at the Office of the President, Room 3-208, or via e-mail to provostsearch@mit.edu.

# Institute runs in families

Sasha Brown  
News Office

Commencement 2005 was particularly poignant for 20-year MIT Professor John Guttag of electrical engineering and computer science: Guttag's son David graduated with a degree in economics at the June 3 ceremony.

"This will be a special one," Professor Guttag said before graduation. He added that watching his son's four-year journey at MIT had opened his eyes to another side of the Institute. "It gave me extra insight into life as a student."

The Guttag family was in good company. Many of the guests who attended the sun-soaked 139th Commencement last week have deep roots at MIT.

Alvin Lin of Vienna, Va., a graduate in electrical engineering and computer science, became the third in his family to process through Killian Court. Older sisters Vicki (S.B. 2001) and Sandi (S.M. 2003) both attended MIT.

"We have always been interested in science and math," said Alvin. "I guess I was drawn to MIT because even if you change your mind about what to study, you are still in the best place."

When he entered MIT four years ago, he said he felt he had a head start thanks to his sisters. "I knew the area and some people," he said.

Janet Lieberman of New Jersey, an MIT sophomore, said she decided to attend MIT based on her older sister Sarah's experience. Sarah received her degree Friday in mathematics and computer science.

"I really liked the culture here," said Janet, who was sitting with her aunt Kathleen Joint.

"There is a lot of ceremony in the MIT graduation," said Joint, whose sister-in-law and brother-in-law also graduated from MIT. "It is a very nice celebration."

For others in the crowd, Friday's Commencement was a first. Corinne Connally of Austin, Texas, came with her mother, mother-in-law and daughter to watch her husband earn a master's in both management and mechanical engineering.

"It has been a nice day," said Connally. The Connally family planned to return to Texas this week. "I have really enjoyed Boston," she said.

After four years spent close to his family, David Guttag will move to Manhattan next month to start a job with Merrill Lynch. Though they were thrilled with his success, his family is sad to see him leave.

"We saw more of David than he or we expected," said his father. The proximity was especially nice for David's two younger brothers who were able to spend time with their older sibling—"I was able to go to their baseball games," said David. Last Friday, both of his younger brothers sat on Killian Court cheering for David.

David is the first brass rat in the family, but his father hopes he will not be the last. "Maybe one of my other children will go," he said, smiling.

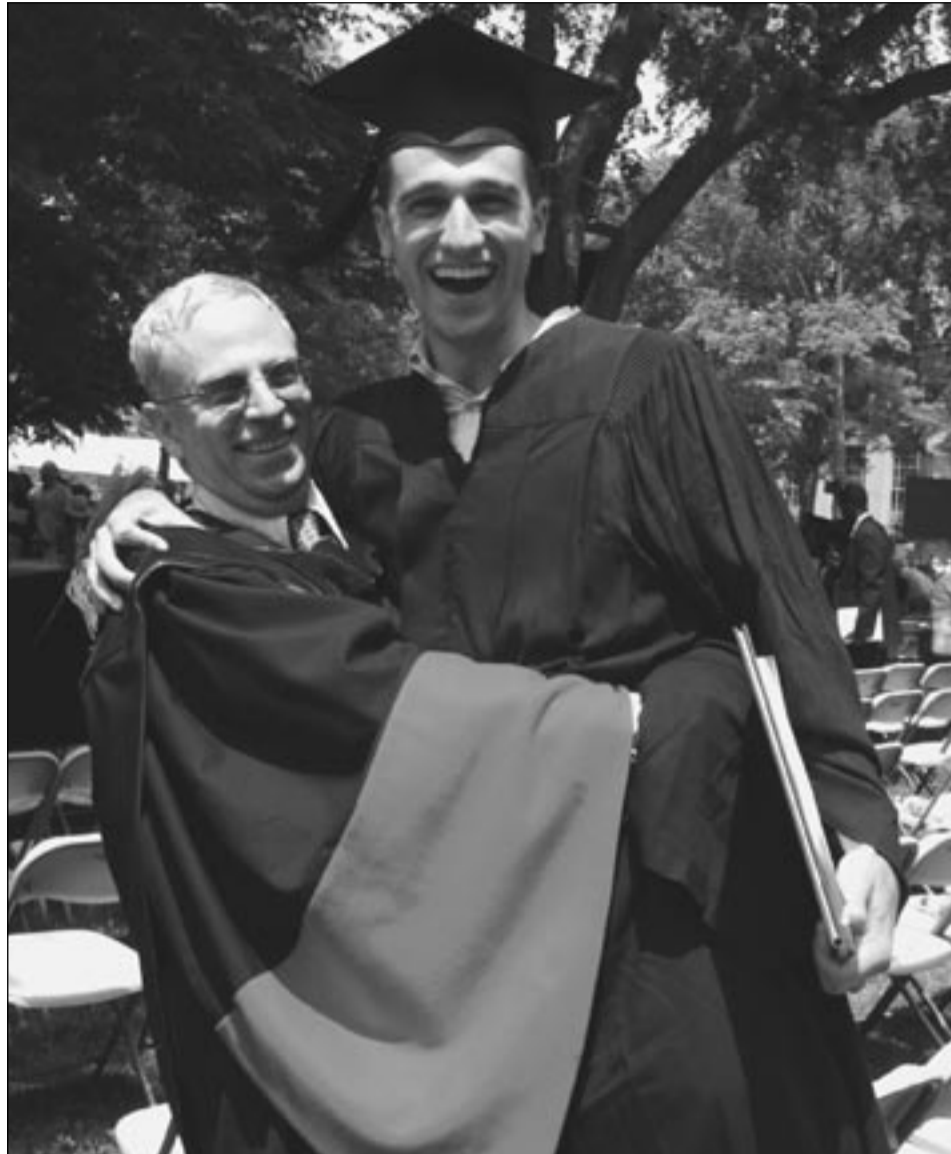


PHOTO / DONNA COVENEY

Professor John Guttag proves he can still pick up his 'little boy' by giving David Guttag a lift shortly after he graduated Friday, June 3.



PHOTO / L. BARRY HETHERINGTON

Alvin Lin celebrates his graduation Friday with his sisters, MIT alumnae Vicki (S.B. 2001), left, and Sandi (S.M. 2003).

## Tech reunion classes raise \$138 Million

Nancy DuVergne Smith  
MIT Alumni Association

Reunion classes from 1935 through 2000 and the graduating Class of 2005 reported the results of their fund-raising efforts at a rousing Technology Day luncheon at the Johnson Athletic Center held Saturday, June 4. The results, announced by MIT Alumni Association President Linda Sharpe '69, totaled \$138,563,600.

"The financial support that alumni provide to the Institute assures MIT's continued success," Sharpe said. "Reunion class gifts are one of the most significant forms of this support."

The largest contribution came from the Class of 1940, which contributed a 65th reunion total of \$109.4 million over a five-year period, counting gifts and bequests from 69 percent of the class.

The Class of 1955 presented a 50th reunion gift total of \$7 million, representing contributions from 65 percent of the class. A 40th reunion gift total of \$1.9 million came from 64 percent of the Class of 1965. And the Class of 1980, which set a 25th reunion gift participation record of 84 percent, gave \$3 million.

The Class of 2005 presented a senior gift of \$31,742, earmarked to support a student lounge off Lobby 10.

Visit the MIT Alumni Association Web site, [alum.mit.edu](http://alum.mit.edu), for more 2005 Tech Reunions coverage, including class-by-class totals.



PHOTO / JUSTIN KNIGHT

Nearly 3,000 alumni and guests, including Don Bishop '50, left, and Graham Sterling '48, S.M. '49, attended Tech Reunions, June 2-5, on campus. Cardinal and Gray Society members have reached their 50th reunion. They wear red jackets, a tradition since 1966.

## CEREMONY—

Continued from Page 1

changes in their lives.

A native of New Bedford, Mass., Jacobs began college as a student of hotel management—his parents owned a restaurant—but switched to engineering, "by far the best preparation for any field." It's "very exciting to come up with ideas, be able to apply theory to things that were rather practical, rather useful," he said.

Jacobs served on the MIT faculty for seven years after receiving his doctorate. He urged the new graduates to consider teaching—"the best way to learn material"—then described how he co-founded Linkabit, a consulting firm, in 1969 and Qualcomm, the wireless giant, in 1985.

In suggesting to the new graduates that they need not be swayed by conventional wisdom, Jacobs laughed at the memory of how he simply "had not heard" of an industry forecast that a million cellphones would be in use by 2000. The real figure was 600 million, he declared with relish.

"If you go into your own business, the time will come when you have to make a decision," he said, noting that Qualcomm later moved away from devices and into chips.

