MIT TECH TALK

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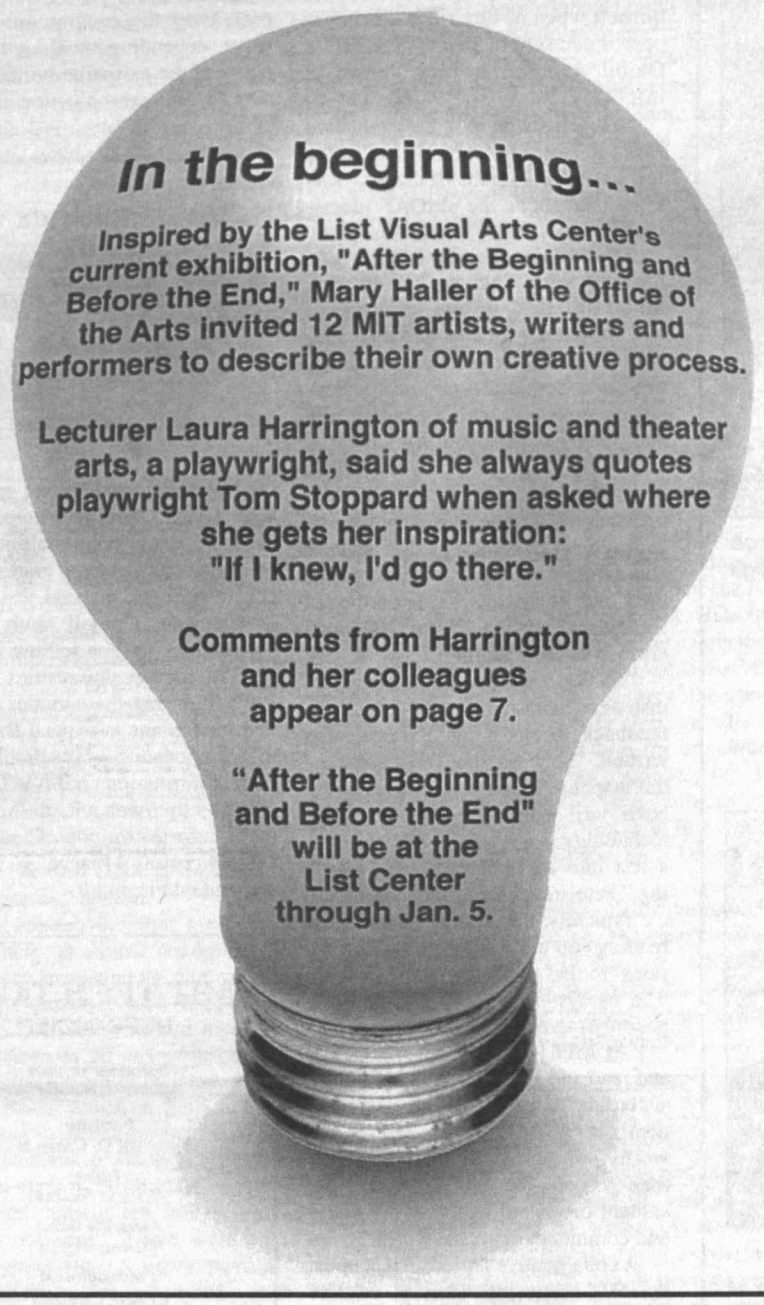
WEDNESDAY ■ DECEMBER 18, 2002



Julian Bond to speak at MLK commemorative breakfast on February 14

■ **By Robert J. Sales**
News Office

Julian Bond, who stood shoulder to shoulder with Dr. Martin Luther King Jr. during the early days of the civil rights movement, will be the keynote speaker at MIT's 29th annual breakfast celebrating Dr. King's life and legacy.

Bond, a professor at the University of Virginia and chair of the National Association for the Advancement of Colored People (NAACP), will address the theme "Faces at the Bottom of the Well: Nightmare of Reality vs. Dr. King's Dream."

The breakfast will take place on Friday, Feb. 14 at 7:30 a.m. in La Sala de Puerto Rico in the Stratton Student Center. Reservations are required.

The theme is suggested by Derrick Bell, lawyer and civil rights activist, in his 1992 book, "Faces at the Bottom of the Well." In his introduction, Bell wrote:

"Black people are the magical faces at the bottom of society's well. Even the poorest whites—those who live their lives only a few levels above poverty—gain their self-esteem by gazing down at us. Surely they must know that their deliverance depends on letting down their ropes. Only by working together is escape possible. Over time, many reach out, but most simply watch, mesmerized into maintaining their unspoken commitment to keeping us where we are, at whatever cost to them or us."

While an undergraduate at Morehouse College, Bond played a key role in organizing protests that led to the desegregation of Atlanta's movie theaters, lunch counters and parks. Bond himself was arrested for sitting in at the segregated cafeteria in Atlanta's City Hall.

He helped create the Student Non-Violent Coordinating Committee in 1960 and worked in voter registration drives in rural Georgia, Alabama, Mississippi and Arkansas.


Bond


King

He was elected to the Georgia legislature in 1965 and 1966 but was denied his seat because of his outspoken opposition to the Vietnam War. The U.S. Supreme Court ruled that the Georgia House had violated his rights, and Bond went on to serve four terms in the Georgia House and six terms in the Senate.

In 1968, Bond co-chaired the Georgia Loyal Delegation to the Democractic Party national convention and was nominated for vice president. He withdrew his name because he was too young to serve.

Bond was the founding president of the Southern Poverty Law Center in 1971. A longtime member of the NAACP board, he was elected chair in 1998.

He narrated the critically acclaimed 1987 and 1990 PBS series "Eyes on the Prize" and the 1994 Academy Award-winning documentary "A Time for Justice."

Bond is a distinguished scholar in residence at American University and member of the faculty in the University of Virginia Department of History. He has taught at the University of Pennsylvania, Drexel University, Harvard University and Williams College. He is the author of "A Time to Speak, a Time to Act" (1972).

Inexpensive glasses: sight for poor eyes

MIT researcher develops process that lowers cost of lenses

■ **By Denise Brehm**
News Office

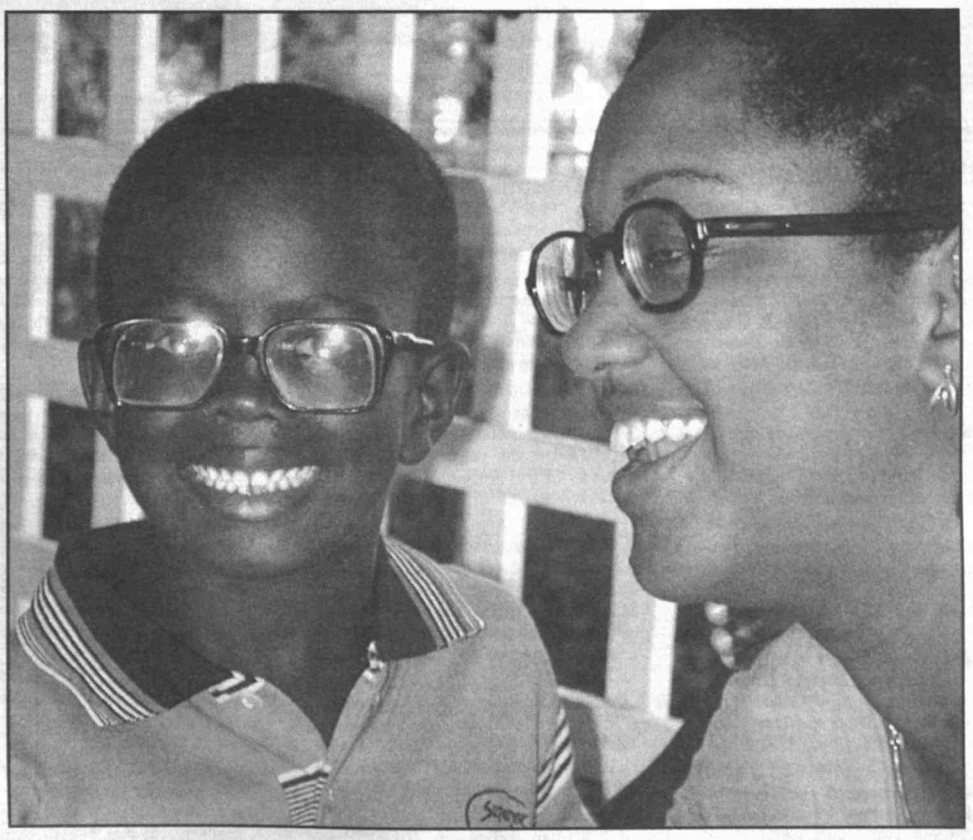
Saul Griffith's vision may help millions of people see better.

The Media Lab graduate student has invented a machine to make low-cost prescription eyeglass lenses for people in the developing world who can't afford them now.

The portable device, about the size of a snare drum, has a programmable mold that forms an acrylic lens in the exact shape prescribed by an optometrist. Griffith won the Collegiate Inventors Competition for his invention and was inducted into the National Inventors Hall of Fame last month. He and a friend, Neil Houghton, won the Harvard Business School business plan contest in 2001 for their proposed company, Low Cost Eyeglasses, which they hope will market the eyeglasses in Africa, India, South America and other parts of the developing world.

Griffith said he made the machine from "stuff I could find around the house." For instance, the flexible mold changes shape when Griffith pushes the plunger on a large syringe that injects baby oil into a small rubber tube leading to the mold.

The machine is an alternative to the far more expensive injection molding, which requires that a separate mold be produced for each eyeglass prescription. And while this machine is designed specifically for molding lenses, the concept would work for other uses as well, said Griffith, who imagines that mass-produced dolls could be individualized by giving each a discrete face.


While on a trip to distribute donated eyeglasses, senior Selam Daniels (right) smiles after fitting a very nearsighted Guyanan boy with his first pair of glasses. **Photo by Saul Griffith**

Griffith went to Guyana in 2001 with the Midland (Texas) Lions Club, which had collected used eyeglasses for distribution in Africa. He said he was frustrated by the difficulty of matching a person's vision needs to glasses from the collected batch.

"If you do find the exact prescription match, you might be placing a pair of large, rose-tinted women's glasses on a strapping young man whose girlfriend giggles when he turns around to show her," said Griffith. "It was mostly in frustration with that initiative and its low-quality product" that he developed his system for

(continued on page 8)

He's in the Army now

■ **By Robert J. Sales**
News Office

Senior Aneal Krishnan, cadet battalion commander of the MIT Army ROTC unit this semester, will be commissioned as a second lieutenant in the U.S. Army National Guard on Friday, Dec. 20, at the unit's offices in Building W59.

After Krishan graduates in February, he goes directly to Ft. Benning, Ga., for four months of infantry officer basic training. After that, he will join Goldman Sachs' investment banking division in New York and be assigned to the New York National Guard as a platoon leader.

