

One Broadway (tall square building on right), recently purchased by MIT, can be seen in this view of Kendall Square photographed from One Memorial Drive. Photo by Laura Wulf

MIT buys building at One Broadway

MIT announced last month it has made another major investment in Kendall Square, purchasing the 17-story building at One Broadway from Raytheon Corp. MIT's partnership with the City of Cambridge started the redevelopment of the Kendall Square area three decades ago with the development of Technology Square on the abandoned Lever Brothers soap factory site.

One Broadway, built in 1970 by the Badger Engineering Co., now a division of Raytheon, has views of the Boston skyline and is at the gateway to Kendall Square at Broadway and Third Street, near the Marriott Hotel and the MBTA station. MIT expects to make a substantial additional investment to upgrade the 301,000-square-foot building and the associated parking garage, insuring the site's continued ability to attract commercial clients

"We firmly believe in the continued economic strength of Cambridge," said MIT Deputy Treasurer and Treasurer-Elect Allan S. Bufferd. "MIT is a major factor in the growth of the Cambridge economy. This purchase complements other commercial investments MIT has made in Cambridge, such as University Park and the rehabilitation of 640 Memorial Drive, which contribute to the city economy and the tax rolls, and provide opportunities for employment."

In another transaction announced by MIT, the Institute has purchased from Polaroid Corp. its property at 28 Osborn St., which MIT is planning to upgrade and lease for commercial purposes.

The property is adjacent to 21 Osborn St.—owned by MIT and leased to Analog Devices, which is manufactur-

(continued on page 9)

Dying stars leave an exotic legacy, research shows

By Deborah Halber
News Office

When massive stars die, they may leave behind objects that are more unusual and exotic than previously imagined, says Victoria M. Kaspi, assistant professor of physics in the Center for Space Research. For one thing, the pulsar—a type of neutron star that has long been thought to be the standard product of such stellar deaths—may be merely one species in a larger zoo.

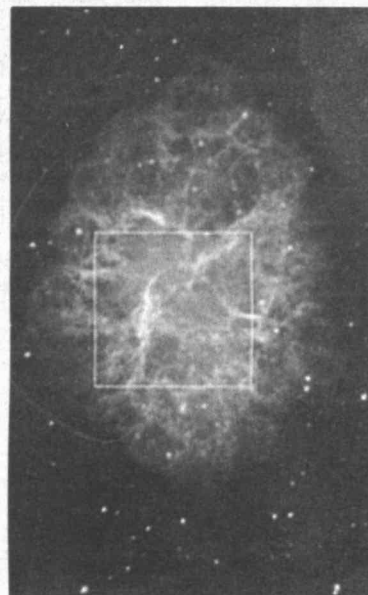
"There's increasing observational evidence that young neutron stars are not as simple as everyone thought," Professor Kaspi said during an invited talk titled "The Neutron Star/Supernova Remnant Connection" at the annual meeting of the American Astronomical Society on January 8.

By taking a broad look at diverse types of recent observations, she and other astronomers are starting to unify these observations into one cohesive explanation of what happens when a massive star dies.

Among the alternatives to pulsars, Professor Kaspi said, are unusual celestial X-ray sources such as anomalous X-ray pulsars, the unpredictable soft gamma-ray repeaters, and magnetars—ultra-magnetized neutron stars hypothesized to explain these phenomena. Also in the family may be quiet, isolated, cooling neutron stars that,

for unknown reasons, never "turned on" to radiate like their cousins.

Considered some of the most exotic objects in space, pulsars are believed to (continued on page 12)



Within the box superimposed on this image captured by the Hubble Space Telescope of the Crab Nebula is the Crab Pulsar, a relatively young, rapidly rotating neutron star.—Image courtesy Jeff Hester and Paul Scowen (Arizona State University) and NASA

MLK celebration to feature exhibit in Lobby 7

By Robert J. Sales
News Office

MIT's 25th annual celebration of the life and legacy of Dr. Martin Luther King Jr. will include an interactive exhibit in Lobby 7, designed by 15 students during an IAP seminar.

The theme for this year's celebration is "Teaching and Learning: The Key to Full Inclusion." Keynote speaker for the celebratory break-

fast on Thursday, Feb. 4 in Mors Hall at Walker Memorial is the Hon. Kweisi Mfume, president and CEO of the NAACP. Invitations are required for the breakfast, hosted by President and Mrs. Charles M. Vest. Requests for invitations must be made by February 1. For information, see <<http://web.mit.edu/mlking/www>>.

The Lobby 7 exhibit is the brainchild of Eto Otitigbe, a senior in (continued on page 10)

501 accepted early to Class of 2003

MIT has accepted 510 of 2,188 applicants for early admission in September. Ninety-two percent of them are in the top 5 percent of their high school graduating class, including 122 class valedictorians.

The other 1,678 will be considered for acceptance along with the pool of general applicants. A year ago, 524 of the 2,107 early admission candidates

were accepted and 70 percent matriculated. Of those deferred, 150 were admitted along with 1,216 who applied for the regular action deadline.

Pending approval, plans are under way to invite all students accepted to Campus Preview Weekend, an offer which previously was restricted to women and underrepresented minorities. Early acceptan-

ces have until the regular reply date of May 1 to decide whether to join the class of 2003.

This year, those accepted early include 222 women, or 44 percent of the group, and 288 men. Of these, 117 indicated that they intended to concentrate in the Department of Electrical Engineering and Computer Science and (continued on page 12)

Jackson is president of RPI

Professor Shirley Ann Jackson, MIT graduate and life member of the Corporation, has been named the 18th president of Rensselaer Polytechnic Institute, effective July 1, 1999.

"Professor Jackson will be a truly outstanding university president," said MIT President Charles M. Vest, who described her as one of a handful of close personal advisors. "That calm, reasoned voice on the other end of the telephone has been a source of strength and wisdom for me."

Professor Jackson, 52, is chairman of the Nuclear Regulatory Commission. She received the SB (1968) and PhD (1973) in physics from MIT—the first African-American woman to receive a doctorate from MIT and the first African-American woman in the country to receive a doctorate in physics. She will also be the first African-American woman to head one of the nation's top technological universities.

Professor Jackson describes herself as a "change agent." While an undergraduate at MIT, she was a founder of the Black Students Association and helped increase the number of African Americans entering the Institute from two to 57 in just one year.

Looking ahead to the challenges of leading RPI, Professor Jackson commented, "Leadership, in this context, must begin with setting an example—an example of hard work, creative thinking, and commitment to ideals and mission."

"To be effective, a leader must also be able to motivate those she leads, to build consensus among diverse stake-



Jackson

(continued on page 12)

Life imitates art



Two people converge on the stairwell in the Building E23/E25 atrium, where the Aaron Fink painting Out for a Walk offers a counterpoint in the background. Photo by Laura Wulf

Student Notices

* Open to public
** Open to MIT community only

January 13-31

ANNOUNCEMENTS

Career Services and Preprofessional Advising Recruitment Presentations**—Jan 25: Bank of America, 6pm, Rm 4-370. Synergy, Inc., 5pm, Rm 4-145.

EECS VI-A Orientation Lecture**—Wednesday, Feb. 3, 3pm, Rm 34-101. For course VI sophomores interested in applying for the VI-A Internship Program with Industry and Government. More info: x3-64644 or <via@eeecs.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>.

Christian Science Organization**—Thursdays at 7pm. Call x3-8797 or <lnorford@eagle.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>.

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>.

Lutheran-Episcopal Ministry at MIT*—Regular Wednesday worship 5:10pm, followed by supper 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 Sarvagatana, MIT Chaplain and Head, Ramakrishna Vedanta Society of Boston. Every Friday, 5:15-6:30pm, MIT Chapel. Sponsored by the MIT Vedanta Society. More info: 661-2011 or <mehta@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. John Kymissis x5-7649 or Costa Sapuntzakis x5-7683.

Protestant Eucharist/Holy Communion*—Wednesdays, 5:10pm in the Chapel. Sponsored by the Lutheran-Episcopal Ministry at MIT. More info: x3-2325 or <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>.

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

VOLUNTEERS

Contact the MIT Public Service Center for more information (Room W20-311, x3-0742).

Nine year old boy from Wellesley would like to learn computer programming (Basic). Two hours per week in the afternoon. Can come to MIT. Jane Verplanck (781)431-7908.

Harvard singing group seeks to expand. Looking for college volunteers to join them in singing for patients at local hospitals. No singing experience is necessary. More info: Annie Oreskovich (617)493-7664 or <oreskov@fas.harvard.edu>.

Mass Pre-Engineering Program is looking for people to help teach pre-engineering workshop series for sixth-eighth graders. Workshops run for seven consecutive Saturdays February 27-April 10 from 9am-noon. More info: Bernie Zubrowski at (617)427-7227.

Crimewatch

The following summary contains most of the incidents reported to Campus Police from December 10-January 3, 1999. It does not include medical shuttles, ambulance transfers, false alarms and general service calls.

December 10: Ashdown House: suspicious activity, persons on roof. New House: suspicious activity, unwanted phone calls. Bldg. N52: suspicious activity, tampering with door lock. Albany Garage: suspicious activity, forged parking sticker. Sloan Lot: assist other police department with arrest of shoplifter from MIT Coop. Bldg. 26: student reports possible laptop scam. Bldg. E52: larceny, backpack and contents, \$295. Amherst alley: possible forged parking permit. Hermann Garage: malicious destruction to motor vehicle.

December 11: Bldg. 66: larceny of Christmas tree. Bldg. 7: hack, star placed on dome. Mass Ave and Amherst alley: assist other police department with traffic complaint. Baker House: malicious destruction, damage to dorm during unauthorized party. Hermann Garage: suspicious activity; possible bicycle theft. Bldg. 34: accident with property damage, parked bicycle frame bent. Bldg. 13: larceny of bicycle, \$100. Mass Ave and Memorial Drive: motor vehicle accident, student struck while walking bicycle.