Jacobs urged the degree recipients to see themselves and their accomplishments in a global context. A well-known philanthropist in education and the arts, Jacobs reminded the Class of 2005, "The opportunity for philanthropy never goes away."

### Hockfield stresses values

President Susan Hockfield congratulated the Class of 2005 for the "successful completion of demanding courses of study" and challenged them to "put what you have learned here to work for the good of this nation and the world. We have never needed your talents and skills more."

Hockfield characterized MIT graduates as "uniquely equipped" to address issues in energy, climate change and global poverty, among others, and she urged them to ask themselves, "Where can I do the most good? How can I make a difference in the world?"

Hockfield also urged graduates to "transmit the values that define this community to the other communities that you will now join." These include "leadership as an opportunity to serve," integrity as the "touchstone of your judgments," "pursuit of truth," a "drive toward excellence" and "plain old-fashioned hard work."

Hockfield asserted, "I have tremendous faith in you. I know that in the years to come you will ... surprise and delight us with achievements we could never have predicted."

### Salutes from students

Barun Singh, president of the Graduate Student Council, saluted the Class of 2005, echoing themes introduced by Hockfield and Jacobs.

"We celebrate the hope and potential that you represent for the future of human events and the world we all share," Singh said. "You have demonstrated the ability to reason. Be open to unconventional solutions... Keep strong that passion and drive. The world needs it, and it waits for you."

Rohit Gupta, president of the senior class, presented President Hockfield with the senior class gift, \$31,000 for a new student lounge.

A site on the Infinite Corridor has been proposed for the lounge. It will be a "space for conversation and collaboration," said Hockfield.

Dana Mead, chairman of the MIT Corporation, officially convened and concluded the exercises. The MIT Chorallaries led the crowd in Killian Court in one verse of the Star Spangled Banner, with the Class of 1955 providing a spontaneous and moving baritone section, stage left.



Barun Singh



PHOTO / DONNA COVENEY

Ryan Eustice, center, celebrates receiving his Ph.D. hood with his son, Noah, 9 months, and his wife, Karen, who said she hopes that someday their son will remember seeing his father celebrate his degree from Wood's Hole Oceanographic Institution.



PHOTO / DONNA COVENEY

Garry and Karlene Maskaly, who met as MIT undergraduates and went through grad school together, picked up their Ph.D. hoods together on Thursday, June 2. The couple, married in 2000, both got degrees in materials science.

# Grads share joy at hooding ceremony

Sarah H. Wright  
News Office

Three dozen strollers were parked outside MIT's annual hooding ceremony, the family-friendly celebration of graduate students receiving Ph.D. or Sc.D. degrees that took place on Thursday, June 2, in Johnson Athletic Center—a standing-room-only event.

But many more adults cried than children: The sentimental overlap of past and future doesn't carry much weight with the sippy-cup set.

It was a day to ponder dreams, and Karen Eustice said she hopes her son, Noah, 9 months, will remember how exciting it was to see his father, Ryan Eustice, "walk in the procession in his cap and hood," celebrating his new Ph.D. from Wood's Hole Oceanographic Institution.

Inside the cavernous ice rink, Eustice's was one of 459 names read aloud, one of 459 gray and crimson hoods dispensed to signify the passage into membership in a "community of scholars that stretches around the world and back in time," as President Susan Hockfield remarked in her address.

Hockfield praised the degree recipients, emphasizing "newly created work, done on your own. In doing this, you've discovered something new about the world and something new about yourselves. You have reached the pinnacle of academic achievement."

Hockfield noted the faculty seated on the stage appreciated the work that went into these new Ph.D.s and Sc.D.s as few others do. "You have made sacrifices. Your families have made sacrifices," she said.

Chancellor Philip Clay remarked on the medieval roots and persistent idiosyncrasies of academic regalia. Individual faculty members modeled examples ranging from Carnegie-Mellon's bold plaid to the fluffy white bib of the University of Padua in Italy.

"This ceremony is informal, but it has a big and serious purpose: It witnesses your passage from students to colleagues. We look forward to years of association with you as members of the MIT extended family," Clay said.

Other members of the extend-



PHOTO / DONNA COVENEY

Newly hooded Artur Arsenio holds a shy but happy son, Hugo, 3, after the hooding ceremony on Thursday, June 2. Arsenio received the Ph.D. in electrical engineering and computer science.

ed MIT family looked forward, too, as the next generation waited—children who would be the doctoral class of 2033, if they follow their parents' paths.

Keum Park (S.B. 1993) imagines just that for daughter, Lauren Park Roberge, 2 ½. Park remembers how hard she and her hus-

band, Christopher Roberge (S.B. 1993, Ph.D. 2005), worked as MIT undergraduates, and she offered a light take on what Hockfield meant by "sacrifices."

Currently residents of New Jersey, Park and Roberge lived in Next House as MIT undergraduates; they met "doing chemical

engineering homework," she said. Roberge's doctoral journey meant their honeymoon was delayed a year. A patent attorney, Park supported Roberge for eight years, rather than the two she expected.

Park hoped her daughter would see the bright side of a "very long and bumpy journey. Mom and

”

*I hope [my daughter] remembers the pride we all feel, how hard Jenny worked, and the pageantry of the day.*

**Chris Lee**

Brother of Jennifer Lee,  
Ph.D. in biological engineering

dad worked very hard, and we took you along for the ride. Just remember the smile on your dad's face," she said to her daughter.

As for Lauren's academic future, Park would "definitely like her to go to MIT. After hearing Susan Hockfield at the [Women's Leadership Conference held at MIT in April], I had a 'Wow!' experience. There is so much Lauren could do here," Park said.

Chris Lee was visiting MIT from Orlando, Fla., to celebrate his sister, Jennifer Lee, who received the Ph.D. in biological engineering. His daughter, Alison, 1, stayed awake for the ceremony and crashed for the reception.

"I hope she remembers the pride we all feel, how hard Jenny worked, and the pageantry of the day," Lee said on her behalf.

Annette Frese looked to the future and into the past as she held grandson Sanjay Govindarajan, 6 months. Sanjay's mother, Annette Govindarajan, received the Ph.D. in oceanography from Wood's Hole. His father, Arvind Govindarajan, received the Ph.D. in neurobiology.

Frese would like Sanjay to remember the light of this day—not only the bright sun but also the light of love and pride.

"I want him to remember the beautiful smile his mother gave him when she marched in," Frese said.

Frese's parents came from Italy during the Great Depression; she was the first in her family to go to college. Reflecting on her daughter's and son-in-law's MIT experiences, she said, "They had wonderful mentors. We're very proud of MIT. And we're proud to make America great."

# President Hockfield's charge to the graduates

Graduates of MIT: This is your day. We have gathered here today in Killian Court to celebrate your accomplishments—the successful completion of demanding courses of study, often lasting several years. You have our deepest respect for all that you have accomplished. But today is not yours alone. None of you would be here this morning were it not for the families and friends who have nurtured and supported you since childhood—who have embraced your dreams and lighted your path. This is their day, too. Graduates, I ask you please to rise and thank those families and friends.

\* \* \*

A month ago, I stood here in Killian Court and spoke about what defines MIT—and about my dreams and hopes for this great institution. Those inaugural remarks were addressed to the whole Institute community. This morning, I would like to speak to those of you who are graduating today—about my hopes and dreams for you.

You, our graduates, are exceptional individuals. You arrived at MIT with remarkable native talents, already honed by years of demanding study. Here, you have learned from a brilliant faculty, and—just as important—from each other. You have learned about complex subject matter and you have learned about yourselves. Now, as you leave MIT, I challenge you to put what you have learned here to work, for the good of this nation and the world. Because we have never needed your talents and skills more than we do now.

We live in an uncertain, unsettled age. And we face great challenges—to name only a few—in energy, in climate change, in contagious diseases, in the design of our urban communities and in global poverty.

You—the graduates of MIT—are uniquely equipped to address issues like these. You are ready to make the necessary advances in science and technology, to employ rigorous quantitative and qualitative analysis, and to develop new methods of interdisciplinary inquiry and problem-solving. So, 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 a difference in the world?”

Now, you will not be able to do this work alone. Meeting the great challenges of our era will require teamwork and collaboration. You will need to draw not only on what you have learned in the classroom and lab, but also on what you have learned about the importance of community.

As the currents of your lives draw you away from MIT's shores, you will in important and real ways remain part of this community. At the close of this morning's ceremony, Linda Sharpe, the president of the Alumni Association, will formally welcome you into the association's membership. We hope you will stay connected and engaged with the life of the Institute.