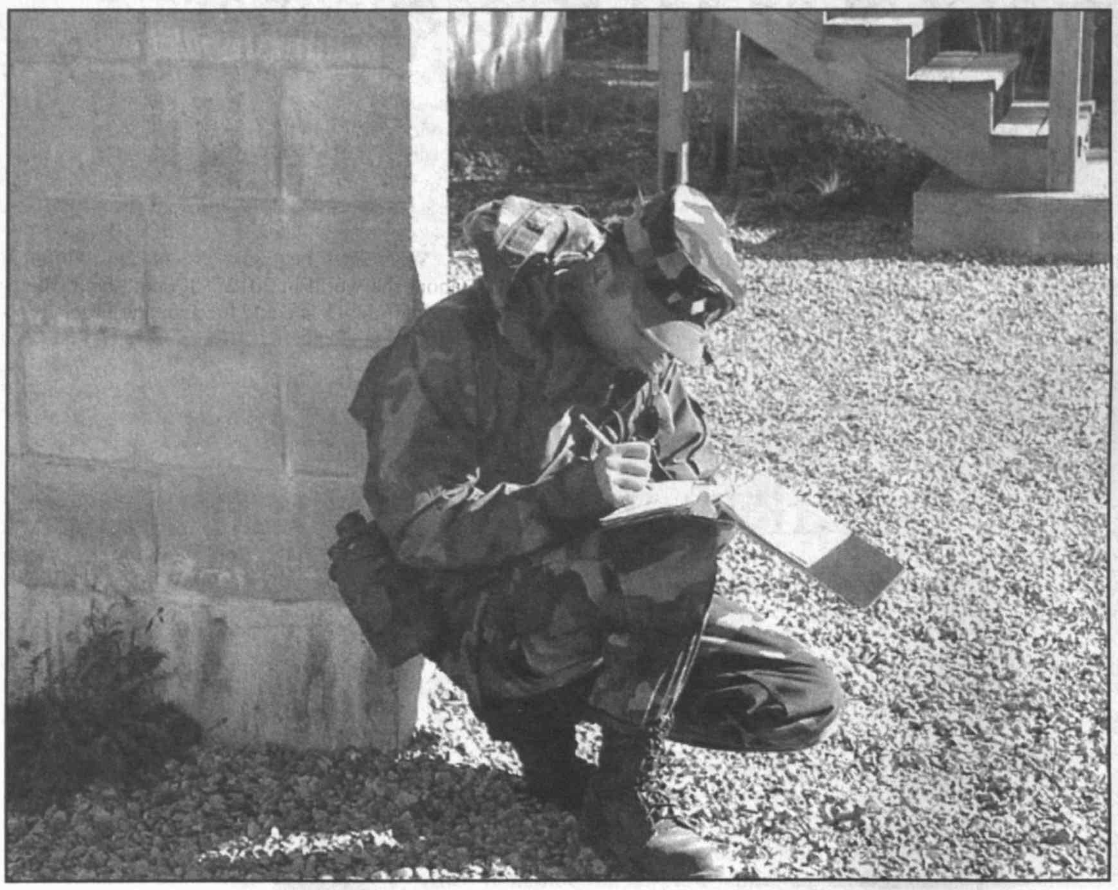
All this transpires as the United States armed forces prepare for combat with Iraq. Krishnan will be assigned to a light infantry unit, one of the more dangerous postings.

"Honestly, it concerns me," he said. "Our mission is to attack enemy infantry and tanks on the front lines and hold our position until we are reinforced by heavier units. Casualty rates for units like mine in combat are fairly high. I could think of safer ways to spend my time than clearing enemy bunkers in the desert wearing full chemical environment pro-

(continued on page 2)

Schedule change

There will be no Tech Talk on Jan. 15. The paper will be published as scheduled on Jan. 8 and 29.



Cadet Battalion Commander Aneal Krishnan hunkers down to write an evaluation of a cadet's performance during fall field training exercises at Camp Edwards on Cape Cod. **Photos by Lt. Sean McDonough**

Cadet commander is in the Army now

(continued from page 1)

tection suits."

Krishnan, who is from Arlington, Texas, is an honors student with a double major in management and electrical engineering and computer science. Last summer, he commanded an active-duty infantry platoon in South Korea during a month-long internship designed to provide field experience for ROTC cadets.

"I led my platoon in combat training along the DMZ," recalled Krishnan, a graduate of the U.S. Army Airborne School. "It was an awesome experience. The internship was one of the main reasons I was hired by Goldman Sachs. This is a perfect example of how the military gives you experience and skills to make you highly marketable in the civilian world."

Krishnan was awarded the Armed Forces Communications and Electronics Association (AFCEA) Educational Foundation Award in 2001 for achievement in a technical field. He received the 2002 MIT Charles Smith Award, the highest cadet honor, for outstanding performance and dedication in the battalion. He will also receive the Army First Command award for being the top-rated cadet in a brigade of 20 schools at the commissioning ceremony.

"My conception of a difficult task has drastically changed since I joined ROTC," Krishnan said. "The training was as much fun as it was challenging. I have gotten the free opportunity to fly in helicopters, jump out of airplanes and throw hand grenades, which are things that some people pay tons of money to do."

Krishnan, a member of Theta Xi and the a cappella singing group, Chorallaries, derived a valuable fringe benefit from his ROTC training. "I'm in great shape," he said. "I am one of the few guys in my group of friends who is graduating without a beer belly."

Wearing dress uniform, Commander Krishnan poses for a formal portrait in front of the American flag.

Students give rave reviews to online critic

■ **By Sarah H. Wright**
News Office

Thank-you notes so rarely follow exams that Leslie Perelman, director of Writing Across the Curriculum in the Program in Writing and Humanistic Studies, has to repeat himself when he describes this unexpected measure of success for MIT's Online Assessment Tool, known as iMOAT.

"Students who took the evaluation loved it. Even students who failed the test have sent e-mails of thanks," said Perelman about the iMOAT assessment process.

The test doesn't sound like a gift; it's hard work. Each student entering MIT must read on the web one or two substantial articles and then submit two essays for evaluation to determine what level of communication-intensive course in the humanities, arts and social sciences they will take.

A 'suite' of web-based services for online writing assessment, iMOAT provides a secure environment for students to read the assigned selections and write the essays at home using their own computers. It also provides students a detailed 250 to 300-word critique of their writing.

"Students prefer using a computer instead of handwriting, and getting the feedback means a lot. Parents have written, 'That was the most substantial response to our child's writing we have ever seen!' It's a great use of technology in education; it transforms a test into an opportunity for learning," Perelman said.

Typically, the student receives the readings on a Tuesday, and the questions to be pondered on a Friday. The essays—one narrative, one expository—are due 72 hours later.

"At MIT, we print out the essays and read and grade them on hard copy according to a point scale. Each student gets about a page—250 to 300 words—of general comments. These then go onto the secure site and the student can see his or her own score and comments," Perelman said.

A collaborative project of iCampus, the MIT-Microsoft Alliance, iMOAT was developed in conjunction with the California Institute of Technology, DePaul University, Louisiana State University and the University of Cincinnati. All four universities used iMOAT in the summer of 2002 with rave reviews from both students and faculty.

Perelman praised the "robustness" of iMOAT's design, noting that collaborators in the project development each used the program in different ways, depending on the culture and needs of the particular university.

LSU, for example, uses iMOAT at the beginning, middle and end of the school year, Perelman noted. "They use it to assess accountability and to measure consistency of grading across course sections," he said.

"Even students who failed the test have sent e-mails of thanks."
—Leslie Perelman

Clemson, Cornell, and Oakland Universities will be joining MIT and its four partner universities in using iMOAT during the summer of 2003. Perelman plans to expand the system to accomodate 50-60 schools. Additional information on iMOAT is available at http://web.mit.edu/imoat. For more information on iCampus, the MIT-Microsoft Alliance, go to http://web.mit.edu/icampus.

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Student
Notices

* **Open to public**
** **Open to MIT community only**

INSTRUCTIONS: Listings for Student Notices should be submitted using the form at http://web.mit.edu/newsoffice/tt/calform.html. If you have questions, please contact ttcalendar@mit.edu or 253-1683.

December 18 - January 12

■ RELIGIOUS ACTIVITIES

The Chapel is open for private meditation 7am-11pm daily.

Baptist Campus Ministry**—Monthly events: First Sunday, 6pm, food followed by Christian discussion, Westgate Lounge, Bldg W85 bsmnt. Weekly: Mondays, 1:30pm, sm group Bible study, Westgate Lounge. Thursdays, 1-3pm, free intl student English classes, Bldg W11 board rm. Thursday, 7pm, BSF Bible study/worship, contact bgoza@mit.edu. Chaplain: Michael Dean (W11-029), Campus Minister: Bryan Goza. More info: 253-2328 or mdean@mit.edu.

Buddhist Meditation and Worship*—Sundays, 10-11am, intro to Buddhist meditation/mind training, beginners welcome. Mezzanine Lounge, Stratton Student Ctr. Wednesdays, 7-8pm, lecture/discussion on Shantideva's "Guide to Bodhisattva Way of Life." Rm 8-205. Sponsored by Buddhist Community. More info: 617-324-6030 or http://www.mit.edu/activities/metta/home.html.

Campus Crusade for Christ**—Wkly mtg: Tuesdays, 8pm, PDR 1 & 2, Student Ctr. More info: 225-6229 or amalwitz@mit.edu.

Chi Alpha Christian Fellowship**—Wkly worship, Bible teaching, discussion. Fridays, 7:30-9pm, W11-080. More info: 253-2327, cacf@mit.edu or http://www.mit.edu/activities/xa/main.html.

Communitas-Life Together**—Protestant worship, Sundays, 11am. Sponsored by Amer Baptist Church, United Church of Christ, United Methodist Church, Presbyterian Church. Chaplain John Wuestneck, 252-1780 or chaplain@mit.edu.

Graduate Christian Fellowship**—Wkly mtgs Fridays, 6pm. Also wkly Bible studies, prayer and volleyball. More info: http://web.mit.edu/mitgcf or mit-gcf-info@mit.edu.

Lincoln Lab Bible Study*—Wednesdays, noon-12:30pm, Group 73 conference rm (D-382). More info: Sharon Frigon, 181-7730 or frigon@ll.mit.edu.

Lutheran-Episcopal Ministry at MIT*—Worship, Wednesdays, 5:10pm, followed by dinner and program, Bldg W11 dining rm. Mondays, 5:30-7pm, Bible study and pizza, Bldg W11 bsmnt. More info: 253-0108.

Meditation and Discourse on the Bhagavad Gita*—Fridays, 4:30pm, MIT Chapel. MIT chaplain Swami Tyagananda, monk of the Ramakrishna Mission of India. Sponsored by the MIT Vedanta Society. More info: 617-661-2011 or mehta@cytel.com.

MIT Hillel**— Daily Orthodox services, Sun-Fri, 7:30am and 7:45am and each afternoon. Kosher dinners, Mon-Thurs, 6-7:30pm. Sundays, 11am, volunteer group at local soup kitchen. Mondays, 6pm, Jewish philosophy class. Tuesdays, 5pm, Jewish holidays class. Tuesdays, 6:45 pm, Tanya Class. Wednesdays, 5pm, advanced Talmud class. Thursdays, noon, weekly Torah class. Fridays, 6pm, Shabbat evening services (Conservative, Orthodox and Reform). Fridays, 7pm, Shabbat dinner. Saturdays, 9am, Shabbat services (Orthodox). Saturdays, 12:30pm, Shabbat lunch. More info: 253-2982 or web.mit.edu/hillel.

MIT Muslim Students Association*—Five daily prayers, Bldg W11. Also, Friday congregation 1:10-1:45pm, Rm W11-110. Daily Iftars during Ramadan. More info: msa-ec@mit.edu.

MIT Orthodox Christian Fellowship**—MIT Wednesdays at 5:30pm in West Lounge 2nd flr of Student Ctr, discussion meeting followed by Chapel Vespers. More info: orthodox-acl@mit.edu.

Protestant Eucharist/Holy Communion*—Wednesdays, 5:10pm in Chapel. Sponsored by the Lutheran-Episcopal Ministry at MIT. More info: Lutheran Chaplain, 253-2325 or jkiefner@mit.edu or Episcopal Chaplain, 253-2983 or mccreath@mit.edu.

Tech Catholic Community**—Sunday Masses at 9:30am, 1pm and 5pm. Weekday Masses Tuesdays and Fridays at 12:05pm when classes are in session. MIT Chapel. More info: 253-2981 or catholic@mit.edu.

United Christian Fellowship (UCF)**—Lrg group mtgs, Fridays, 7:15pm, Kresge Rehearsal Rm B. Wkly dorm-based Bible studies on and off campus. More info: mitucf-request@mit.edu or http://web.mit.edu/ucf/www.

■ STUDENT JOBS

For other job listings and more information about the following listings, go to the Student Employment Office, Rm 11-120 or http://web.mit.edu/seo. The MIT Student Employment Office functions much like the classified section of a local newspaper, and does not screen potential employers or employees.

