

## Hammers for homes



Students and staff volunteering for Habitat for Humanity built frames next to the Student Center for houses that will eventually appear in Roxbury and elsewhere. See page 8. Photo by Gábor Csányi

## School of Engineering ranked best by US News for 12th year

21 graduate areas in 4 schools are #1

MIT's School of Engineering continued its unbroken record since 1987 as the best engineering school in the nation, topping second-ranked Stanford by a wide margin of 10 points (100-90) in US News and World Report's 12th year of graduate school rankings.

In all, 21 graduate areas—10 departments and 11 graduate programs—

were ranked number one in MIT's Schools of Engineering, Humanities, Management and Science.

The Sloan School of Management placed a close fourth among business schools, with a rating of 98 compared to 100 for Harvard and Stanford, and 99 for the University of Pennsylvania.

The seven #1 departments in the School of Engineering were aerospace/aeronautical engineering; chemical engineering; computer engineering; electrical/electronic/communications engineering; materials engineering;

mechanical engineering; and nuclear engineering. MIT was #2 in civil engineering and #4 in environmental/environmental health engineering.

In the School of Humanities and Social Science, the Department of Economics again tied for #1 with Harvard and Stanford. MIT ranked eighth in political science and 12th in psychology.

In the School of Science, the Department of Mathematics was first in the nation. MIT also ranked #1 in

(continued on page 8)

## Event spotlights invention directions

Future of biology, materials engineering discussed

■ By Denise Brehm  
News Office

Advances in genome sequencing, materials science and bioengineering were discussed at the Technology Licensing Office's Licensee Convocation session on "Hot Trends in Biology and Materials" last Thursday.

Professors Richard Hynes, director of the Center for Cancer Research, described ways in which genome sequencing will lead to the prevention and treatment of disease. Comparing the genome to an encyclopedia set, he said each of the four chromosomes would be a volume, and each gene a chapter in a volume.

He estimates that scientists will have a "working draft" (continued on page 6)

Applications for improved computer technology probed

■ By Deborah Halber  
News Office

If Tim Berners-Lee, "father of the World Wide Web," has his way, his baby will get much more proficient at gathering and correlating data and providing trustworthy information.

If Rodney Brooks, creator of the humanoid robot Cog, has his way, computers will respond much more intelligently to human needs. And if artificial intelligence expert Eric Grimson has his way, computers will save lives by providing foolproof tools for surgeons to use in tricky situations.

Dr. Berners-Lee (director of the World Wide Web Con- (continued on page 8)

## New instrument aims to make endoscopic surgery safer

■ By Denise Brehm  
News Office

Before the gall bladder surgery, Ernesto Blanco wanted to know precisely which instrument or "trocar" the surgeon would use to puncture his abdomen. His interest in the trocar was driven by more than mere curiosity—the gall bladder was his own—and by something other than personal

concern.

Adjunct Professor Blanco, a mechanical engineer and inventor, loves mechanical devices; the tools used in endoscopic surgeries, minimally invasive surgeries that have all but replaced many of the traditional "open" surgeries of the past, hold a special appeal for him.

For several years he had been working on an idea for a device that would make the initial

puncturing of the body safer in these procedures. And now he's finally solved the problem by designing a better trocar.

To begin endoscopic surgeries, the abdomen (or knee, wrist, hip, etc.) is pierced using a pointed instrument called a trocar, about the size and shape of a ballpoint pen, which is enclosed in a tube called a cannula. Once the trocar has pierced the skin and its tip pushed inside the body, the

surgeon pulls out the trocar, leaving only the small piece of tubing through which other instruments used in the surgery will be inserted.

Although minimally invasive surgeries are better in many ways than open surgeries—shorter healing time, less chance of infection—that initial entry is fraught with danger. According to Professor Blanco, no matter how you slice it, even the (continued on page 8)

## Similar genetic culprit found behind plant, mammal infections



Professor of Biology Graham C. Walker (right) and postdoctoral fellow Kristin D. Levier show alfalfa they grew for research on bacteria that affect alfalfa and cause brucellosis. Photo by Donna Coveney

■ By Deborah Halber  
News Office

Researchers at MIT and Louisiana State University Health Sciences Center (LSUHSC) at Shreveport reported in the March 31 issue of *Science* that they have found surprising similarities in how two bacteria with widely different lifestyles manage to establish chronic infections in mammals and plants.

Among other things, this information potentially could lead to a vaccine for human brucellosis, a debilitating disease also known as undulant fever.

At first glance, the agriculturally important bacterium *Rhizobium meliloti* and the pathogen *Brucella abortus*, which causes brucellosis in cows and humans, don't have much in common. But there are intriguing similarities in the ways the two bacteria interact with their hosts, even though rhizobia form a mutually beneficial association with plants and brucellae produce disease in mammals, said Graham C. Walker, professor of biology at MIT.

All living organisms require nitro-

gen. Plants cannot use the nitrogen gas in the atmosphere unless it is converted to ammonia, a form of nitrogen found in fertilizer. Leguminous plants such as alfalfa accomplish this conversion naturally with the help of rhizobia, bacterial microorganisms that live in the soil.

The rhizobia set up house by invading nodules on the roots of legumes like alfalfa. At the end of an elaborate invasion process, the plant's cells engulf the rhizobia much the way white (continued on page 8)

## IN BRIEF

## NO TECH TALK

There will be no Tech Talk on April 19 because of the Patriots Day holiday. The deadline for submitting classified ads and announcements for Tech Talk's April 12 issue, which will cover the period from April 12-26, is Friday, April 7 at noon.

# Student Notices

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

**INSTRUCTIONS:** Listings for Student Notices should be submitted using the web form at <http://web.mit.edu/newsoffice/tt/calform.html>. If you have questions, please contact [ttcalendar@mit.edu](mailto:ttcalendar@mit.edu) or x3-2704.

April 5-16

## ANNOUNCEMENTS

**MIT Sloan eBusiness Awards\***—Wednesday, April 12, 4:30-10:30pm, Kresge Auditorium. The MIT Sloan eBusiness Awards recognize and reward successful innovation in eBusiness in seven categories. More info: x3-2659, [info@mitawards.org](mailto:info@mitawards.org) or <http://www.mitawards.org>.

**26th Annual I. Austin Kelly III Essay Prize\*\***—Deadline April 12. Two prizes of \$626 each to MIT undergraduates for the best scholarly or critical essays concerning any field or interdisciplinary combination of fields in the humanities, arts or social sciences. More info: Music Office, Rm 14N-207, <http://web.mit.edu/mta/www/music/kellyprize.htm>, x3-5623 or [mcabral@mit.edu](mailto:mcabral@mit.edu).

## RELIGIOUS ACTIVITIES

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

**Baptist Campus Ministry\*\***—Weekly events: Sunday Nights at the RAC, 6pm, Main Dining Rm, Bldg W11. Home-cooked meal at 6pm (cost: by donation), followed by Bible Study. Tuesday Vespers, 6-6:30pm, chapel. A quiet time for reflection. More info: x3-2328.

**Baptist Student Fellowship\***—Weekly meetings on Tuesdays, include dinner followed by Bible Study. 5:30-7pm, Bldg W11, small dining room. Sponsored by Baptist Campus Ministry. More info: x3-2328.

**Campus Crusade for Christ\*\***—Weekly meeting on Wednesdays, 8pm, PDR 1 & 2, 3rd fl Student Center. Morning prayer, Tuesday and Thursday, 8:30am, Rm W11-080 (CFL). More info: x2-1781 or [bigbob@mit.edu](mailto:bigbob@mit.edu).

**Chi Alpha Christian Fellowship\*\***—Weekly Organizational Meeting, Tuesdays, 7:3-9pm, Private Dining Room 3 in Stratton Student Center. Christian worship and an examination of the Book of Revelation. Prayer and fasting each Thursday from 12-12:45pm in W11-063. More info: x3-2327, [cafc@mit.edu](mailto:cafc@mit.edu) or [www.mit.edu/activities/xa/main/html](http://www.mit.edu/activities/xa/main/html).

**Christian Science Organization\*\***—Thursdays at 7pm. Call x3-8797 or [lnorford@mit.edu](mailto:lnorford@mit.edu) for further information.

**Communitas-Life Together\*\***—Protestant Worship Sunday at 11am. Sponsored by: American Baptist Church, United Church of Christ, United Methodist Church, Presbyterian Church (USA). Chaplain John Wuestneck, x2-1780 or [chaplain@mit.edu](mailto:chaplain@mit.edu).

**Graduate Christian Fellowship\*\***—Weekly meetings Fridays at 6pm. Also weekly Bible studies, prayer and volleyball. More info: <http://web.mit.edu/mitgcf/> or [mit-gcf-info@mit.edu](mailto:mit-gcf-info@mit.edu).

**Lincoln Laboratory Bible Study\***—Thursdays, 12-12:30pm, weekly Bible study in the Division 7 conference room, D-430. More info: Sharon Frigon at 981-7751 or [frigon@ll.mit.edu](mailto:frigon@ll.mit.edu).

**Lutheran-Episcopal Ministry at MIT\***—Regular Wednesday worship 5:10pm, followed by either a brown bag supper or social activity in the Bldg W11 dining room. On the second Sunday of each month, LEM assists at Common Cathedral, a gathering of homeless people on the Boston Common, at 1pm. More info: x3-0108.

**Meditation and Discourse on the Bhagavad Gita\***—With Swami Tyagananda, monk of the Ramakrishna Mission of India, assoc. minister of Vedanta Society of Boston and MIT chaplain. Every Friday, 5:15pm, MIT Chapel. Sponsored by the MIT Vedanta Society. More info: 661-2011 or [mehta@cytel.com](mailto:mehta@cytel.com) or <http://www.cytel.com>.

**MIT Hillel\*\***—Tuesdays: 5:30pm Beginning Hebrew Class; 6:30pm Intermediate Hebrew Class. Wednesdays: noon Hebrew Conversation Table in Walker Cafeteria; 7pm Haftorah Class. Thursdays: noon Taste of Torah. Fridays: 6pm Egalitarian Chavurah Services and Orthodox Minyan Services; 7pm Shabbat dinner. Saturdays: 9am Orthodox Minyan Services; 12:45pm Shabbat lunch. More info x3-2982.

**MIT Muslim Students Association\***—Five daily prayers, Bldg W11; also Friday congregation 1:10-1:45pm, Rm W11-110. Info: x8-9285.

**MIT Orthodox Christian Fellowship\*\***—Wednesdays at 5:30pm in Student Ctr DR 1

for dinner followed by Chapel Vespers. x5-7649 or x5-7683.

**Protestant Eucharist/Holy Communion\***—Wednesdays, 5:10pm in Building W11. Sponsored by the Lutheran-Episcopal Ministry at MIT. More info: x3-2325 or [lutheran@mit.edu](mailto:lutheran@mit.edu).

**Taize Prayers\***—Fridays, noon-12:30pm in W11, the Board Room. All invited. Sponsored by students from the Protestant Ministry at MIT, Tech Catholics and the Lutheran-Episcopal Ministry. Taize Prayers, coming from the Taize community in France, are a form of Christian meditation based on singing and silence.

**Tech Catholic Community\*\***—Sunday Masses 9:30am, 1pm and 5pm. Weekday Masses Tuesdays and Fridays 12:05pm when classes are in session. More info: x3-2981 or [catholic@mit.edu](mailto:catholic@mit.edu).

**United Christian Fellowship (UCF)\*\***—A member of INTERVARSITY Christian Fellowship. Weekly meetings Fridays at 7:15pm, 3rd floor of Student Center. Weekly dorm-based bible studies on campus. More info: Sherry or Sara at 576-5157, [mitucf@mit.edu](mailto:mitucf@mit.edu), <http://web.mit.edu/ucf/>.

## 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.

**On-Campus, Non-Technical.** The Admissions Office seeks friendly, energetic students to work as interns in the reception center (Rm 10-100) for the summer. M-F 9am-5pm; \$8.25/hr. Contact Brad Plaster at x8-5501 [plaster@mit.edu](mailto:plaster@mit.edu).

**On-Campus, Technical.** Needed: a student with experience with web graphics, Photoshop and HTML to generate and update graphics on several web sites Knowledge of MacOS, GoLive, and/or Dreamweaver very helpful. If the student has a computer, much of the work may be performed at home. 5-20 hrs/wk, \$15/hr. Contact Scott Jensen at x3-0441 or [cjensen@mit.edu](mailto:cjensen@mit.edu).

**Off-campus, Technical.** MIT grad looking for a student who can tutor in basic internet programming skills for a Windows 2000/NT environment including Visual Basic, SQL, ASP, etc. 3-4hrs/wk, \$50/hr. Contact Audrey Kadis at 916-1610 or [askadis@alum.mit.edu](mailto:askadis@alum.mit.edu).

The following positions are for students with Federal Work Study eligibility.

**Community Service.** The B.E.L.L. Foundation is a non-profit organization that works to increase the educational and life opportunities and achievements of Black and Latino elementary school-aged children living in economically disadvantaged communities. Summer positions include: director of Summer Programs, administrative assistants, classroom teachers, and music, gym and art instructors. Contact Ayana Dilday at 282-1567 ext. 110.

**Community Service.** Dorchester House teen tutoring center is a supportive, stimulating

and safe environment where teenagers from the Dorchester community receive the individualized attention they need to achieve their full academic potential. Tutors needed to help students understand their homework and study for tests. The center operates Monday-Thursday 2:30-6pm. Flexible hours; \$8/hr. Contact Tom Powers at 288-0100 or [teen\\_ed@write.me.com](mailto:teen_ed@write.me.com).

**Community Service.** Openings for four math tutors, through America Counts. Work as a team of instructors with 20 students, grades 5-8 in after-school program. Provide innovative, small-group instruction, assist students in achieving mastery of grade-level math problem solving skills, and train students to teach younger students. Six hrs/week. Contact Tim Groves at 349-6567 or [timothy\\_groves@cps.ci.cambridge.ma.us](mailto:timothy_groves@cps.ci.cambridge.ma.us)

## VOLUNTEERS

The MIT Public Service Center (PSC) has compiled the following volunteer opportunities. Please contact the PSC for more information (Room W20-547, x3-0742).