December 12: Bldg. W20: malicious destruction, tampon machine. Bldg. E23: unknown odor, burning smell, Cambridge Fire responded, electrical problem. Bldg. E52: routine check, workers found in Faculty Club after hours. Next House: report of smoke, Cambridge Fire responded, self cleaning oven.

December 13: MacGregor House: student problem, loud argument. Bldg. E52: alarm, student in alarmed area studying.

December 14: Bldg. W20: larceny, purse and contents, \$30. Bldg. W20: larceny, credit card. Eastgate: fire alarm, Cambridge Fire responded, burnt food. New House: fire alarm, Cambridge Fire responded, overloaded laundry machine.

December 15: Lobby 7: hack, Christmas tree hung from top of lobby. Bldg. W59: arrest, default warrant. West Garage: malicious destruction, parking gate broken off. Memorial Drive: Assist other police department with motor vehicle accident.

December 16: Bldg. 10: suspicious activity, people on dome staging. Bldg. E53: suspicious activity, office door unlocked. W34: larceny of wallet and contents, \$33. Bldg. W20: larceny of bicycle, \$450.

December 17: Phi Beta Epsilon: notified student to call home. Bldg. 54: report of fireworks. Amherst alley: bottles thrown at students. Bldg. NE43: briefcase containing a laptop stolen, \$800. Bldg. W31: flimflam involving sale of vitamins, \$100. Burton: report of suspicious activity. Baker: report of loud noise.

December 18: Student Center: camera stolen, \$700. Bldg. 5: report of persons on roof, individuals identified as Department of Facilities workers. Bldg. N10: report of suspicious activity, person removing chairs from building, same checked out okay.

December 19: New House: student problem. Student Center: report of graffiti. Kenmore Square: MIT student was the victim of an attempted robbery. Bldg. 3: report of high pressure water pipe breaking causing damage from basement to 3rd floor. Boston, Sigma Nu: malicious damage to lock.

December 20: MIT Boathouse: suspicious activity, employee had problem with lock. MIT Police notify Cambridge Police of suspicious activity at Salvation Army Thrift store. Bldgs. 5 and N10: report of homeless person, same sent to shelter. Bldg. 13: report of skateboarders, same sent on way. Boston, Sigma Nu: attempted break in to building. Cambridge Police: reports of 911 hangup calls from 131 Mass. Ave. Bldg. E15: suspicious person, individual located and taken into custody on an outstanding warrant. Bldg. E23: wallet stolen, same later recovered by victim. duPont gym: report of unauthorized use.

December 21: Zeta Psi: computer stolen, \$3,000. West Garage: malicious damage to vehicle. Kappa Sigma: report of a past assault. New House: noise complaint. Student Center: suspicious activity. Bldg. E19: suspicious activity.

December 22: Kappa Sigma: report of suspicious person, later discovered leather jacket missing, \$250. N10 lot: malicious damage to vehicle. Bldg. E19: suspicious activity. Bldg. E53: zip drive stolen, \$200. Bldg. 1: MIT Card stolen. Boston, Pi Lambda Phi: break and entering.

December 23: Bldg. 66: suspicious person given trespass warning. Bldg. E40: report of unauthorized use of an office. Bldg. 10: report of person on roof, same checked out okay, contractor. Bldg. E19: power tool stolen, \$125. Bldg. W31: report of contractor working at MIT an outstanding warrant.

December 24: Bldg. 24: copper stolen, unknown value. Tang Hall: burnt food caused apartment to get smoky setting off fire alarm. Building evacuated. Bldg. 10: report of a fight, officers discovered friends just horsing around. Bldg. E19: officer to assist with potential personnel problem.

December 25: Walker: report of homeless person, given trespass warning. Assist Cambridge Police: Pacific St., MIT students involved in a dispute that resulted in an assault and battery.

December 26: Rear of Bldg. NW14: routine check of two individuals. Assist Cambridge Police: Pacific Street, intoxicated homeless person.

December 27: Bldg. 3: report of a disorderly person, given trespass warning.

December 28: East Campus: stereo stolen, \$150. Student Ctr.: report of homeless person, individual gone upon officers arrival. Walker: report of annoying phone calls. Bldg. E51: report of a person with binoculars looking into another building. Bldg. 9: men's room suspicious activity. Bldg. NW13: report of a homeless and intoxicated person. Person was making his way to the shelter.

December 29: Memorial Dr.: Assist State Police with truck vs. bridge. Bldg. W59: male arrested for breaking and entering. Kresge: camera stolen, \$2,330. Bldg. NW10: report of homeless person trying to enter, same making his way to shelter.

December 30: Bldg. 36: miter saw and vacuum stolen, \$305. Bldg. W15: report of homeless person on loading dock. Bldg. E15: attempted larceny of laptop computer, suspect chased out of building.

December 31: Bldg. 9: flatware and coffee pot stolen, \$50. Bldg. E17: cellular telephone stolen, \$250.

January 1: Mass. Ave. at Amherst St.: assist Cambridge Police with bicyclist vs. motor vehicle.

January 2: Bldg. 14: suspicious person, trespass warning issued. Bldg. 24: Cambridge Police report 911 call. Area checked, no cause found. Bldg. W5: hang-up on campus emergency telephone, no one in area.

January 3: Pacific Lot: homeless person on campus emergency telephone, request Cambridge Police for assistance. Bldg. 3: male arrested for trespassing, also investigate past fire due to disposal of cigarette. Bldg. 66: broken water pipe. Bldg. NE13: broken water pipe. Student Ctr. Athena Cluster: backpack stolen, \$1,300.

Campus Police will begin Back Bay patrols of FSILGs next month

MIT Campus Police have been authorized to hire four officers and one sergeant and purchase one cruiser to patrol portions of the Back Bay on a regular basis starting in February.

To implement the patrols, Campus Police Chief Anne P. Glavin has asked Sheriff Richard J. Rouse to appoint all MIT police as deputy sheriffs, giving them full police powers in Suffolk County. He agreed.

In announcing the new policy, Chief Glavin said, "I am very happy to have our department add the Boston-based fraternities, sororities and independent living groups [FSILGs] to our patrol responsibilities. Over the last six months we have worked with our students to develop a closer working relationship. Having a continuous presence in Boston will enable us to assist students with neighborhood issues and with Boston and [Boston University] police relationships. Having visited with many residences this past fall, I

know there are many dedicated students who want to work hard to improve the MIT student image in Boston. We are happy to help them work toward this goal."

Officers assigned to Back Bay patrol will perform all duties carried out by officers on campus, including answering medical calls, making arrests and issuing alcohol citations. In addition, they will be expected to foster relationships with neighbors of MIT residences. They will patrol from 6pm-2am, seven days a week.

The patrols will cover portions of Bay State Road, Beacon Street, Commonwealth Avenue, the Fenway and Hereford Street, where many FSILGs are located. Campus Police have been informally patrolling these streets on weekends since September, but the new commitment will greatly increase their presence in the area.

The new hires will increase the number of MIT police to 60.

Libraries unveil first web version of Barton

(This article by Joan Thompson, document resources librarian, originally appeared in the November/December 1998 issue of the i/s newsletter.)

The MIT Libraries have launched a web version of Barton, their online catalog. Although WebBarton is up and running, it is still under development. An updated version from GEAC, the system vendor, is expected in the coming months, though a firm date has not been set.

This first version has been made available in response to user demand and to provide improved access to Barton. WebBarton is linked throughout the Libraries site and can be found at <http://libraries.mit.edu/barton/>. Telnet access to Barton will continue to be offered at <telnet://library.mit.edu/>.

NEW FEATURES

Users of Barton will notice that the web version maintains most of the functionality of the old telnet version while offering new features and enhancements. For example, WebBarton has an e-mail option for exporting search results and a search history function that lets users review and combine past searches.

The web interface is also more responsive than the telnet version in other ways. You can limit searches by location or type of material before or after initiating your query, and con-

necting and printing from the web is simpler. To see a chart outlining the differences between the telnet and web interfaces, go to <http://libraries.mit.edu/help/barton/BartonTable.htm>.

The Libraries would like to involve the MIT community in the development of WebBarton. There is an e-mail link for user feedback on the login page; comments and suggestions are welcome. As always, the Libraries reference staff is available to help users with WebBarton or any library resource.

MIT TECH TALK

(USPS 002157)

January 13, 1999
Volume 43, Number 16

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 World Wide Web 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 <mailsvc@mit.edu>.

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

Domestic mail subscriptions are \$25 per year, 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 on the World Wide Web.



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Addendum

An item in Awards and Honors in the September 30, 1998 issue of MIT Tech Talk, noting that Dr. Bruce Lahn (a postdoctoral associate at the Whitehead Institute) had won the \$10,000 third prize in the Merrill Lynch Forum's Innovative Grants Competition, should also have said that Dr. MacMurray Whale (PhD 1997, mechanical engineering) was also a winner. He was awarded a \$3,000 discretionary grant for his technology for producing electricity by direct energy conversion from a thermal source by exploiting microscale effects. Possible applications include solar energy and alternative-powered microscale thermophotovoltaics. The contest sought dissertation topics that could be translated into a commercial product or service. Dr. Whale is now an assistant professor at the University of Victoria in Canada.

Schmidt to head microsystems labs

Professor Martin A. Schmidt of the Department of Electrical Engineering and Computer Science (EECS) has been named the new head of the Microsystems Technology Laboratories effective January 16. He succeeds Professor L. Rafael



Schmidt

Reif, who will become associate department head of EECS from electrical engineering in mid-January.

The Microsystems Technology Laboratories (MTL) carry out research activities in the fabrication

of extremely fine structures and their applications for integrated systems including X-ray lenses, VLSI circuits

and micro-gas turbine engines. These artificial microstructures in micron, submicron and nanometer scales are at the heart of the information revolution and of the newer fields of microsensors and actuators.