Off-Campus, Technical. Office assistance needed in the Langer lab headquarters during December and into 2003 (IAP, spring and summer). Seeking several student workers to photocopy, answer phones, file, mail reprints, etc. Hrs flexible, pay iss $10/hr. Contact Constance Beal, 258-5290 or cjbeal@mit.edu.

Off-campus, Technical. Java programmer needed. Must understand web services, spidering and information parsing. Part time, Dec-Feb. Pay is $25-$33/hr. Contact Axel Christensen, 617-335-9080 or axelc@attbi.com.

On-Campus, Non-Technical. Assist the staff at Rotch Visual Collections in researching a slide project. Work includes data entry, library research, fact-checking. Some knowledge of art history and architecture useful. Pay is $9/hr. Contact Nicole Rioles, 253-2955 or nrioles@mit.edu.

The following positions are for students with Federal Work-Study Eligibility.

Community Service. Boston Learning Center seeks tutors for students in grades 6-12. Tutor in reading, English, writing, grammar, algebra, geometry, calculus, biology, chemistry, physics, Spanish, French, Latin or test prep for SAT exams. Pay is $10-$15/hr. Contact Sonya Esther, 617-265-7170 or boslearn@aol.com.

Community Service. Cambridge School Volunteers, an agency that provides tutoring and academic support to students (K-12), seeks outgoing, flexible person to provide office coverage Mon-Thurs, 11:30am-2:00pm. Answer phones and work on projects with fun supportive staff. Contact Jennifer Fries Singh, 617-349-6794 or daisy_rodriguez@cps.ci.cambridge.ma.us.

RNA pioneer looks back

■ By Deborah Halber
News Office

DNA makes RNA makes protein. In retrospect, it couldn't be clearer. But to Alexander Rich and the other pioneers trying to figure out RNA structure and protein synthesis in the low-tech 1950s and '60s, nothing was obvious.

Rich, the William Thompson Sedgwick Professor of Biophysics, gave the 2002 Christmas lecture Monday in the History of Molecular Biology Series.

Fifty years ago as a postdoctoral fellow in Linus Pauling's laboratory, Rich followed his mentor's directive to "have a look at DNA." Watson and Crick's paper showing the DNA double helix came out shortly after, so Rich turned his attention to RNA. What followed was a wild ride through false steps, persistent misinformation and dead ends as researchers tried to reverse engineer the beginnings of life.

"What's remarkable is we got there," Rich told his audience, made up largely of people born after the work had been done as many of his audiences are these days.

Rich first showed that RNA, like DNA, could form a double helix. Then, as head of physical chemistry at the National Institutes of Health, he performed the first hybridization reaction. Later at MIT, he created the first DNA-RNA hybridization, where one strand with a DNA backbone is made to wrap around another strand with an RNA backbone and the strands are held together by complementary hydrogen bonds.

"I thought it would be very nice if we could work with DNA as well as RNA in these systems," he said.

Rich created the first pictures of the double helix at atomic resolution, labeled by Science magazine as "the missing link in DNA structure" and leading Francis Crick to declare, "I've had my first good night's sleep in 20 years." Rich also first demonstrated what is now known as messenger RNA, although he acknowledged that it took a long time for the concept of mRNA to become widely accepted.

"You cannot imagine the profundity of ignorance" among researchers, including himself, he said. "There were so many things going on, so many possibilities." Each incremental step forward was the result of years of painstaking work to try to visualize a microscopic entity before the age of 3-D computer modeling. "Now," he said, "you wonder, 'What's all the fuss about? Why did it take so long?'"

Magazines discover MIT researchers

MIT researchers are among visionaries featured in end-of-the-year magazine stories that either profile or query experts about developments in their field.

Professor Robert S. Langer is one of the "15 people who will reinvent your future," according to a Dec. 10 piece in Forbes Magazine.

In its December issue, Scientific American includes Professor Alice Amsden of urban studies and planning among 50 "visionaries from the worlds of research, industry and politics whose recent accomplishments point toward a brighter technological future for everyone."

Professor Steven Pinker was one of the "10 top scientists" the British science magazine Focus asked to look into the future. Focus also cited Tim Berners-Lee's conception of the World Wide Web as one of the top 10 science stories over the last 10 years. Berners-Lee is a senior research scientist at the Laboratory for Computer Science.

LANGER

Monte Burk, writing in Forbes, dubs Langer "Plastic Man," describing him as "an architect in plastic whose remarkable work may one day let you grow a new heart or replace a bone."


Langer

Langer, the Germeshausen Professor of Chemical and Biomedical Engineering, is the "top of the top in [the field of] tissue engineering," Bruce Hamilton of the National Science Foundation told Burke. Hamilton should know; he's director of bioengineering and environmental systems at the agency.

Burke also notes Langer's work in a variety of other areas, including the controlled release of cancer drugs. For example, his degradable wafer for distributing drugs directly to brain tumors "became the first new brain cancer treatment in 25 years when the FDA approved it in 1996."

The Forbes profile caps a particularly extraordinary year for Langer. In January he was awarded the Charles Stark Draper Prize, a $500,000 award considered to be engineering's equivalent of the Nobel Prize. He received the prize for his work on drug delivery technologies.

AMSDEN

In its December issue, Scientific American includes Professor Alice Amsden of urban studies and planning among the 50 "visionaries from the worlds of research, industry and politics whose recent accomplishments point toward a brighter technological future for everyone." The Scientific American 50 "have demonstrated clear, progressive views of what our technological future could be, as well as the leadership, knowledge and expertise essential to realizing those visions."


Amsden

Amsden was cited because she "identified strategies for economic development that could be of singular value to non-Western countries on the rise," the magazine said.

Amsden, too, has had a good year. In January she wrote an editorial for the New York Times on globalization and how it remains provincial. "A smattering of rich countries exercises leadership in international organizations and world markets, despite the principle of a level playing field," she wrote.

PINKER

To celebrate its 10th anniversary, Focus looked at the scientific advances of yesterday and tomorrow. MIT researchers are featured in each.


Pinker

Focus asked Pinker several questions about the future. For example, what major advances does he expect to see in his area of science over the next 10 years?

"We'll know more about what parts of the brain are involved in a greater number of human activities," said the Peter De Florez Professor of Psychology. "Things like the appreciation of beauty, or the emotion of anger, or moral sense—we know they've got to be in there somewhere, unless you believe in the soul, but we haven't the foggiest idea where."

What does he think will be most different about the world in 2012? "It could be a smouldering ruin. Or it could have greater peace, prosperity and democracy. I'm more of an optimist than a pessimist. I think that, on the whole, things have been getting better in the last 50 years, and, on the whole, they'll continue to get better."

BERNERS-LEE


Berners-Lee

Focus cited Berners-Lee's conception of the World Wide Web as one of the top 10 science stories over the last decade. The web, says the magazine, is "the biggest advance in information technology since Gutenberg's invention of the printing press in 1450."

Elizabeth Thomson


The recently promoted members of the Department of Facilities are (left to right): James Wallace, Patricia Kennedy Graham and Dave McCormick. Photo by Donna Coveney

Three promoted in Dept. of Facilities

James Wallace was promoted to director of facilities operations and administration in the Department of Facilities, effective Nov. 1.

Wallace, who as director of operations restructured the department's repair and maintenance unit, will be responsible for all operational, administrative and financial issues within the department.

"Having Jim assume these additional responsibilities will allow me to focus on our renovations and capital building program as well as further developmental work with CRSP [the Committee for the Review of Space Planning], the Building Committee and the Capital Planning Group," Chief Facilities Officer Vicky Sirianni said in making the announcement.

At the same time, Sirianni announced promotions for David McCormick and Patricia Kennedy Graham.

McCormick, who helped construct the Reflecting Wall immediately after the Sept. 11 attacks, is now assistant director of operations. He previously served as the structural services manager of Repair and Maintenance.

"He will expand his work with Jim in the operational areas," Sirianni said.

Graham has been promoted to director of administration and assistant director of facilities. As the department's executive administrator, she has represented the Department of Facilities on several institutional committees, including Administrative Advisory Council II.

"She has the vision necessary to assist Jim in our administrative areas," Sirianni said.

In addition to his administrative responsibilities, Wallace was a trainer in the department's "Communications Solves Problems" customer service training program, adapted by the Professional Learning Center and offered to the MIT community in 1999.

The course supported specific departmental objectives such as standard response times to customer inquiries, guidelines for providing telephone assistance and involving other staff to help solve problems. All department employees were required to take the course.

Institute ■ Calendar

* Open to public
** Open to MIT community only

(For arts-related listings, see page 6.)

INSTRUCTIONS: Seminars & Lectures must be submitted to the online Events Calendar at http://events.mit.edu. If you have questions about using that calendar, see the online help page, contact the I/S Computing Help Desk (Mac: 253-1101, PC: 253-1102) or e-mail computing-help@mit.edu.

Listings for Community Calendar should be submitted to the News Office using the form at http://web.mit.edu/newsoffice/tt/calform. html. If you have questions, please contact ttcalendar@mit.edu or 253-1683.

Events must be MIT sponsored and take place on the MIT campus or at an MIT affiliate (Draper Labs, Lincoln Laboratory, etc.).

Next deadline for all types of listings is noon Friday, January 3, covering events from Wednesday, January 8 through Sunday, February 2.

December 18 – January 12

■ SEMINARS & LECTURES

WEDNESDAY, DECEMBER 18

Diabetes—William Kettyle.** Sponsored by MIT Medical. Noon-1pm. Rm E25- 401. More info: 253-5770 or http://web.mit.edu/medical/yourhealth.

Public Service in a Liberalizing World*—Raymond-Franqois Le Bris. Sponsored by MIT France Program. Noon-2pm. Millikan Room (E53-482). More info: 253-8095 or http://web.mit.edu/mit-france/whatsnew.html.

THURSDAY, DECEMBER 19

The Marginal Impacts of Different Greenhouse Gases—Chris Hope.** Sponsored by Mexico City Project. 9am. Rm 54-915. More info: 253-1603 or ltmolina@mit.edu.

THURSDAY, JANUARY 9

CSBi Conference in Systems Biology*—8:30am-6pm. Sponsored by Biology, EECS, Biological Engineering Division. Wong Aud. More info: http://csbi.mit.edu.

■ MITAC

Edaville Railroad Discounts (South Carver, MA), ongoing. Ticket: $11 (reg $15), under 3 free. Purchase by Jan 5.

Subterranean Landscape Tour at MIT (Cambridge, MA), Jan 8, noon or 1pm. Ticket: free. Pick up by Jan 3.

Lowell Lock Monsters vs Worcester Icecats (Lowell, MA), Jan 12, 4pm. Ticket: $6 (reg $17). Purchase by Dec 27.

The Emperor's New Clothes (Lyric State, Boston, MA), Jan 19, 11am. Ticket: $7. Purchase by Jan 3.

Sunday Afternoon Music at the Gardner Museum (Boston, MA), Jan 19, 1pm. Ticket: $17 (reg $18). Purchase by Dec 20

BB King (Lowell, MA), Jan 19, 8pm. Ticket: $47 flr seats (reg $49.50). Purchase by Dec 19.

Boston Classical Orchestra presents Nina Kotova (Boston, MA), Jan 24, 8pm. Ticket: $20 (reg $23). Purchase by Jan 17.

Obituaries

ROBERT HUDSON

Robert Hudson of Spring Hill, Fla., a former staff member at Lincoln Laboratory, died on Dec. 6 at the age of 75. He was hired in 1952 and retired in 1991. Survivors include his wife, Maureen.

WILLIAM A. MORRELL

William A. Morrell of Sarasota, Fla., a former custodian in Physical Plant, died on Oct. 25 at the age of 90. He began working at MIT in 1968 and retired in 1979. He is survived by two sons, Richard of Kingston, N.H., and William of Weymouth; a daughter, Nancy Sullivan of Sarasota, Fla.; seven grandchildren and five great-grandchildren. A graveside service was held at Blue Hills Cemetery in Braintree on Oct. 31. Memorial donations may be made to the Hospice of Southwest Florida, 5955 Rand Blvd., Sarasota, FL 32438.