**Charles River Earth Day Clean Up** needs individuals or organizations to host a clean-up in their area, and volunteers to participate in the clean-up on Saturday, April 15th (volunteers meet at 9:30am at the Hatch Shell). Contact Erica Wood at (617) 747-4372.

**Tutoring Opportunity.** A tutor/mentor (male preferred) is needed to work with a 16-year-old boy needing help with geometry and English. Can come to MIT 1-2 hours, three times a week. Call Marilyn Parece at (781) 999-9357 (w) or (617) 484-0204 (h).

**Service Civil International Voluntary Service** has volunteer opportunities in Armenia, Azerbaijan, Belarus, Georgia, Hungary, Slovakia, Slovenia, Ukraine, Russia, Bulgaria, Croatia, Kosovo, Macedonia, and Romania. Also other parts of Europe, Asia, Africa and Australia. Volunteer abroad in 2-week summer workcamps or 3-12 month program with a small stipend. Participants pay airfare and a \$125 fee. SCI is a secular, grassroots, nonprofit worldwide volunteer placement and development movement with a branch in the US. More info: [scinfo@sci-ivs.org](mailto:scinfo@sci-ivs.org) or <http://www.sci-ivs.org>.

## UROP

The UROP Office invites MIT and Wellesley students to join faculty members on research projects. For information on procedures, please contact the UROP Office, Rm 7-103 [urop@mit.edu](mailto:urop@mit.edu) or x3-7306. Information and current listings available on-line at <http://web.mit.edu/urop/www/>.

## Environmental Tip

Read e-mail messages on the screen rather than printing them out.

Environmental Programs Task Force

Contact: Kevin Healy [recycling@mit.edu](mailto:recycling@mit.edu)

## Crimewatch

The following incidents were reported to the MIT Campus Police between March 22-29. This summary contains most incidents reported, but does not include incidents such as medical shuttles, ambulance transfers, false alarms and general service calls.

**March 22:** Briggs Field: trailer stolen, \$1,500. Bldg. E52: palm top computer stolen, \$300. DuPont Gym: wallet stolen, \$40 cash. West Garage annex lot: '97 Dodge stolen, later recovered in Somerville. Bldg. E23: homeless person transported to shelter. Student Ctr.: check and inquiry, trespass warning issued. Bldg. N52: report of suspicious person, checked out okay. Bldg. 68: complaint of skate boarders.

**March 23:** Bldg. E52 plaza and Bldg. 68: complaint of skate boarders. Bldg. N52: suspicious person, checked out okay.

**March 24:** Bldg. 50: suspicious person, gone upon MITPD arrival. Bldg. NW21: suspicious person. DuPont: student problem. Pacific Lot: check and inquiry. Bldg. 7: two males arrested for trespassing and other related charges. Phi Beta Epsilon: sudden death.

**March 25:** Student Ctr.: homeless people. Bldg. NW61: homeless person.

**March 26:** East Parking lot: check and inquiry. Rear of W89: male taken into custody on an outstanding warrant. DuPont: report of unauthorized persons in area. Baker: employee problem. Pacific Lot: two vehicles broken into.

**March 27:** Audrey St.: vehicle broken into and four cartons of T-shirts stolen, \$1,500. Mass. Ave.: check and inquiry of vehicle. Bldg. NE20: harassment. Bldg. 6: bike tire stolen, \$150. DuPont: suspicious persons involved in an argument. Student Ctr.: male arrested for trespassing. Bldg. 7: suspicious person.

**March 28:** Bexley: suspicious person. Memorial Dr.: notify State Police, report of suspicious person hiding behind cars; individual stole two car tires and fled. Memorial Dr.: vehicle vandalized. MacGregor: obscene phone call. Baker: report of suspicious person.

**March 29:** Memorial Dr.: notified State Police of vehicle operating erratically. Bldg. 10: suspicious person. Bldg. 17a: working fire on second floor. Ashdown: suspicious phone calls. Student Ctr.: credit card stolen and used for several purchases.

# Community input invited on child care facility at Stata Center

Members of the MIT community are invited to play a role in planning the first new on-campus child care center in 38 years—the 104-child facility in the Ray and Maria Stata Center for Computer, Information and Intelligence Sciences, scheduled to open in 2003.

The Stata Center Child Care Committee is conducting an online survey to learn about people's previous experiences, attitudes and needs in choosing child care centers. Faculty, staff and students who have at least one child under age 13 or who anticipate having a child in their household in the next five years are encouraged to take part in the survey. The questionnaires may be downloaded from the Family Resource Center home page at <http://web.mit.edu/personnel/www/frc/>. Participants will be asked to identify themselves only by their affiliation to MIT.

The committee is also seeking volunteers for focus group discussions in the next few weeks. Participants will offer input on the design of the center's services and options, as well as discussing the needs of the parent community on such issues as scheduling and services to children at

different ages. Anyone willing to participate in focus groups or those with questions should send an e-mail to [childcaresurvey@mit.edu](mailto:childcaresurvey@mit.edu).

The Technology Children's Center (TCC) currently accommodates 50 children from 15 months to five years old. The facility at the Stata Center will provide care for children from birth through five years. Infant care and expanded toddler care are included to respond to the critical need for care in these age groups.

The center at Lincoln Laboratory also plans to increase its capacity.

The last on-campus child care facility added was in 1965 when the Westgate-based Technology Nursery School opened a second site at Eastgate.

Gail Sullivan Associates, a local architecture firm specializing in child care facilities, is the program architect for the Stata Center child care area. A rendering of the entire complex, designed by world renowned architect Frank O. Gehry and Associates, is available at <http://ciis.lcs.mit.edu/>.

The advisory committee was established by Provost Robert A. Brown to address program and governance issues related to the new center. Committee members include Professors Leigh Royden, Richard Locke, and Anne McCants; staff members are Kathy Simons of the Family Resource Center, Lydia Snover of the Planning Office, Pat Bartels of MIT Medical, David Silverman of Facilities and Marianne Howard of the Benefits Office. Professor Phillip L. Clay, associate provost, chairs the group. Suggestions and comments should be sent to [childcaresurvey@mit.edu](mailto:childcaresurvey@mit.edu).

MIT facilities serve children of faculty, staff and students on a priority basis, as well as children from the wider community, space permitting.

## MIT TECH TALK (USPS 002157)

April 5, 2000  
Volume 44, Number 26

Publisher  
KENNETH D. CAMPBELL  
Editor  
ALICE C. WAUGH  
Photojournalist  
DONNA COVENEY

**News Office**  
Director: Kenneth D. Campbell; Associate Director: Robert J. Sales; Assistant Directors: Donna Coveney, Elizabeth A. Thomson, Alice C. Waugh; Senior Writer: Sarah H. Wright; Science Writer: Deborah Halber; Assistant Editor of Tech Talk: Denise Brehm; Administrative Assistant: Myles Crowley; Design/Editorial Assistant: Lisa Damtoft; Administrative Secretary: Mary Anne Hansen; Senior Office Assistant: Patricia Foley.

The Arts page is produced by the Office of the Arts, Room E15-205, (617) 253-4003. Director of Arts Communication: Mary Haller; Administrative Staff Assistant: Lynn Heinemann.

News Office e-mail:  
[newsoffice@mit.edu](mailto:newsoffice@mit.edu)  
News Office URL:  
<http://web.mit.edu/newsoffice/www/>  
Office of the Arts URL:  
<http://web.mit.edu/arts>

Tech Talk is published weekly except for most Monday-holiday weeks by the News Office, Room 5-111, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, Massachusetts 02139-4307. Telephone: 617-253-2700.

**Postmaster:** Send address changes to Mail Services, Building WW15, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, Massachusetts 02139-4307. Subscribers may call (617) 252-1550 or send e-mail to [cmailsvc@mit.edu](mailto:cmailsvc@mit.edu).

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

Domestic mail subscriptions are \$25 per year, non-refundable. Checks should be made payable to MIT and mailed to Business Manager, Room 5-111, 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. Selected articles that originated here are also available online (see web URL above).



Printed on Recycled Paper

## It's a fact

George Eastman anonymously donated \$2.5 million to fund MIT's new Cambridge campus, completed in 1916. He went on to contribute more than \$19 million to MIT. See <http://web.mit.edu/museum/fun/smith.html>.

Robert J. Sales

# Quarter Century Club inducts 102 new members into ranks

One hundred and two new members of the Quarter Century Club were inducted at a March 29 Faculty Club luncheon. QCC board member Anthony P. French, professor of physics, served as master of ceremonies. Chancellor Lawrence S. Bacow was this year's guest speaker.

The 102 new members (down slightly from last year's group of 107) included 25 women and 77 men. Eighty-one inductees are from campus and 21 from Lincoln Lab. According to the QCC database, there are approximately 2,834 club members—2,324 men and 510 women.

Membership in the QCC, which aims to promote good fellowship among long-term associates of the MIT community, is offered to the faculty, administrative, research, support, and service staff members who have 25 years of employment with the Institute. The club is a part of the Office of Special Community Services located in Rm 50-005 (lower lobby of Walker Memorial).

The general membership of the QCC will have an opportunity to welcome new members at the annual summer picnic on Tuesday, August 15 at the Johnson Athletics Center from 4:30-7 pm. Other upcoming QCC events include the Silver Club High Tea for Ladies on October 17 at the Faculty Club (2:30-4pm) and the QCC holiday gathering on December 7 in La Sala de Puerto Rico at the Stratton Student Center (5-7 pm).

New Quarter Century Club members this year are:

Walter A. Alessi, Athletics  
Samuel M. Allen, Materials Science and Engineering

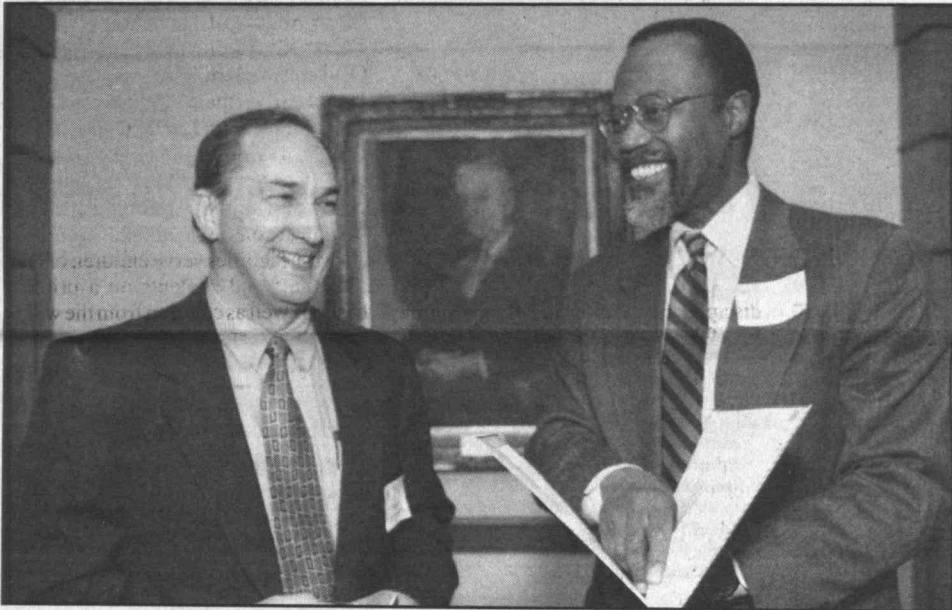
Klaus-Jurgen Bathe, Mechanical Engineering  
Paul J. Berger, Lincoln Lab Group 94  
Stephen B. Bowling, Lincoln Lab Group 108  
Joseph Branco, Housing  
Charles F. Bruce, Lincoln Lab Division 7  
Arnold Carter, Facilities  
John A. Centorino, Materials Processing Center  
Vincent J. Cerrati, Lincoln Lab Group 75  
Chaw-Bing Chang, Lincoln Lab Group 101  
Alvin S. Clarke, Facilities  
Phillip L. Clay, Provost's Office  
Michael W. Cook, Document Services  
James H. Cosgrove, III, Lincoln Lab Group 108  
Susan M. DeFranzo, Lincoln Lab Group 17  
Ward DeHaro, Center for Cancer Research  
Robert L. Devine III, Lincoln Lab Group 44  
Robert W. Field, Chemistry  
Stan N. Finkelstein, Sloan School  
David T. Flett, Campus Activities Complex  
John E. Foley, Treasurer's Office  
John J. Ford, Lincoln Fiscal Office  
Cecil A. Forde, Facilities  
James G. Fox, Provost's Office  
Eulogio Gallardo, Haystack Observatory  
Anne P. Glavin, Campus Police  
Thomas H. Glick, Medical Department  
David C. Gossard, Mechanical Engineering  
James M. Grenham, Lab for Nuclear Science  
Alan J. Grodzinsky, Center for Biomedical Engineering  
Kenneth J. Hall, Copy Technology Centers  
Gerald N. Hamm, Haystack Observatory  
Barbara A. Haven, Campus Police  
Thomas R. Henneberry, Office of the Executive Vice President  
David E. Housman, Biology  
Stanley G. Hudson, Office of the Dean of Students



The Quarter Century Club welcomes new members (left to right) Bonny Kellermann, recording secretary in the Treasurer's Office; Bonnie Jones, manager of Alumni/ae Recognition Services; and Campus Police Chief Anne Glavin. Photo by Donna Coveney