But beyond your own connection to MIT, I hope that you will also transmit the values that define this community to the other communities you will now join; that you will see leadership as an opportunity to serve the common good; that you will make integrity the touchstone of your judgments; that you will exemplify the pursuit of truth and an unwavering drive toward excellence; and that you will continue to demonstrate the value of plain old-fashioned hard work.

Finally, and perhaps most crucially: I ask you to inspire your own generation and those 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. 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. The intelligence, diligence and creativity you have demonstrated here at MIT have inspired us all. And I know that in the years to come you will do even more—and surprise and delight us with achievements we could never have predicted.

For now, in closing, let me say simply, “Congratulations, graduates of MIT!”



PHOTO / DONNA COVENEY

At her first MIT Commencement, President Susan Hockfield charged graduates ‘to kindle in others the same love and passion for truth and discovery, for creativity and problem-solving, that brought us all here.’



PHOTO / DONNA COVENEY

Temitope Sonuyi poses with his parents, Labi (left) and Yomi Sonuyi, after receiving his bachelor's degree in electrical engineering and computer science at MIT's Commencement exercises Friday. The family lives in California.

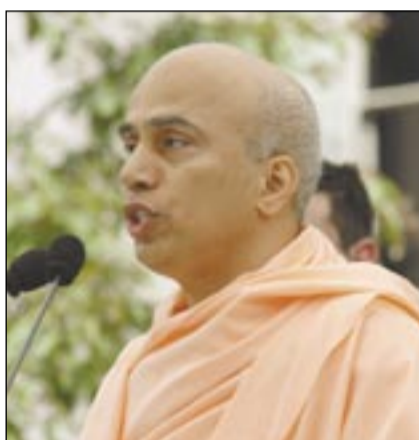


PHOTO / DONNA COVENEY



PHOTO / L. BARRY HETHERINGTON

Swami Tyagananda, left, MIT's Hindu chaplain, gave the invocation in both Sanskrit and English at Friday's graduation ceremony. Irwin M. Jacobs, right, the co-founder and CEO of Qualcomm, gave the Commencement address.



PHOTO / DONNA COVENEY

Linda C. Sharpe, president of the Association of Alumni and Alumnae, leads the procession down the steps of 77 Mass. Ave. with MIT President Susan Hockfield and Dana G. Mead, chairman of the Corporation, right behind her.



The Charles River and guests and the MIT



MIT President Susan Hockfield and Dana G. Mead, chairman of the Corporation, lower center. Gupta



PHOTO / DONNA COVENEY

and the Boston skyline create a beautiful backdrop as the members of the Class of 2005, their families, faculty and administration gather for the sunny 139th Commencement exercises, held Friday, June 3.



PHOTO / DONNA COVENEY

Vitaliy Pereverzev celebrates receiving his bachelor's degree in electrical engineering and computer science on June 3.



PHOTO / DONNA COVENEY

Francisco Diarte's sunglasses reflect MIT's famed dome during Commencement. Diarte received his M.B.A. from MIT's Sloan School of Management.



PHOTO / DONNA COVENEY

an Hockfield, right, hands Rohit Gupta his diploma during the exercises as Dana G. Mead, chairman of the Corporation, looks on at is the president of the Class of 2005.



PHOTO / DONNA COVENEY

Some students gave their caps a touch of individuality. At left is Jennifer Hu, who received the bachelor of science in mechanical engineering. Brian Loux, right, received the master's degree in civil and environmental engineering.



PHOTO / L. BARRY HETHERINGTON



### Raymond C. Kurzweil

Chair and CEO, Kurzweil Technologies Inc.

**Term:** Two years

**Education:** S.B. 1970 (MIT)

**MIT honors:** Lemelson-MIT Prize (2000), MIT Inventor of the Year Award (1988)



### R. Erich Caulfield

Ph.D. candidate in electrical engineering and computer science, MIT

**Term:** Five years (Recent Classes nominee)

**Education:** Two B.S. degrees in 1998 (Morehouse College), S.M. 2001 (MIT)

**MIT honors:** Martin Luther King Jr. Leadership Award (2005), Karl Taylor Compton Prize (2004), Dean for Student Life Multicultural Service Award (2002)



### Kenneth Wang

President, U.S. Summit Co.

**Term:** Five years (Alumni Association nominee)

**Education:** S.B. 1971 (MIT), M.B.A. 1976 (Harvard)

**Current MIT activities:** Corporation Development Committee, vice president of Alumni Association board, visiting committee for economics

**MIT honors:** Life Sustaining Fellow (1979), Henry B. Kane '24 Award (1993)



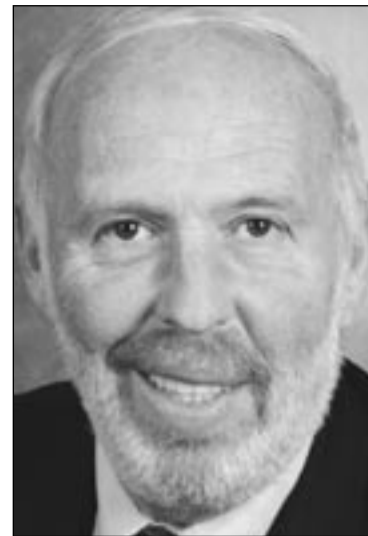
### John A. Thain

CEO, New York Stock Exchange

**Term:** Five years (Corporation member since 2000)

**Education:** S.B. 1977 (MIT), M.B.A. 1979 (Harvard)

**Current MIT activities:** Dean's Advisory Council, Sloan School of Management; visiting committees for dean for student life, economics, electrical engineering and computer science



### James H. Simons

President, Renaissance Technologies Corp.

**Term:** Five years (Corporation member since 2002)

**Education:** S.B. 1958 (MIT), Ph.D. 1962 (University of California at Berkeley)

**Current MIT activities:** Visiting committees for brain and cognitive sciences and mathematics

# Corporation names new members

The MIT Corporation, the Institute's board of trustees, elected one life member and nine term members at its quarterly meeting on June 3. 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

73 distinguished leaders in education, science, engineering and industry; of those, 23 are life members and eight are ex officio. An additional 30 individuals are life members emeriti, participating in meetings but without a vote.

It was also announced at the meeting

that Scott P. Marks Jr. has been named the 2005-06 president of the Association of Alumni and Alumnae of MIT. As such, he becomes an ex officio member of the Corporation. A Corporation member since 2001, he serves on the Corporation's auditing committee and the visiting committees

for chemical engineering and mechanical engineering. He received the Henry B. Kane '24 Award in 2003 and the Harold E. Lobdell '17 Distinguished Service Award in 2000. Marks earned the S.B. and S.M. degrees in electrical engineering from MIT in 1969.



### Brian G.R. Hughes

Chair, HBN Shoe

**Term:** Life membership (Corporation member since 2000 and also 1978-83 and 1993-98)

**Education:** S.B. 1997 (MIT), M.B.A. 1979 (Harvard)

**Current MIT activities:** Corporation Development Committee Advisory Group; visiting committees for aeronautics and astronautics, biological engineering and mechanical engineering

**MIT honors:** Bronze Beaver Award (2000), president of the Alumni Association (1999-2000), Henry B. Kane '24 Award (1997), Life Sustaining Fellow (1989), William L. Stewart Award (1976)



### Anita K. Jones

Lawrence R. Quarles Professor of Engineering and Applied Science, University of Virginia at Charlottesville

**Term:** Five years (Corporation member since 2004)

**Education:** A.B. 1964 (Rice), M.A. 1968 (University of Texas at Austin), Ph.D. 1973 (Carnegie Mellon)

**Current MIT activities:** MIT Lincoln Laboratory advisory board member; Charles Stark Draper Laboratory Corporation member; visiting committees for Engineering System Division and sponsored research



### Robert L. Blumberg

President, Spectragraphics Corp. and SMS Technologies Inc.

**Term:** Five years (Alumni Association nominee)

**Education:** S.B. 1964, S.M. 1965 (both from MIT), M.B.A. 1967 (Harvard)

**Current MIT activities:** Corporation Development Committee, vice president of Alumni Association board of directors

**MIT honors:** Bronze Beaver Award (1999), Harold E. Lobdell '17 Distinguished Service Award (1992)



### Linda C. Sharpe

Senior associate, Cambridge Systematics Inc.