"I'm very pleased to announce Marty Schmidt's appointment to this position," said Professor John Vander Sande, who made the appointment while he was acting dean of the School of Engineering. "Marty's leadership, combined with the support he has from the MTL faculty and staff, assures a very bright future for the Laboratories as they move aggressively into the 21st century."

"Professor Schmidt has done a tremendous job as an associate director of MTL and understands the operations of the Laboratories very well," Professor Reif added. "He is an outstanding choice, and I am looking forward to an

exciting MTL under his leadership."

Professor Schmidt, an expert in microelectromechanical systems (MEMS), received the BSEE from Rensselaer Polytechnic Institute in 1981 and the SM (1983) and PhD (1988) from MIT. He joined the Institute faculty as an assistant professor in 1988 and was promoted to associate professor in 1992. He received tenure in 1994 and became a full professor in 1998. He has been associate director of the MTL since 1997.

Professor Schmidt's research involves novel applications of MEMS technologies to a variety of fields, including miniature gas turbines, miniature chemical reactors, microswitches, biological applications and sensors monolithically integrated with electronics. He received an NSF Presidential Young Investigators Award in 1990.

House Speaker Hastert of Illinois called supporter of science and technology issues

The new Speaker of the House, Representative J. Dennis Hastert, Republican of Illinois, is considered a supporter of science and technology issues by fellow members of an Illinois coalition of science and technology leaders in academia, business and government, according to a report from the American Institute of Physics.

His district includes DOE's Fermi National Accelerator Laboratory, of which he has been a strong advocate. Other major technology-related employers in the 14th district include AT&T Corp./AT&T Bell Laboratories, Matsushita Electric Corp./Panasonic Industrial Co., and numerous hospitals and medical centers.

Mr. Hastert, 57, who is beginning his seventh term, is considered an honorable and pragmatic legislator, solid rather than flashy, who believes in conservative principles but is willing to work hard to find compromises.

In the past, Mr. Hastert has been active behind the scenes in the Republican leadership. He has served for the past four years as chief deputy whip, the second-in-command to Majority Whip Tom DeLay (R-TX). In this role, Hastert earned a reputation for convincing members to vote the party line, but with subtlety and persuasion rather than arm-twisting. Although he worked side-by-side with the more partisan DeLay, Mr. Hastert's amiable style is thought to be reminiscent of his old mentor, former Minority Leader Robert Michel (R-IL).

An Illinois native, Mr. Hastert lives in Yorkville in a suburban and rural congressional district outside of Chicago. The institutions of higher learning in his district are Aurora University, Elgin Community College, Judson College, Kishwaukee College, Northern Illinois University, Sauk Valley Community College and Waubesa Community College.

He is a graduate of Wheaton College in Illinois and has an MS from Northern Illinois University. For 16 years, Mr. Hastert taught high school history and government, and was a wrestling and football coach.

As he has never been much in the public eye, there is little indication of the strength of his support for science-related programs. He has been a proponent of Illinois's Fermilab (he was active in pushing for funding upgrades to Fermilab's Tevatron) and Argonne National Laboratory.

As a member of the Illinois General Assembly from 1981-86, he supported the effort to create the Illinois Math and Science Academy to improve education in those fields.

In 1995, Mr. Hastert opposed an amendment to cut NSF and NASA appropriations, and in 1996 he signed a letter to appropriators recommending that NSF be fully funded during a time when government shutdowns had left the appropriations process in disarray. He did not sign a 1996 letter to the administration calling for a strong budget for DOE fusion funding.

In up-or-down votes on the inter-

national space station in 1993 and 1994, Mr. Hastert voted to terminate the project. He has parted somewhat from the conservative line by endorsing funding for energy efficiency programs.

As he looks toward the first session of the 106th Congress, Mr. Hastert has called Social Security reform "the number one priority" for Congress. In his January 6 acceptance speech, he emphasized "four big challenges": Social Security and Medicare reform; economic security through tax relief and leaner, more efficient government; stronger national defense; and improved K-12 education.

According to voting records and interest group ratings compiled by Congressional Quarterly, Mr. Hastert has voted the Republican Party line 95 percent of the time in each of the last three years. Over the same period, his voting record has coincided with the Conservative Coalition position 98 percent of the time.

Last year he supported President Clinton's position in 21 percent of votes. He has received a 100 percent rating in each of the last three years from the US Chamber of Commerce for his pro-business, antiregulatory votes.

The American Conservative Union gave him a score of 88 percent last year, and has scored him at 100 percent in some preceding years. He has earned a zero rating from the AFL-CIO for all four of the past years, and a zero in three of those years from the Americans for Democratic Action.

Faculty hears report on MEng program

The master's of engineering (MEng) program received high marks on its five-year review from the Professional Education Policy Committee (PEPC), Professor Paul Penfield Jr., head of electrical engineering and computer science, said at the December 16 faculty meeting.

Professor Penfield said about 200 degrees have been awarded each year under the MEng program starting in 1994, with 50-80 students continuing to work toward a PhD.

With 75 percent of EECS students qualifying after their junior year, 70 percent are admitted to the program and 65 percent enroll, according to the report, written by Professor Jesus del Alamo, PEPC chair. "Student satisfaction is very high," the 48-page report says.

When the program was introduced, the model was based on 290 sophomores majoring in EECS. The number reached 363 last semester.

While "the data indicate that the MEng is largely satisfying its education goals," the report says, increased

enrollment, particularly in computer science, could have a negative effect on traditional SM and PhD programs, leading to faculty hiring difficulties in the future.

"Junior faculty in computer science [have] been particularly affected by this state of affairs," the report says. "For them, it is difficult to teach their specialty at the graduate level. If not redressed, the malaise that exists among sectors of the EECS faculty might affect faculty hiring and retention."

Before the briefing on the MEng report, the faculty voted to establish a PhD program in bioengineering. Director of Personnel for Benefits and Systems Marianne Howard also reported on proposed changes in the pension plan. Institute Professor Sheila Widnall, chair of the Faculty Policy Committee's subcommittee on pensions, said, "We feel comfortable that the changes which will go into effect on Jan. 1, 1999 will be fair and provide a benefit to plan participants."

Robert J. Sales

Vest will address global sustainability group in Japan

President Charles Vest will travel to Japan next week to attend the annual meeting of the Alliance for Global Sustainability (AGS), an international collaboration formed in 1994 by the University of Tokyo, the Swiss Federal Institutes of Technology and MIT.

Dr. Vest will give a welcoming address at the AGS conference, which runs from January 19-23. The consortium takes a multidisciplinary, multicultural and multi-institutional approach to environmental problems.

At the meeting—which will be attended by more than 200 academics, students, researchers and business leaders from a dozen countries—research results will be presented, individual research groups addressing topics of global sustainability will integrate their work, and the scope of AGS in the

coming century will be addressed.

While in Japan from January 16-23, Dr. Vest also will take part in a series of meetings with industry leaders, MIT alumni/ae and friends of the Institute. He plans to attend an event in Tokyo commemorating the 50th anniversary of the Office of Corporate Relations' Industrial Liaison Program.

Among his planned stops is a gathering at the MIT Club of Japan. Around 1,250 MIT alumni/ae live in Japan, representing the largest concentration of MIT graduates living in any country outside of North America.

MIT shares a long-standing tradition of mutual support with Japan and Japanese industry. Since the mid-19th century, cultural, academic and technological exchanges have taken place between MIT and Japan.

UA to hold public forums on faculty rules, exams

The Undergraduate Association's Student Committee on Educational Policy (SCEP) will hold two public forums for undergraduates and recent alumni/ae this month to gauge student opinions on faculty rules and take-home exams.

Attendees at a session today (January 13) from 1-3pm in Dining Room 3 in the Stratton Student Center will discuss "How Should Rules Issues Be Resolved?" The faculty have a number of rules intended to ensure that students get the most out of their educational experience, but what happens when a faculty member contravenes these rules and causes a problem for students? Participants will be asked what they think should happen if a violation affected them.

"Should MIT Offer Take-Home Exams on an Honor System?" is the

topic of the second session on Wednesday, Jan. 20 from 1-5pm in W20-400. The forum is being held at the request of the Faculty Policy Committee. Discussion will invite opinions on allowing professors to offer take-home exams on an honor system, in lieu of evening exams and/or some final exams, and if so, how such an honor system would work. Would it improve students' educational experiences and strengthen the MIT community?

Lunch will be served at both forums. RSVP to <jdsher@mit.edu> as soon as possible to be guaranteed a meal. Attendance is limited to undergraduates and recent alumni/ae, but faculty members, graduate students and administrators are encouraged to register their opinions by sending e-mail to <scep@mit.edu>.

MIT hosts NAS symposium today

A regional meeting of the National Academy of Sciences, featuring a public symposium with three MIT faculty members, will take place this afternoon (January 13) from 1-3:30pm in the Tang Center's Wong Auditorium.