Richard O. Hynes, Center for Cancer Research  
Hitoshi Inada, Lincoln Lab Group 93  
Nerva E. Irvine, Medical Department  
Philip O. Jarvinen, Lincoln Lab Group 75  
John Joannopoulos, Physics  
Bonnie S. Jones, Alumni Association  
Joanne E. Jonsson, Mathematics  
Michael A. Kane, Medical Department  
William E. Keicher, Lincoln Lab Group 48  
Bonny S. Kellermann, Treasurer's Office  
Charles S. Langston, Medical Department  
Ronald M. Latanision, Materials Science and Engineering  
Marilyn J. Lewis, Lincoln Lab Group 98  
Henry A. Lieberman, Media Lab  
Nathan E. Lindgren, Lincoln Lab Group 36  
Nancy J. Maida, Lincoln Lab Group 13  
Kenneth R. Manning, Program in Writing and Humanistic Studies  
Marlene Manoff, Libraries  
Judith E. Mason, Sloan School of Management  
Anne Maynard, Aeronautics and Astronautics  
J. Terence Meehan, Property Office  
Janez Megusar, Materials Processing Center  
Richard B. Melrose, Mathematics  
Errol W. Morrison, Information Systems  
Victoria H. Murphy, Civil and Environmental Engineering  
Kevin L. Newcomb, Lincoln Lab Group 88  
Ronald R. Parenti, Lincoln Lab Group 67  
Linda L. Patton, Housing  
Ernest Patturelli, Lincoln Lab Group 12  
Noemi M. Pedraza, Medical Department  
Anita C. Perkins, Libraries  
Austin H. Petzke, Facilities  
Bing M. Potts, Lincoln Lab Group 33  
Rudrapatna V. Ramnath, Aeronautics and Astro-

nautics  
Leslie Regan, Mechanical Engineering  
Ronald L. Rivest, Electrical Engineering and Computer Science (EECS)  
Urnal G. Robinson, Facilities  
Richard D. Rosen, Earth, Atmospheric, and Planetary Sciences  
James S. Rourke, Facilities  
David K. Roynance, Materials Science and Engineering  
Nannaji Saka, Mechanical Engineering  
Steven C. Sanders, Haystack Observatory  
Penny B. Schwan, Lincoln Lab Division 9  
Jeffrey J.T. Sealy, Lab for Computer Science  
Phillip A. Sharp, Institute Professors  
A. Rae Simpson, Family Resource Center  
Janet L. Snover, Office of the Executive Vice President  
Frank Solomon, Biology  
Nancy V. Sotak, Lincoln Lab Division 5  
Joseph G. Sousa, Housing  
Glenn P. Strehle, Administration  
Peter Szolovits, EECS  
Richard J. Temkin, Physics  
Susan Marks Ting, Lab for Nuclear Science  
Lorraine G. Toher, Medical Department  
H. Sharon Trohon, Ocean Engineering  
Stephen D. Umans, EECS  
Frank Urbanowski, MIT Press  
James M. Utterback, Sloan School  
J. Kim Vandiver, Ocean Engineering  
Daniele Veneziano, Civil and Environmental Engineering  
Stephen A. Ward, EECS  
Cardinal Warde, EECS  
Leslie N. Weiner, Lincoln Lab Group 68  
Anne Hartung Whealan, Facilities.



New QCC members Thomas Henneberry (left), director of insurance and legal affairs, and Associate Provost Phillip Clay converse at the annual member induction luncheon, held March 29 at the Faculty Club. Photo by Donna Coveney

## Engineering, Sloan schools receive multimillion-dollar gifts

The School of Engineering and the Sloan School of Management will each receive \$2.6 million from the Siebel Scholars Program plus an annual \$25,000 scholarship to be awarded to one student selected by the dean at each school.

The program, announced yesterday at Siebel Systems Inc.'s headquarters in San Mateo, CA, recognizes outstanding students at 11 prestigious computer science and business schools across the United States. It's part of an educational initiative launched by the e-business firm in 1999 to assist institutions that foster academic excellence and leadership to produce the next generation of corporate executives.

"Today, information technology and computation are pervasive and are shaping both engineering and our world in unprecedented ways," said Dean Thomas L. Magnanti of the School of Engineering. "For this reason, we are extremely pleased to be sharing in this generous grant from Siebel Systems. The Siebel Scholars Program not only assists us in expanding fellowship support to our graduate students—a goal that is very important to us—but it also encourages outstanding work and leadership by these students to better serve society."

"Sloan's educational mission is to develop effective, innovative leaders who advance the global economy—

leaders who will define tomorrow's best practice and shape emerging industries," said Dean Richard Schmalensee of the Sloan School. "The Siebel Scholars Program will help us recognize these future leaders while providing needed fellowship support."

Other recipients, each of which receives \$2.6 million and an annual scholarship, are Stanford's Graduate

School of Business and School of Engineering, Harvard Business School, Carnegie Mellon's School of Computer Science, Northwestern's J.L. Kellogg School of Management, the University of California at Berkeley's School of Engineering, the University of Chicago's Graduate School of Business, the University of Illinois at Urbana-Champaign's School of Engineering and the University of

Pennsylvania's Wharton School.

"The graduate programs at these universities have made great contributions to industry and society, both here in Silicon Valley and worldwide," said Thomas M. Siebel, chairman and CEO of Siebel Systems. "Siebel Systems wishes to support those efforts on a personal level, and the Siebel Scholars Program is our way of helping develop the talent."

## Libraries present e-resource celebration

This afternoon (April 5) from 2-4pm, the MIT Libraries will sponsor a celebration of the 200th database and the 1,200th electronic journal to become available to the MIT community via the campus web site.

The event will be held in the Science Library (Rm 14S-100) and will feature demonstrations of the databases and e-journals, refreshments, mementos, and a drawing for a door prize—a gift certificate to the MIT Press Bookstore. A terminal to demonstrate the electronic resources will also be set up in the Student Center from 11am-1pm.

Derwent Innovations Index, a new web-based resource that allows searching of the worldwide patent literature, is the 200th database to be made available by the MIT Libraries. Coverage

for many source patents begins in 1963. Updated weekly, the database can be searched on many elements, including topic, assignee, inventor, and patent number. Full citations and a detailed abstract are presented for each patent.

Science, the weekly magazine published by the American Association for the Advancement of Science, is the 1,200th electronic journal accessible through the Libraries to the MIT community. Available in full text are issues from October 1995 to the present. This online version of the journal is searchable by such elements as author, title and topic, as well as by individual words in the title, abstract or in the entire article.

"These 200 databases and 1,200 electronic journals—in science and

technology, the social sciences, management, architecture and planning, the humanities and the arts—reflect a profound revolution in library service," said Ellen Duranceau, digital resources acquisitions librarian. "With the power of the web, we can now offer desktop access to key resources from anywhere on campus. We hope that everyone at MIT will take advantage of this flexible and efficient access, for it is safe to say that with 1,400 titles available on all topics, we have something for everyone."

The e-resource celebration will also feature demonstrations of Vera, the Libraries' new interface for accessing e-resources. For Vera and other information on the MIT Libraries, see <http://libraries.mit.edu>.

## Lab hosts two-day symposium on manufacturing

The Laboratory for Manufacturing and Productivity is holding a symposium entitled "The Future of Manufacturing: New Developments in Technology and System Design" at the University Park Hotel in Cambridge on April 18 and 19. Participants from industry, business and academia will explore new research in manufacturing processes and systems.

The Ralph E. Cross, Sr. lectures will be delivered both days at 9:15am. On April 18, Professor Kent Bowen of Harvard Business School will deliver an address about the Toyota production system, and on April 19, Professor Nam Suh, head of the MIT Department of Mechanical Engineering, will speak about the design of manufacturing systems.

Both lectures are open to the MIT community. For more information about the symposium, including a registration form, see the LMP web site at <http://web.mit.edu/lmp/www>.

## Amex no longer an MIT preferred travel vendor

The relationship between MIT and the American Express Travel Agency (Amex) as a preferred ticket supplier will be terminated as of April 8. As of that date, Amex will no longer be eligible to receive any MITMASCO or other MIT airline discounts, nor can they accept a departmental cost object to charge airline tickets.

The action is based on an announcement from Amex that beginning April 8, a processing fee will be charged for each airline ticket issued to MIT. This is because airlines have been reducing the commissions they pay to travel agencies. MIT is one of the last corporate businesses not being charged fees by agencies to make up for their lower commissions. Although MIT's avoidance of these fees thus far has saved

the Institute approximately \$1 million over the past two years, it is likely that MIT will eventually be forced to pay them.

The Travel Office asks that MIT customers use one of the other two MIT approved travel agencies, the Travel Collaborative or Navigant International (formerly Omni Travel). All new clients are asked to call the Travel Collaborative at 497-8196 or Navigant International at x3-9405.

Anyone interested in an educational seminar by either or both travel agencies on their services may contact Ellen Sico in the Travel Office at x3-3547 or <esico@mit.edu>, or see the office's web site at <<http://web.mit.edu/cao/www/travel.htm>> for more information.

## Cancer update is focus of 'Aging Successfully' panel

"Cancer: Update and Outlook" is the topic of the 13th annual Catherine N. Stratton "Aging Successfully" seminar, which will take place in Wong Auditorium (Building E51) on Thursday, April 13 from 9:30am-noon. The seminar is sponsored jointly by MIT Medical and the Women's League.

National attention has galvanized around this topic with the death from colon cancer of "Peanuts" creator Charles Schultz, and the frequent appearance in the media of studies on the effects of diet, environment and heredity on the incidence of cancer adds to our awareness. MIT Medical itself devoted the March issue of "Health at MIT" to colon cancer.

"Cancer: Update and Outlook" will be moderated by Dr. William M. Kettle, an internist, geriatrician and associate director of MIT Medical. He will introduce the panelists and, using a case study of a 42-year-old male with a fam-

ily history of colon cancer, focus the discussion on cancer prevalence, detection, prevention and treatment, as well as future approaches to the disease.

Panelists are Dr. William C. Hahn, medical oncologist and cancer researcher at the Whitehead Institute and the Dana-Farber Cancer Institute; Dr. Frederick P. Li, research physician and epidemiologist at Harvard Medical School, Harvard School of Public Health and Dana-Farber; and Dr. Helen M. Shields, gastroenterologist at the Beth Israel-Deaconess Medical Center and assistant professor of medicine at Harvard Medical School.

Dr. Li is the recipient of the fourth American Cancer Society Award for Research Excellence in cancer epidemiology and prevention. He will review his current research on cancer risk reduction based on new knowledge of the genetic and environmental causes of cancer.

As the director of the 1986-87 Mas-

sachusetts Colon Cancer Screening Project at Beth Israel involving 23,000 subjects, Dr. Shields will share some of the pertinent data gleaned from this far-reaching project. She will cover methods of screening for colon cancer and who to screen, how vigorously and how often, as well as the limitations of current tests. Dr. Shields is hopeful about "virtual colonoscopy" as a diagnostic tool, which would be especially beneficial to the aging population.

Dr. Hahn will cover what's new and down the road in drugs and approaches to cancer. His success in creating cancer cells in the laboratory for the first time was reported in the July 1999 issue of Nature and reported widely in the press, including Time magazine.

A question period will follow the presentations. The program is free and open to the public. Coffee will be available in the lobby before the seminar at 9am.

### Do you have news or information you'd like to share with the MIT community or outside readers?

Contact the News Office at x3-2700 or send e-mail to <[newsoffice@mit.edu](mailto:newsoffice@mit.edu)>. Also see our web page at <<http://web.mit.edu/newsoffice/www>>

## Institute Calendar

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

(For arts-related listings, see page 7.)

**INSTRUCTIONS:** Seminars & Lectures must be submitted to the online TechCalendar at <<http://tech-calendar.mit.edu>>. If you have questions, please contact <[help@tech-calendar.mit.edu](mailto:help@tech-calendar.mit.edu)>.

Listings for Community Calendar should be submitted using the web form at <<http://web.mit.edu/newsoffice/tt/calform.html>>. If you have questions, please contact <[calendar@mit.edu](mailto:calendar@mit.edu)> or x3-2704.

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, March 31, covering events from Wednesday, April 12 through Sunday, April 30.

### April 5-16

#### ■ SPECIAL INTEREST

**Community, Culture, Spirituality & Technology\***—Panel discussion. Speakers: Pete Seeger (singer, activist), Sen. Hank Sanders (Alabama), Martha Richards (Fund for Women Artists), and others. **Wednesday, April 5, 2-4pm**, Student Center Rm 491. **Free concert**, 7pm, Wong Auditorium, featuring Pete Seeger, and Jane Sapp. Sponsored by Center for Reflective Community Practice, Urban Studies and Planning. RSVP for concert: x2-1380 or <[rcrp@mit.edu](mailto:rcrp@mit.edu)>.

**Cancer: Update and Outlook\***—Catherine N. Stratton seminar on Aging Successfully. **Thursday, April 13, 9:30am-noon**, Wong Auditorium. Sponsored by MIT Medical and the MIT Women's League. Coffee available at 9am in the lobby. More info: x3-3656, <[wleague@mit.edu](mailto:wleague@mit.edu)>.

#### ■ SEMINARS & LECTURES

(Listings compiled by TechCalendar, courtesy of The Tech.)

#### WEDNESDAY, APRIL 5

**High Speed Transmission Systems and All-Optical Signal Processing\***—Benny Mikkelsen, Lucent Technologies, Bell Labs. EECS/RLE-Optics & Quantum Electronics Seminar Series. 11am, Rm 34-Grier Room B. More info: x3-8504, <[ippen@mit.edu](mailto:ippen@mit.edu)>.

**Expanding NATO: A Look Backward and A Look Forward\***—Richard Kugler, Research Professor, National Defense Univ. Security Studies Program seminar series. 12pm, Rm E38-615. Bag lunch; refreshments will be provided. More info: x3-0133, <[levine@mit.edu](mailto:levine@mit.edu)>, <<http://web.mit.edu/ssp/>>.

**Community, Culture, Spirituality & Technology\***—Panel discussion. See Special Interest above.

**Maximum Product of Spacings Method: A Unified Formulation with Illustration of Strong Consistency\***—Marjorie Hahn, Tufts Univ. Statistics Seminar. 5:15-6:15pm, Rm 2-105. Refreshments at 4:45pm in Rm 2-349. More info: x3-4390 or <[genton@math.mit.edu](mailto:genton@math.mit.edu)>.

#### THURSDAY, APRIL 6

**Clouds over Tropical Ocean: Development & Evaluation of a Parameterization for Use in Climate Models\***—Sandrine Bony, MIT. MIT Atmospheric Science Seminars. 2:30-3:30pm, Rm 54-1411. More info: x8-6910, <[yong@mit.edu](mailto:yong@mit.edu)>, <<http://www-paoc.mit.edu/MASSseries.html>>.

**Deliveries in an Inventory/Routing Problem Using Stochastic Dynamic Programming\***—Prof. Dick Larson, dir., Center for Advanced Educational Services, MIT. Sponsored by Operations Research Center. 4-5pm, Rm E40-298. Refreshments follow. More info: x3-6185, <[jshollyw@mit.edu](mailto:jshollyw@mit.edu)>, <<http://web.mit.edu/orc/www/>>.