**Term:** Five years (Alumni Association nominee; Corporation member since 2000)

**Education:** S.B. 1969 (MIT)

**Current MIT activities:** Visiting committees for dean for student life and mechanical engineering

**MIT honors:** President of the Alumni Association (2004-05), Black Alumni of MIT Life Member (1999), Bronze Beaver Award (1999), Harold E. Lobdell '17 Distinguished Service Award (1996)



### David D. Ho

Founding scientific director and CEO, Aaron Diamond AIDS Research Center

**Term:** Five years (Corporation member since 2003)

**Education:** B.S. 1974 (California Institute of Technology), M.D. 1978 (Harvard)

**Current MIT activities:** Visiting committees for biology (chair since 2004) and Whitaker College of Health Sciences and Technology

**MIT honors:** 1998 Commencement speaker, with then President Clinton

## CLASSIFIED ADS

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](mailto:ttads@mit.edu) or mail to Classifieds, Rm 11-400. Deadline is noon Wednesday the week before publication.

### HOUSING

W. Roxbury near Chestnut Hill: 2BR, 2nd flr apt. Hrdwd flrs in victorian house. Mins from comm rail. \$1,300, plus utils. 617-797-8819.

Chestnut Hill: 1BR, Near T, supermarket, movies etc. Quiet street. 990/mo. Includes heat, all utils, parking, cable. Start sept. 1, 1-1.5 yrs. 617-731-9142.

Martha's Vineyard: 1 week in July, 2 weeks in August, some September. 4BR. Newly renovated. 1 mile to beach, 3 miles from Edgartown. 781-

981-5087 or 603-654-5513.

4 family home for sale. Maquan Sq., Somerville. Plenty of parking. 781-395-7265.

### VEHICLES

1977 Porsche Targa Carrera 3.0 Rare, Euro specs, 5-speed transmission (recently rebuilt), 200hp, whale tail, recent paint, new brakes. Ex. cond. Pampered, never raced. \$12,000/bst. 339-237-0960 or [bwyoung@mit.edu](mailto:bwyoung@mit.edu).

1993 Mercury Sable LS. Air, power steering, windows, locks, seat. Leather, tilt, cruise, air bags, sun roof, alloy wheels. 3.8L V-6. 140K. \$2,000. [bruce@ll.mit.edu](mailto:bruce@ll.mit.edu) or 978-263-0880.

'97 Mercury Mountaineer SUV - Dark blue with gray interior. Well cared for, all records, looks and runs great. New brakes, AC, power steering, windows and locks. Standard and Thule roof

racks, heavy-duty tow package. Privacy glass and alloy wheels, ABS and 4 wheel drive. 119K. Asking \$5,350/BO. Call 978-369-8832

2001 Ford Mustang, 'true blue,' auto, v-6, abs brakes, traction control, a/c, cd player. 43K. Well maintained (one owner). \$9,000. 978-263-6434.

Saturn Wagon, 2000. Power, air, leather, top model perfect. 61K. \$6,900. 781-861-0027 or 781-289-9735.

2001 VW Passat Sedan. 48K. Sage Green, ex. cond., ding free. 5-speed manual, leather interior, alloy wheels, Monsoon sound. \$11,500/bst. 253-2449 or [samuels@mit.edu](mailto:samuels@mit.edu)

### FOR SALE

AKC Reg. Golden Retriever pups, hip and eyes cleared, champ. Stock, great family dogs, ready

week of June 20th. \$1,000-\$1,200. 617-332-8251 or [rgunder@mit.edu](mailto:rgunder@mit.edu).

2 yr old Scotts riding lawn mower. 15HP, 42 inch cutting width, w/double bagger. Like new, \$1,800. 508-725-3000.

### STUDENT POSITIONS

**Positions for students with work study eligibility.**

Zoo New England offers many positions: work in offices, help with guest services, work with animals, etc. [www.zoonewengland.org/involve/jobop.shtml](http://www.zoonewengland.org/involve/jobop.shtml).

The Margaret Fuller House seeks 2 teachers/counselors for summer program (9-10 weeks). Teach arts, crafts, sports, math. Teaching experience helpful, Spanish or Haitian useful. 617-547-4680 or fax resume: 617-497-0166. \$10-12/hr.



# Schnitzer Prize winners display their works

Lynn Heinemann  
Office of the Arts

The winners of this year's Harold and Arlene Schnitzer Prize in the Visual Arts drew inspiration from trick-or-treating, cornfields, MIT courses and ketchup.

About 20 artists competed for the prizes, which reward excellence in a body of work. First prize, \$1,500, went to architecture graduate student Luis Berrios-Negron.

Berrios-Negron will exhibit his video, installation and photography at the Wiesner Student Art Gallery on the second floor of the Stratton Student Center in September. A sampling of the other winners' works is on view there now through June 20. The gallery is open 24 hours a day.

Media arts and sciences graduate student Andrew "Zoz" Brooks won second prize, \$900, for video, sculpture and agit-prop. In his artist's statement, Brooks says he aims to "twist around things that are intimately familiar ... to encourage people to think in new ways about events and rituals." His exhibited works include a series of videos that confront and subvert such traditions as trick-or-treating, religious holiday observances and broadcast television.

"My intention is primarily to wrestle with things that interest me," Brooks wrote. "I hope to inspire [others] to think about their experiences with a distorted perspective."

In one work, "Protest Flags," Brooks dyed American flags and added provocative slogans to convey what he calls "a very different and unfamiliar visual impression of these well-known icons."

Brooks' "Steer Roast Shield" serves as a functional symbol for Senior Haus' annual Steer Roast. The stainless steel shield acts as a weight for the traditional ignition system of lighted toilet paper, Brooks says, descending down a wire from the roof to the steer roast pit in the dorm courtyard. Left to burn overnight, the shield rises phoenixlike from the ashes, essentially unmarred, Brooks says.

The third prize of \$600 went to architecture senior Cecilia Ramos for her oil landscape paintings of the Midwest. Cecilia Ramos says she found her inspiration far off-campus, on a plane flying into St. Louis. "The vast expanse of America's Midwest landscape is tremendous, awe inspiring and sublime," she wrote in her statement, explaining how she spent June and July 2004 in the cornfields of southern Illinois, devoted to "the landscape and to my paints, striving to experience, understand, grasp and depict the immensity as well as the subtleties of the landscape through intense explorations on canvas."



PHOTO / BARRY KUDROWITZ

Ramos used what she calls intense layering of colors, textures, brush strokes and forms to try to capture the power of the land.

"I believe that immersion is the perfect word to describe this painting series and the overall experience," she says about being alone in the cornfields with her easel, canvas and paints. With the wind often toppling her easel and insects frequently landing on her canvas, "nature continued its everyday course, unaware of my presence and without regard for my art project," she wrote.

Mechanical engineering graduate student Barry Kudrowitz received an honorable mention for illustration, sculpture and

"unuseless invention."

The exhibition includes a collection of Kudrowitz's "CourseToons," lighthearted illustrations in acrylic on canvas of the courses available at MIT. "CourseToons," Kudrowitz says, "serve as a means to promote the fun side of MIT... through quirky representations of the majors."

Kudrowitz has also created small sculptures such as "Sleepy Girl" and "Arnold Soft," using Super Sculpey, a sculpting compound. "Arnold Soft" is a model created for an illustration for Kudrowitz's "The Enchanted Poetry of Arnold Soft," which tells the story of a boy who uses his ability to turn poetry into reality to save his kidnapped grandmother.



PHOTO / ANDREW BROOKS

Second prize winner Andrew Brooks' "Steer Roast Shield," in stainless steel, is built to survive Senior Haus' roasting pit fire.



PHOTO / BARRY KUDROWITZ

Honorable mention winner Barry Kudrowitz' "CourseToons," left, is meant to show the "fun side of MIT." His sculpture, "Arnold Soft," above, is a model for a fictional poet.

Also on view is the "Ketchup Crapper," for which Kudrowitz won first place with fellow mechanical engineering graduate students Bill Fienup and Marc Graham in the MIT Unuseless Competition. Visitors to the Schnitzer exhibition can see what the artists call "the first ketchup bottle to roller-skate to your plate and excrete a pleasant mound of condiment," even if they can't actually try it out in the adjacent Lobdell Dining Hall.

The Schnitzer Prize was established in 1996 by the Student Art Association through an endowment from Harold and Arlene Schnitzer of Portland, Ore. Schnitzer, a real estate investor, graduated from MIT in 1944 with a degree in metallurgy.

## AWARDS AND HONORS

Associate Professor **Thomas DeFrantz's** analysis of choreographer Alvin Ailey's body of work, "Dancing Revelations: Alvin Ailey's Embodiment of African American Culture," will be awarded the 2004 de la Torre Bueno Prize for outstanding English-language publication in dance on June 11 in Chicago. The de la Torre Bueno Prize, awarded annually, honors the late J.R. de la Torre Bueno, who founded the dance book publishing program at Wesleyan University Press in Massachusetts. The only adjudicated recognition given in the field of dance publications, the prize is awarded for depth of research and thought, quality of writing, and significance to the field of dance.