MANUEL SOUZA

Manuel Souza of Woburn, a former guard at Lincoln Laboratory, died on Dec. 4 at the age of 75. He retired in 1992 after 18 years at Lincoln Lab. Survivors include his wife, Mildred.

LEONARD WHALEY

Leonard Whaley of Cambridge, a former area manager in Housing, died on Oct. 23 at age 92. He retired in 1975 after working at MIT for 30 years. Survivors include his wife, Barbara.

Pharmaceutical industry balances profits, moral responsibilities

■ **By Nancy DuVergne Smith**
CTPID Communications Director

The pharmaceutical industry is a high-stakes venture with both a fiscal and moral bottom line, the leader of pharmaceutical giant Roche Holding Ltd. told an MIT audience recently.

While investors have come to expect double digit returns each year, development costs are steadily rising and productivity has stalled. "The biggest challenge for us is how to cure the sick and run a profitable business at the same time," Roche chair and CEO Franz Humer said in Wong Auditorium on Nov. 20.

Costs and risks have accelerated in recent years, Humer said in his talk on "The Pharmaceutical Industry in the Global Economy," co-sponsored by the Office of Corporate Relations and the Center for Technology, Policy and Industrial Development. The cost of a new drug program runs about $800 million and drug development costs have risen more than 7 percent a year for the past decade.

Humer

These costs are significant since so few drugs make it to market. "Of 10,000 compounds in the test tube, only 10 make into human testing," Humer said in his talk, this year's third Industry Leaders in Technology and Management lecturer. "Only one makes it to market. And only one of four that make it to market returns its investment." A further obstacle is the slowdown in the government approvals. In the 1990s, the FDA approved 35-45 new compounds a year. In the first nine months of 2001, only 11 were approved, he said.

During Humer's time with Glaxo Holdings PLC from 1981-94, the patent exclusivity period for the heartburn medicine Tagamet was eight years. "When Roche launched the first protease inhibitor for the treatment of AIDS, the second and third one followed 11 and 12 months later," he said.

Despite these challenges, Roche posted nearly $15 billion in sales and 12 percent growth in 2001. Under Humer, who became chairman in 2001, Roche is refocusing its energies. He has abandoned the 1990s mergers and acquisitions trend in favor of alliances among equals.

"Large mergers, large acquisitions in this industry destroy value, destroy innovation," Humer said. "You do need critical mass to compete globally, but once you have that, size does not give you an ability to innovate. What you need is agility, focus, speed, and the ability for research, development and marketing to work together."

The dual goal of relieving suffering while making a profit has made the industry vulnerable to recent charges of overpricing AIDS drugs in developing countries. Humer, who says Roche does not patent drugs in the least-developed African countries, says the problem is not so simple. He said lack of transportation, cold storage and medical personnel have meant wasted medications and the rise of resistant strains.

"To produce long-term benefits, price cuts on AIDS drugs can only be useful as part of a comprehensive approach that includes prevention, information, education and reliable means of transportation and monitoring of treatment," he said.

Humer said drug resistance is becoming an acute problem worldwide, with as many as 50 percent of AIDS patients in pockets of the United States and Europe resistant to known treatments.

"Our industry's obligation is to develop new, better AIDS drugs that can tackle the emergence of resistance in the developed world and, in the years to come, in the developing world," he said.

'Adopt-a-Boat' links fishermen and educators

(This article is adapted from one originally published in the spring 2002 issue of Two if by Sea, a joint newsletter of the MIT and WHOI Sea Grant Programs.)

■ **By Andrea Cohen**
MIT Sea Grant

Tim Alley, captain of the 72-foot trawler Bay Flyer, is accustomed to long, rough days at sea. But earlier this year he found himself barraged, not by waves or regulations, but by questions from second-grade students.

The students and Alley are participants in Adopt-a-Boat, an innovative project funded by the Northeast Consortium and coordinated by MIT Sea Grant.

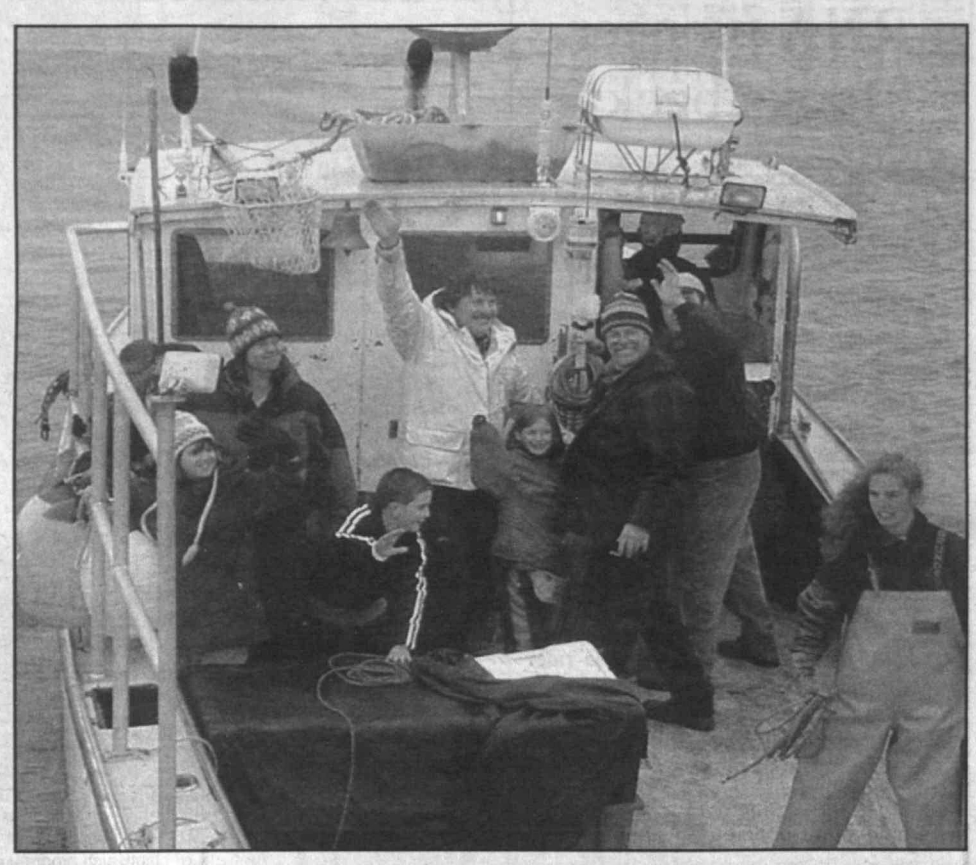
Adopt-A-Boat, which began in fall 2001, partners New England fishermen with educators and their classes. The program uses commercial fishing boats as a vehicle for teaching K-12 students about marine resource utilization, marine ecology and life as a fisherman. Now in its second year, the project is expanding and already includes 30 fishermen and 60 classrooms in the Northeast.

While the concept of stewardship via "adopt-a-something" programs isn't new, Adopt-a-Boat is a bit different, according to MIT Sea Grant education coordinator Brandy Moran. "A lot of those programs are related to a specific location or environment," she said. "This is related to an industry."

Cliff Goudey, MIT Sea Grant's marine advisory leader, added that Adopt-a-Boat is special "because of the depth of support we're prepared to give to make the partnerships work." Along with funds and time, this support has included supplies such as nautical charts for teachers, digital cameras for all fishermen and computers for some, since electronic communication is critical for spanning distances between boats and classes.

Flexibility has proven key to the program. "We work with each teacher to help figure out how Adopt-a-Boat can work with his or her class," said Moran. "Partly this is because we are dealing with such a wide age range."

Partnerships involve visits to classes and vessels as well as regular e-mail exchanges. At Kimball Union Academy in Meriden, N.H., Dean Goodwin's ninth-grade and Advanced Placement environmental students conducted research projects using real-time data telemetered from the Adventurer, Cameron McClellan's trawler out of Portland, Maine. Goodwin and his students have taken part in research cruises with McClellan, gaining hands-on experience with the vessel's technology, equipment and safety procedures.



Mattie Thomson (center, in white jacket), skipper of the F/V Striker, took school children out on his fishing boat to teach them about marine ecology and a fisherman's life, as part of Adopt-a-Boat, a program coordinated by MIT Sea Grant.

At Essex Agricultural High School, Amy Holt Cline's 11th-grade students are paired with Nino Randazzo, captain of the F/V Skimmer, out of Gloucester. Cline's students analyzed Randazzo's catch data and made maps showing how permanent and periodic fishing closures, shipping lanes and marine sanctuaries play a role in keeping the Gulf of Maine a sustainable resource. Students are also learning about groundfish biology by raising fish in a 100-gallon recirculating system built by Moran and Goudey. Additionally, the class visits the National Marine Fisheries Services office to better understand the regulations that govern New England fisheries.

Mary Graham, the fourth-grade teacher at Zippel Elementary in Presque Isle, Maine, is communicating with her captain in So. Bristol, Maine each week via e-mail. Using the information from Captain Bruce Morton, her class is presented with math problems. "I have found that the ability of my class to solve math problems has increased since we are solving problems involving 'our captain,'" said Graham.

Eighth-grade teachers Amy Donnelly and J.P. Ware at the O'Maley Middle School in Gloucester, are "hooked" on using Adopt-a-Boat in their classroom. Their students have had several question-and-answer sessions with Capt. Bob Anderson and Capt. Sam Novello to find out about their lives, how weather impacts fishing, and superstitions in the fishing industry. Donnelly and Ware joined Anderson on a fishing trip to document a day in the fisherman's life for their students.

Part of what makes the program work so well, Goudey said, may be the fact that teachers and fishermen have much in common. He pointed out that both professions draw highly committed individuals who often could not conceive of other professions.

"Teaching and fishing both involve oft-repeated tasks, and the outcome is never predictable," he said. And both teachers and fishermen have found that their work environments have grown remarkably more complex with increased regulations.

Visit http://www.adoptaboat.org for more details.

Classified ■ Ads

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INSTRUCTIONS: Ads are limited to one (of about 30 words) per issue and may not be repeated in successive issues. Ads may be resubmitted after skipping a week. Ads/renewals are not accepted via telephone or fax. All must be accompanied by full name and extension (or proof of MIT affiliation).

- **E-mail address (return address must be mit.edu): ttads@mit.edu**
- **Interdepartmental/walk-in address: Calendar Editor, Rm 11-400.**

Please note that all Tech Talk ads are posted on the Internet on the date of publication, which makes them accessible world-wide.

Deadline is noon Friday before publication.

■ FOR SALE

Seiko RM2000 Japanese/English dictionary w/Roget's II New Thesaurus. Perfect cond, orig guarantee/pkging. List $179, sell for $140/bst. twarog@mit.edu or 617-492-0627.

Delta Head skis and poles w/Nordica boots (size 9), gd cond, $75/bst. Girl's Huffy Bike, 26", never used, $50. J Blair, 258-2843.

Sound blaster card and CD-ROM/3.5" floppy drives, $40 for all. Electric baby swing, $50. Refrigerator, $130. Gas leaf blower, $40. Yamaha CD player, $55. 258-2497 or 987-535-0270 (eves).

■ VEHICLES

1989 Honda Civic DX hatchback. 170k miles, lovingly maintained, w/records, 5-spd. Runs grt. $1,700. Pat, 253-8567.

1991 Subaru Legacy station wagon. 120k miles, CD, vry reliable, $1,500. rader@ll.mit.edu or 781-981-2574.

1992 Toyota Previa LE. 1 owner, exc cond, maintenance record, 112k miles, must drive, won't last, $5,495. 978-750-0586.

1998 Honda Civic EX. 58k miles, 4-dr, auto, all pwr, A/C, new tires, moonroof, alarm, CD, garaged, 1 owner, exc cond, $10,500. Janet, 508-399-5695.