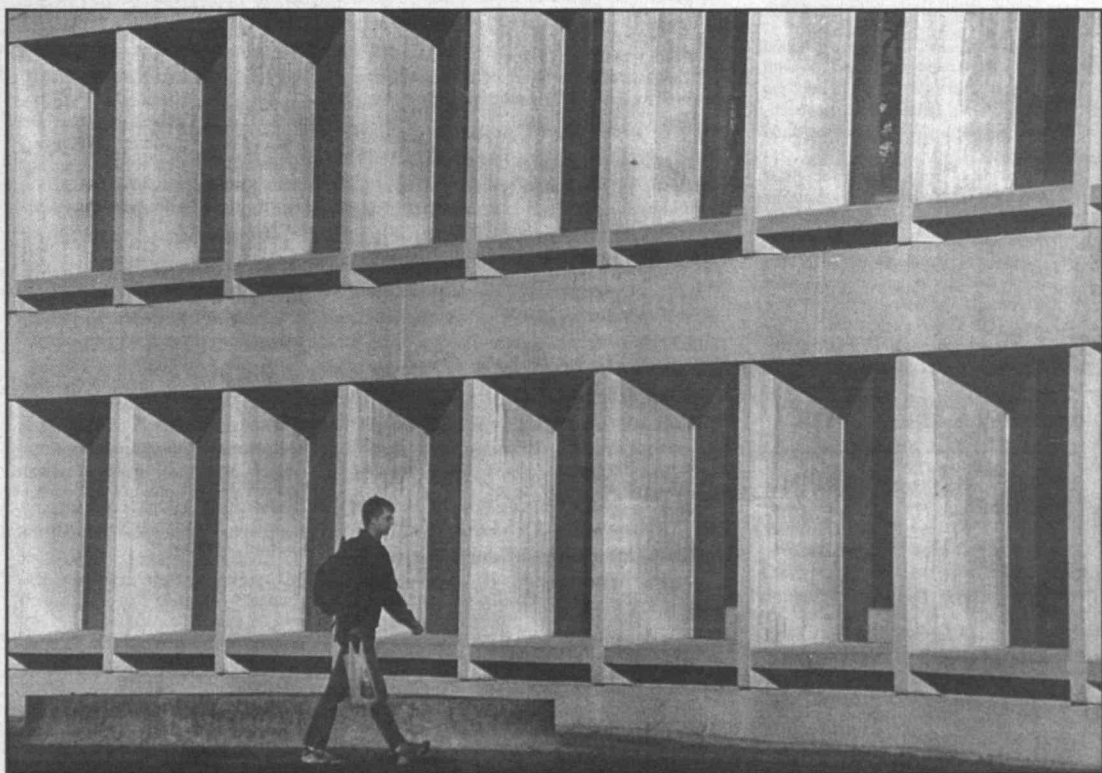
The symposium is hosted by President Charles M. Vest and co-moderated by Sylvia T. Ceyer, the J.C. Sheehan Professor of Chemistry. The other moderator is Don C. Wiley of Harvard University's Department of Molecular and Cellular Biology.

Three talks will comprise the scien-

tific program: "Molecular Biology of Pheromone Detection in Mammals" by Catherine Dulac of Dr. Wiley's department at Harvard; "Bose-Einstein Condensates: New Physics at Nanokelvin Temperatures" by Professor of Physics Wolfgang Ketterle; and "Words and Rules: The Ingredients of Language" by Professor of Psychology Steven Pinker, director of MIT's Center for Cognitive Neuroscience.

Registration and the meeting for NAS members begins at 3:30pm, though the symposium is open to the public.

Taking steps



Bright winter sun highlights the architecture of the Dreyfus Building (Building 18). Photo by Laura Wulf

Researchers: Half of 'fen-phen' duo inhibits key enzyme

■ By Deborah Halber
News Office

Even a single, low dose of the diet drug phentermine inhibits an important enzyme in the blood, according to a paper published January 2 in *Lancet* by researchers at MIT and the Massachusetts College of Pharmacy and Allied Health Sciences (MCP/AHS).

Researchers Timothy J. Maher, the Sawyer Professor of Pharmaceutical Sciences and director of the Division of Pharmaceutical Sciences at MCP in Boston and lecturer in MIT's Department of Brain and Cognitive Sciences; visiting MIT scientist Dr. Ismail H. Ulus, professor of pharmacology at the University of Uludag in Bursa, Turkey; and Dr. Richard J. Wurtman, the C.H. Green Distinguished Professor at MIT and director of the Clinical Research Center, also reported these findings in September 1998 at the International Congress of Obesity in Paris.

Although the amphetamine-like phentermine was first used as an appetite suppressant in the 1960s and became available in a generic version around 1980, it got new life in the United States after 1992 when it was

paired with another anti-obesity drug, fenfluramine. The drugs were combined to cancel out the tendency of one to act as a stimulant and the other as a depressant.

From 1992-97, millions of Americans were prescribed "fen-phen" for weight control. (Because the two drugs were never in one pill, their use in combination didn't require US Food and Drug Administration approval.) A small number of people who took the anti-obesity drug combination developed primary pulmonary hypertension and heart valve lesions.

In 1997, half the fen-phen drug duo, fenfluramine, was voluntarily withdrawn by its manufacturer because it was speculated that fenfluramine was responsible for these health problems. The other drug, phentermine, does not seem to cause adverse effects when taken alone. It still is used to treat obesity.

The *Lancet* article, "Phentermine, and other monoamine-oxidase inhibitors, may increase plasma serotonin when given with fenfluramines," shows that phentermine inhibits the enzyme monoamine oxidase (MAO). MAO helps the body to control the amount of

serotonin in the bloodstream.

According to the article, a 15-milligram dose of phentermine led to an increase in platelet serotonin levels in test subjects. The researchers attributed this to an inhibition of the metabolism of MAO. "That phentermine inhibits the MAO that catabolizes serotonin was well known in the early '70s but apparently this information never made its way onto the drug's label," the researchers wrote.

KEEPING SEROTONIN IN CHECK

Serotonin in brain cells is involved in transmitting nerve impulses, and the antidepressant and anti-obesity drugs are designed to enhance its effect. Serotonin levels in the blood plasma are kept low by two mechanisms: absorption into platelets and the serotonin-destroying MAO enzyme. Too much serotonin appears to harm heart valves and lead to damaged blood vessels in the lungs.

He said that to his knowledge, Redux is no longer being developed as a weight-loss pill, although the researchers contend that taking a serotonin-uptake blocker alone would not be expected to raise serotonin levels or cause heart valve lesions or primary pulmonary hypertension.

"Subsequent to our September report, three reports from various universities have appeared comparing the frequency of cardiac valvular changes in people taking fen-phen or Redux, and in all three, either the frequency was twice as great in the fen-phen group, or there were no cases at all in the Redux group," Professor Wurtman said. "Additionally, a multi-center study conducted by the University of Oregon found that if one omitted from consideration patients who were also taking a drug that inhibits MAO, there were no differences at all in the frequency of valvular changes between people taking Redux and control subjects."

United Way drive at 89%

As of January 11, MIT's United Way campaign is more than \$30,000 ahead of last year's total at that time, though still about \$37,000 short of its goal.

So far, 1,098 donors have pledged \$285,011, putting the campaign at 89 percent of its \$322,000 target amount, according to Liz Mulcahy, employee campaign manager. By early January 1998, 1,055 donors had contributed \$254,621, or 81 percent of the campaign goal. The number of Leadership Givers (those who have pledged at least \$1,000 apiece) is also up, from 59 to 77.

Twenty prizes will be awarded at a

February 9 end-of-campaign raffle that includes all MIT donors to the United Way. Recent additions to the roster of prizes include four passes to the Children's Museum, tickets to the Museum of Science and the Topsfield Fair, a kids' pool party for 20, and a limited-edition Boston Celtics poster. There are also overnight stays for two at several area hotels, tickets to various musical and theatrical performances, and other prizes. Winners will be notified by phone or interdepartmental mail.

To make a donation, contact your area's chief solicitor or call the Office of Special Community Services at x3-7914.

Institute Calendar

* Open to public
** Open to MIT community only

(For arts-related listings, see page 11.)

An IAP course teaching how to enter lectures and seminars into the online TechCalendar is being offered on Friday, Jan. 15 at 1pm in Rm 2-135. No advance registration needed. All are welcome.

INSTRUCTIONS: Seminars & Lectures listings must now be submitted to the online TechCalendar at <<http://tech-calendar.mit.edu>>. If you have questions about that procedure, please contact <help@tech-calendar.mit.edu>.

Listings for Community Calendar and Student Notices should be submitted using the web form at <<http://web.mit.edu/newsoffice/tt/calform>>. If you have questions, please contact <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, Jan. 22, covering events from Wednesday, Jan. 27 through Sunday, Feb. 7.

January 13-31

SEMINARS & LECTURES

(Listings compiled by TechCalendar, courtesy of The Tech)

WEDNESDAY, JANUARY 13

National Academy of Sciences Public Symposium*—Sponsored by Conference Services with National Academy of Sciences. 1pm, Wong Auditorium, Building E51. Catherine Dulac: "Molecular Biology of Pheromone Detection in Mammals." Wolfgang Ketterle: "Bose-Einstein Condensates—New Phys-

ics at Nanokelvin Temperatures." Steven Pinker: "Words and Rules: The Ingredients of Language." More info: Conference Services x3-1700.

COMMUNITY CALENDAR

Contra Dance for All at MIT*—Tuesday, Jan. 26, 7:30-10:30pm, W20-407 (Stratton Student Center). Sponsored by MIT Folkdance Club. Special IAP edition, beginners encouraged! Traditional American dance. Beginners, experienced and singles welcome. All dances taught. Caller: Laura Johannes. Music: Vince O'Donnell and Cal Howard. Donation \$4, students free. Part of a series of dances every second and fourth Tuesday. More info: x3-folk, 617-354-0864 <fdc-request@mit.edu> or <<http://web/fdc/www/contradance.html>>.

Wives Group**—Jan. 13, 20: no meetings. Jan. 27: trip to the North End. Meet in front of MIT Coop in Kendall Square at 3pm. A support network sponsored by MIT Medical for partners and spouses of students, staff and faculty. Meetings held every Wednesday from 3-5pm in W20-400. Childcare provided. More info: x3-1614 or <<http://web.mit.edu/medical/wivesgroup>>.

MITAC

The MIT Activities Office (MITAC) serves the cultural and recreational needs of the MIT community (including MIT's retirement community). Two locations: (1) Walker Memorial Rm 005, 9:30am-3:30pm, Wednesday-Friday (2) Room LLA-218, x6130, Lincoln Lab, 1:15-4pm, Thursday and Friday only. More info: x3-7990 or <julieh@mit.edu>. MITAC accepts only cash or a personal check made payable to MIT. MIT IDs must be presented.

Enrique Iglesias (Lowell Memorial Auditorium)**—Thurs., Feb. 18, 8pm. Tickets: \$38.50 orch. seating. Purchase by 1/21.

"Smokey Joe's Cafe" (Lowell Memorial Auditorium)**—Thurs., Feb. 25, 8pm. Tickets: \$27.50 orch. seating. Purchase by 1/21.