Professor **Neil E. Todreas** of the Department of Nuclear Science and Engineering has been awarded the Henry DeWolf Smyth Statesman Award in recognition of "statesmanlike contributions to the many aspects of nuclear energy activities." The award, established by the American Nuclear Society (ANS) and the Nuclear Energy Institute in 1972, was presented May 18 by James S. Tulenko, ANS president.

**Stephen Benton** (1941-2003) was posthumously awarded the Edwin H. Land Medal in ceremonies held recently in Washington, D.C. Benton, who was director of the MIT Center for Advanced Visual Studies (CAVS) and the E. Rudge ('48) and the Nancy Allen Professor of Media Arts and Sciences at the Media Laboratory, was honored for his "seminal research and innovation in three-dimensional imaging, including the famed rainbow hologram." Originally endowed by Polaroid Corp. and awarded in alternate years by IS&T and the Optical Society of America, the Edwin H. Land Medal recognizes an individual who has demonstrated from a base of scientific knowledge, pioneering entrepreneurial creativity that has had major public impact.

**Edward M. Greitzer**, H. N. Slater Professor of Aeronautics and Astronautics, has been selected to receive the R. Tom Sawyer Award from the ASME. He is being recognized for "the development of practical engineering models that unify the understanding of compression system stability and end wall flows; for serving as a catalyst for collaborative research on a global scale; and for longstanding service to the ASME International Gas Turbine Institute." The award will be presented in Nevada in June.

**David M. Konisky**, a political science graduate student, has been named a 2005 Udall Dissertation Fellow. The Udall Dissertation Fellowship is awarded to two outstanding doctoral candidates nationwide who have achieved distinction in their scholarly research and who are entering the final year of writing the dissertation. The dissertation topic must be significant and relevant to national environmental public policy and/or environmental conflict resolution. The award covers both academic and living expenses up to \$24,000 for the year.

**Iris Fanger**, a music and theater arts lecturer, was honored as the 2005 Dance Champion by the Boston Dance Alliance at its fourth annual benefit on May 12. Fanger has been a theater and dance journalist as well as an educator and historian for 40 years. The Boston Dance Alliance is comprised of members from the Greater Boston dance community.

**Stephen M. Meyer**, professor of political science and Director of the Project on Environmental Politics and Policy, has received the Francis W. Sargent Conservation Award in recognition of his contributions and leadership in incorporating the "latest science on wetland wildlife habitat in Massachusetts' wetland regulatory program."

**Mark H. Jacobs**, Director of Technical Services in Alumni Association Operations and Information Systems, is the 2005 Steven Wade Neiterman Award winner for his "lead in establishing and leading technical, and many non-technical teams, both inside and outside the Alumni Association" and for his "outstanding commitment to the Alumni Association and to MIT for over 15 years." The award was created by Neiterman's parents in memory of their son, who died in 1998 after working at MIT for 11 years.

**Eric W. Hudson**, assistant professor of physics and Class of 1958 Career Development Chair, was named a Cottrell Scholar by Research Corp., one of the nation's first private foundations to promote basic research in the physical sciences by supporting the research of young faculty in American and Canadian universities. The honor includes a \$100,000 cash award to support and recognize excellence in both teaching and research. Hudson was one of 13 North American faculty to receive the annual award out of a pool of 136 peer-reviewed proposals.

Professor **Esther Duflo** of economics has won the Prize for Best Young Economist in France, awarded jointly by the Parisian newspaper *Le Monde* and the *Cercle des Economistes*. The prize honors contributions made by an economist under 40 to the development of French economic thought.

The Rossby Award, given annually by MIT's Program in Atmospheres, Oceans and Climate for the most outstanding thesis submitted to the program, went to **Peter Huybers** for 2003-2004. Huybers, whose thesis was titled "On the Origins of the Ice Ages: Insolation Forcing, Age Models and Nonlinear Climate Change," was advised by Professor Carl Wunsch of earth, atmospheric and planetary sciences.

# MIT family fights disease together

Patti Richards  
News Office

Many at MIT already know the story of Stephen Heywood, son of Professor John Heywood of mechanical engineering, who has been fighting a seven-year battle with Lou Gehrig's disease. The tragedy has drawn in the whole tightknit Heywood family, particularly Stephen's brother Jamie, MIT Class of 1991, who abandoned his own career to focus on finding a cure.

Last year the Heywood story spawned a book, "His Brother's Keeper," written by Jonathan Weiner and published by HarperCollins, and in April, WCVB-TV's "Chronicle" did a segment. Now, a team of filmmakers are making a documentary on the family. All of which focuses new attention on what remains an incurable, fatal disease.

Although Stephen's physical condition has declined unrelentingly, his mind is as sharp as ever. There are glimmers of hope: already he has outlived most ALS sufferers. His brother's ALS Therapy Development Foundation continues to experiment with potential treatments. Confined to a wheelchair and unable to speak, Stephen communicates via a computer similar to that used by fellow ALS sufferer Stephen Hawking, the renowned British physicist. "One learns," says his father, one of the world's leading experts on internal combustion engines. "to have conversations where answers are 'yes' or 'no.'"

Stephen Heywood was a strapping 6-foot-3-inch carpenter working on restoring his dream house in Palo Alto, Calif., when he was diagnosed with amyotrophic lateral sclerosis (ALS), a neuromuscular illness that gradually destroys the central nervous system.

Stephen and his older brother Jamie had always been close. A mechanical engineer turned high-tech entrepreneur, Jamie was heading up technology development at the Neurosciences Institute outside San Diego when his brother got sick. Within a few months, he quit his job, returned to Boston and threw himself into the burgeoning world of genetic engineering.

Jamie had no medical training, but he did have boundless energy, an entrepreneur's confidence and drive and an intense passion for the cause. He initially focused his efforts on an experimental gene therapy, but after the death of a patient undergoing similar genetic treatments made news headlines all over the world, he shifted his focus, first to neurovaccines, then to stem cells and ultimately to drug development.

Weiner, a Pulitzer Prize-winning sci-



PHOTO COURTESY / HEYWOOD FAMILY

The Heywoods gather together for a family wedding in July 2004. Stephen is in the wheelchair with his brothers behind him: Jamie is at left; Benjamin is at center. Their parents, Professor John and Peggy Heywood, are at the far right. The bride is Benjamin's wife, Sherie. Stephen's wife, Wendy, is at the far left behind Jamie's daughter, Zoe. Stephen's son, Alex, is in front.

ence writer, heard about Jamie's race to save his brother and became immersed in the story. He wrote a lengthy New Yorker article, followed by "His Brother's Keeper"—a New York Times notable book for 2004.

"The Heywoods' story taught me many things about the nature of healing in the new millennium," he wrote. "It also taught me about what has not changed since the time of the ancients.....what Lucretius calls 'the everliving wound of love.'"

Today, Jamie's foundation is the largest worldwide test factory for possible medications and treatments of ALS in the world, with 13 full-time scientists on staff and \$20 million in funding.

"The foundation has become the machine Jamie always envisioned," Stephen wrote in a recent letter posted on his web site. "I think we have doubled the number of mouse trials ever done and have two drugs in human trials. We have tested every conceivable drug and have started to make our own."

When Stephen was initially diagnosed

with ALS, he had just met up again with an old friend, Wendy Stacy, and the two had fallen in love. They married in 2000 and have a 4-year-old son, Alexander, who clearly dotes on his father. The three of them live in another house that Stephen had helped renovate, near his parents' home in Newton.

Though Stephen needs round-the-clock medical care, all of the Heywoods are involved in taking care of him and they try to give each other a lot of emotional support. "This disease is impossible without family support," Stephen said recently. The family still makes its annual pilgrimage to the Outer Banks of North Carolina each summer, as they have been doing for 30 years.

Although Jamie has yet to find the magical cure for Stephen, their father says that his oldest son has broadened his view: "It's no longer just about saving Stephen, but about saving all the others who are going down the same path, and giving them a support network that helps them manage their disease."

## ENERGY

Continued from Page 1

may now be ready to focus on these matters and it is MIT's responsibility to lead the way," she said.

Brown appointed the Energy Research Council to lead the planning for the initiative in energy-related research and education—including developing a picture of the current state of MIT energy-related research and expertise; developing a list of promising science and engineering research areas that match global needs and MIT capabilities; and recommending an organizational structure that would facilitate work in these areas.

"MIT is exceptionally well-suited for launching a major initiative in energy research and education because the Institute's strengths in engineering, science, economics and public policy can all be brought to bear on this important problem," said Brown. "Moreover, MIT has a long tradition of major research efforts that cut across disciplinary boundaries in precisely the way an effective energy initiative must work."