**Wild Minds/The Design of Animal Communication\***—Prof. Marc D. Hauser, Dept. of Psychology, Harvard Univ. Sponsored by The MIT Press Bookstore with authors@mit. 6-7:30pm, Bartos Theater. More info: x3-5249, <[books@mit.edu](mailto:books@mit.edu)>, <<http://mitpress.mit.edu/bookstore/events>>.

**Careers in Venture Capital\***—Panel Discussion featuring speakers from five venture capital firms. Sponsored by Science Business Club. 7-8pm, Rm 6-120. More info: x3-5106, <[jparker3@mit.edu](mailto:jparker3@mit.edu)>, <<http://grapes.mit.edu/sbc.html>>.

#### FRIDAY, APRIL 7

**Emotions and Learning: Innovative Model-based Reasoning Machines\***—Dr. Barry Kort, Visiting Scientist, MIT. Sponsored by Media Lab-Affective Computing. 12-1:45pm, Room E15-054. More info: x3-0611, <[nerd@mit.edu](mailto:nerd@mit.edu)>, <[www.media.mit.edu/affect](http://www.media.mit.edu/affect)>.

**Nuclear Power in Asia\***—Mr. Katsuya Tomono, Tokyo Electric Power Company (TEPCO). Sponsored by Nuclear Engineering. 2-3:30pm, Rm 3-133. More info: x3-7407, <[ned1@mit.edu](mailto:ned1@mit.edu)>.

**Bulk Solids Handling/Granular Flow\***—Tony Royal, Jenike & Johanson, Inc. CEE Department Series. 4-5pm, Rm 1-350. Refreshments at 3:30pm.

**Artificial Intelligence and the Soul\***—Prof. Rosalind Picard, Media Lab. Sponsored by Graduate Christian Fellowship. 6pm, Student Center, Rm 491. Dinner and discussion afterwards. More info: x3-4699, <[mit-gcf-info@mit.edu](mailto:mit-gcf-info@mit.edu)>, <<http://web.mit.edu/mitgcf/>>.

#### TUESDAY, APRIL 11

**Smith-Purcell Radiation in the Relativistic Regime\***—John Walsh, Dartmouth College. Plasma Science and Fusion Center Seminar Series. 11am, Rm NW17-218. Refreshments served at 3:45pm. More info: x3-8101, <[rivenberg@psfc.mit.edu](mailto:rivenberg@psfc.mit.edu)>, <<http://www.pfc.mit.edu/>>.

**Single-Molecule Imaging, Spectroscopy, and Dynamics of Biological Systems\***—

Sunney Xie, Harvard Univ. Modern Optics and Spectroscopy. 12pm, Rm 37-252. Refreshments follow. More info: x3-4881, <[chearn@mit.edu](mailto:chearn@mit.edu)>, <<http://web.mit.edu/spectroscopy/www/>>.

**Adding a Dimension to Cochlear Mechanics\***—Elizabeth S. Olson, physics dept., Princeton Univ. Sponsored by Physical Mathematics Seminar. 2:30-3:30pm, Rm 2-338. Refreshments at 3:30pm. More info: x3-4387, <[bush@math.mit.edu](mailto:bush@math.mit.edu)>.

**Mind: From Underdetermination to Potentiality\***—Zdravko Radman, Fulbright Visiting Scholar, Dept. of Philosophy, UC Berkeley. Sponsored by STS. 3pm, Rm E51-275. More info: x3-4084, <[cbates@mit.edu](mailto:cbates@mit.edu)>.

**Factor Graphs, Belief Propagation Algorithms and Analog Computation\***—Andi Loeliger, J. Endora Tech AG. LIDS Colloquium. 4-5pm, Rm 35-225. Reception will follow. More info: x3-2832, <[soosan@mit.edu](mailto:soosan@mit.edu)>.

**The Flow of Viscoelastic Fluids through Axisymmetric Abrupt Contraction-Expansions\***—Jonathan Rothstein, Dept. of Mechanical Engineering, MIT. Sponsored by Fluid Mechanics Seminars. 4-5:30pm, Rm 5-234. More info: x3-202, <[dwilker@mit.edu](mailto:dwilker@mit.edu)>.

**The Limit of CMOS Scaling: How Far Can We Extend it?\***—Yuan Taur, IBM Research. Sponsored by MTL VLSI Seminar. 4-5pm, Rm 34-101. Refreshments at 3:30pm. More info: x3-5264, <[debb@mtl.mit.edu](mailto:debb@mtl.mit.edu)>, <<http://www-mtl.mit.edu/>>.

**Role of Endwall Flows on Compressor Stability\***—Mr. Huu Duc Vo, MIT-Gas Turbine Lab. GTL Spring 2000 Lecture Series. 4:30-5:30pm, Rm 31-161. Refreshments served 4:15pm. More info: x3-2481, <[dragonl@mit.edu](mailto:dragonl@mit.edu)>.

**Lighting Sydney's Olympic Boulevard using Mirrors and Translucent Photovoltaics\***—Barry Webb, lighting engineer, Sydney; visiting professor, MIT. Sponsored by Office of the Arts with Department of Architecture. 6:30pm, Rm 10-250. Dept of Architecture Lecture. More info: x3-7991.

**The Challenges and Rewards of Interracial Dating\***—Norma Lopez and Mark Tracy, Residential Life and Student Life Programs. Tuesday Nights @ Baker. 7:30-8:30pm, Baker House Dining Hall. Snacks and refreshments will be served. More info: x8-0691, <[deepblue@mit.edu](mailto:deepblue@mit.edu)>, <<http://web.mit.edu/arc/tnb/tuesdays.html>>.

#### WEDNESDAY, APRIL 12

**The US Institute of Peace: How Are We Doing?\***—Dr. Richard Solomon, President, US Institute of Peace. Security Studies Program seminar. 12pm, Rm E38-615. Bag lunch; refreshments will be provided. More info: x3-0133, <[levine@mit.edu](mailto:levine@mit.edu)>, <<http://web.mit.edu/ssp/>>.

**Remote Sensing for Marine Archaeology: Past, Present and Future\***—Martin Klein, '62. Sponsored by DeepArch Research Group, STS. 3pm, E51-095 (subject to change). More info: x5-7273, <[croff@mit.edu](mailto:croff@mit.edu)>, <<http://web.mit.edu/sts/deeparch/>>.

**Return to the Moon\***—Mr. Harvey Willenberg, Boeing Corp. 16.S26 Modern Space Science and Engineering. 3-4pm, Rm 37-212. More info: x8-5546, <[halaris@mit.edu](mailto:halaris@mit.edu)>, <<http://web.mit.edu/masgc/www/phaseI.html>>.

**The Remarkable Impact of Interior Methods for Constrained Optimization\***—Dr. Margaret H. Wright, Computing Sciences Rsch Ctr, Bell Labs, Lucent Technologies. Distinguished Speaker Series in High Performance Computation for Engineered Systems. 4-5pm, Rm 4-237. Reception at 3:30pm. More info: x3-8122, <[patera@mit.edu](mailto:patera@mit.edu)>, <<http://web.mit.edu/sma/>>.

**Latest Results from the Hadley Centre Climate Prediction and Research Programme\***—Alan Thorpe, Hadley Centre, UK Meteorological Office. MIT Atmospheric Science Seminars. 4-5pm, Rm 54-915. More info: x8-6910, <[yong@mit.edu](mailto:yong@mit.edu)>, <<http://www-paoc.mit.edu/MASSseries.html>>.

**10-250 Case Presentation\***—6-9pm, Rm 10-250. Monthly program for entrepreneurs with speakers and technology-oriented companies focused on the issues of building and growing the business. Students: Free; \$10/ Forum members; \$15/non-members. More info: x3-8240, <[mitcfmb@mit.edu](mailto:mitcfmb@mit.edu)>, <<http://www.mitforum-cambridge.org/>>.

#### THURSDAY, APRIL 13

**Cancer: Update and Outlook\***—Catherine N. Stratton seminar on Aging Successfully. 9:30am-noon, Wong Auditorium. See Special Interest above.

**Global Environmental Negotiations: Issues in Getting to "Yes" in an Unequal World\***—panel discussion on global climate change, featuring keynote address by Nobel laureate Mario Molina, and book release by Sunita Narain, Center for Science and Environment, New Delhi. Sponsored by SANGAM, PAKSMIT, SAVE, Mexico City Project(EAPS), AID-Boston and Social Justice Cooperative. 5:30pm, Tang Center (E51-345). More info: x7-5768, <[samudra@mit.edu](mailto:samudra@mit.edu)>, <[web.mit.edu/sangam/www/](http://web.mit.edu/sangam/www/)>.

**Database Nation: The Death of Privacy in the 21st Century\***—Simson Garfinkel. Sponsored by The MIT Press Bookstore with authors@mit. 6-7:30pm, Rm 10-250. More info: x3-5249, <[books@mit.edu](mailto:books@mit.edu)>, <<http://mitpress.mit.edu/bookstore/>>.

#### FRIDAY, APRIL 14

**Composite Materials Synthesis: Learning from Nature\***—Galen D. Stucky, Univ. of CA, Santa Barbara. Chemical Engineering Department Spring 2000 Seminar. 3-4pm, Rm 66-110. Reception at 2:45pm. More info: x8-7031, <[carline@mit.edu](mailto:carline@mit.edu)>, <<http://web.mit.edu/cheme/www/>>.

**Modeling of Calcium Leaching in Cement Based Material\***—Marc Mainguy, MIT CEE. CEE Department Series. 4-5pm, Rm 1-350. Refreshments at 3:30pm.

#### SUNDAY, APRIL 16

**Media and Imagination Science Fiction Readings\***—Greg Bear, author of "Darwin's

#### ■ COMMUNITY CALENDAR

**MIT Libraries E-Resources Celebration\***—Wednesday, April 5, 2-4pm, Science Library, Rm 14S-100. Celebrating the 200th database and the 1200th electronic journal to be mounted on the campus network with online demonstrations, gifts, refreshments and a door prize. More info: x3-5686, <[crks@mit.edu](mailto:crks@mit.edu)>, <<http://libraries.mit.edu/vera/>>.

**MIT Libraries Book Sale\***—Thursday, April 6, 10am-3pm, Hayden Basement Gate, Building 14S. Free materials at every sale. Proceeds support the MIT Libraries Preservation Fund. More info: x3-5693, <[gifts-lib@mit.edu](mailto:gifts-lib@mit.edu)>, <<http://macfadden.mit.edu:9500/colserv/gifts/booksale.html>>.

**Children and Sleep\***—Faun R. Zarge, Creative Learning Strategies, Monday, April 10. Sponsored by Family Resource Center. 12-1:30pm, Rm 16-151. More info: x3-1592, <[frc@mit.edu](mailto:frc@mit.edu)>, <<http://web.mit.edu/personnel/www/frc/>>.

**Working Group on Support Staff Issues Monthly Lunch Meeting\***—Wednesday, April 12, 11:30am-1:30pm, Bush Room, 10-106. Organizational issues, co-convenor announcement and new task group presentation. Contact Martha Bezzat for an invitation: x3-7455, <[mbezzat@mit.edu](mailto:mbezzat@mit.edu)> or <<http://web.mit.edu/committees/wgssi/>>.

**Alcoholism in the Family\***—Judy Osborne, Stepfamily Associates, Thursday, April 13. Sponsored by Family Resource Center. 12-1:30pm, Rm 16-151. More info: x3-1592, <[frc@mit.edu](mailto:frc@mit.edu)>, <<http://web.mit.edu/personnel/www/frc/>>.

**Spouses and Partners@MIT Group\***—April 5: Brazil. Wednesdays, 3-5pm, Rm W20-400. More info: x3-1614.

#### ■ MITAC

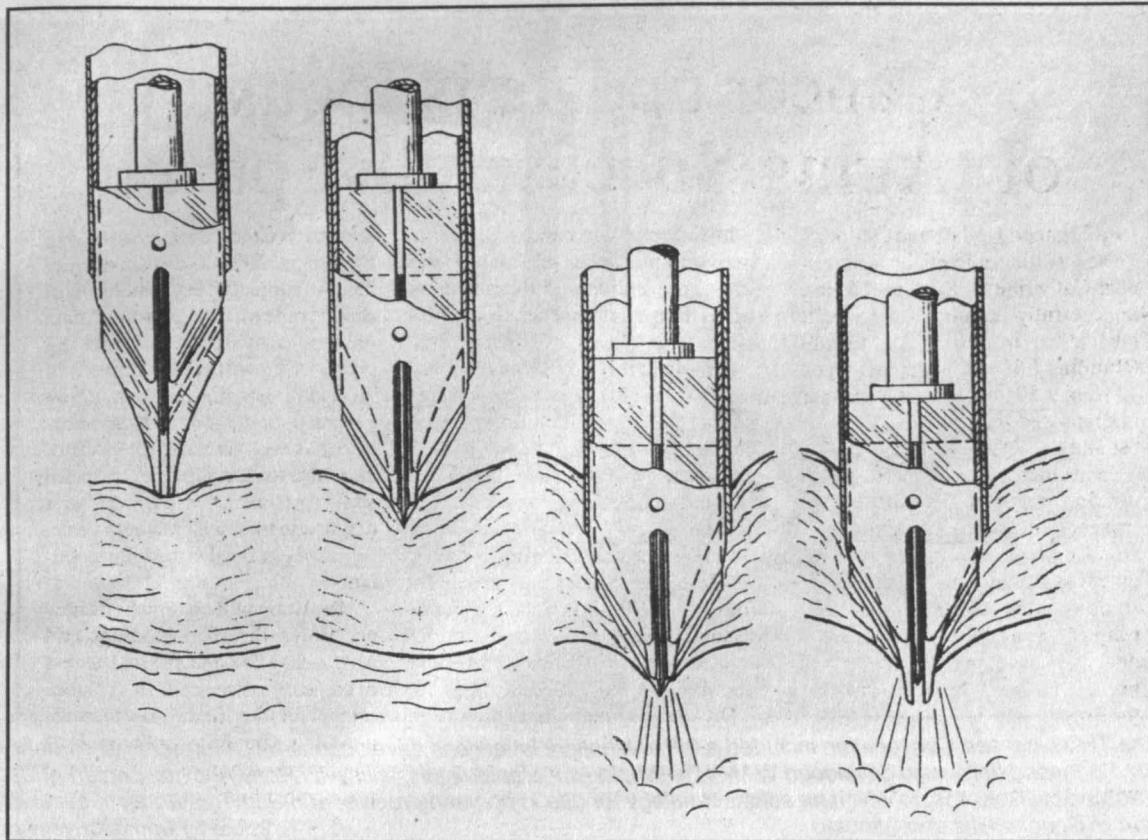
The MIT Activities Office (MITAC) has two locations: Walker Memorial, Rm 50-005, 9:30am-3:30pm, Wednesday-Friday; and Lincoln Lab, Rm LL-B-210, 1:15-4pm, Thursday and Friday only. More info: x3-7990, <[ekm@mit.edu](mailto:ekm@mit.edu)>. MIT IDs must be presented.