"Kodo Drummers" (Symphony Hall, Boston)**—Sun., Feb. 28, 3pm. Ticket: \$31 (reg. \$35) 2nd balc. seating. Purchase by 1/21.

COMMUNITY

MIT Ballroom Dance Club*—For schedule, call x8-6554 or see <<http://web.mit.edu/mitbdt/>>.

The Furniture Exchange at MIT**—Used furniture needed in good condition, to be sold to MIT/Harvard students. Donations are tax-deductible and receipted; profits go to MIT scholarships. Call x3-4293 or see <<http://web.mit.edu/medical/wivesgroup/resource.htm#anchor545694>>.

GABLES (Gay, Bisexual, and Lesbian Employees and Supporters) at MIT**—Monthly lunch-time get-togethers held on and off campus on the last business day of the month. Info line x2-1014. Staff lesbian e-mail list sign-up: <gables-request@mit.edu>.

Graduate Student Council Grocery Shuttle*—The GSC offers a grocery shuttle from MIT to the University Park Star Market on Saturday mornings every half-hour from 8-11:30am from Eastgate. Free to all members of the MIT community. For schedule and stops, see <<http://www.mit.edu/activities/gsc/Committees/HCA/Grocery/grocery.html>>.

MIT Folkdance Club*—Sundays: International Dancing 7-11pm. Second and fourth Tuesdays of each month: Contradance for all, 7:30-10pm see <<http://web.mit.edu/fdc/www/contradance.html>> for details. Wednesdays: Israeli Dancing 7-11pm. MIT/Wellesley students free, \$1 others. For location, see <<http://www.mit.edu/activities/fdc/home.html>>.

MIT Toastmasters**—An organization that helps people improve and practice their public speaking and presentation skills. Meets second and fourth Friday of each month, 12:05-1:30pm, Rm E19-220. For schedule, see <<http://web.mit.edu/personnel/toastmasters/>>.

Tech Squares*—MIT's Square and Round dance club, meets on Thursdays, with caller Ted Lizotte. For more info, see <<http://www.mit.edu/activities/tech-squares/>> or e-mail <squares@mit.edu>.

MIT Working Group on Support Staff Issues**—Employees throughout the Institute who work together to address issues of concern to support staff at MIT. We organize task groups that report findings to the membership for action and implementation. If you would like to attend one of the monthly meetings, contact Heather Mitchell at <mheather@mit.edu> or x3-9474.

FAMILY

Family Resource Center**—In addition to parenting workshops and programs, the Family Resource Center also offers support and training programs for child care providers, workshops at your request, a lending library, and individual consultations concerning parenting, schools, child care options, and work/family issues. See <<http://web.mit.edu/personnel/www/frc/>>, call x3-1592 or e-mail <frc@mit.edu>.

Family On-Line Services**—A computer workstation is available in the Family Resource Center reception area

Taking an MAO inhibitor like phentermine with serotonin uptake-blockers like fenfluramines inhibits the body's ability to keep serotonin in check. Fenfluramine stops plasma serotonin from being taken up into platelets. Phentermine, the investigators found, raises serotonin by another chemical action: it inhibits the MAO that destroys serotonin.

Professor Wurtman is the co-inventor of the use of Redux, an MIT-patented drug, to treat obesity. Redux, or dexfenfluramine, is the half of the chemical compound of fenfluramine that directly works on serotonin metabolism. Redux also was withdrawn from the market in 1997 though there was little evidence that Redux given alone caused heart or lung damage. Redux was licensed to several companies, including Interneuron Pharmaceuticals Inc. of Lexington, of which Professor Wurtman is a director.

Ongoing Community Meetings

for those who would like to access child care databases and on-line parenting resources. Also, the FRC maintains a list of those members of the MIT community who would like to be on an e-mail list to receive news, program updates, etc. To be added to the subscriber list, e-mail <frc@mit.edu> or call x3-1592.

Fathers Group**—Peer-led, informal discussions of the challenges and joys of fatherhood. No fee. Cosponsored by the Family Resource Center and the Health Education Resource Center. Open to MIT, Draper and Whitehead communities. Thursdays noon-1pm; call or e-mail for meeting place, x3-1316 or <mit-dads@mit.edu>.

Mothers Group**—Professionally led group, Wednesdays, 1-2pm, Rm E23-297. No fee or preregistration required. Co-sponsored by the Family Resource Center and the Health Education Resource Center. For schedule and information, call x3-1316.

Off-Campus Playgroups**—The MIT Wives Group, with the cosponsorship of the Family Resource Center, provides ongoing support for establishing and maintaining informal parent-child playgroups. Contact Wives Group, Rm E23-376, x3-1614.

Parents Forum**—Peer-led discussions for parents. No fee. Info: Chris Bates, x3-4084 or <cbates@mit.edu>.

Wives Group**—A support and self-help program sponsored by MIT Medical for partners and spouses of students, staff and faculty. Meetings held every Wednesday from 3-5pm in W20-400. Childcare provided. Info: Jennifer, x3-1614.

HEALTH

Alcoholics Anonymous (AA)*—Meetings every Tues, 12-1pm; Thurs, 12-1p; Womens AA meets Mon 6-7pm., Rm E23-376. Info: Denise x3-4911.

Alcohol Support Group**—Meetings every Wednesday, 7:30-9am. Info: Denise, x3-4911.

Cancer Support Group**—Meets last Tuesday of the month, 12:15-2pm. For those with acute and chronic forms of cancer. Sponsored by the MIT Medical Dept. Info: Dawn Metcalf, x3-4911.

Co-Dependents Anonymous (CoDA)*—Thursdays, 6:30-8pm, Rm 66-168. Info: Alise, x3-4911.

Early Pregnancy, Prepared Childbirth and Childbirth Review**—Classes are offered to patients of the Medical Department's Obstetrics Service. Call x3-1316.

Falun Gong Classes*—Falun Gong is an ancient way of self-improvement in body and mind, an advanced Qigong system of the Buddhas' School. Good for all ages. Everyone is welcome. No fees or donations. Tuesdays, 6:30-7:30pm, Rm. 1-134. Contact Leonard at x3-0720 or see <<http://falun.mit.edu>>.

Health Education Resource Center**—Books, free video loan program and brochures on diet, exercise, wellness, childbirth, parenting, aging and much more. Rm E23-205; open weekdays 9-5pm. Call x3-1316.

Nursing Mothers Room**—A comfortable, private place to nurse babies or express milk. Cosponsored by the Family Resource Center and the Medical Dept. Located within the Women's Lounge in Rm 10-384 and Rm E19-6th floor, accessible 24 hrs/day. Make arrangements with Margery Wilson, Rm E23-407, x3-2466.

Nursing Mothers' Group**—First and third Wednesday of each month, 11am-noon, Rm E23-297. For pregnant and nursing women. Babies and toddlers welcome. No fee or registration. Sponsored by the Medical Dept. Info: x3-2466.

RSI Alert!**—RSI Alert! is a group of MIT employees and students dedicated to creating an awareness of Repetitive Strain Injury, educating to prevent RSI, and facilitating treatment and accommodations for those who have RSI. To receive notices about events and meetings, subscribe to our listserv mailing list by sending e-mail to <listserv@mitvma.mit.edu> with the following message: [SUBSCRIBE RSIAlert YourLastname YourFirstname]. Info: x8-9328.

INTERNATIONAL

Guide for Foreign National Spouses Seeking Work**—Information on topics such as American resumes, job interviews, volunteer work, employment agencies, salary negotiation, visa issues and more. Reference binders may be used in Rm 12-170; ask for Beth Anderson.

Hebrew Lunch Table**—Come join us for an informal discussion in Hebrew every Tuesday. Students meet in the Walker Cafeteria at 12:15. Bring your lunch or buy it there. Speaking ability ranges and attendance need not be consistent. All are welcome. Info: Adam Bovilsky, <adambov@mit.edu> or 252-1521.

Hosts to International Students Program*—Offer assistance, encouragement and occasional hospitality to our students from around the world. Not a home-stay program. Faculty, staff and alumni/ae (singles, couples or families) are encouraged to participate. Kate Baty, x3-4862 or <cbaty@mit.edu>.

International Women's Discussion Group*—Meets Tuesdays beginning Oct. 28 from 12:30 to 2pm in Rm E23-347. Info: Dr. Grace Gibson, x3-2916.

Japanese Lunch Table*—Japanese and non-Japanese students meet every Wednesday at noon for language and cultural exchange. E38-7th floor. Bring your own lunch. Info: <japanprogram@mit.edu>.

MIT Japan Program**—Students: Go to Japan with the MIT Japan Program and do cutting-edge research in your field in a Japanese corporate, government or academic organization. All expenses paid. Info: x8-8208 or <japanprogram@mit.edu>.

MIT Job Support Group for international spouses. Meet people in the same situation you are. We can help you find information and prepare for your job search and interviews. Info: Jennifer, x3-1614.

MIT Language Conversation Exchange**—We find conversation partners for those interested in practicing a language with a native speaker. Info: x3-1614.

Stammtisch/German Table*—Join us for lunch auf deutsch, all are welcome. Every Monday at 1pm, MIT's Walker cafeteria. Info: <debi@mit.edu> or <sberka@mit.edu>.

IAP Notebook

Chisholm: Don't muck around with oceans

"NO!" read the first slide in Professor Sallie W. (Penny) Chisholm's IAP talk last Thursday.

The question to her emphatic answer: Should we fertilize the oceans?

To further make her point, Professor Chisholm began her remarks by saying, "I thought of putting that [slide] on and then leaving, but..." But she didn't. Instead, she spent the next hour describing why some people would like to fertilize the oceans by adding iron and why she disagrees.

Proponents believe that fertilizing the oceans would be good for two reasons: it could decrease the amount of the greenhouse gas carbon dioxide in the atmosphere, and it could enhance fish production. In the first case, fertilization would increase the amount of phytoplankton—microscopic plants. The increased number of plants, in turn, would pull more carbon dioxide from the atmosphere as part of the plants' normal growth.