2001 Nissan Frontier King Cab 4x4. Silver, V6, loaded, off-road package, tow package, sunroof, A/C, 6 CD changer, auto, 45k miles, $17,500. 253-3096 or janine@mit.edu.

■ HOUSING

Lexington: Music prof's beautiful hse, 3 BR, 3b, indoor pool, furn, mint cond, 2 car garage, exc schools, avail Jan-May. 781-862-9462 or ae1930@rcn.com.

White Mountains, NH: Waterville Estates, 2 hrs from Boston, sleeps 8, walk to athletic ctr. $800/wk, $300/wknd. Brian, 252-1796.

Southern VT: 1820 farmhse, 24 acres in Green Mntn Natl Forest, nr skiing, 4BR, 1.5b, wide board flrs, woodstove, 3 hrs from Boston, winter/summer, 617-452-2248.

White Mountains, NH: Nr Waterville, Loon and Cannon Mntn. Mntntop views, 3BR twnhse, 2b, sleeps 6, athletic ctr, hot tub, sauna. No smoking/pets. Avail wknd or wkly. lamcham@aol.com.

Lutry (nr Lausanne), Switzerland: Visiting scholar will exchange renov presbytery in village on Lake Geneva, for furn hse in/nr Cambridge, min 3BR. 8/03 to 9/04. goemans@math.mit.edu.

Cambridge: Prof's grt family home. Sunny, spacious, modernized Victorian, nr Harvard Sq, Agassiz neighborhood, quiet street. Avail Jan 1 to August 2003. Ken Wexler, 253-5797, 617-661-3521 or wexler@psyche.mit.edu.

■ ROOMMATES

Cambridge: Female wanted to share furn 2BR apt w/porch, convenient to MIT. Avail now, $650/mo + utils. lyricmc@hotmail.com, 617- 642-7233 or 253-8379.

■ WANTED

Babysitter for girl in first grade, for after school hrs in Andover. 258-6268, 617-513-4645 or volfson@mit.edu.

■ LOST & FOUND

Lost: Necklace, white gold chain w/3-diamond pendant, somewhere between Kendall T stop and Bldg 16. Wed morning, Dec 11. Reward. 253-1758 or 253-1757.

■ MISCELLANEOUS

Going on sabbatical? MIT professor and wife will house-sit for 2003-04 academic yr (or hse-swap if your sabbatical is in San Diego area) Also interested in 2BR rentals w/gardening privileges. 253-3934 or joels@mit.edu.

$25 Caspar contribution saves one life for one day

■ By Sarah H. Wright
News Office

A little goes a long way in the season of more, more, more, and donating to the annual MIT Community Giving Campaign is one way for members of the Institute faculty and staff to make a dramatic difference in the lives of those in need.

Sometimes, that dramatic difference is one of life and death.

For example, it costs the CASPAR shelter at 240 Albany St. in Cambridge less than $25 to fund an overnight bed—and to save one life for one day.

CASPAR (Cambridge and Somerville Program for Alcoholism and Drug Abuse Rehabilitation), a shelter for homeless alcoholic men and women, is one of several programs supported by CSF through financial and volunteer assistance.

"For members of the MIT community, the fund serves as a reminder that we champion those among us who volunteer their time, talent and energy through local public service. To our Cambridge neighbors, it demonstrates our strong concern and willingness to face various challenges together," said Paul Parravano, co-director of the Office of Government and Community Relations.

Gail Enman, executive director of CASPAR, commented, "That funding level for overnight beds hasn't changed in 18 years, but the need for services for homeless men and women struggling with alcoholism or addiction has risen steadily. Even the smallest donation goes to saving a life by providing access to a bed. And saving a life today makes recovery possible tomorrow."

Recovery, said Enman, begins with getting clean and sober. With 15 different programs in place, CASPAR offers a "continuum of care" from the shelter through finding work and permanent housing.

"We don't give up on anyone. It starts with offering the bed, with saving the life. We make the opportunity available to get sober, find work and become tax-paying citizens.

"Our clients never forget. They come back to CASPAR as staff to give back what was given to them. Up to 85 percent of our staff in residential programs are former clients," said Enman.

Donations to the Community Service Fund are used to sustain community service programs like CASPAR. This year, donations are down by 18%—a lot of $25 beds—from last year.

CASPAR has been situated on MIT property since 1979. In 1993, MIT built the current facility, composed of a shelter for homeless men and women and a medical clinic. Numerous MIT student groups work or have worked with CASPAR, including CityDays, MIT Hunger Action Group, MIT South Asian American Students, MIT Hillel, MIT Graduate Student Volunteer Corps and MIT Atheists, Agnostics, Humanists.

Enman, who has served as director since 1994, also described the effects of cuts in federal and state funding on both the homeless population in Cambridge and on health and human services agencies ranging from police to fire to hospital emergency rooms.

"We cut staff during the summer and had to close the shelter during the day, otherwise neither staff nor our clients would be safe. The city's other emergency systems of care were overwhelmed immediately—calls for police, ambulances and rescue went up over 30 percent—and after three months the city manager intervened. We're now back to 107 overnight beds and they're occupied every night," Enman said.

The CSF was established in 1968 by a vote of the faculty to strengthen cooperation and understanding between MIT and the Cambridge community.

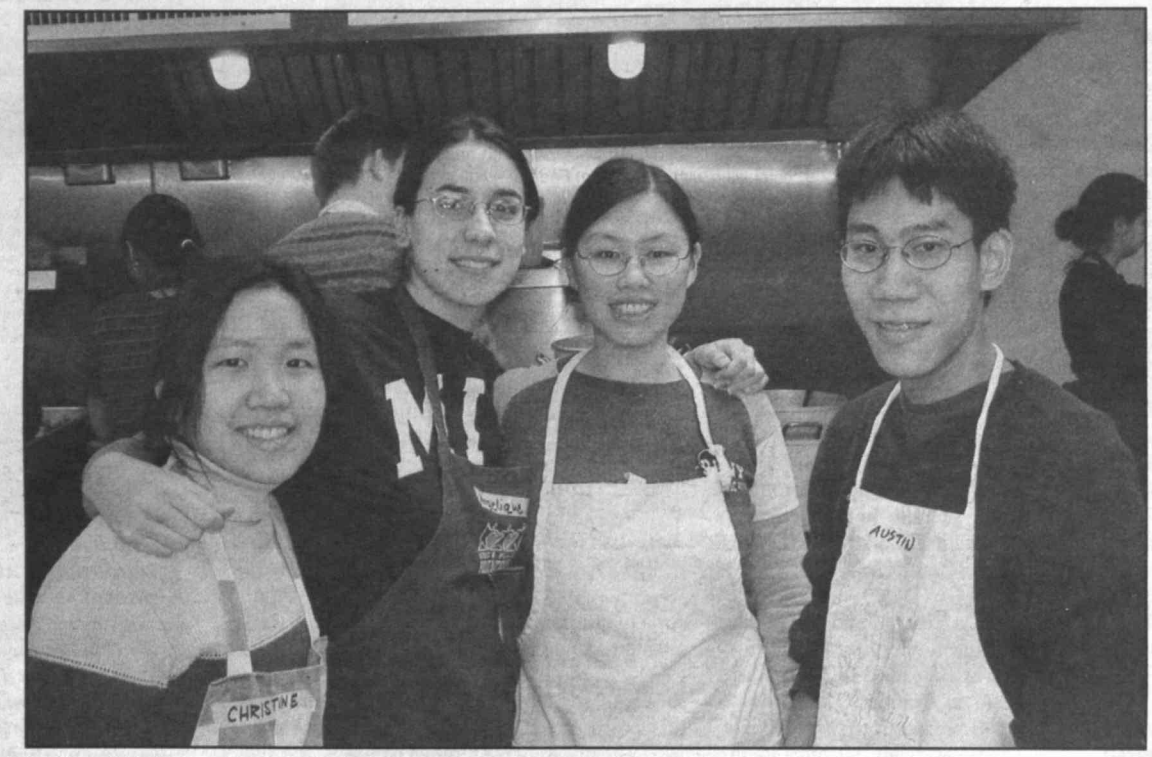
MIT's Community Service Fund supports CASPAR and On the Rise, a shelter for domestic violence survivors and homeless women.

The Community Giving Campaign allows MIT employees to give to the CSF through payroll deduction, check or credit card. The Campaign lasts until Dec. 31.

Annually, the campaign sponsors a winter clothing drive for local shelters and agencies. The clothing drive will run from Wednesday, Dec. 18, until Monday, Dec. 30, and will assist the Salvation Army, CASPAR, Shelter, Inc. and On the Rise. All these organizations were recognized at MIT's Cambridge First Day this year.

Shelters especially need winter sweaters, pants, coats, hats and gloves for adults; men's new underwear and white socks; and personal hygiene and first aid items. Organizers ask donors to sort and label clothing bags as men's or women's so donations can be distributed to appropriate shelters.

Enman emphasized, "We need high quality things for people who can't or who choose not to come indoors. For those who are outside, we are out there 18 hours a day distributing socks, underwear, mittens and scarves."



Members of the MIT Graduate Volunteer Council cooked and served food for homeless women at Rosie's Place in Boston over Thanksgiving. Left to right are seniors Christine Ng and Angelique Dousis, and graduate students Maria Chan and Austin Che.

Another area in which a little goes a long way is white socks. "Homeless men and women are on their feet all the time. Our medical staff treat lesions and bandage sores right on the street where the clients are. Dyes are not good against open sores," said Enman.

Donated clothing ("what to do with that old prom dress?" asked Enman) that is not appropriate for shelter clients is sorted and sent to GEAR, a store on Highland Avenue in Somerville where homeless people may shop using vouchers and where others pay cash.

The 11 clothing drop-off locations include Lobby 13, Lobby 34, the rear lobby of Building 50, E18/E19, E23/E25 atrium, E52 lobby, the Student Center lobby, W91 outside of room 103, NE43 lobby, NW21-104 and NW16-205.

Community Giving campaign needs support

Organizers of the Campaign for Community Giving at MIT are calling for increased participation from faculty and staff.

The campaign's goal is to raise $400,000 by Dec. 31. As of Dec. 16, $216,608 had been raised from 739 contributors. Campaign chair Professor Kenneth A. Smith of chemical engineering said, "It is critical that we as individuals and as a community support non-profit agencies and the clients they serve who are severely affected by funding cuts and times of economic uncertainty."