**Boston Classical Orchestra (BCO)** (Faneuil Hall, Quincy Market)\*\*—Friday, April 28 at 8pm and Sunday, April 30 at 3pm. Ticket \$14.

**Big Apple Circus** (Fan Pier, Old Northern Ave., Boston)\*\*—Friday, May 5 at 7pm. Ticket: \$14 (reg. \$19), grandstand seating.

**Boston Pops Swing Night** (Symphony Hall, Boston)\*\*—Sunday, May 7 at 7:30pm. Ticket: \$47, orchestra; \$34, 1st balcony; \$14, 2nd balcony.

**Mother's Day Sunday Brunch** (MIT Faculty Club)\*\*—Sunday, May 14, 11:30am-2:30pm. \$25.95; \$12.95, children age 6-12.



This diagram from Professor Blanco's trocar patent application shows the progression of his trocar as it pierces the skin during endoscopic surgery. At the moment the sharp point perforates through the skin (third image), the safety guard has already fully deployed, protecting internal organs. A puff of CO<sub>2</sub> further safeguards the organs by gently blowing them out of reach.

## Instrument intended to make surgery safer

(continued from page 1)

best surgeons in the world can't always control what he calls the "plunge effect"—the sudden change in resistance that occurs at the instant when the trocar's tip pierces the body cavity.

As it turned out, luck wasn't with Professor Blanco on the day he had his gall bladder removed.

When the surgeon plunged the trocar through the professor's abdomen, the sudden drop in resistance as it penetrated the skin caused the sharp instrument to plunge in just a fraction of an inch too deep, apparently nicking one of Professor Blanco's organs and putting an abrupt end to the minimally invasive surgery.

Instead he had to be opened up the old-fashioned way, with a scalpel and a four-inch incision. The inadvertent damage was repaired and his gall bladder removed, but the difference for Professor Blanco was a four-day hospital stay instead of an overnight, an ugly scar instead of a barely visible mark, and an increased risk of infection.

But he doesn't blame the surgeon. Occasionally even the best surgeons have trouble controlling the plunge effect. The problem lies with the so-called safety trocars, "which in the opinion of many surgeons are far from being safe," said Professor Blanco, adding that this sort of thing happens "more often than surgeons would like to be known, and fatal cases are on record."

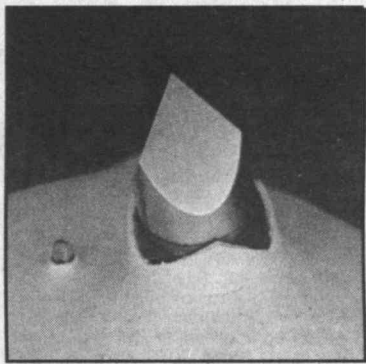
The trocar he designed should eliminate that risk altogether, he said, by changing the shape of the instrument's point and the way the safety guard deploys at the moments during and just after penetration of the body.

### SAFER DESIGN

Traditional trocars have a solid, three-sided triangular point (the name stems from "trois," the French word for three); Professor Blanco's resembles two flat, arrow-shaped knives intersecting to look like an X when viewed from above, yielding a four-edged cutting tip ending in a sharp point.

Although it sounds dangerous, his device actually puts the "safety" back in safety trocars. Trocars have a safety guard that springs up around the tip after the puncture has been made. How quickly the guard is deployed determines how far into the body cavity the blade is able to get before the sharp edges are covered. Some trocars are able to plunge in up to three-quarters of an inch with the blades still exposed.

Professor Blanco's trocar is designed so the protective guard always covers the portion of the blade inside the body, eliminating all danger of cut-



This photo compares the new trocar (left) with another commonly used trocar. The standard trocar (right) has pierced the body (actually a synthetic test material) by about 14mm without the safety guard deploying; the guard on the new trocar has already deployed.

ting internal organs.

Another important aspect of endoscopic surgery provided by his device concerns the insufflation of the patient with carbon dioxide. Filling the abdomen with gas helps to separate organs from the abdominal walls, making the operation easier for the surgeon, whose hands are manipulating a tiny camera and other tools inserted through the trocar but whose eyes are seeing the action on a video screen.

Insufflation is usually started through a hypodermic needle, inflating the body cavity prior to the insertion of the trocar to minimize risks of the plunge effect. Later, more CO<sub>2</sub> is pumped in through the cannula.

Professor Blanco's device eliminates the need for preliminary insufflation. The cutting edges on his trocar are thin blades instead of a solid cutter, allowing gas to flow through the tip. This adds a second layer of protection to the patient because at the very instant the point pierces the body, a pressurized jet of CO<sub>2</sub> will issue forward, gently blowing aside any delicate organs that might be too close.

Professor Blanco has applied for a patent on the device. Once it has been licensed by a manufacturer, he estimates it will take about a year to build prototypes, test them and prepare for the market.

### OTHER INVENTIONS

The Cuban-born mechanical engineer has 14 patents and four patent applications to his name. About half are for medical devices, including an eye stapler used instead of stitches following ophthalmic surgery, a suture remover and other microsurgical instruments. (The suture remover, as it turns out, is a further outgrowth of that gall bladder operation. After experi-

encing the additional trauma of having the stitches removed from the incision on his abdomen, Professor Blanco was keen to make the entire process easier on other patients.)

Some of his patents are for more whimsical gadgets, like the automatic pancake flipper (MIT Tech Talk, June 21, 1995) that embosses Mickey Mouse's image on flapjacks, now for sale at Disney stores.

Still others are for mechanical devices that could be useful to people from many walks of life. For instance, he designed an automatic page-turner for musicians (MIT Tech Talk, May 19, 1999), then found that many disabled people need an inexpensive, reliable way to turn the pages of their reading materials.

"The intellectual process of creation is exactly the same, whether the goal may be a cooking device or a high-tech microsurgical instrument," said Professor Blanco, who loves the process of inventing. "At the end of the line, every system has to interact with the physical world."

He has a long history of mechanical inventions spanning decades and industries. Before leaving Cuba in 1960, he designed machines for a textile mill and headed the mechanical engineering department of the University of Villanova. During and just after the Cuban revolution, he was named chief of research in unconventional energy for the new government, and he designed a solar refrigerator, among other things.

That and his other designs were left behind when Professor Blanco, like many of his colleagues, left Cuba with his wife and children to avoid the risk of imprisonment by Fidel Castro's government.

After coming to the United States, he taught at MIT and Tufts University before the "lure of industry took hold," he said. Shortly afterward, "the lure of teaching called again" and since 1977 he has taught half-time at MIT and continued consulting for industry.

In his mechanical design classes, Professor Blanco continually emphasizes to his students the creative aspects of design, which he considers equally important to the analytical. "We try to present creation as the product of analysis, but it's not. Creation is done with the right side of the brain; analysis with the left," he said.

"I like to show my class my inventions and describe the process so they feel the anxiety and uncertainty that we inventors all go through," he said. "Only thus will they be prepared to face the challenges of the future. The future comes from inventing; progress comes from new devices."

## Data offer new spin on strange class of pulsars

■ By Deborah Halber  
News Office

Astronomers from MIT and McGill University reported on March 23 that they have taken a major step toward categorizing rare, strange-acting stars called Anomalous X-ray Pulsars (AXP) as neutron stars.

Victoria M. Kaspi, assistant professor of physics in the Center for Space Research (CSR) on leave from McGill University in Montreal, has found that one such AXP has experienced an "earthquake"—a sudden, catastrophic shifting of the star's interior—that is similar to quakes seen in regular neutron stars. This provides strong confirmation that the AXP is indeed a neutron star and has properties surprisingly similar to its "non-anomalous" cousins.

Professor Kaspi's finding may also support the magnetar hypothesis, which predicts the existence of neutron stars up to a thousand times more magnetic than the already strongly magnetic neutron star. She presented her work, based on observations with the Rossi X-ray Timing Explorer (RXTE) satellite, at the Rossi 2000 meeting at NASA Goddard Space Flight Center in Greenbelt, MD.

Her collaborators include her UROP student and physics senior Jessica Lackey, whose senior thesis is the basis for this work, and Assistant Professor of Physics Depto Chakrabarty, also with the CSR.

"We have thought that earthquake-like events might occur on these stars for some time now, but we have lacked the right instrument to check this," said Professor Kaspi. "No X-ray astronomy satellite in the past had the ability to observe these objects as often and as regularly as we needed. Thanks to RXTE, we now know for certain that glitches occur in AXPs, and we can study the interiors of these unusual objects using a form of 'seismology,' like the way geologists study the Earth from earthquakes."

A neutron star is the skeletal remnant of a star once several times more massive than the sun that exhausted its nuclear fuel and subsequently exploded its outer shell. The remaining core, still possessing about a sun's worth of mass, collapses to a sphere about 10 miles in diameter. The collapse sets the neutron star spinning quickly, much like an ice skater spins faster as she "collapses" her body by pulling her arms inward.

A pulsar is a neutron star that "pulses" with radiation with every spin. The radiation comes largely from the neutron star's polar regions, channeled by strong magnetic fields. We on Earth see pulses each time the polar regions spin our way, in the same way that we see the rotating beacon of a lighthouse.

Since they were discovered in 1967, pulsars have been known to be strong emitters of radio waves. With the arrival of X-ray satellites, however, astronomers found that many pulsars also emitted X-ray radiation. A handful of pulsars emit their light exclusively as X-rays. The slow-spinning AXPs are

among these X-ray-only pulsars, and the puzzle astronomers are trying to unravel is just how AXPs are related to the well-studied radio pulsars, if at all.

### FINDING GLITCHES

To solve this mystery, the MIT/McGill team needed to find evidence that AXPs had many of the same quirks as the well-studied radio pulsars. One such quirk is that some radio pulsars occasionally, without warning, start spinning faster than normal. These sudden spin-up events are called "glitches."

The glitch, or change in spin-down rate, is likely due to the earthquake-like phenomenon, technically called vortex line upspinning, which occurs within the stellar interior, beneath the stellar crust. Professor Kaspi's group set out to carefully monitor the spins of several AXPs in the hope of detecting a similar spin-up event.

After two years of watching and waiting, their patience was rewarded: one of their targets, called 1RXSJ1708-4009, suddenly started spinning faster.

"We were delighted! The glitch we saw was practically identical to glitches that have been seen in the Vela radio pulsar," said Professor Kaspi. (The Vela pulsar is a well-studied neutron star in a nearby system that exploded some 20,000 years ago.) "This is clear evidence that the AXP is a neutron star with an internal structure just like the radio pulsars."

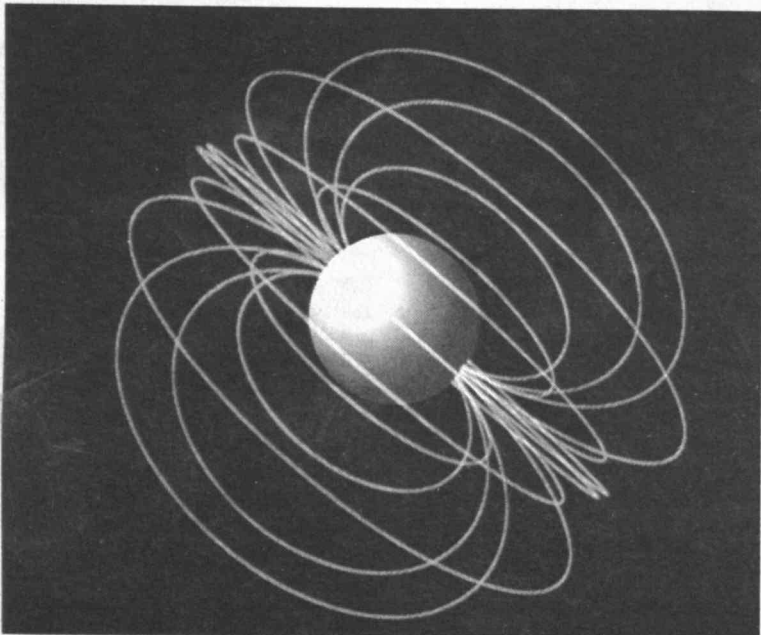
There are only five known AXPs. Professor Kaspi said many more of these objects may exist but that others are hard to identify because they are isolated and emit only X-ray radiation. The plethora of radio and optical telescopes, therefore, cannot identify them. RXTE is one of only three or four satellites best optimized for AXP hunts.

Magnetars, if proven to exist, would be neutron stars born with immense magnetic fields so powerful they could swipe clean the information on a credit card at a distance halfway to the moon. The galaxy holds a handful of magnetar candidates. The AXP glitch observation supports the magnetar hypothesis, Professor Kaspi said, but does not provide irrefutable proof.

"That can only come with patience and continued observations of these strange beasts," she said.

Professor Kaspi and her colleagues' work represents the latest chapter in understanding these strange types of objects first seen in the 1990s by a Japanese satellite named the Advanced Satellite for Cosmology and Astrophysics. She hopes that identifying the nature of AXPs will pave the way in understanding equally rare and bewildering objects, such as the magnetars and soft gamma-ray repeaters, which may be related to AXPs.

Rossi 2000 is the first meeting to bring together the diverse pool of observational astronomers and theorists utilizing RXTE, which was launched by NASA in December 1995. Images are available at <<http://universe.gsfc.nasa.gov/press/images/rossi2000/>>.