The second argument says that low amounts of nitrogen in some areas of the ocean limit the amount of fish. Fertilizing the ocean with iron and phosphate, proponents believe, would increase the amount of algae that can turn nitrogen gas from the air into a usable form for marine creatures. More nitrogen means more fish.

Dr. Chisholm, the McAfee Professor of Engineering in biology and civil and environmental engineering, gave several reasons why she disagrees with both arguments. Key among them: we do not know how the system works. "If we start mucking around with the oceans, they will definitely throw us some surprises," she said. For example, fertilization could cause dramatic changes in the food web structure. It could also increase production of other greenhouse gases like methane, "so you could be worse off."

Fertilizing to increase fish production also has major potential drawbacks. "You could get blooms of toxic algae [some species of the nitrogen-fixing kind are toxic], stimulate the production of less valuable fish species, and destroy indigenous fish stocks," Professor Chisholm said.

Her conclusion: The "quick fix" idea that we can find another place to put carbon dioxide "is absolutely the wrong mentality... If you're asking where to put it, you're asking the wrong question. We should focus on decreasing emissions of carbon dioxide into the atmosphere."

Professor Chisholm's talk was part of a series called Environmental Perspectives: Research at MIT sponsored by the Department of Civil and Environmental Engineering and the student group Share a Vital Earth.

Elizabeth Thomson

How to get research on the small screen

Cutting-edge science on TV—film at 11!

Introducing MIT Video Productions (MVP), which regularly helps MIT researchers produce videos of their research. Why are such videos useful? How much do they cost? What are some tips for creating one?

Those questions and more were answered at a two-hour IAP session last week run by members of the MVP staff. The same session will also be offered Thursday, Jan. 14 from noon-2pm in Rm 9-057 and Wednesday, Jan. 20 from 4-6pm in Rm 9-057.

Why produce a video of your research? MVP Director Lawrence D. Gallagher gave several reasons. For example, a video can document a project over time. "People like to see in retrospect how the research has evolved," he said.

Videos can also be shown to sponsors, used to present the research at conferences or trade shows, and substituted for live demonstrations that can be time-consuming. Another use: videos can help "publicize and promote your research to a national (and international) TV audience." The latter works well in collaboration with the MIT News Office, which can develop other publicity materials (such as a press release) to accompany the video.

Last year the MVP, in collaboration with the News Office, produced a video of Cog, the humanoid robot being developed by Professor Rodney A. Brooks and colleagues at the Artificial Intelligence Laboratory. The video has been used in many ways. For example, Brian M. Scassellati, one of the graduate students involved in the work, used the original 45-minute tape to create a shorter version for a conference on artificial intelligence.

The original tape has also helped the researchers handle media interest in Cog. Since last May it has been distributed to almost 40 TV outlets.

The cost of producing a video depends on the project. Videos that are scripted, filmed and edited by the MVP staff cost more than those in which some steps are completed by the researcher. For an estimate of how much a given video will cost, contact Mr. Gallagher at x3-0544 or <ldg@mit.edu>.

"Once I get [something] together, can I bring the patient to you to cure?" asked one audience member. "Yes," answered Jay F. Collier, MVP post-production coordinator/editor. "We have a system that allows us to work with tape produced from almost any system."

Among the tips Mr. Collier gave for shooting your own research video: don't use VHS. "It has several problems," he said. "It doesn't hold up well to copying; there are no digital numbers (time codes) on the tape, which makes it very difficult to edit; and it has a limited resolution."

A researcher can also ask the MVP to do the filming. Enter Craig R. Milanesi, MVP production coordinator, who also had some tips for the audience. "When I come in to your lab I need to know what you want to see [in the video]," he said. "Establish for me who, what, when, where and how."

Before the actual shoot, "I would encourage you to invite me over to look at your lab to evaluate the lighting and other factors." Cog, for example, was a difficult lighting situation due to such things as a bank of video monitors behind the robot. In such a situation, "it can take half an hour to set up the lights for a single shot."

For more information on MIT Video Productions, go to <<http://caes.mit.edu/mvp>>. The MVP site includes an online guide intended to help MIT producers prepare their research video projects. It is at <<http://caes.mit.edu/mvp/postguide/>>.

Elizabeth Thomson



Sgt. Cheryl de Jong Vossmer demonstrates the proper technique for changing a tire in the IAP session called Women's Introduction to Auto Safety and Fix-It. Photo by Laura Wulf

Coming up...

Prizes offered for residence-system ideas

Up to six people from the team that comes up with the winning redesign of MIT's residence system will win a trip to England. The second-place team will win a trip to California.

A celebration launching the community-based process of designing the new residence system will take place today (January 13) starting at 3pm in Lobby 10 and moving into the Bush Room (10-105) from 3-5pm for free ice cream and a pep talk from the event's organizers.

Organizers hope to bring together a diverse group of MIT faculty, staff, students, alumni/ae and parents for a two-week IAP session that aims to produce a design for a new approach to living and learning at MIT.

Among other issues, the design will address how first-year students select housing, the timing of dorm and fraternity/sorority independent living group rush as well how faculty and students interact overall.

Tomorrow and Friday will feature auxiliary team-building exercises in preparation for the IAP session called "A Community Shapes Its Future: Designing the New Residence System at MIT," which will run from January 19-29. Kirk Kolenbrander, associate dean in the Office of the Dean of Students and Undergraduate Education, noted that while this seems like a large time commitment, it is not necessary

for every team member to be present at all of every session, and the second week consists of unstructured meetings scheduled at the convenience of team members.

During the first five days of the session, participants will take part in a forum to propose designs for the system from 1-4pm in McCormick dining hall. The teams, which can be any size, can be pre-formed by participants or created after the session is under way. While not every participant has to attend every design and discussion session, each team must be represented at each of the sessions.

For the second five-day period, from January 24-28, teams will develop system design proposals, which will be presented to the residence system steering committee on January 29 at 1pm in Rm 10-250. Outstanding designs will serve as the foundation for community discussion throughout the spring semester. A maximum of six of the first-prize winners will get a chance to visit the model Cambridge University residence system in England and second-prize winners can choose to visit Stanford or Caltech.

Preregistration is not necessary. For more information, see <<http://web.mit.edu/residence/systemdesign/>>.

Experts discuss Internet2 and MIT today

A day-long IAP seminar on Internet2 and its applications for MIT will be held today (January 13) from 8:30am-4:30pm in Rm 10-250.

"Internet2: The Next High-Performance Network for Higher Education" will open with remarks by James Bruce, vice president for information systems, and Vijay Kumar, director of academic computing. Internet2 is a collaborative effort by more than 120 US universities to develop advanced Internet technology and applications vital to the research and education missions of higher education.

From 9:15-11am, Jeff Schiller, network manager with

Information Systems, and Ted Hanss, director of applications development for Internet2, will discuss engineering issues, immersive environments, "middleware" and high-performance communications networks.

Presentations and discussion from 11am-noon and 1:30-3pm will take place on MIT applications including the interactive Shakespeare archive, the hypermedia documentary "Berliner sehen" and research TV.

More information is available on the web at <<http://web.mit.edu/acs/www/IAP99-I2.html>> and <<http://www.internet2.edu/>>.

The ins and outs of science reporting

Ever see a story in the media dealing with an aspect of science that you know something about? Chances are that you thought one of two things: that the reporter did a pretty good job, or that he or she got it completely wrong.

Come to an IAP session on January 28 from 3-5pm in Rm 3-370 to hear MIT's very own science journalists-in-residence, the Knight Science Journalism Fellows, talk about how the mass media deal with science and how scientists can deal more effectively with the media.

The eight Fellows and program director Boyce Rensberger, formerly of the Washington Post, will talk candidly about how the mass media work, how they treat science and how scientists should treat them. Also addressed will be questions such as: Does a scientist have the right to read a story before it's published? What should a scientist do if a

story misrepresents his or her work? When should a researcher call a press conference? What does it mean to go "off the record?"

The current Knight Fellows are Kevin Coughlin, technology reporter for the Star-Ledger in Newark, NJ; Kerry Fehr-Snyder, technology reporter for the Arizona Republic in Phoenix; Venkatesh Hariharan, a freelance electronics reporter in Bombay, India; Andrew Lawler, science policy reporter for Science magazine in Washington, DC; Robin Lloyd, science writer for the Pasadena (CA) Star-News; Daniel Pendick, a freelance writer in Milwaukee; Bruce Schechter, a freelance writer in Altadena, CA; and Claudia Wassmann, a television science journalist in Heidelberg, Germany.

Strehle tribute



Retiring vice president for finance and treasurer Glenn Strehle and his wife, Kathy, share a laugh at the retirement party in his honor held in Walker Memorial on December 17. Photo by Donna Coveney

Blacks in science have rich history, but diversity efforts must continue

■ By Prof. Kenneth R. Manning
Writing and Humanistic Studies

(In tribute to the 150th anniversary of AAAS, *Science* is publishing a weekly series of personal viewpoints on the theme of science and society. Essayists include prominent scientists plus a wide range of nonscientists, including artists, politicians, religious leaders, science fiction writers and philosophers. An archive of these essays is on line at <http://www.sciencemag.org/cgi/content/full/282/5391/1037>. Reprinted with permission from *Science*, Vol. 282, No. 5391, issue of 6 Nov 1998, pp. 1037-8. ©1998 by The American Association for the Advancement of Science.)

In a speech entitled "Science, Education and Democracy," delivered at the 1913 annual meeting of the American Association for the Advancement of Science (AAAS) in Atlanta and published a month later in *Science* magazine, J. McKeen Cattell, owner and editor of *Science*, declared—while arguing for educational opportunities for blacks—that "there is not a single mulatto who has done creditable scientific work."