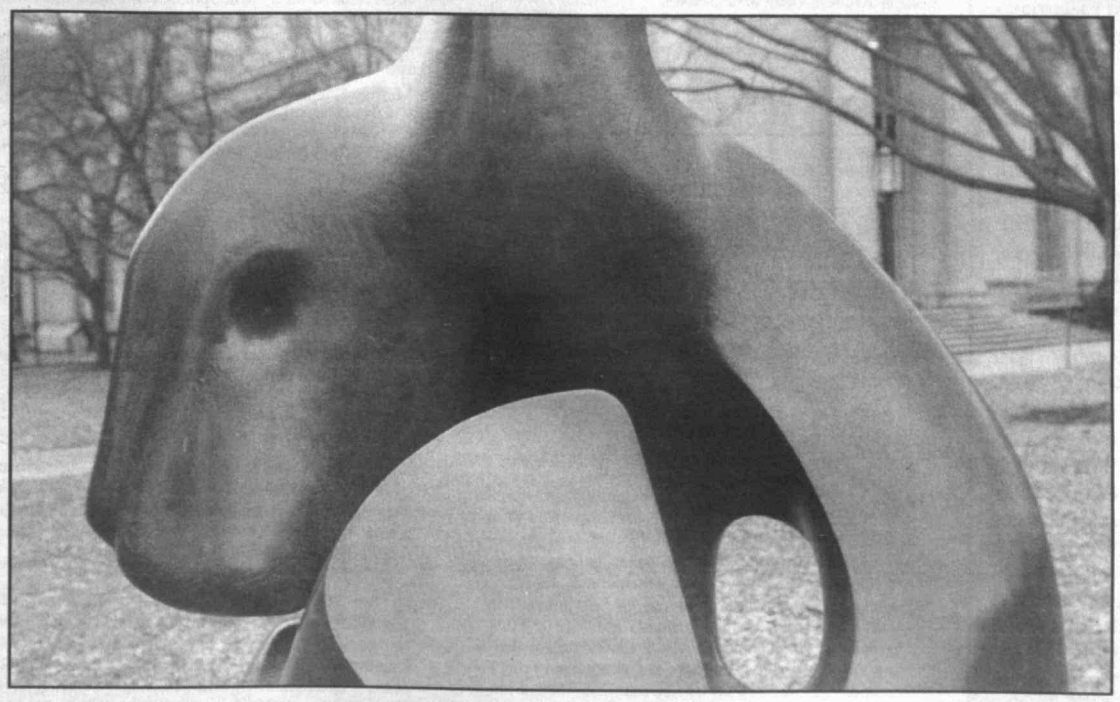
In a letter distributed to the MIT community on Tuesday, Dec. 17, President Charles M. Vest said: "In these difficult economic times, it is more important than ever to join together and support the many charitable organizations that serve individuals and families in need. Last year, the campaign raised an impressive $400,000. This year, we hope to surpass that amount and increase the number of people who participate in the campaign. As campaign chair Ken Smith stated in his kickoff letter to you, 'Please know that every donation, large or small, makes a difference and is appreciated.'

"We recognize that MIT staff and faculty contribute to their communities in many ways through volunteerism, activism and financial support. Through the Community Giving at MIT campaign, we have made it convenient for you to support local health and human service agencies … If you have already contributed to the 2002 campaign, I thank you. If you have not, I encourage you to consider making a donation to the United Way of Massachusetts Bay, the MIT Community Service Fund, or other charities."

The campaign offers a range of giving options: the MIT Community Service Fund, which provides financial support for staff and students who volunteer at Cambridge schools, educational programs, homeless and domestic violence shelters, and substance abuse programs; the United Way of Massachusetts Bay and its affiliated organizations; or employees can contribute to local 501(c)(3) health and human service agencies which are not affiliated with the United Way of Massachusetts Bay. MIT employees can contribute through payroll deductions, personal checks, credit card or securities. Please send completed pledge forms to your department representative or directly to campaign headquarters in Room 50-005.

For more information about the Community Giving at MIT Campaign, contact Ted Johnson at tej@mit.edu or Traci Swartz at tswartz@mit.edu in the Community Services Office, Room 50-005, 253-7914.

Ink blot



This section of the Henry Moore sculpture on Killian Court looks porpoise-like. **Photo by Donna Coveney**

Grants available in international fields

Grants are available through the Center for International Studies (CIS) for advanced doctoral students working in close collaboration with a faculty member on any international aspect of energy, environment and international affairs.

Projects may include research on energy issues in developing countries, energy and security, energy and the environment and topics in international affairs. Both summer and academic-year funding will be awarded. Academic-year awards will be in the form of a standard RA position, including tuition and stipend. Summer research grants will be up to $5,000 and may cover travel, living costs and other necessary expenses related to the research.

For application information, contact Carolyn Makinson, executive director of the CIS, at makinson@mit.edu or 253-9861; or Laurie Scheffler, CIS administrator, at lauries@mit.edu or 253-3121.

Endicott House rep has campus office hours

The MIT sales manager for Endicott House now has regular on-campus hours on Wednesdays and Thursdays from noon to 2 p.m. to meet with community members who may want to use MIT's facility in Dedham for conferences, meetings or other events.

To schedule an appointment, contact Ginna McAuliffe at ginnam@mit.edu or 253-9813.

Faculty members who book a meeting package for 15 or more people that will be held before April 1, 2003 will receive complimentary round-trip transportation between MIT and Endicott House for attendees. In addition, all student group bookings include free transportation from campus to the center.

■ Awards & Honors

■ An MIT team of **John Danaher** (a junior in electrical engineering and computer science), **Reid Barton** (a sophomore in mathematics), and freshmen **Velin Tzanov** and **Mihai Patrascu** (reserve member) finished third out of 13 universities in the regionals of the ACM Association for Computing Machinery's International Collegiate Programming Contest. The Nov. 9 regionals at the Rochester Institute of Technology challenged teams of three students and a single computer with eight or more complex, real-world problems and a five-hour deadline. The MIT team, coached by Associate Professor **Martin Rinard** of EECS finished behind first-place Harvard (which goes on to the world finals) and second-place University of New Brunswick. Last year's team from MIT, which included Barton and Danaher, finished second in the contest's world finals and won it all in 1978 (MIT Tech Talk, April 10).

■ The Leonardo Da Vinci Medal, the highest recognition from the Society for the History of Technology, was bestowed on **Leo Marx** in October. The medal is presented to someone who has made an outstanding contribution to the history of technology through research, teaching, publications and other activities. Marx, who taught at the University of Minnesota and Amherst College before coming to MIT in 1976, is a senior lecturer and the Kenan Professor of American Cultural History Emeritus in the Program in Science, Technology and Society. His work examines the relationship between technology and culture in 19th- and 20th-century America.


Marx

■ **Mitsuko Barker** has received the MIT Japan Program Award for Cross-Cultural Understanding for her work as head of the program's lunch table. Barker has headed the weekly lunch table since 1995 and has developed programs such as Japanese language exchanges, a tea ceremony and flower arrangement classes that bring together students and Japanese spouses and researchers.

■ **Boyce Rensberger**, director of the Knight Science Journalism Fellowships at MIT, was honored at the National Press Club in Washington by the American Chemical Society, which presented him with the James T. Grady-James H. Stack Award for Interpreting Chemistry for the Public. Previous recipients of the award include Isaac Asimov and Don Herbert ("Mr. Wizard"). In a career spanning more than 32 years, Rensberger has been a science writer or science editor for The Detroit Free Press, The New York Times, PBS and The Washington Post.


Rensberger

■ **Junot Diáz**, who will join the MIT faculty as associate professor in the Program in Writing and Humanistic Studies in February, shares with Ursula Leguin the 2002 Pen/Malamud Award, given for a body of work that demonstrates excellence in the art of the short story. Previous winners include John Updike, Saul Bellow, Eudora Welty and Joyce Carol Oates. Diáz's stories have appeared in Story, The New Yorker, The Paris Review, Time Out, Glimmer Train, African Voices, and four annual volumes of Best American Fiction between 1996 and 2000. His story collection "Drown" was published in 1996. Diaz has taught at Syracuse University since1997.

■ **Peter Roth**, a lecturer in architecture, received the 2002 Preservation Award from the Massachusetts Historical Commission for his restoration of the Upham's Corner Marketplace in Dorchester. Roth co-teaches "Design for Development," a core course in the Center for Real Estate's S.M. program, and is a member of the real estate program's first graduating class in 1984. He is principal of New Atlantic Development, which does community-oriented development with a focus on affordable housing and mixed-use development. The Upham's Corner Marketplace is on the site of the country's first supermarket and has been on the National Register of Historic Places since 1989. Empty for 15 years, it now contains retail space and 45 units of affordable housing, including 14 units for formerly homeless seniors.

■ The president of the Federal Republic of Germany, Johannes Rau, has awarded Professor **Wolfgang Ketterle** the Knight Commander's Cross (Badge and Star) of the Order of Merit of the Federal Republic of Germany in recognition of his outstanding research accomplishments in the field of atomic physics. In 2001, Ketterle, the John D. MacArthur Professor of Physics, shared the Nobel Prize for a major breakthrough in research on Bose-Einstein condensate.


Ketterle

■ Professor **Dimitri A. Antoniadis**, the Ray and Maria Stata Professor in Electrical Engineering, has received the Andrew S. Grove Award from the Institute of Electrical and Electronics Engineers (IEEE). The award recognizes outstanding work in the field of solid-state devices and technology. "Antoniadis has had a tremendous effect on the design of modern computing and electronics devices, especially in microelectronics technology; field-effect-controlled, quantum-effect devices; and silicon process modeling," the IEEE said. Antoniadis co-founded and was the first director of the Microsystems Technology Laboratories.

■ Professor Emeritus **Ira Dyer** of ocean engineering has received the Per Bruel Gold Medal for Noise Control and Acoustics from the American Society of Mechanical Engineers. Dyer (S.B. 1949, S.M. 1951, Ph.D. 1954) was honored for contributions to understanding underwater acoustics, flow-generated noise, ocean ambient noise and structural acoustics. He was head of the Department of Ocean Engineering from 1971-81, developed the graduate degree program in ocean acoustics, and helped develop the MIT-Woods Hole Oceanographic Institute joint program.

■ The Cambridge City Council officially thanked the **residents of 70 Pacific St.** for the residence hall's bike rental program and commended MIT and **Anke Hildebrandt**, a graduate student in civil and environmental engineering who coordinated the program. The council noted in a proclamation adopted on Oct. 7, that the goals of the program "work in unison with the City Council goal to reduce dependency on motorized vehicles and reduce congestion."

The program rents bicycles to residents for $1 a day; the bikes were acquired for $175 apiece from Bikes Not Bombs (see MIT Tech Talk, Sept. 25).

■ **David R. Martinez**, an associate division head of Lincoln Laboratory, has been named a Fellow of the Institute of Electrical and Electronics Engineers effective Jan. 1. Martinez was recognized "for technical leadership in the development of high-performance embedded computing for real-time defense systems." Election to IEEE Fellow is one of the organization's most prestigious honors.


Martinez

■ A paper by a research group in the Sloan Automotive Laboratory led by graduate student **Ertan Yilmaz** and alumnus **Benoist Thirourd** (Ph.D. 2001) won the Society of Automotive Engineers Award for Research on Automotive Lubricants. The paper showed through engine experiments, use of laser-induced fluorescence visualization and detailed computer modeling why oil consumption increases during nonsteady engine operating conditions. Other authors of the paper were lecturer and research scientist **Tian Tian** (Ph. D. 1997), lecturer and principal research scientist **Victor Wong** and Professor **John Heywood**. Wong also received the award in 1991.

Handel's silence speaks volumes to author Ellen Harris

German composer George Frideric Handel, renowned for "Messiah," his bold holiday hit, had his quiet moments, too.

In fact, Ellen T. Harris, the Class of 1949 Professor of Music and head of the music and theater arts section, was so intrigued by Handel's deliberate use of silence in his 100 chamber cantatas that she spent years studying the subtle layers of meaning in these powerful but lesser-known works produced for private patrons.

art talk
conversations with MIT art-makers

The result is Harris' recent book, "Handel as Orpheus: Voice and Desire in the Chamber Cantatas" (Harvard), a combined study of the cantatas themselves, of the sexual subtexts within them, and of the 18th-century social context in which Handel (1685-1759) composed.

In November, "Handel as Orpheus" received the prestigious Otto Kinkeldey Award, presented annually by the American Musicological Association to "honor the work of musicological scholarship deemed by a committee of scholars to be the most distinguished of those published during the previous year in any language and in any country by a scholar who is a citizen or permanent resident of Canada or the United States."

An eminent Handel scholar, Harris is also a distinguished opera singer, having performed roles from Mozart, Puccini, Massenet, Gilbert and Sullivan and others. From 1989-95, she served as the first Associate Provost for the Arts at MIT. Harris is a Fellow of the American Academy of Arts and Sciences.

Soundings, published by the School of Humanities, Arts and Social Sciences, printed an interview with Harris just after her book appeared. Excerpts from the interview, conducted by Orna Feldman, follow.

Q Why does your book's title compare Handel to Orpheus?

A Mythologically, Orpheus is a great musician. He wins back his deceased wife from the Underworld by singing, but then he fails the human test: because he looks back at her before they reach the Earth, he loses her forever. According to the classical legend, Orpheus gave up all women, urged other men to give up women, and said he would love only other men. This part of the Orpheus myth seemed particularly important to the cantata, because Handel's Italian and early English patrons had been associated with same-sex love and a number of the texts were related to same-sex love.