The council will report to the provost and to Alice Gast, vice president for research and associate provost. The 16 council members come from all five of MIT's schools: science, engineering, management, architecture and planning, and humanities, arts and social sciences.

"All the schools will be engaged, because the involvement of economists,

architects, urban planners, political scientists and management experts is crucial to make sure that the research results can be rapidly deployed in the real world," Armstrong said.

"Technology is ultimately the solution, but we don't have time to wait decades for it to make its way into the marketplace. Policy is important to help deploy the technologies more quickly," said Moniz, who pointed out that the development of carbonless forms of energy—nuclear and renewables (wind, biomass, hydro and solar)—is crucial. "The reaction to the major energy problems in the '70s—oil shocks and pollutants—did not go to the core structure of the energy industry itself. The confluence of problems we see today—climate change and the energy demands of the emerging economies—are going to require longer-lasting responses."

The council expects to inform the search for five or six new faculty members whose research will address energy production and use; members will also recommend an administrative structure to facilitate interdisciplinary research on energy problems among other faculty at the Institute. The council also plans to engage the energy industry in its deliberations. "Industry will offer a very important perspective," said Armstrong.

In announcing her initiative, Hockfield observed: "Many MIT faculty are working already on new routes to renewable and sustainable energy. We need to advance

“  
MIT is exceptionally well-suited for launching a major initiative in energy research and education.

Robert A. Brown  
Provost

this scientific and engineering work, while focusing our efforts and magnifying their impact, through our world-class expertise in economics, architecture and urban planning, political science and management."

Moniz and Armstrong ask that members of the MIT community contact them with ideas for the council's consideration at [rca@mit.edu](mailto:rca@mit.edu) or [ejmoniz@mit.edu](mailto:ejmoniz@mit.edu).

In addition to Armstrong and Moniz, council members are Professors Steven Ansolabehere of political science, Angela Belcher of biological engineering and materials science and engineering (MSE); Vladimir Bulovic of electrical engineering and computer science (EECS); Gerbrand Ceder of MSE; John Deutch of chemistry; William Green of chemical engineering; John Heywood of mechanical engineering; Jake Jacoby of MIT's Sloan School; Mujid Kazimi of nuclear engineering; Steven Leeb of EECS; Dale Morgan of earth, atmospheric and planetary sciences; Daniel Nocera of chemistry; Karen Polenske of urban studies and planning; and Yang Shao-Horn of mechanical engineering.

# 'Green' labs project wins EPA prize

An MIT student design project has won a People, Prosperity and Planet Award from the U.S. Environmental Protection Agency. More than 400 students representing 65 teams from more than 50 schools participated in the first "P3" competition, which was held at the National Mall in Washington, D.C., on May 16 and 17.

To win the P3, a project had to demonstrate how it would advance sustainability in the developed or developing world. There were seven winners this year.

MIT's project, titled "Encouraging Toxic Use Reduction (TUR) in Academic Laboratories," led by Professor Jeffrey Steinfeld of the chemistry department and Jamie Lewis Keith of the Environmental Programs Office, received an EPA grant of \$30,000.

MIT's project combined a survey of the laboratory culture surrounding chemical purchasing, use, sharing and disposal (overseen by anthropology Professor Susan Silbey), with an investigation of chemical waste generation and management at the Institute. The project yielded a methodology for selecting more benign and environmentally preferable substitutes ("green chemistry"). The project's primary goal is the development of educational tools, including a chemical alternatives purchasing interface, which researchers and students can use to make more sustainable chemical selections.

"The promise of green chemistry seems to already be recognized by industry, which many argue can afford to make these types of changes as opposed to a small academic laboratory," states chemistry major Jacqueline Tio '06, who, in tandem with fellow major Kendra Bussey '05, developed much of the project content. "But I am convinced, even on a small scale, incorporating green chemistry upstream in batch reactions would greatly help those downstream fine-tuning a reaction on larger scales.

"If small labs start making more chemically sustainable choices, it will at some point in time become affordable and, ultimately, cost effective for academic laboratories in general."

Jamie Lewis Keith, managing director for environmental programs and risk management, and senior counsel said, "The Environmental Programs Office is delighted that we were able to support Professor Steinfeld and his students in this important green chemistry work, which we plan to implement on campus. We are deeply appreciative of the EPA's recognition and continuing support for this innovative and practical project."

For more information on MIT's winning project, visit [http://web.mit.edu/environment/academic/green\\_chemicals.html](http://web.mit.edu/environment/academic/green_chemicals.html). For more information about green chemistry at MIT, e-mail [greenchem@MIT.edu](mailto:greenchem@MIT.edu).

## New 'Mind and Hand' traces history of MIT

A new MIT Press book by Julius A. Stratton and Loretta H. Mannix provides a rare glimpse into the earliest days of MIT. Titled "Mind and Hand: The Birth of MIT," the book delves into the ideas about science and education that shaped MIT and defined its mission—from the new science of the Enlightenment era and the ideals of representative democracy spurred by the Industrial Revolution to new theories on the nature and role of higher education in 19th-century America. MIT emerged in midcentury as an experiment in scientific and technical education, with its origins in the tension between these old and new ideas, the book records.

Stratton, a former MIT student, faculty member, provost and chancellor, served as Institute president from 1959 to 1966. Mannix, Stratton's administrative assistant at MIT, continued the project after Stratton's death. The book was completed by Philip N. Alexander from the MIT Program in Writing and Humanistic Studies.

# Professor plans African AIDS clinics

Denise Brehm  
News Office

An MIT architecture professor has completed a design prototype to build at least 20 pediatric AIDS care centers in Lusaka, the capital of Zambia.

An estimated 30,000 children in Lusaka have AIDS or are HIV positive. The African city has a population of 1.2 million (about twice that of Boston), but only two hospices for AIDS patients, with a total of 20 beds. Each of the new care centers would have beds for about 20 children and provide outpatient clinical services for many more.

MIT architecture Professor Jan Wampler is working on the project with Suresh Subramanian, director of the Power of Love Foundation in San Diego.

"The Power of Love care centers are truly smart designs incorporating expanded functionality, local materials and community management—all at a cost savings of more than 60 percent over current alternatives," said Subramanian, who is raising funds to build the centers.

"We are in the process of identifying partners to help us take this up to scale. Our goal is 20 in 2006, 50 in 2007 and 100 in 2008."

The clinics will be "as self-sufficient as possible," said Wampler, who included solar panels, a power generator and a rainwater collection system in his design. "They will be built with the simplest materials of local wood and inexpensive concrete blocks covered with white plaster. Children will paint murals on the outside walls," he said. The clerestory roof design allows air and light to flow; ceilings will be made of woven reeds.

Wampler previously has designed attractive, inexpensive housing for Hondurans who lost their homes to Hurricane Mitch in 1998 and for people left homeless after the earthquake in Turkey in 2003.

He said he welcomed the challenge of building clinics for children in Zambia and was determined to keep the new institutions small and cozy so that children feel at home.

"I wanted to make the scale more homelike than institutional. I did everything I could think of to make it not look like a hospital," Wampler said. On a visit to Lusaka, he was taken with the traditional insakas or thatched-roof open rooms that Zambians use as communal areas. "I immediately decided to make the main entrance to the clinic be an insaka," he said.

His modular design includes the insaka, a small chapel that can store rainwater on its roof, and three buildings situated