This myth was common in the white world of science, which found it easy both to accept and perpetuate the notion that African Americans had never done any worthwhile scientific work. Among those unacknowledged were the 18th-century mathematician and astronomer of African-American descent Benjamin Banneker, who had sent his scientific work to Thomas Jefferson who in turn publicized it in the United States and abroad; Edward Bouchet, one of the first African Americans to receive a doctorate in the United States—in physics from Yale University in 1876; and Charles Henry Turner and Ernest Everett Just, who had been publishing scientific articles in major journals for several years before Cattell delivered his speech.

It was left to black intellectuals such as W.E.B. DuBois to take issue with this myth, especially since no objections came from white scientists, not even from liberal-leaning ones like Jacques Loeb, a friend of Cattell's.

DuBois's criticism of Cattell in the pages of *The Crisis*, the official journal of the National Association for the Advancement of Colored People (NAACP), was one of the factors that led the NAACP a year later to create the Spingarn Medal, an award slated for a male or female of African descent "who had performed the foremost service to his race." The first award, serving as a conspicuous counterexample to Cattell's pronouncement about the lack of achievement by blacks in science, went to the rising biologist Ernest Everett Just.

Cattell's type of sweeping generalization about what a race has or has not done in science is rarely, if ever, heard today. The scientific community has, by and large, moved beyond such crude, unsubstantiated myths. The change of attitude first became evident in the 1920s, when research results of African-American scientists began more often to appear alongside their white counterparts in the various professional journals, as blacks began, in greater numbers, to participate in scientific communities at the Marine Biological Laboratory in Woods Hole, MA, and elsewhere.

World War II brought further opportunities. At Los

Alamos and at the universities and research laboratories involved with the Manhattan Project, many white scientists witnessed for the first time black scientists joining their community in closer, more integral ways. Blacks who worked together with whites on the atomic bomb included physicists Edwin R. Russell and George W. Reed, as well as the chemists Moddie D. Taylor and the brothers William J. and Lawrence H. Knox. The eminent white physicist Arthur Holly Compton remarked that the bomb project was unique in bringing together "colored and white, Christian and Jew" for a common purpose.

However, while African Americans were clearly doing creditable scientific work, they were still not full-fledged members of the scientific community. After the war, African Americans in science continued their tradition of working at historically black universities, barred as they were from holding faculty positions at most white research and teaching institutions.

This pattern continued through the 1950s, well beyond the legal end to segregation in the landmark *Brown v. Board of Education* case. Black scientists attracted young black students into the various scientific fields at black colleges and universities, institutions that had limited resources for scientific research. Herman Russell Branson and

Warren Henry of Howard University, S. Milton Nabrit and Henry C. McBay of Morehouse College, and James R. Lawson and Samuel Massie of Fisk University all served as inspiring mentors to students who went on to earn doctorates at white institutions in the late 1950s and 1960s. The scientific community owes this cohort of pioneering mentors of black students a great debt.

In the early to mid-1960s, additional opportunities began to open up in science. These were the consequence, in part, of the social and political upheavals in the United States—the sit-ins and demonstrations in the South by young black college students, the March on Washington, and the passage of federal civil rights legislation.

While universities began to admit more African Americans as undergraduates, some of whom entered scientific fields, the scientific community was mostly a passive beneficiary of these developments. Little, if any, progressive action to integrate blacks into higher education or to bring them into the mainstream of the scientific enterprise emanated from the professional ranks of science.

That is not to say that some individual white scientists did not join blacks on the freedom rides in Mississippi, Alabama and other parts of the Deep South. During the last half of the 1960s, political activists on college campuses throughout the country questioned not so much science itself as its uses and abuses. African Americans, some of them pursuing science as a career, were part of this group.

As aspiring scientists, they worked to balance their political commitments and their career goals. It was sometimes difficult for them to explore Banach spaces in mathematics classes or repeat Arrhenius's experiments on the conductivity of electrolytic solutions in the chemistry lab while demonstrations against Dow Chemical Co., the Vietnam War and the killing of black students at Jackson State proceeded apace.

There were university-wide strikes during two spring terms of my four college years—strikes protesting the Reserve Officers' Training Corps (ROTC) and police brutality on campus in 1969, and the invasion of Cambodia and the

(continued on page 10)

Vest describes MIT outlook in speech to local Rotary Club

President Charles M. Vest outlined MIT's accomplishments, challenges and vision for the future at the Cambridge Rotary Club's weekly meeting last week at Howard Johnson's Hotel on Memorial Drive.

President Vest was introduced by Sarah Gallop, co-director of the Office of Government and Community Relations, who is president of Cambridge Rotary this year. "When I asked Sarah what she thought I should talk about today, she had a ready answer: 'Just tell them what's on your mind.'"

"On balance, my thoughts about MIT's past and future disclose an MIT agenda that, while complex and dynamic, has also remained remarkably consistent over time."

Among the topics he discussed were:

HISTORIC MISSION

"Since its founding by William Barton Rogers in 1861, MIT has sought to advance knowledge and educate students in science, engineering and other areas of scholarship—and to bring this knowledge to bear on the world's great challenges.

"These objectives are informed by a strong commitment to national and community service, and they are enriched by our dedication to creating a diverse and supportive campus community."

STRATEGY

"MIT's mission was made substantially easier in the last half of this century by a clear federal policy of investment in science- and technology-based education and research.

"Throughout the 1960s, '70s and '80s, research grants provided at least half of MIT's annual campus operating revenues—and sometimes as much as 60 percent. Far and away the largest contributor was the federal government. By the mid-1980s, however, that began to change. In 1990, when I arrived at MIT, the growth in federal research funds available to US universities had stagnated, and was barely keeping pace with inflation.

"It was clear to me that I had an opportunity, acting in close cooperation with other leaders from academia, industry and government, to help rebuild the national consensus about the value of investments in education and research."

WASHINGTON PRESENCE

"In 1991, we established a Washington office. Our goal was *not* to lobby for funding specific to MIT, but to help federal decision-makers in both the executive and legislative branches to understand the value of public investment in US research universities.

"Working closely with other universities and with national advocacy groups, we have undertaken a systematic effort designed to bring home the fact that every dollar invested in university-based R&D does double duty. These investments not only produce the research advances that drive our economy and improve our quality of life, but they also help to create the next generation of talented scientists, engineers and managers..."

"Together with about 60 other research universities, including Harvard, and almost 300 organizations and individuals, we have helped create an effective advocacy organization called The Science Coalition. We have also provided increased public service by operating a successful and popular series of annual seminars for Congressional staff held here in Cambridge."

CAMPUS DEVELOPMENTS

"Over the past five years, we have revamped many of our services, including our internal mail system, custodial and maintenance services, publications services, printing, our pur-

chase of office supplies and inventory management functions.

"Perhaps our most important managerial innovation, however, has been the campus-wide adoption of a comprehensive financial management software program called SAP. Over time, SAP will allow us to reduce costs for financial transactions and improve our auditing and accounting functions. Along the way, SAP has also helped us deal with our so-called Y2K problem—and, believe me, that is something for which I am especially grateful as we approach the end of the decade.

"Our students, of course, have paid little attention to these important behind-the-scenes improvements. There is one change, however, which they *have* noticed—and greatly applauded. Last year, we consolidated all of the various student-related services—bursar, registrar, financial aid administration, etc.—into a single Student Services Center with staff cross-trained to handle any inquiry or transaction.

"The Center has been a major hit with both undergraduate and graduate students, and is a highly visible symbol of our efforts to create an efficient, user-friendly campus environment."

COMMUNITY RELATIONS

"MIT's community relations efforts reflect our commitment to striking a balance between, on the one hand, being good citizens of Cambridge, and on the other, assuring that MIT continues to fulfill our missions in education and research..."

"Nowhere is this relationship more in evidence than in MIT's engagement with the Cambridge public schools. I am very proud of this long-standing partnership, and of the positive impact that I believe it has had on the Cambridge school system (and on our students, faculty and staff).

"Members of the MIT community are engaged in a wide variety of volunteer programs involving the teaching, mentoring and tutoring of Cambridge youth. Also, MIT volunteers and Cambridge teachers regularly team up on activities related to curriculum, technology and pedagogical techniques. Working with the City of Cambridge on educational advancement has been, and will remain, a priority for me and for the Institute as a whole..."

"MIT is also an incubator that spawns many new enterprises that add jobs and tax revenues to the city's economic base. In fact, there are about 150 such businesses in the city, founded by MIT graduates or faculty, and accounting for some 14,000 jobs."

THE FUTURE

"I believe that the next few decades will see enormous advances in understanding neuroscience, the brain and the mind. We will begin to find therapies and cures for genetically based mental and emotional diseases similar to those that have emerged in recent years for many physical diseases. We will be leaders in this great endeavor.

"Modern molecular biology and genomics will become a new scientific base for engineering, especially in the design of environmentally friendly production of materials. We are reorganizing part of our School of Engineering to lead this change.

"MIT is placing, and will place, great emphasis on the daunting problems of the Earth's environment and on wiser use of energy and materials to enable the sustainable development of societies and economies around the world. We must do this in partnership with industry. In the 21st century good environmentalism will be good business.

"We will play a role in understanding and guiding the development of new organizational, management and entrepreneurial enterprises of the future. The goal is innovation to gain efficiency and produce jobs and wealth."

■ Here & There

COMIN' UP ROSES

MIT was a winner in the Rose Bowl on New Year's Day.

When the University of Wisconsin and UCLA squared off, Ginger Taylor, administrative staff assistant in the Office of Government and Community Relations, was there along with her parents, Carol and Scott Taylor of Beacon Hill, and a friend, Esther Carver of Framingham.

The five-day, all-expenses-paid trip was Ms. Taylor's reward for winning the grand prize in a nationwide FTD-sponsored poetry contest. The assignment was to describe your unique relationship with your mother, in 100 words or less.

"A friend of our family who knows I write poetry sent me the contest application," said Ms. Taylor, who submitted the winning poem in August. "I never enter contests, so it's pretty funny that I won when I just sent it in on a whim."