Q What conclusions do you draw from this?

A Handel lived in a context where same-sex love was a very real part of the atmosphere. As was relatively common among the aristocracy at the time, Handel's patrons frequently were married, sometimes had children, and sometimes had same-sex relationships as well. The term "homosexual" had no meaning in the 18th century.

Q In your book you discuss the role of silence in same-sex love. Can you elaborate?

A The cantata texts consistently refer to a "love that I cannot speak about" and "a love I must keep to myself." That silence then moves from the text into the music. Suddenly there are gaping silences—the whole music stops, as if the singer can't go on. That's unusual even for music of the time. So I would argue that Handel is one of the first composers to bring silence into the fabric of the music. Handel was an intensely private person, and the need for silence in matters of love must have been clear to him. Not surprisingly, this life lesson found its way into his music.

Q What kind of responses has your book received?

A Responses have been mixed. There are people who simply cannot accept the placement of Handel into a society in which same-sex love played a significant role—primarily because he's the composer of "Messiah" and an iconic image is being challenged. Other people might like the book for the wrong reasons—because they want that piece of divinity to be associated with homosexuality. For me, the book is important because it explores and makes available a huge repertoire of Handel's music that no one has listened to and addresses context in Handel's creative process.

Q How has performing the cantatas affected your research?

A The experience of actually participating in the creation of the sounds that Handel conceived is important to my understanding of how the music works from the inside out.

Q How do you teach music at MIT?

A I play a song and sing it, and then begin taking the song apart. I talk about compositional tools: "What would happen if you did it differently? If you changed this cadence?" You can actually get at the music through a toolbox exercise and then lead from mechanics into historical context. That approach works particularly well with MIT students.

Institute ■ Arts

* **Open to public**
** **Open to MIT community only**

For more arts-related information, call the 24-hour hotline at 253-ARTS or consult the web site at http://web.mit.edu/arts.

INSTRUCTIONS: To submit an item to the Arts Calendar, please contact the Office of the Arts at heine@media.mit.edu or 253-4003.

December 18 - January 12

■ MUSIC

Guild of Bell Ringers*—Change ringing on hand bells. Beginners always welcome. Will also ring for occasions. Meets Mondays, 6:30pm, Lobby 7, 2nd flr balcony. More info: 253-3573 or http://web.mit.edu/bellringers/www.

■ THEATER

"Don't You Hear"*—Dec 22. Play written and directed by grad student Chen-Pang Yeang. 8pm. Kresge Little Theater. More info: 577-8736 or cpyeang@mit.edu.

■ EXHIBITS

List Visual Arts Ctr*—"After the Beginning and Before the End." Over 220 works on paper examples of so-called "Instruction Drawings," in a variety of forms, such as working drawings, installation instructions, musical scores, sketches, visual or textual memoranda, fabrication notes, and work records. **"Videos by Latvian Artists."** Viesturus Kairis and Ilmars Blumbergs: "Magic Flute"; Laila Pakalnina: "Papagena." Both shows through Jan 5. List Visual Arts Ctr. Tues-Thurs and wknds noon-6pm, Fri noon-8pm, closed holidays. More info: 253-4680 or http://web.mit.edu/lvac/www. **Dec 22: Gallery talk.** Includes hands-on activities about "Instruction Drawings." Noon. **Jan 3:** Curator's tour. 6pm. **Jan 4:** Curator's tour. 2pm.

MIT Museum*—Ongoing: "Mind and Hand: The Making of MIT Scientists and Engineers"; "Robots and Beyond"; "Exploring Artificial Intelligence at MIT"; "Gestural Engineering: The Sculpture of Arthur Ganson"; "Holography: The Light Fantastic"; "Flashes of Inspiration: The Work of Doc Edgerton"; "Thinkapalooza." $5 adults, $2 non-MIT students, srs, children 5-18, free w/MIT ID. 265 Mass Ave. Tues-Fri 10am-5pm, Sat-Sun noon-5pm. More info: 253-4444 or http://web.mit.edu/museum.

Compton Gallery*—"From Page to Stage: A Theatrical Process." A look into the process by which directors and designers collaborate to stage a play. Through Jan 6. Compton Gallery (10-150). Wkdays 9:30am-5pm. More info: 253-4444 or http://web.mit.edu/museum/exhibitions/comptongallery.html.

Dean's Gallery*—Carol D. Blackwell: "Object Lessons." Box constructions and mixed media collages. Through Jan 15. Sloan School of Management, Rm E52-466. Wkdays 9am-5pm. More info: 253-9455 or http://mitsloan.mit.edu/deansgallery.

Rotch Library*—"Form & Element." Works on paper by Jacquelyn Martino. Through Jan 3. Bldg 7, 2nd flr. Wkdays, 9am-5pm. More info and for holiday closings: 258-5592.

Institute Archives and Special Collections*—"Fire insurance policy, 1866-1867, on MIT's first building on Boylston Street in Boston." Hallway exhibit case across from Rm 14N-118. More info: 253-5136 or http://libraries.mit.edu/archives/about/project.html.

Media Test Wall*—"William Wegman: Selected Video Works 1970-1978." Works include: "Milk/Floor," "Stomach Song," "Randy's Sick," "Out and In," "Rage and Depression," "Massage Chair," "Crooked Finger/Crooked Stick," "Deodorant," "Spelling Lesson," "Drinking Milk," "Dog Duet" and "Horseshoes." Whitaker Bldg 56. More info: 253-4400 or http://web.mit.edu/lvac/www.

In the beginning ... there was light

Shapes...sounds...silence...faith...feel...forms...memories...images inspire MIT artists

Francis Doughty
Songwriter/guitarist
Administrative Staff Assistant, Research Laboratory of Electronics

"Inspiration for me ranges widely. It can simply come from the beautiful and exciting sound qualities of the guitar itself or it may be driven by a strong visual image which comes upon me as I'm playing around with a new theme, related motifs and gestures. Other times an episode in life and its attendant mood and feelings will become the inspiration. There are times when I can't recognize the inspiration right away, but as I'm guiding and following the music, there will come a point of recognition and then things start to cohere and flow. That recognition helps everything to fall into place: the moods, the dynamics, melodies, beat patterns, rhythmic gestures, modulations, overall structure, the whole thing."

Laura Harrington
Playwright
Lecturer, Music and Theater Arts

"Whenever I'm asked where I get my inspiration, I quote the playwright, Tom Stoppard: 'If I knew, I'd go there.'

"Lately I feel that my work is created in response to silence—whether it's the silence that overtook my mother as she plummeted into dementia, or the silence surrounding the terrors my father witnessed during World War II. There is something about the mystery of silence that seduces me again and again and makes me want to shout or sing. It's as if the unheralded, the unknown, the voiceless, all speak to me, asking me to give them their hour on stage, to hear their inchoate cry for justice or recognition, or peace."

Whitney Erin Boesel
Writer
Senior, creative writing major

"I find that the creative inspiration behind my plays tends to come from both myself and my characters. When I sit down to begin a play, I generally don't know where the story will end up going; what I have is a few characters, usually sketched from composites of people I know, and a vague premise. After the first pages are written, however, the characters take on personalities, desires and lives all their own—at which point my job as a writer is to watch and listen and let them have their way on the page. Ironically, it's near impossible to win a power struggle with a fictitious character, even one of my own creation; every time I've tried to impose my will on a script, the writing comes out feeling forced and unnatural and I end up rewriting whole scenes on a second or third pass. The characters almost always win in the end; I tend to be the one who has to compromise."

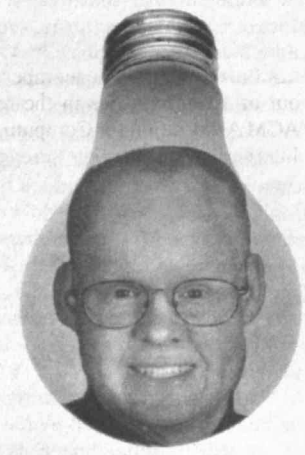
Evan Ziporyn
Composer
Kenan Sahin Distinguished Professor, Music and Theater Arts

"In my experience 'inspiration' is never present tense; it's already happened or I'm still waiting for it. For me, composing is some version of staring into the granite, looking for the sculpture already inside. I try to find a simple, empty starting point—a phrase or a noise that's not particularly interesting, then listen to it, stare at it, play with it, go away from it, listen to it again and again. At some point something will eventually stick in my mind, become interesting, start to suggest possibilities. There's a fair degree of passivity involved in all this, a patience that's always difficult to arrive at. I walk away, the vision gets skewed and the intractable suddenly seems simple. Once that happens it's a lot more fun, impersonal, ego-free. When it's going right (that is, occasionally) it feels like thoughts without a thinker, and it's very nice to escape—even illusorily—from one's inner taskmaster."

Kay Walsh
Visual artist
Administrative Assistant, Center for Environmental Health Sciences

"The things that inspire me are events in my life, and things that I strongly believe in. Recently, I've been hearing truths in my Bible class, and feel compelled to see them visually.

"I do a lot of different kind of art. I have a little 'art basket,' and when I have a project that I'm thinking about or a situation or event I'm working out in my mind, I start dropping objects and inspiration in there—things that remind me of the situation. It's very surprising what winds up being in there. Sometimes I use the objects in a collage; sometimes I actually redraw the object or paint the textures that are on the objects; sometimes I transform the object itself. I never know what I'll wind up with. But I always feel really good about what I've created, and grateful that God was able to give me a product that describes what's going on in my heart."



David M. Foxe
Composer
Senior, architecture and music major

"Most of my strongest ideas for music compositions come from knowing the type of performance and performers for which the work is intended. As a result, I feel quite comfortable working between music for solo, church, chamber and orchestral settings, even if they turn out quite differently. I still do almost all sketching and development by hand, with computer notation as a helpful way to check accidentals and instrumental doublings.

"The connections between architecture and music are for me strongest in terms of being communicative processes. One creates drawings and scores that are a means of communicating ideas to builders and performers who will re-create the work in its final form. Both are inherently experiential art forms that use the element of time to tell stories and contrast different characterizations in art."

Alan Brody
Playwright
Associate Provost for the Arts

"An impulse for a play grabs me when my mind is turned. It could come from an image, a memory of a place or a person, a laugh on the subway, sometimes even a story (but when the last happens, it's like Christmas). In other words, I fall in love. I free associate about it in my journal and give it the shave test. That means, I think about it for three days while I'm shaving. If it still seems like a good idea I spend a lot of time following it up in my journal, exploring more concrete possibilities of action, theatrical premise, radiating themes. When I'm sick of talking to myself, I start to write."

Thomas DeFrantz
Choreographer
Associate Professor, Music and Theater Arts

"To create choreography, I typically focus on the emotional narrative at the center of the project. How the work will "feel" to its audience shapes the movement vocabulary and the approach to its performance. From there, various theatrical elements that might enhance that narrative help me hone in on a unique manner of storytelling. In all, a musical score, libretto, costume, scenic, lighting and media design all combine with visual references to aid me through the first jerky impulses of making a dance."

Helen Elaine Lee
Fiction writer
Associate Professor, Program in Writing and Humanistic Studies

"Writing is part discipline, part mystery. My primary job is to pay attention, as a story can begin anywhere—with an image, a bit of overheard conversation, a family tale, a person observed, an object or a place. Once snagged, I try to follow the seemingly small thing that compels me into the unknown, trusting that I will be led somewhere meaningful, and working hard to find words for it."

Marc Rios
Printmaker
Sophomore, mathematics major

"Most of my work is focused on the visual noise and errors which come from trying to create a representational figure. In the process of creating the image, I think there is a point where the surrounding noise is more interesting then the actual figure and I build on it. One of my favorite monoprints is a drawing of a model made with a broken ink roller. At the end the image looked nice, but it was also surrounded by a haze of lines suggesting where the roller had been in creating the image."