An artist's conception of an Anomalous X-ray Pulsar with magnetic fields, now shown to be part of the neutron star family. Image courtesy NASA

# Computer research improving web, robots

(continued from page 1)

sortium at MIT's Laboratory for Computer Science), Professor Brooks (director of the Artificial Intelligence Laboratory) and Professor Grimson, associate director of the AILab and the Bernard Gordon Professor of Mechanical Engineering, spoke at the first Convocation of Licensees, sponsored by the Technology Licensing Office (TLO) on March 30. Their topic was hot trends in communications and robotics.

Contrary to people's perceptions, Dr. Berners-Lee said, the web is far from technically complete. While the web is good at presenting data to humans, it's not so good at making data available to machines in a form they can find and manipulate. The limitations of the web language HTML prevent computers from running a program that correlates, for instance, the temperature at various corporate headquarters. The information is out there, but no software exists to let a web surfer gather the data in a format he or she might want.

Dr. Berners-Lee is working on the next generation of web communication, which seeks to ensure that machines can exchange data with each other as well as provide user-friendly pages and ways for people to communicate.

Right now, he said, there is a threat of fragmentation. He tried to look at information at one university's site, he said, but needed all sorts of add-ons to open it. And it's unlikely that libraries of the future will be able to access such data. Universality is key, he said. "You should be able to link from anything to anything. The web must be able to embrace information of all sorts, beyond language, culture or whether the site is polished or casual."

Once the web has a "global search" feature, the results of a query will be much more accurate. "Each of the things returned [from a web search] can be logically checked for proof that the two are related and compatible," Dr. Berners-Lee said. Thus, with the addition of what he calls a "digital signature" that guarantees a user's identity,

"we can construct not just a web of logic but also a web of trust."

## COMPUTERS OF THE FUTURE

The five-year Project Oxygen led by the Laboratory for Computer Science and the AI Lab aims to "make computers more aware of us, and come out into the human world to understand what we're doing," Professor Brooks said. "Oxygen is people-centric, not device-centric." In the process, by some estimates, human productivity may increase 300 percent.

Using techniques borrowed from a variety of disciplines, Oxygen has developed the Handy 21, a handheld unit that includes an antenna, speaker, microphone, camera and a whole lot of software. It can be a cell phone, TV receiver or short-wave radio as the need arises. "Pick one up and it becomes yours," Professor Brooks said. It is designed to belong to anyone, but will only provide private information to a user who proves his or her identity.

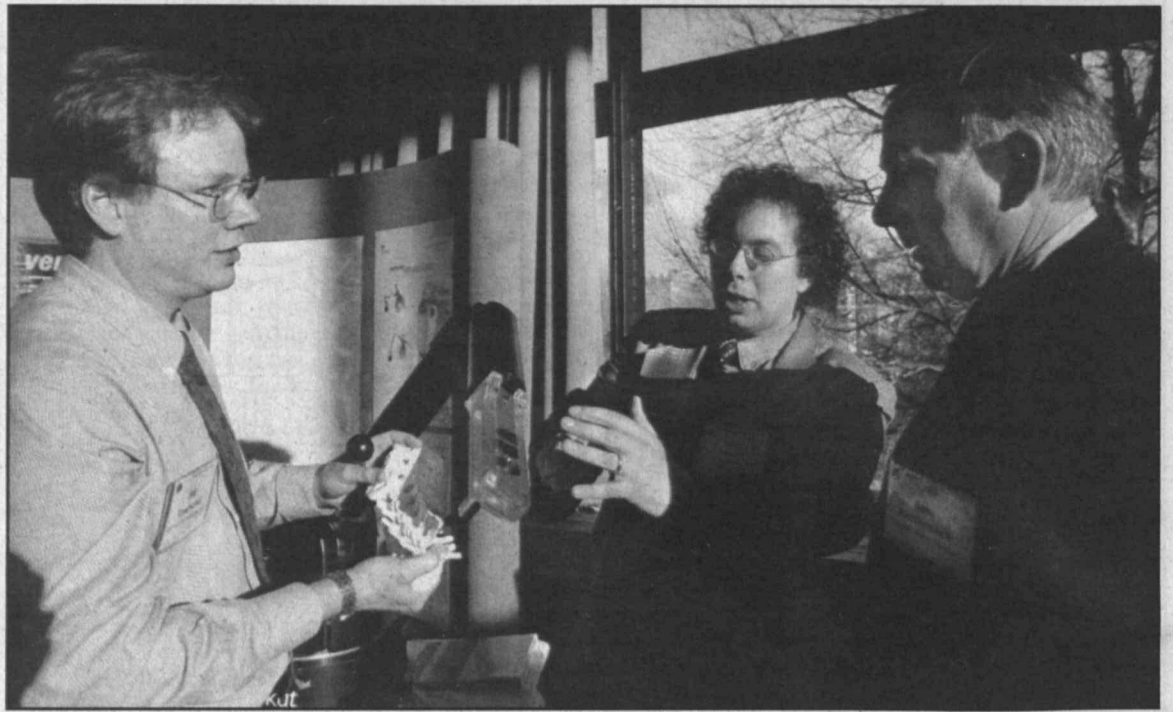
Another device, the Enviro21, is a stationary unit built into offices, homes or cars. It enables the space to "understand what we are doing" and provide assistance. For instance, a wall can take the place of a computer screen. People can talk directly to the computer and it will understand and provide information.

Professor Brooks would like to see the new Ray and Maria Stata Center for Computer, Information and Intelligence Sciences "infiltrated" with Handy21 and Enviro21. He even wishes they could bar keyboards from the building, but he admitted that not everyone was ready for that.

## 'SUPERMAN' SURGEONS

Professor Grimson tells surgeons that he wants to turn them into Superman by giving them X-ray vision—the ability to see inside a patient and plan a surgery before picking up a knife.

To do this, he has developed technology that builds a computer model of the patient. Using data from magnetic resonance, tomography scans and other sources, he creates a three-dimensional image of the patient's skull, brain and



The TLO Licensee Convocation included a fair to highlight inventions developed at MIT. Former PhD student Bill Townsend (left), who developed WAM (the Whole Arm Manipulator), talks with Rony Abovitz (center) of Z-Cat Medical Robotics, to which he sold technology for use in operating rooms, and Sam Pasternak of the law firm of Choate, Hall and Stewart.

Photo by Donna Coveney

blood vessels. If the patient has a tumor, it shows up in bright green on the image, which the surgeon can study and rotate in space as he or she plans the surgery. These methods have so far been applied to spine, knee, abdominal and brain surgery, prompting one neurosurgeon to say that the tools take three hours off an eight-hour operation.

While the surgery is under way, the physician's entry into the skull is depicted in real time so that he can track his movements on the screen. Another device allows the surgeon to remote control a very small robotic hand. It provides feedback that allows him or her to "feel" the patient's tissue as the hand works.

As one surgeon put it, these tools will help build the "Nintendo" surgeon of the future who is totally at ease with augmented visualization and robotically assisted hand-eye coordination. "These tools amplify surgeons' basic capabilities and help them do what they do better," Professor Grimson said.

## Scientists discuss gene sequencing, therapy

(continued from page 1)

of the human genome by late this year, and a complete sequence by 2003. Sequencing of the mouse, an animal important to medical research, will follow, with a draft expected by 2003 and the full genomic sequence by 2005.

The sequencing of two organisms—the fruit fly *Drosophila* and the nematode, *C. elegans*—has been completed already. Fruit flies are especially useful animals for gene research because they're easy to grow in large numbers, making it easier to study genetic mutations, he said.

This is useful to humans, because

we share genes with these organisms. For instance, 50 percent of the genes of a fruit fly have counterparts in the human genome. More important, said Professor Hynes, is the fact that of the 289 human genes known to cause disease, 177 have counterparts in the fruit fly.

Humans are estimated to have between 80,000 and 100,000 genes; the fruit fly has about 13,000 genes and *C. elegans* about 18,000.

In his overview of the hottest areas in materials science and engineering, Professor John Vander Sande of materials science and engineering pointed out that the use of materials to classify stages in human evolution—the Bronze Age, the Iron Age, etc.—continues to be an appropriate means of categorization. "Materials are crucial to the forward movement of technology," he said.

He described our world as one in which materials are made on demand with the appropriate characteristics and properties to perform as needed. In general, he said, the need is for materials to be light, inexpensive to manufacture, environmentally sound and, above all, small.

Professor Douglas Lauffenburger, co-director of the Division of Bioengi-

neering and Environmental Health, described activity at the interface of the two fields: bioengineering.

He used the example of bone, which he said has been treated in the past as a conventional material. When damaged, it is mended with metal pins or by other traditional means. But biology tells us that bone is a dynamic, living multicellular system and scientists are now learning to control cell functions in that system with the use of material agents such as drugs, he said.

Engineers are beginning to create special materials that can be inserted into damaged bone to provide the right architectural structure for regrowth. These materials can be treated with a chemical, such as a growth factor, to affect cell function.

Professor Lauffenburger described another field, gene therapy, as "very promising but very problematic." While the field currently relies on viruses as gene vectors, he predicts that within the next two decades, materials scientists will be able to create synthetic materials that will mimic virus properties in a safer way.

In these areas, he said, we're still in the "Neanderthal stage" of development, but "we're starting to see a glimpse" of what's possible.

## Classified Ads

Tech Talk ads are intended for personal and private transactions between members of the MIT community and are not available for commercial use. The Tech Talk staff reserves the right to edit ads and to reject those it deems inappropriate.

INSTRUCTIONS: Ads are limited to one (of about 30 words) per issue and may not be repeated in successive issues. Ads may be re-submitted 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 5-111.

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

All extensions listed below are campus numbers unless otherwise specified, i.e., Dorm, Lincoln, Draper, etc.

MIT-owned equipment may be disposed of through the Property Office.

Deadline is noon Friday before publication.

### FOR SALE

LL Bean single seat, foldable aluminum frame jogger w/hand brake, 3 yrs old, \$175. Contact: <benkert@LL.mit.edu> or Line x1200.

Mt bike, M's, Bridgestone, gd cond, \$200. Jan Blair, Draper x8-2843.

Dehumidifier, Whirlpool 40 pt, new last October, used through December for short term problem, \$85. Contact x3-4716 or <trometer@mit.edu>.

Westinghouse double decker stove, exc cond, 1 oven selfclean, 4 burners, timer, fan, harvest gold, \$250 or bst; secretary desk, new, pd \$650, sell for \$300. Call 617-332-8251.

Dark wood dining room table, 2 leaves, expands to 48"x72", 4 matching chairs, \$300 or bst. Contact: 617-731-2683 or <hels@med.mit.edu>.

### ANIMALS

Do you have new kittens? I'm looking to adopt. Mary x3-2281.

### VEHICLES

Parts vehicle: 1986 GMC S15 truck, extended cab, tape, 124K miles, nds new throwout bearing & more but probably could be a great truck again, \$500. Ginny x8-8131 or <siggia@mit.edu>.

1993 Jeep Grand Cherokee Laredo, loaded, 81K, dealer maint, ps, pw, ABS, fog lights, skid plates, tow pkg, V8, Quadra-trac, more, mint cond, \$10,500. Mark x8-8399.

1996 Dodge Neon, 2-dr red base coupe, 43K, manual 5-sp, ps, CD player, flawless cond, \$5500 or bst. Deny 617-491-5096, x3-1811, <deny@mit.edu>.

1999 Nissan Altima GXE, auto, fully loaded (AM/FM/CD, a/c, cc, etc), 19.5K. Nissan warranty 36K mi or 3 yrs, mint, owner, \$13,300 negot. Contact 781-8617804 or <mktam@mit.edu>.

### HOUSING

Boston: 1BR luxury suite at historic Marriott Customs House avail for 4 nights (5/31-6/3) during Graduation Week 2000, sleeps 4, LR, kitchenette, \$1300. Greg, x3-2167, <gkscott@mit.edu>.

Cambridge: sunny 2BR apt avail June-Aug, wd flrs, huge kitchen-dining-living room, porches,

yd, nr T and bus, no smkg or pets, \$4,800 w/sec dep & refs. Call 617-496-3025.

Cape Cod, Wellfleet: 2BR cottage on priv road, nr bay beach, nr bike path, BBQ, cable, VCR, encl outdr shower, deck, fpl, \$450/wk May & Oct, \$550/wk Jun & Sep, \$750/wk July. Call 617-332-7104.

Chestnut Hill: lrg, modern 1BR avail for sublet May & June w/lease option in July, pool, prkg, d/w, a/c, sun porch, w/d, storage, new carpet, \$1,000/mo. Merlene x8-5875.

Florida: Disney area, 3BR, 2b villa, htd pool, slps 8, \$495-550/wk. More info: <http://users.aol.com/mcdeeke> or email <cdkew@psfc.mit.edu> or 617-666-5805.

Plymouth, MA: summer cabins for rent, grt spot for group retreats, family vacations, beaut setting on pristine lake, special off-season rates avail. Contact 617-696-6293 or <pconant@mit.edu>.

White Mts, NH: Waterville Estates, 3BR, 2b, grt vw, on site pond, 3 htd pools, hot tub, tennis, biking, hiking, 5 min to golf club, no pets, non-smkg unit, summer \$545/wk. Chuck, Draper x8-2957.

### WANTED

Used piano wanted. Contact x3-6926 or <bochen@mit.edu>.

House or apt rental wanted from June 1-30 for visiting surgeon and family from Italy; anywhere in Boston area OK. Contact <awaugh@mit.edu> or x8-5401.

Law student sks summer house-sitting opportunities in Boston area while working for Boston law firm; quiet, gd w/pets & plants, avail mid-June through August. Contact x3-9467, <rsimpson@mit.edu>.

Belgian family with daughter treated at Mass General seeks housing from late May to late July, close to Red or Green line, 2BR+. Contact <goemans@math.mit.edu> or 781-643-6373.

## Awards & Honors

Professor of Chemistry **Stephen L. Buchwald** has received the American Chemical Society Award in Organometallic Chemistry for developing and analyzing better ways for researchers to make pharmaceutical drugs, plastics and other products.