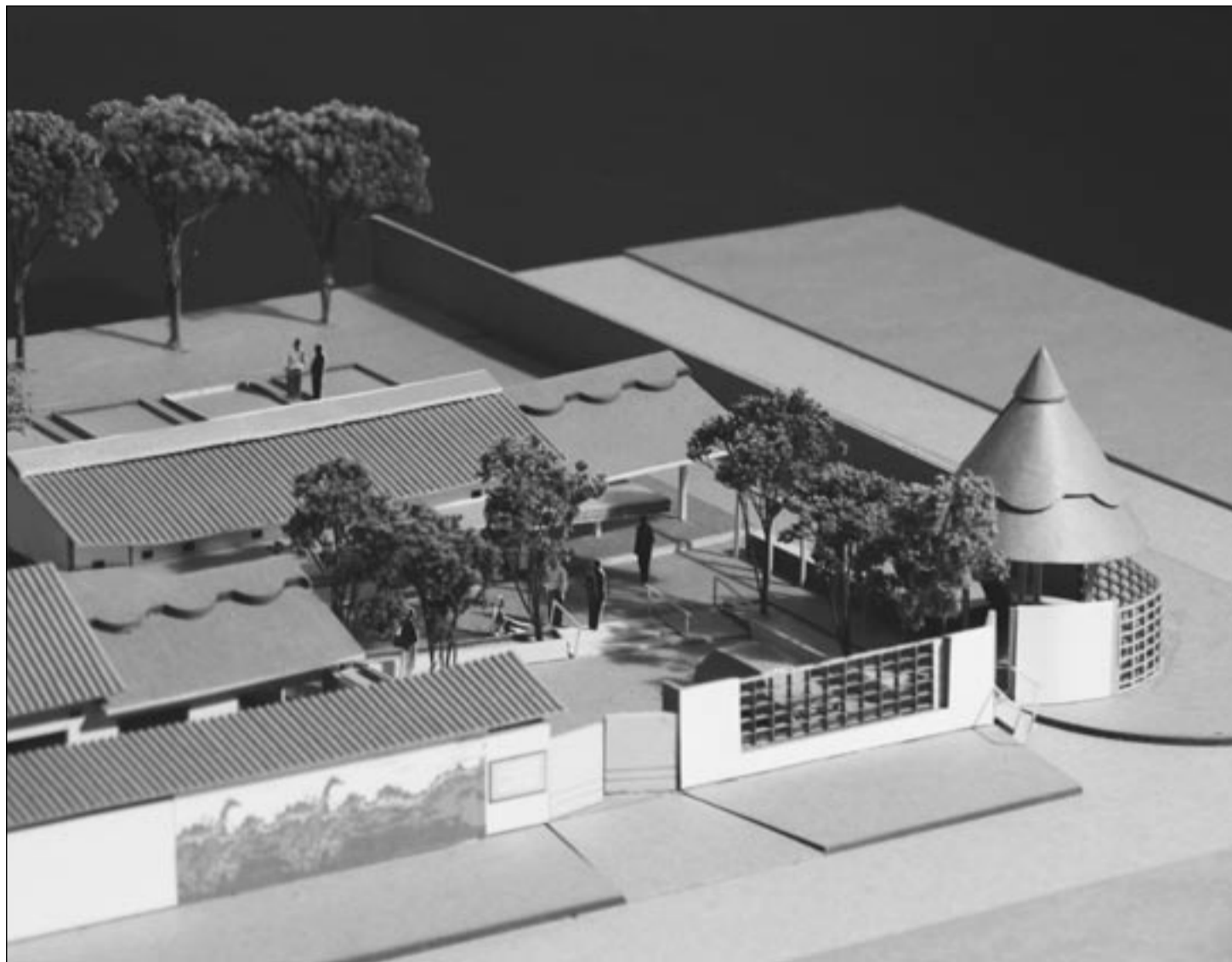


PHOTO / STEPHEN FORM

This architectural model of a proposed Community Care Center, made by graduate student Katice Helinski, shows the courtyard, a "microvillage" of buildings and the traditional Zambian insaka at the entrance. Children's murals will grace the outer walls. The design is by Professor Jan Wampler, assisted by students Helinski and Stephen Form.

around a small courtyard: a building with four wards of four beds each that open onto a wooded area; a common building with meeting rooms inside and out; and a service building with laundry, kitchen and staff room.

"We were hoping to change some attitudes toward these clinics and avoid a cold, institutional feel that makes them places to be avoided," said Stephen Form, a graduating senior who accompanied Wampler to Zambia. "There are ways to bring natural light into the wards and break up the program to create a microvillage rather than a single, huge building. It was simple moves with a few special touches here and there that can make all the difference in a project like this."

Wampler estimates that the three buildings, chapel and insaka would cost about \$35,000 in total to construct. Construction on the first center is expected to start late this summer.

"With our model, each community can be in a position to have its own care center, and with a couple of hundred of these across the country we will make a dent in this epidemic," said Subramanian. "Twenty years into it, we are learning that the AIDS epidemic can be solved only at a community level and only with the participation of the family and community," said Subramanian.

Community participation has been integrated into Wampler's design, which calls for an activity room in the service building

for people to learn skills for starting their own small businesses. Local skills-acquisition is a hallmark of Wampler's projects in the developing world; his projects are designed to build shelter and improve the financial standing of the people they house.

Wampler designed the prototype without pay. The foundation paid for his travel and a portion of the travel costs of two MIT architecture students—Form and graduate student Katice Helinski—who accompanied Wampler on a short trip to Zambia to assist him with the design.

Other funding for the trip came from MIT's Undergraduate Research Opportunities Program, Public Service Center and Edgerton Center.

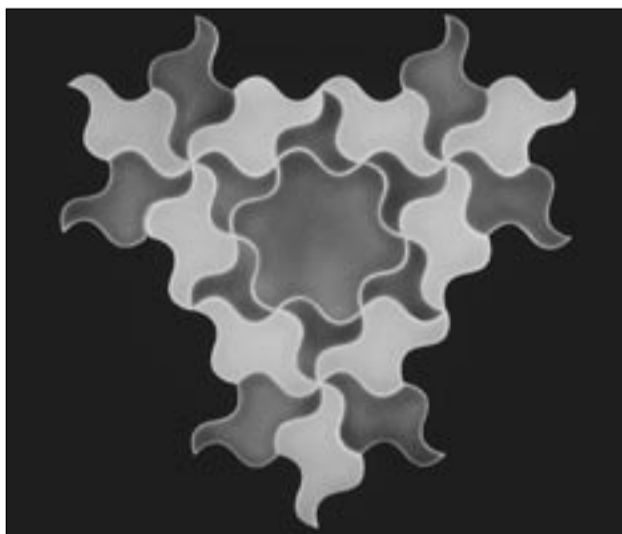


IMAGE COURTESY / AMY SANFORD

## MIT, Cambridge support arts

MIT is collaborating with the Cambridge Arts Council for Art Up Front, a community-building initiative presented through June 19 in conjunction with the 26th Cambridge River Festival (June 18). Art Up Front matches visual artists to local businesses to create window displays. Amy Sanford, administrative assistant in the Admissions Office, is showing her ceramic tiles (above) at Kirkland Cleaners (86 Kirkland St.). The MIT Coop will exhibit works by Amy Ross; the MIT Press Bookstore will feature works by James DeLancey; and the MIT Grounds Department in Building NW62 is hosting: works by Franceska Schifrin and Tova Speter.

## New index links housing needs to jobs

Anyone living within commuting distance of MIT—and these days that can be quite a distance—knows the litany: "Policemen and firemen often can't afford to live in the towns they serve," said David Geltner, director of MIT's Center for Real Estate (CRE). "Anyone who has kids trying to start out here knows how hard it is to afford a starter home. Bright students graduating from this region's universities are leaving rather than staying, because of the high cost of housing."

Geltner, opening the May 25 research conference sponsored by CRE's Housing Affordability Initiative (HAI), ticked off the familiar list to underscore why the center's researchers have developed a new way of tracking and evaluating the availability of affordable housing in the Greater Boston area.

The new technique not only measures housing prices relative to what people can afford, but also where people might want to live—by taking into consideration access to jobs throughout the Greater Boston area. The regional perspective is a first.

Data from the prototype index were presented by the CRE research team, led by Dr. Henry Pollakowski, director of HAI. Pollakowski limited his discussion to the availability of rental housing for households whose income is 50 percent to 80 percent of the Boston area's median income (AMI), which is \$66,200 for a family of two.

To illustrate the prototype results, Pollakowski gave several examples. Burlington and Woburn are towns with comparable accessibility to Boston-area jobs, but Woburn gets a higher (more favorable) index score because a greater percentage of Woburn's available rental housing is affordable.

Consider another pair of towns—Arlington and Haverhill. The two have similar percentages of affordable rental units, but Haverhill's index score is more than twice Arlington's, because Arlington, with better proximity to jobs than Haverhill, needs to have a larger stock of affordable rental units to rank as well as less-accessible Haverhill.

In other words, the index tells us that the Boston area would benefit more from additional units of affordable housing in Arlington than in Haverhill.

The conference was a lively one, with unusually brisk exchanges between presenters and the audience. Two panel discussions illuminated both the audience's enthusiasm for this novel approach to a chronic problem, as well as the challenges the team needs to consider as it refines its work over the coming year. Thomas Gleason, executive director of MassHousing, noted that the index would be extremely valuable as a tool "to help planners take charge of their destiny" but added, "I would plead for simplicity...if we need an MIT Ph.D. econometrician to explain it, it's not going to be helpful."

That's a challenge that Geltner relishes. He had noted previously that the Center for Real Estate is committed to solving "real problems in the real world," and reminded the audience that the Housing Affordability Index already has an excellent track record. Last month, HAI announced the results of its study of affordable housing projects—so-called 40B developments—in six towns in suburban Boston. That study demonstrated conclusively that mixed-income, high-density rental developments do not lower nearby property values. Both the 40B report, as well as materials from the May 25 research conference, are available at <http://web.mit.edu/cre/research/hai>.