Suzana Lisanti
Ceramic artist
Team Leader, Web Communications Services, Information Systems

"I explore shapes and forms in my mind, like words of a poem, and I compare my imaginary forms with something I am looking at or touching to see where the forms coincide and where they differ. This visual and tactile overlay allows me to make better judgments when the pottery wheel is spinning or when I am adding or subtracting clay on a piece of sculpture."

Andrea Cohen
Writer
Communications Manager, Sea Grant Program

"I never know exactly what will inspire a poem. It might be an image, a snippet of conversation, a memory, something I read. Sometimes an experience resonates immediately; other times it might take years to germinate and find its way into a poem. There's a mystery to the process and always an element of surprise."

MIT's new optical fiber carries more power with less loss

■ By Deborah Halber
News Office

MIT researchers have created a low-loss optical fiber that may lead to advances in medicine, manufacturing, sensor technology and telecommunications.

Scientists and members of MIT's Research Laboratory of Electronics (RLE) and Center for Materials Science and Engineering (CMSE) developed the photonic bandgap fiber, which has a hollow core surrounded by a highly confining reflective surface dubbed "the perfect mirror" when MIT researchers invented it in 1998. The team reports on their findings in the Dec. 12 issue of Nature.

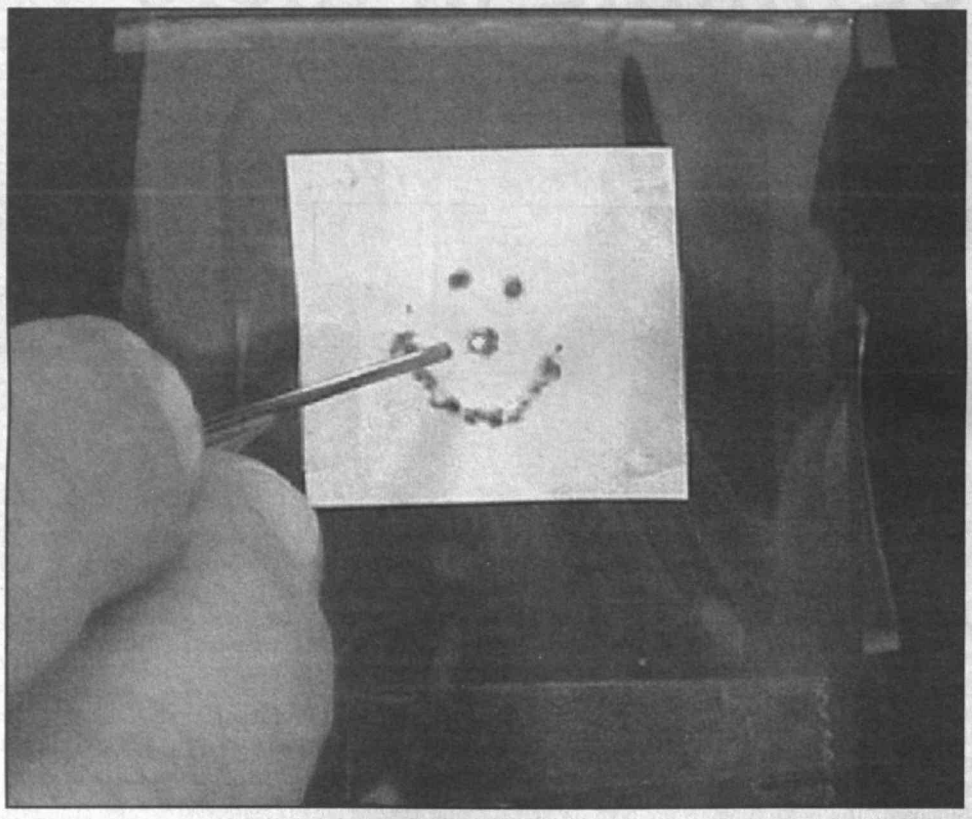
The fiber conducts an intense stream of laser light that would melt traditional fiber-making materials.

"Due to the efficient confinement of light in the hollow core, enabled by the mirror surface, we are able to utilize materials that would normally be damaged under such intense illumination conditions," said team leader Yoel Fink, assistant professor of materials science and engineering. As an MIT graduate student, Fink was instrumental in creating the "perfect mirror."

To create the fiber, the researchers identified a pair of materials that have very different optical properties yet soften at the same temperature.

These materials are layered in alternating thicknesses to create a hollow pre-form—a scaled-up version of the final fiber. When the pre-form is fed into a furnace and drawn into a fiber, the layers reduce in thickness to micrometer dimensions, resulting in a mirror that confines light to the hollow core.

The transmission window is determined by the layer thickness and thus can be scaled to target a wide range of wavelengths.



Members of the Fink lab use laser light—produced by a powerful carbon dioxide laser and transported through the new photonic bandgap fiber—to burn a smiley face in one of the materials that is used to make the fiber. **Photo courtesy Fink Group, MIT**

Tens of meters of fiber with "transmission losses ... orders of magnitude lower than those of the constituent materials" demonstrate that "low attenuation can be achieved through structural design rather than high-transparency material selection," the authors write.

The researchers chose to concentrate on the transmission of 10.6-micron light because there are "no good fibers at this wavelength, and yet very strong, low-cost lasers exist at this wavelength that may be useful for a variety of applications," said co-author Shandon D. Hart, a graduate student in the Department of Materials Science and Engineering. The new fiber would allow a carbon dioxide laser's high power to be transmitted over longer distances than are possible today.

Possible applications include medical treatments that necessitate high-power delivery, such as surgery or facilitating the breakup of kidney stones, and medical diagnosis requiring broad-band infrared transmission such as detecting cancerous cells with spectroscopy. For manufacturing and materials processing, the fiber may in the future transmit sufficient laser light to cut metal. Another potential spectroscopic application involves the construction of a fiber-optic sensor.

"The significance of this work is that it clearly demonstrates a key attribute of photonic bandgap fibers, namely the ability to achieve lower losses than their index-guided counterparts," said co-author John D. Joannopoulos, the Francis Wright Davis Professor of Physics.

In addition to Fink, Joannopoulos and Hart, authors include RLE research scientist Burak Temelkuran and materials science and engineering graduate student Gilles Benoit.

This work is funded by the Defense Advanced Research Projects Agency Quantum Information Science and Technology Program/ Army Research Office, the National Science Foundation (NSF), the U.S. Department of Energy and an NSF graduate research fellowship. This work also was supported by the Materials Research Science and Engineering Center (MRSEC) program of the NSF and made use of MRSEC shared facilities.

Teamwork needed for Massachusetts to lead in biotech industry, report says

■ By Kenneth D. Campbell
News Office

The Massachusetts biotech industry, which has grown at 10 percent a year over the last five years, has an extraordinary advantage over rival states seeking biotech companies because of the strengths of its research universities, hospitals and three decades of development of the industry. But a report, "MassBiotech 2010," warned last week that an opportunity to create 150,000 new jobs in the state over the next eight years could be lost unless there is greater collaboration among state and local governments, industry and academia.

Sponsored by the Massachusetts Biotechnology Council and the Boston Consulting Group, the report said the biotech industry in Massachusetts had 30,000 jobs in 2001, one out of every eight biotech jobs in the U.S. The gain of 12,000 jobs in the Bay State represents half the state's net growth in industrial jobs.

Similar growth is needed over the next few years to generate revenue for the state. David Matheson of Boston Consulting Group noted that job creation is the only way to generate revenue for Massachusetts without raising taxes.

The potential for biotech to aid the state's economic woes is enormous, but immediate action is required or the opportunity could be lost, the report said.

The elements needed for significant growth include:

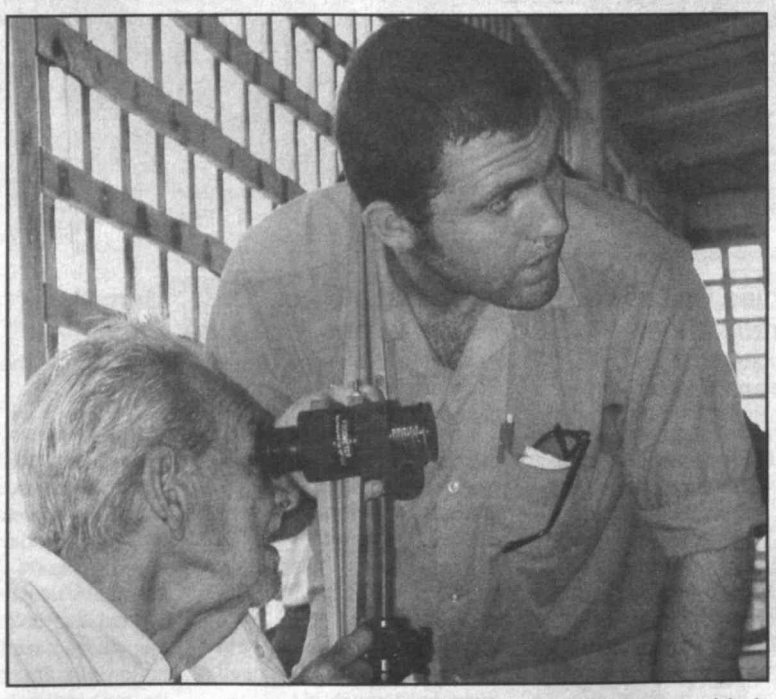
- The governor and other leaders need to champion the industry, lobbying for federal support and facilitating collaborations among the entire life sciences cluster.
- The business climate must be improved to ensure a streamlined framework for innovation and regulation. Some 27 state and local agencies have to approve a new biotech building. Massachusetts firms that have located manufacturing plants outside the state report they felt more welcomed elsewhere.
- Massachusetts must keep pace with the states, such as California and North Carolina, that have implemented various ways to attract the industry.
- The state must invest in strong science education from kindergarten through post-graduate studies.

If the state succeeds in wooing more biotech, by 2010, the increase in total jobs due to biotech expansion could range from 19,500 jobs to 148,000 jobs in the state. One-third of those jobs would be in biotech and two-thirds would be in other fields, generated by the multiplier effect of biotech's economic expansion, the Boston Consulting Group said.

Annual personal income taxes, now at $300 million with 30,000 jobs, would increase to about $350 million for 36,500 jobs for the low range, or to as much as $750 million if there were 78,000 biotech jobs in the state.

"This report," said MIT President Charles M. Vest, "is a wake-up call that we, as a community, must bring our intellectual, business and civic talents together to make the Boston area the hub of the next-generation biotechnology industry."

Inexpensive glasses: sight for poor eyes



Above: Media Lab graduate student Saul Griffith determines an elderly man's optometric prescription during a trip to Guyana with the Midland (Texas) Lions Club. **Photo by Selam Daniels**

Left: Saul Griffith looks through the lens molder of the portable device he invented to make low-cost prescription eyeglasses for people in the developing world. Griffith won the Collegiate Inventors Competition and was inducted into the Inventors Hall of Fame last month.

Photo courtesy Saul Griffith

(continued from page 1)

making new glasses in the field.

"I think the hearts of the Lions Club are in the right place, but as with a lot of those aid programs they do not account for all their costs and so the economies are false. And second-hand glasses are ultimately not very good," he said.

He received $20,000 for winning the Collegiate Inventors Competition; his thesis advisor Professor Joseph Jacobson received $10,000. (Griffith's thesis research is actually on "programmable self-assembly, how to make things automatically make things," he said.)

The money "almost pays my library fines," said the 27-year-old researcher from Sidney, Australia, who negotiated a $2,740 fine down to $130. "But I was pretty uncomfortable for a few days." Actually he plans to put the prize money back into the company, which he hopes can work around the political difficulties of doing business in the developing world and help the estimated one billion people who need prescription eyeglasses but can't afford them.

"If we could make a self-sustaining project that makes glasses for kids in India, that'd be great. And I'd go make money someplace else," said Griffith.