His discoveries include a set of processes for creating a useful but difficult-to-make chemical bond. That wasn't the goal when he started work 11 years ago. "In the beginning, we were trying to make a natural product of interest to cancer research," he said. His work has drawn the interest of pharmaceutical companies because of its usefulness in research on the central nervous system. It is also important for photocopy toner cartridges as well as light-emitting diodes, or LEDs.

Marvin L. Minsky, the Toshiba

Professor of Media Arts and Sciences, has been selected as one of three recipients of the 2000 R.W. Wood Prize of the Optical Society of America. The award recognizes Professor Minsky and two others for "seminal contributions to confocal microscopy."

Paul M. Newberne, professor emeritus of nutritional pathology, has received the Princess Chulabhorn Gold Medal of Merit in Thailand. The award recognizes his contributions to the training and educational programs and the development of biological research programs of Mahidol University and the Princess Chulabhorn Research Institute. Professor Newberne's research has focused on carcinogenesis and cancer biology as influenced by dietary nutrients.

# Essay prizes, travel fellowships to be awarded to undergraduates

Submissions are being invited for two arts essay contests and an arts/humanities fellowship.

The List Visual Arts Center has announced the Vera List Competition in Arts and Writing—a \$500 award to be presented to a full-time MIT undergraduate for unusual and thoughtful expression on some aspect of contemporary art.

Students can submit applicable coursework or pursue their own particular focus, not necessarily pertaining to List Center exhibitions. Although competitors expect most entries to be in prose, they note that since “art can speak to both the head and the heart, less conventional formats may be allowed.” In this case, prior consultation with List Center staff is required.

The entry deadline is noon on Thursday, April 20 in Rm E15-109. The winner will be announced on Wednesday, May 3. For competition rules or further information, contact Jennifer Riddell at x3-4400 or <jlr@mit.edu>, or see <<http://web.mit.edu/lvac/www/listprize2000rules.html>>.

Two \$626 I. Austin Kelly III Essay Prizes will be awarded to entries that must be essentially humanistic in aim and style, but may concern any field or combinations of fields in the humanities, arts or social sciences. The main topic should be meaningful to readers outside as well as within the chosen field. Technical data should not be the focus, but should be introduced as needed to illustrate whatever broadly humanistic points are being made.

All full-time MIT undergraduates except former Kelly Prize winners are encouraged to submit historical, analytical or sociological essays written during their years at MIT. The length must be 4,000-8,000 words. This is the 26th year for the I. Austin Kelly III Essay Prize.

One or two \$1,000 I. Austin Kelly/Richard M. Douglas Traveling Fellowships will be awarded to current MIT juniors who are committed to further work in the humanities or arts and to travel that will enhance their understanding of their chosen field. Applicants must submit two letters to Mary Cabral, Rm 14N-207 or <[mcabral@mit.edu](mailto:mcabral@mit.edu)>. In the first, they will describe their travel and study plan, and in the second an MIT instructor will endorse this plan. This is the first year this fellowship will be awarded.

All Kelly essay and Kelly/Douglas fellowship submissions must be delivered to the music and theater arts office in Rm 14N-207 by Wednesday, April 12 at 5pm. Guidelines for both are available in that office. Guidelines for the essay prize are also on the web at <<http://web.mit.edu/mta/www/newmusic/resources/kellyprize/html>>.



Peggy Shaw, Lois Weaver and Stacy Makishi (left to right) perform in Split Britches' *Salad of the Bad Café*. Photo by Lianne Harris

## Split Britches appears at MIT

Since the late 1970s, Split Britches has created lesbian-feminist theater in the US and Europe. On Wednesday, April 5, company members Peggy Shaw and Lois Weaver and Asian-American performance artist Stacy Makishi will bring their brand of deconstructivist theater to MIT for a performance lecture titled “Love in a

Post Claustrophobic Era: Reflections on *Salad of the Bad Café*” from 5-7pm in Rm 50-201 (Walker Memorial).

Split Britches celebrates and parodies butch-femme identities in autobiographical cabaret and deconstructed drama, while Ms. Makishi's surreal and visual poetry draws from an eclectic Hawaiian-style aesthetic. Interspersing scenes from *Salad of the Bad Café*, a postmodern cabaret written and performed by the trio with audience discussion and questions and answers, the women will explore the literary, dramatic and thematic territory of the piece.

*Salad of the Bad Café*, inspired by the similarly named Carson McCullers novel and the lives of Tennessee Williams and Yukio Mishima, offers a treatise on love in a post-claustrophobic era beginning in 1945. The cast is, according to the authors, a collection of “racial, gender and regional stereotypes such as the queer lonesome clown, the drunken homosexual writer, the gender outlaw, the Japanese transformer toy, the homoerotic cowboy, the reluctant lesbian bride, the mutant refugee, the faded southern belle, the geisha and the soldier” who come together to tell a story of unrequited love.

The event is sponsored by the Office of the Arts and the Program in Women's Studies. For more information, call x3-8844.

## Arts at MIT

### Arts News

Folks at the Media Lab are represented in *The Electronic Canvas*, a WGBH television documentary produced in conjunction with an exhibition on view at the DeCordova Museum and Sculpture Park in Lincoln, MA through April 30. The program, which airs on Thursday, April 6 at midnight on channel 44, focuses on Boston as a global center in the 1960s where artists were drawn to the growing power of television and media. Media Lab principal research associate **Glorianna Davenport** and two of her graduate students, **Barbara Barry** and **Brian Bradley**, are interviewed on the future of media art, and work by graduate student **Stefan Agamanolis** is presented.

Associate Provost for the Arts **Alan Brody** and music and theater arts lecturer **Laura Harrington** will

share billing with 38 other playwrights at the second annual Boston Theatre Marathon on April 16 at the Boston Center for the Arts.

“I loved the whole event because it really created a sense of a Boston theater scene and a Boston theater community,” said Professor Brody, who also participated in last year's marathon. This year, his play *Moses* will be performed by the African Repertory Theater; Ms. Harrington's *Dress Right* will be performed by the Nora Theatre Company. The 40 selected plays were chosen from more than 200 submissions.

On Saturday, April 8, the MIT Festival Jazz Ensemble led by lecturer **Fred Harris** will participate at the Williams College Intercollegiate Jazz Festival. They'll perform at 1:30pm in Chapin Hall.

## Arts activities planned for Campus Preview weekend

Classes in jazz and opera... hip-hop dance performances... Bengali singing... contemporary art and chocolate desserts... chamber music... the world's largest collection of holography... All these can be sampled this weekend (April 6-9) by participants in Campus Preview Weekend 2000, when admitted students and their parents will visit MIT to get a feel for the campus, students and community.

In addition to the multitude of music, theater, dance and visual arts activities that occur on any given weekend at MIT, participants will have opportunities to sit in on various music classes and rehearsals sponsored by the music and theater arts section, at-

tend a question-and-answer session about music at MIT, enjoy an “Open House/Dessert Circuit” sponsored by the MIT Museum and List Visual Arts Center and take an MIT architecture tour.

Throughout the weekend, Lobby 7 will be the site of Arts Stage, where members from MIT performance groups such as *Movements in Time*, Chamber Music Society, Gilbert & Sullivan Players and the Chorallaries will perform for passersby.

For more information, see the Campus Preview Weekend schedule of events at <<http://web.mit.edu/admissions/www/mitcpw/agenda.shtml>> as well as the arts calendar below.

### Institute Arts

For more arts-related information call the 24-hour hotline at 253-ARTS or consult the World Wide Web at <<http://web.mit.edu/arts/>>.

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

#### April 5-16

#### MUSIC

**MIT Chapel Concerts\***—April 6: La Fontegara: Natalie Palme, recorders, viol, voice; Raymond Rosenstock, viol, recorders, voice; Brian Warnock, recorders, voice. Early music from Spain & Italy. April 13: Andrew Halberstadt, organ. Daphna Mor, recorder. Works by Bach, Handel, Telemann, Costello. Noon, Chapel. x3-2826.

**AMP Student Recitals\***—April 5: Adeline Leong '00, piano. Beethoven's Piano Sonata No. 21 in C Major Op. 53, “Waldstein”; Chopin's Ballade No. 4 in F minor, Op. 52; Debussy's *Estampes*. 5pm, Killian Hall. April 7: Ole Mattis Nielsen '00, flute; Yukiko Ueno, Jaemin Rhee, piano. Poulenc's Sonata for flute and piano; Brouwer's La region mas transparente; Ibert's Aria; Mozart's Quartet in D. 5pm, Killian Hall. April 12: Margaret Glasner (G), flute; Rebecca Sun, piano. Martin's Ballade; Piazzolla's Etudes Tanguistiques Nos. 3 and 4; Harbison's Duo for flute and piano; Lavista's Nocturno para flauto en sol (1982); Casella's Sicilienne et Burlesque. 5:30pm, Killian Hall. x3-2826.

**“Winds, Brass and Jazz in Killian Hall”\***—April 7. MIT Jazz Combo & MIT Wind Ensemble. Fred Harris, music dir. The MIT Festival Jazz Ensemble will also appear. 7pm—Campus Preview Weekend Open Forum “Music at MIT”. 8pm—Concert, Killian Hall. x3-2826.

**e-strings@mit Chamber Orchestra\***—April 8. Dante Anzolini, director. Schoenberg's

Verklarte Nacht, Op. 4 and other works. 8pm, Killian Hall. x3-2826.

**Gospel Choir Concert: “Lift Him Up”\***—April 15. With guest group: PraiseDance. 7pm, Lobbell Dining Hall. Kodjo Hesse, x5-8326 or <[gospelchoir@mit.edu](mailto:gospelchoir@mit.edu)> or <<http://web.mit.edu/mitgoscho/>>.

**MIT Chamber Chorus\***—April 15. William Cutter, music dir. 8pm, Kresge Aud. x3-2826 or <<http://web.mit.edu/21m.405/www/>>.

**Seshgopalan, Carnatic vocal\***—April 16. With violin and mridangam. \$15, \$12—MITHAS & New England Hindu Temple members, students & srs; \$10 MIT students. 4pm, Wong Aud. x8-7971, <<http://web.mit.edu/mta/mithas/>>.

**MIT Faculty Concert\***—April 16. Mark Harvey and the Aardvark Jazz Orchestra. Original works and the premier of a new composition for large jazz orchestra. 8pm, Kresge Aud. x3-2826.

#### MULTI-CULTURAL

**“Pragati: The .COMing of Age”\***—April 8. Student performers present MIT's diverse South Asian culture, ranging from Bengali singing to traditional Gujarati folk dances. The show will be projected on Kresge Oval. 7pm; doors open at 6:30pm, when free food will be served. Kresge Aud. x5-8617 or <[dgandhi@mit.edu](mailto:dgandhi@mit.edu)>.

#### THEATER

**Love in a Post Claustrophobic Era: Reflections on *Salad of the Bad Café*\***—April 5. Split Britches. See story above. 5-7pm, Walker 201. x3-8844.

**Princess Ida or The Castle Adamant\***—April 7-9, 13-16. Gilbert & Sullivan Players pro-

duction. \$9, \$7 MIT community/other students/children/seniors; \$5 MIT/Wellesley students, \$3 prefrish with ID. 8pm except 2pm on April 9 & 16, Sala de Puerto Rico. x3-0190, <[savoyards-request@mit.edu](mailto:savoyards-request@mit.edu)>, <<http://web.mit.edu/gsp/www/>>.

**About Time\***—April 14. Play written and directed by STS graduate student Chen-Pang Yeang. 8pm, Kresge Little Theater. Info: 577-8736 or <[cpyeong@mit.edu](mailto:cpyeong@mit.edu)>.

**Once on this Island\***—April 14-15. Theater Arts student workshop production of the musical by Lynn Ahrens and Stephen Flaherty, based on the novel *My Love, My Love* by Rosa Guy. Directed by Sara Jo Ellice '01 and Seth Bisen-Hersh '01. 8pm, Kresge Rehearsal Rm B. More info: x5-6256, <[seth42@mit.edu](mailto:seth42@mit.edu)> or x5-6407.

#### DANCE

**Dance Troupe Spring Concert\***—April 7-9. Dance Troupe is a student run organization and all pieces in the concert are student choreographed. Advance tickets: \$5 students; \$6 non-students (at door: \$6/\$7). April 7-8 at 8pm, April 8 at 4pm, April 9 at 2pm, Little Kresge Theater. Info: 494-8677 x20, <[dharmesh@mit.edu](mailto:dharmesh@mit.edu)>, <<http://web.mit.edu/dancetroupe/www/>>.

**Movements in Time Spring Show\***—April 9. Ballet, pointe, jazz, lyrical & hip-hop performances, a slide show of the dances in the making, and a photo exhibit. Refreshments served. \$5, \$3 MIT community. 2:30pm, Kresge Aud. Info: x5-7480, <[gcharles@mit.edu](mailto:gcharles@mit.edu)>, <<http://web.mit.edu/movements/www/>>.

**Donald Byrd and Dancers\***—April 14. Using videotape and live performance excerpts, Donald Byrd and two members of his company will demonstrate and talk about his work. Followed by Q & A session. 1pm, T-Club Lounge (duPont Athletic Ctr). x3-6957.

#### FILM/MOVIES

**“Where East Meets West” Series\***—April 6: *Stranger than Paradise* Dir. by Jim Jarmusch (1984). Ctr for Bilingual/Bicultural Studies/International Film Club. Refreshments. 8pm, Rm 4-237. x3-4771, <[ifilm@mit.edu](mailto:ifilm@mit.edu)> or <<http://web.mit.edu/ifilm/cbbs/>>.

**Clockwatchers\***—April 11. Four women, four dreams, one office. Screening of the film & discussion. Women's Studies Student program. 7pm, Rm 4-231. x3-8844.

#### READINGS

**poetry@mit: Fanny Howe\***—April 5. 7:30pm, Rm 14E-304. x3-7894, <[poetry@mit.edu](mailto:poetry@mit.edu)>, <<http://web.mit.edu/humanistic/www/poetseri.htm>>.

**A Bilingual Reading\***—April 11. Andre Makine, author of *Dreams of My Russian Summer* vs. 7pm, Rm 4-237. x3-7894 or <<http://web.mit.edu/humanistic/www/writers.htm>>.