# Gene may trigger adult stem cell growth

David Cameron  
Whitehead Institute

While research on human embryonic stem cells gets most of the press, scientists are also investigating the potential therapeutic uses of adult stem cells. Although less controversial, this research faces other difficulties. Adult stem cells are extremely difficult to isolate and multiply in the lab.

Now, as reported in the May 6 issue of *Cell*, researchers led by Rudolf Jaenisch of the Whitehead Institute have discovered a mechanism that might enable scientists to multiply adult stem cells quickly and efficiently.

"These findings provide us with a new way of looking at adult stem cells and for possibly exploiting their therapeutic potential," says Jaenisch, who also is a professor of biology at MIT.

This research focuses on a gene called Oct4, a molecule that is known to be active in the early embryonic stage of an organism. Oct4's primary function is to keep an embryo in an immature state. It acts as a gatekeeper, preventing the cells in the embryo from differentiating into tissue-specific cells. While Oct4 is operating, all the cells in the embryo remain identical, but when Oct4 shuts off, the cells begin growing into, say, heart or liver tissue.

Konrad Hochedlinger, a postdoctoral researcher in Jaenisch's lab, was experimenting with the Oct4 gene, curious to see what would happen in laboratory mice when the gene was reactivated in adult tissue in which it had long been dormant. Hochedlinger found that when he switched the gene on, the mice immediately formed tumors in the gut and in the skin where the gene was active. When he switched the gene off, the tumors subsided, demonstrating that the process is reversible.

Discovering that simply flipping a single gene on and off had such an immediate effect on a tumor was unexpected, even though Oct4 is known to be active in certain forms of testicular and ovarian cancer. Still, the most provocative finding was that "Oct4 causes tumors by preventing adult stem cells in these tissues from differentiating," says Hochedlinger. In other words, with Oct4 active, the stem cells could replicate themselves indefinitely, but could not produce mature tissue.

One of the main obstacles with adult stem cell research is that, in order for these cells to be therapeutically useful, researchers need to multiply them in the lab. But when adult stem cells are isolated, they immediately start growing into their designated tissue type, which limits their replication. If scientists could take a liver adult stem cell and multiply it in a dish, without having it form mature liver tissue, more tissue could be made.

This experiment showed that when Oct4 was reactivated, the adult stem cells in those tissues continued to replicate without forming mature tissue. In a mammal's body, this type of cell behavior causes tumors. But under the right laboratory conditions, it could be a powerful tool.

"This may allow you to expand adult stem cells for therapy," Hochedlinger said. "For instance, you could remove a person's skin tissue, put it in a dish, isolate the skin stem cells, then subject it to an environment that activates Oct4. This would cause the cells to multiply yet remain in their stem cell state. And because this process is reversible, after you have a critical mass of these cells, you can then place them back into the person where they would grow into healthy tissue."

"This could be very beneficial for burn victims," Jaenisch said.

This work was supported by the National Institutes of Health and Genzyme.

## Waves will flow through MIT team's new homes

Denise Brehm  
News Office

Using high-tech engineering principles, an MIT/Harvard team has developed a low-tech solution to the problem of how to build homes in tsunami-prone areas.

The team recently produced an architectural model for a Sri Lankan house that essentially would allow a powerful ocean wave to go through the house, instead of knocking it flat.

The "Tsunami Safe(r) Houses," which will be built for about \$1,200 each using materials available locally in Sri Lanka, will have four core columns made of concrete and rebar, each about 3 meters wide. Between these columns, homeowners can build walls of wood or bamboo to individualize the homes. Engineering simulations indicate that the design will help the core and foundation of the homes to withstand water or wind force over five times greater than a traditional concrete-block Sri Lankan home.

MIT's Buddhist chaplain, Tenzin Priyadarshi, and Carlo Ratti of MIT's Senseable City Laboratory (part of the urban studies department) initiated the project. They and the MIT Buddhist Foundation, Prajnopaya, hope to begin building the homes in Sri Lanka next month with money raised from donations. Tenzin will work with a board



PHOTO / BURO HAPPOLD

An MIT team designed homes to withstand waves and flooding in such tsunami-prone areas as Sri Lanka. Each house stands 2 feet above the ground and has four concrete-block columns.

of directors representing several religious traditions and the Sri Bodhiraja Foundation in Sri Lanka. People of all faiths who lost homes in the 2004 tsunami are eligible for the homes.

The one- or two-bedroom, one-bath homes will be about 400 square feet and include an open floor plan for the kitchen and living areas. The homes will be built atop concrete blocks or wood 1 or 2 feet above ground so that high waters can flow

underneath, making them more storm resistant. The architects also designed a community center based on a similar type of construction to provide secular meeting places for the neighborhoods.

The new owners will be encouraged to take part in the construction of their homes.

Coordinators of the project are architects Ratti and Walter Nicolino of MIT, who are working with Luis Berrios-Negron, an MIT graduate student in architecture,

and a team of graduate students from Harvard's Tsunami Design Initiative: Ellen Chen, Eric Ho, Nour Jallad, Rick Lam and Ying Zhou. The London-based engineering firm, Buro Happold, ran the simulations using a computer model the firm designed following its onsite, post-tsunami research.

Donations can be made at [www.prajnopaya.org/tsunamiid.htm](http://www.prajnopaya.org/tsunamiid.htm). For more information about the design, visit [searchable.mit.edu/tsunami-prajnopaya](http://searchable.mit.edu/tsunami-prajnopaya).

## Research explains how the brain finds Waldo in a crowd

At any given moment, the world bombards the senses with more information than the brain can process, and for more than a century scientists and psychologists have debated how the brain filters out distractions and focuses attention on the things that matter.

Using the visual system as a model, Professor Robert Desimone, director of the McGovern Institute for Brain Research at MIT, and his former colleagues at the National Institutes of Health show that neurons synchronize their signals to command attention, like a chorus rising above the din of noisy chatter in a crowded room.

"We think that synchronizing signals could be a general way the brain focuses on what's important," says Desimone, who also holds an appointment through MIT's Department of Brain and Cognitive Sciences. "Attention is a general problem for the brain, and maybe it has a general solution."

This new study, published in a recent issue of *Science*, addresses a central

question that anyone who has tackled a "Where's Waldo?" book can appreciate. "Where's Waldo," (1990) the now-classic children's puzzle book, asks the reader to find a slender Waldo amidst crowds of increasing density.

When looking for Waldo on the crowded page, does the brain scan the page spatially (serial processing), like a mental spotlight moving across an otherwise dark page? Or does the brain take in the whole page at once and gradually zoom in on relevant features such as color and shape (parallel processing)?

In the first model, the spotlight of attention would track across the page, checking each detail against a mental image of Waldo's red stocking cap and striped shirt. In the second model, the color red and stocking-cap shapes would gradually come to the foreground and other shapes and colors would recede.

For decades, scientists divided into two camps regarding these models, but recent evidence made some scientists suspect that the brain conducts a combination of

the two. "What's cool about this paper is that it shows both processes are going on in the same chunk of the brain and in the same neurons," says Jeremy Wolfe, professor of Ophthalmology at Harvard Medical School, who wrote an accompanying review article in *Science*.

To explore visual attention, researchers study macaque monkeys, recording the activity of specific neurons, along with the eye movements, while the monkeys scan a complex array in an experimental equivalent of looking for Waldo. The neurons belong to the V4 area, a midregion of the visual cortex known to be important to attention.

Neurons specialize as to what they detect best. A "red" neuron gives off a stronger signal when red appears in the field of view, and the signal is even stronger if the monkey is actively searching for red. Moreover, if the monkey is searching for a red object, red neurons turn up their activity before the eyes even move toward the red item, as if the louder signal were calling: Look over here! "We think the yelling neurons are commanding the eyes to move

toward a feature that matches something in the mental image," Desimone says.

Even so, the ability of a neuron to raise its lone voice does not explain how it gets heard over the cacophony of all the other neurons. "We think it's not just a question of the individual neuron," he says. "It's how it cooperates with other neurons to make their voices heard. We showed that to increase the signal, the neurons synchronize their activity."

Desimone uses the analogy of a room full of people talking. If random individuals raise their voices, the room just gets louder. If a group of people starts chanting in unison, their voices rise above the background noise.

Synchronization of the signals helps explain how the brain uses parallel processing to concentrate on relevant features in a complex scene. Then the brain switches to serial processing, scrutinizing relevant objects sequentially to find the object of desire.

The study was funded by the National Institute of Mental Health.