#### EXHIBITS

**List Visual Arts Center\* (E15): Jane and Louise Wilson: Stasi City and Crawl Space.** Two video installations. *Self Portrait*. Map. Large-scale digitally manipulated chromogenic prints by Lilla LoCurto & William Outcault. **KNOWMAD: MAP: Motion + Action = Place.** An arcade video game that uses imagery from tribal rugs to explore the end of the nomadic way of life. Shows run through April 9. Hours: Tues-Thurs & Weekends 12-6pm; Fri 12-8pm; closed holidays. x3-4680 or <<http://web.mit.edu/lvac/www/>>.

**MIT Museum\* (N52):** Admission: \$5; \$2 students/seniors; \$1 children 5-18; free with MIT ID. 265 Mass Ave. Tues-Fri 10-5, Weekends 12-5. x3-4444.

#### Compton Gallery—Observing the Observers...

MIT Artists in Residence (Haystack Observatory) Susan Gamble and Michael Wenyon, employ imaging technologies and mapping methods used by astronomers to document the astronomers themselves. Through May 6. **Compton Gallery Talks\***—April 12. Susan Gamble & Michael Wenyon, 12-1pm, Compton Gallery (Rm 10-150). Weekdays 9am-5pm. x3-4444 or <<http://web.mit.edu/museum/exhibits/compton.html>>.

**Hart Nautical Gallery—Deep Frontiers: Ocean Engineering at MIT and Ship Models: The Evolution of Ship Design.** Ongoing. Daily 9am-8pm. x3-5942.

**The Dean's Gallery—Geometric Allegories.** Monoprints by Amy Kaufman. Through May 3. The Dean's Gallery, Sloan School of Management, E52-466. Weekdays 9-5pm. x3-9455 or <<http://web.mit.edu/deans-gallery/www/>>.

**Women's Studies.** Archival photographs documenting the role of women at MIT over the decades. Rm 14E-316. x3-8844.

**Institute Archives and Special Collections: Object of the Month. April: Watercolor by Eleanor Manning O'Connor.** MIT graduate and pioneer “lady architect” Eleanor Manning O'Connor painted beautiful architectural watercolors when she wasn't designing houses. Hallway exhibit across from Rm 14N-118. x3-5136.

#### OTHER

**Potluck Performance Art Party\***—April 14. Bring anything to read, show, perform and/or consume to get in for free. \$4 donation for charity. 9pm, Rm N52-115. x3-2060 or <<http://www.mit.edu/activities/miters/>>.

**Vera List Essay Prize Competition Deadline\*\*\***—April 20. See story this page. x3-4400.

# MIT engineering is again #1

(continued from page 1) computer science, as well as in computer engineering. In addition, MIT departments finished in the top three in all the rated areas: biological sciences at #3, chemistry at #2, geology at #2 and physics at #3.

In the School of Architecture and Planning, the Department of Architecture was ranked #2, with a 4.4 rating (on a scale of 5) compared to Harvard's first-place 4.6 rating.

## GRADUATE SPECIALTIES

In graduate specialty programs within the School of Humanities and Social Science, MIT was #1 in economics/industrial organization and in international economics, #2 in microeconomics and #3 in macroeconomics and in public finance.

In graduate programs within the School of Management, MIT ranked #1 in management information systems, production/operations management and quantitative analysis. MIT ranked 6th in entrepreneurship and 7th in finance.

In graduate programs within the US News category of sciences, MIT ranked first in inorganic chemistry, computer science hardware, computer science artificial intelligence, geological tectonics/structure, atomic/molecular physics and nuclear physics. The Institute ranked #2 in

biochemistry/molecular, #5 in neurosciences, #6 in genetics and #7 in cell biology/developmental.

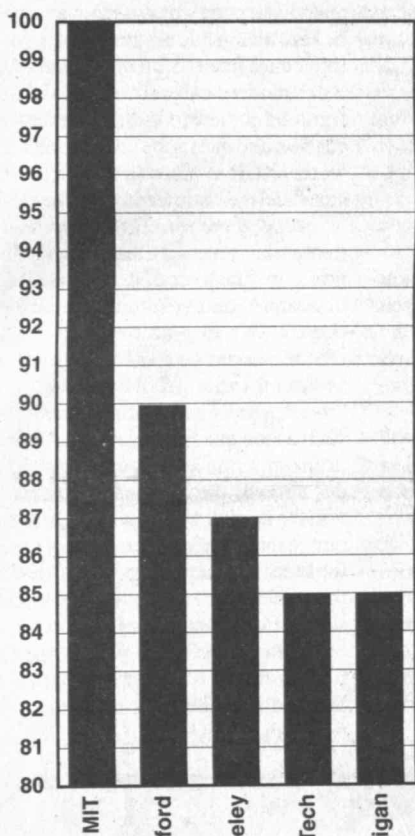
No specialty programs were listed in engineering.

In an e-mail interview with The Tech, President Charles M. Vest commented, "Such rankings are not too meaningful because they reduce a very complex topic to a few simple metrics. They reasonably identify clusters of strong institutions, but the hair-splitting of rank ordering them is not very meaningful. The focused ranking of professional schools such as engineering and business is more substantive than the ranking of entire institutions.

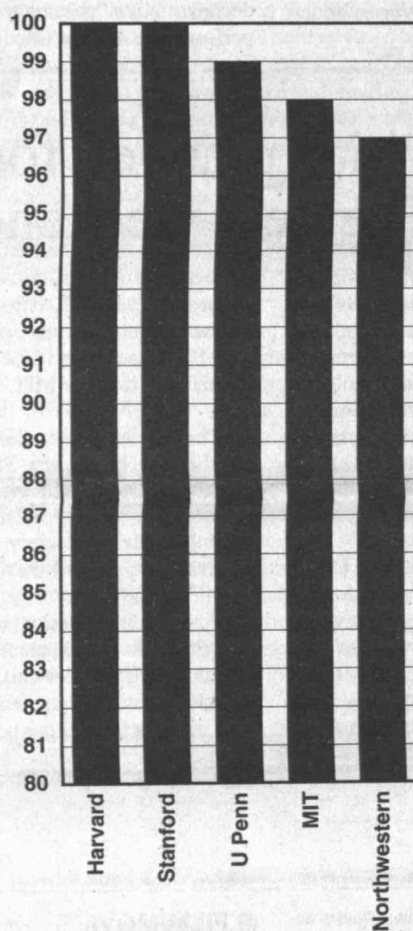
"The ranking of engineering is gratifying but should never be taken for granted. I was particularly pleased that the recent advances in engineering at MIT are being recognized by our peers. Our approach to bioengineering has differed from that of most other schools. It demonstrates that moving in ways we believe are best, rather than fitting what everyone else is doing, is the right approach.

"Many constituencies, including prospective students, pay more attention to rankings than I would like. Thus, it is helpful when we are highly ranked, but it should never drive our decisions. We will live up to strong rankings by striving for excellence and never being complacent," Dr. Vest said.

The top 5 in engineering



The top 5 in business



Felix F. AuYeung posts a flyer advertising an upcoming MIT appearance by the parents of imprisoned former MIT student Lori Berenson. Photo by Donna Coveney

## Student leads MIT campaign to free imprisoned Berenson

Felix F. AuYeung had no idea who Lori Berenson was when he came to MIT from San Francisco two years ago. Now she dominates his life.

Ms. Berenson, a former MIT student (Class of 1991), has served four years of a life sentence in Peru, convicted of treason by a hooded military tribunal in 1995. Amnesty International has declared that she is a political prisoner and that Peru acted in violation of international treaty obligations by imprisoning her.

"I could be the next Lori Berenson," said Mr. AuYeung, who discovered her plight when he visited the web site at <<http://www.freelori.org>> a year ago. He is now a member of the MIT Social Justice Cooperative, which is sponsoring an appearance by Lori's parents, Rhoda and Mark Berenson, on Monday, April 10 at 7pm in Rm 10-250.

"Anybody who visits the wrong foreign country could be the next Lori," said Mr. AuYeung, 24, who came to the US from Hong Kong with his family when he was 9 years old. "If you believe in peace and freedom and you talk up and say people have a right to self-government, you could wind up in jail, or dead."

While adorning bulletin boards with posters advertising the Berensons' appearance, Mr. AuYeung is trying to sensitize his fellow students and the rest of the MIT community to their daughter's plight.

"As a community, we have to stand up for her. The people who graduate from here have to be educated about Lori," he said. "If the entire MIT community writes to their elected Congress representatives or to the President, something will happen. The more people who know about her situation, the better chance she has of getting out and returning to her family."

Mr. AuYeung, who is working toward the SM in mechanical engineering, minored in peace and conflict studies at the University of California at Berkeley as an undergraduate. "If engineers aren't concerned about peace, who will be?" said Mr. AuYeung, who was the only engineering student in the program. "Do we expect to place the fate of civil society solely on decisions by politicians? Everyone has a stake in peace. Everyone wants peace. The world isn't a perfect place and many of us are concerned about making it a better place."

Mr. AuYeung, who was also a member of the Planning Committee for the Dr. Martin Luther King Jr. Celebration, describes his parents and three siblings as ethical and compassionate but not politically active. He jokes that he is "the purple sheep" of the family.

After the Berensons' talk, petitions requesting federal officials to intervene will be circulated. This effort will continue the following day at the Stratton Student Center and in Lobby 10.

"Ultimately, it's a matter of transforming concern into action for social change," Mr. AuYeung said. "In this case, it's about speaking up for justice and dignity for an American citizen. It's about bringing Lori Berenson home."

Rhoda and Mark Berenson visited MIT during Commencement in 1998 when President Clinton spoke. A letter from members of the MIT community was presented to Mr. Clinton by President Charles M. Vest's office, appealing to him to intervene on Ms. Berenson's behalf. The letter was signed by Institute Professor Emeritus Philip Morrison and Episcopal Chaplain Jane Gould, among others.

Robert J. Sales

## Similar infection mechanisms found in two different bacteria

(continued from page 1)

blood cells engulf intruders.

"You can look at it as a chronic infection of the plant, although unlike other infections, this is beneficial to the organism," Professor Walker said. "The plant allows itself to be invaded by the bacteria. In this way, the plant gets ammonia and the bacteria get carbon."

### ENGINEERING AN INVASION

It turns out that the bacterial gene *bacA* is crucial for these two very different host-bacterial relationships. Professor Walker's group had previously identified this key gene in the rhizobia that interact with alfalfa. MIT postdoctoral fellow Kristin LeVier set out to find a potentially similar gene in a bacterial pathogen that infects mammals. She focused on a mammalian pathogen, *Brucella abortus*, so-called because it is the bacterium responsible for brucellosis, a disease that causes infected cows to abort their fetuses. She found that brucellae possessed a gene extremely similar to rhizobia's *bacA*.

"Because of the close evolutionary connections between the rhizobia and brucellae bacteria and the parallels between how each interacts with its host, we thought it might be possible to use

knowledge obtained from studies of plant-rhizobial symbioses to gain insights into the poorly understood mechanisms that enable the brucellae to establish chronic infections in their mammalian hosts," Professor Walker said.

Stringent regulations requiring entire cattle herds to be destroyed if even one cow is infected have effectively eliminated brucellosis in the United States, but the disease is epidemic in some developing countries. Caused by contact with infected animals or by ingesting infected milk, milk products or animal tissue, brucellosis is a hard-to-treat infection whose symptoms include fever, malaise and weight loss. It is difficult to wipe out with antibiotics because brucellae live inside cells.

"The brucellae appear to have an insidious ability to foil the mammal's immune system and rebuild its population from the few cells that survive the first onslaught of the body's immune system," said Martin Roop, associate professor of microbiology and immunology at LSUHSC.

If the *bacA* gene is removed from *Rhizobium meliloti*, the mutant bacteria are able to carry out the early steps of invading the plant nodule but cannot establish a chronic infection and therefore cannot fix nitrogen. When Dr.

LeVier created a mutant strain of *Brucella abortus* that was missing the *bacA* gene, she found something surprising when she used the bacteria to infect mice: the mutant bacteria entered the animals' white blood cells and survived for two weeks. But then, instead of continuing to flourish, the numbers of bacterial cells dropped significantly and the infection cleared from the mice.

"The *bacA* function seems to be necessary for the bacteria to overcome the defense response of the host that would otherwise prevent a chronic infection," Professor Walker said.

This scenario, in which removal of *bacA* from the brucellae allows the body's immune system to recognize and then successfully kill off a persistent intruder, is a perfect basis for the development of a vaccine, Dr. LeVier pointed out. There is currently no vaccine against human brucellosis. The *bacA* protein also may be an interesting target for the development of new antibiotics.

In addition, insights into the mechanism underlying the ability of the brucellae to chronically infect host cells may also apply to other types of bacteria. This information also could help develop nitrogen-fixation systems for plants that do not normally fix nitro-

gen, which has long been a worldwide goal of agricultural, ecological and economic importance.

This work is funded by grants from the National Institute of General Medi-

cal Science and US Department of Energy-Life Sciences Research Foundation and a contract from the US Army Medical Research and Materiel Command to LSUHSC at Shreveport.

## Habitat homes get MIT boost

The MIT chapter of Habitat for Humanity raised \$1,420 on Sunday (April 2) in the kickoff of an eight-month Campus Build drive to raise \$80,000 to build three houses, one in Boston and two overseas.

In addition to the fundraising, 85 volunteers wielded power tools and hammers to construct 62 wood frames on the plaza of the Stratton Student Center. The frames will be used at 15 Habitat construction sites in Roxbury. About 50,000 families are on waiting lists for affordable housing in Boston.

"The response to our event was astounding," said MIT Habitat for Humanity President Catherine Foo, a sophomore in electrical engineering and computer science (EECS). "It really shows that MIT students and faculty have an interest in service and dedica-

tion to the surrounding community."

The volunteers enjoyed the balmy weather and the shared sense of accomplishment at the end of the day. They also had fun.

"I do Habitat because after all the theory and problem sets are done, I feel incomplete," said Goutam Reddy, also a sophomore in EECS. "Habitat allows me to put my hands on something physical and real, and leave a positive change in the world. And I like to play with power tools."

Freshman David Reinhardt said he joined Habitat because "I like to work with my hands on a worthwhile project and leave feeling I've accomplished something."

"It's a real concrete form of community service," said Fred Choi, another EECS sophomore. "You're able to see the results at the end of the day."