In addition to attending the game, Ms. Taylor and her mother rode in the FTD float in the annual Rose Bowl parade through downtown Pasadena, CA, with actor and former football star Merlin Olsen and celebrity TV mothers Marion Ross of *Happy Days*, Cynthia Harris of *Mad About You* and Shirley Jones of *The Partridge Family*.

"The floats were amazing," said Ms. Taylor. "You would not believe all the flowers, tiny seeds, petals, grass and other living materials used to create them. The huge ducks and bunnies on our float had feathers made of coconut shavings which I could smell throughout the whole parade route."

The Taylors wound up rooting for underdog Wisconsin, a 38-31 winner. "My mom and I bonded with Wisconsin along the parade route," Ms. Taylor said. "We were waving to huge crowds of Wisconsin people... all you could see was red. It was a thrill to be in a huge stadium with 100,000 people in attendance."

The winning poem:

"It's more than love... I mean, I'm her daughter. Her *only* daughter. She battled cancer; and won. When she smiles at me, or winks, or laughs, I see in her eyes that she thanks god every day that she is alive to see me becoming the woman she always dreamed I'd be. She lights up a room—but somehow makes me believe I'm the one shining. She follows me when I walk away—and

says, 'I missed you already.' It's more than friendship. She *is* life. I mean, she's my mother."

WATCH YOUR LANGUAGE

The Montreal Gazette quoted Professor Kenneth Hale of linguistics in an article on the declining use of aboriginal languages: "Languages embody the intellectual wealth of the people that speak them. Losing any one of them is like dropping a bomb on the Louvre."

The Boston Review quoted Professor Bernd Widdig of foreign languages and literatures, director of the MIT Germany program, in an article lamenting a management directive for employees in a German retail chain to address each other with the informal *du*, replacing the traditional *Sie*.

"To throw around *du* in a formal business setting is an embarrassing *faux pas*, like being seriously underdressed for a festive occasion," he said.

LIBEL SUIT DISMISSED

Superior Court Judge Judith Fabricant has dismissed Wellesley College Professor Tony Martin's libel suit against Counterpoint writer Avik Roy (SB 1996).

In a 1993 article, Mr. Roy wrote erroneously that Professor Martin had gained tenure in Wellesley's Department of African Studies "after successfully suing the college for racial discrimination."

Professor Martin, who received tenure in 1975, filed a discrimination suit against the college in 1987.

In ruling that Professor Martin had not proved malice or defamation, Judge Fabricant wrote, "There is simply nothing in the statement that a reasonable reader could interpret in a manner that would damage Martin's reputation among any respectable member of the community."

Before the Counterpoint article appeared, Professor Martin was widely criticized for using *The Secret Relationship Between Blacks and Jews*, a book published by the Nation of Islam, in his course. After he received Judge Fabricant's decision, Mr. Roy's attorney, Robert A. Bertschke, said, "The same First Amendment values that protect his right to teach that book protect the right of a student journalist to do reporting about him and give that student breathing room to have honest mistakes."

Professor emeritus Greeley, former director of admissions, dead at 88

Roland Bradford Greeley, professor emeritus of regional planning who served as director of admissions for 10 years during his 27-year career at the Institute, died on January 4 of heart failure. He was 88.

Professor Greeley directed the Admissions Office from 1961-72, a period when the Institute first began the effort to diversify its student and faculty populations. While he was well known for his planning work, his MIT admissions work "was a really important part of his life. The license plate my mother gave him for his car said 'ADMIT,'" said his daughter, Sally Anne Greeley Benson.

"During the period when Rolly was in charge, he brought us from a pre-World War II approach to admissions to the modern-day approach," said Peter Richardson, who served under Professor Greeley as associate director and subsequently became director following Professor Greeley's retirement.

The transition was not an easy one for the Institute, which finally opened its first women's dormitory, McCormick Hall, in 1967. Lack of appropriate housing served as a limiting factor on the number of women admitted for many years.

The 1960s shift in recruitment emphasis also required Institute faculty and administration to learn how and from where to recruit minority students.

Professor Greeley "found himself at the center of heated discussion, with people pushing and pulling in every direction, and with a staff that was not quite certain what to do to help. It was hard work, and Rolly kept us all on an even keel," said Mr. Richardson.

Before becoming director of admissions, Professor Greeley had already demonstrated his commitment to students through his participation on the Undergraduate Policy, Student Environment and Student Aid committees of the faculty. For two years he served as chair of the Freshman Advisory Council, a group of faculty mem-

bers who were directly concerned with the counseling of first-year students.

"For him, admissions work was planning of a different sort—with people," his daughter said. "He was wonderful at interviewing people and making connections with them—wherever they were in the world. He always tried to make that personal connection."



Greeley

Professor Greeley was also widely known for his work in the planning profession. He served as a consultant to numerous cities and agencies in the United States and abroad, including Thailand and India, and was a member of the consulting firm Adams, Howard and Greeley.

But the planning work that was perhaps closest to his heart was in his native Lexington, where he served on the Planning Board in the 1930s, and again in the sixties, holding the offices of secretary and chairman. He was also elected to the Board of Selectmen (1968-71) and held a seat on the Historic District Commission in the seventies. (Professor Greeley's father had played an active role in the Lexington community before him, serving as president of the Historical Society.) Among Professor Greeley's many contributions to his home town are the brown and white plaques he put up at historic sites on Massachusetts Avenue.

The January 7 headline for his page one obituary in the Lexington Minuteman read: "Local icon Roland Greeley dead at 88."

Professor Greeley received the AB from Harvard College in 1931 and attended the Harvard City Planning School from 1931-34. He was chief planner for the New England Regional Planning Commission from 1935-43 and a control engineer at the Federal

Works Agency in Boston.

He joined the MIT faculty as an assistant professor of regional planning in 1945, was promoted to associate professor in 1947, served as acting head of the Department of City and Regional Planning (now the Department of Urban Studies) from 1951-52, and was promoted to professor in 1961.

He was a trustee of Mount Auburn Hospital and a member of the Massachusetts Trustees of Reservations and the Board of Governors of the American Institute of Planners.

Professor Greeley died in his twin sisters' home on Massachusetts Avenue in Lexington, the same house he lived in during his youth. "He spent his last week here, in the music room," said his sister, Anne Greeley Dutka. "His children and grandchildren were around the whole week. He was always very active in the First Parish Church and we had his bed where he could see it from the window. He could also see the Christmas tree, and we kept it lighted all the time for him."

Mr. Greeley's wife, Marion (Kimball) died in 1986. Just last month he suffered the death of his son, Warren Kimball, who died at age 57.

Professor Greeley is survived by three sons: William Bradford of Devon, PA, Edward Houghton of Nairobi, Kenya, and David McLean of Brooks, ME; a daughter, Sally Anne Greeley Benson of Bigelow, MN; twin sisters Ellen Greeley Bryant Warren and Anne Greeley Dutka, both of Lexington; 13 grandchildren and six great-grandchildren.

Funeral services were held on January 7 at the First Parish Church in Lexington.

Donations in Roland Greeley's memory may be sent to the First Parish Unitarian Universalist Church, 7 Harrington Road, Lexington 02421-4897 or to the Star Island Corp. (a Unitarian Congregationalist summer retreat off Portsmouth, NH), 110 Arlington St., Boston 02116-5302.

Denise Brehm

Other obituaries

CHARLES L. ALKINS

A funeral was held November 30 at St. Mark Congregational Church in Roxbury for Charles L. Alkins Sr., 79, of Dorchester, a former shuttle driver for MIT and Draper Laboratories, who died on November 25. He joined MIT's Instrumentation Lab in 1952 and retired from Draper in 1985.

Mr. Alkins is survived by his wife, Barbara; seven sons, Charles L. Jr. of Sharon, Leonard C. of Brockton, David M. and Jeffrey M. of Dorchester, Kenneth A. of Atlanta, and Stephen D. and Brian K. of Randolph; two daughters, Barbara Cassis of Queens and Patricia Clark of Boston and Englewood, NJ; 20 grandchildren and 13 great-grandchildren.

He was buried in Fairview Cemetery in Hyde Park. Memorial donations may be made to the NAACP Boston Branch, P.O. Box 8368, Boston, MA 02114.

EILEEN E. BORLAND

Word has been received of the October 20 death of Eileen E. Borland, 96, of Bedford, a former clerical worker for MIT Libraries. She began working at MIT in 1943 and retired in 1972. Survivors include a niece, Elizabeth B. Roderick of Charleston, WV.

RUDOLPH E. YNGVE

Rudolph E. Yngve, 90, of Batavia, IL, a former heating and ventilation mechanic at Lincoln Laboratory, died on December 14. He retired from MIT in 1974 after working here for 13 years. Survivors include his wife, Edith L.; three sons, Robert of Lady Lakes, FL, Paul of Chapin, SC, and Cal of N. Attleboro; a daughter, Janet of Northbrook, IL; 11 grandchildren and nine great-grandchildren.

JOSEPH CALOGGERO

Joseph Caloggero, 78, of Nahant, MA, a former lecturer and technical instructor in the Department of Mechanical Engineering, died on December 14. He joined MIT in 1951 and retired in 1994. Survivors include his wife, Martha V.; two sons, Anthony and James, and a daughter, Susan Caloggero, all of Nahant; and three grandchildren.

ELIZABETH J. CONNOR

Elizabeth J. Connor, 61, of Waltham, an inpatient nurse in the Medical Department, died of cancer on December 22. After working at Mt. Auburn Hospital for 25 years in the operating and emergency rooms, she joined MIT in 1990, assisting in minor surgical and diagnostic procedures. Memorial contributions may be made to the American Cancer Society, 654 Beacon St., Boston, MA 02215. A memorial service at MIT will be scheduled.

WALTER W. CORREIA SR.

Walter W. Correia Sr., 66, of N. Carver, a former research technical staff member in the Center for Materials Science and Engineering, died on December 27. He retired from MIT in 1993 after working here for 36 years.

He is survived by his wife, Hilda; three sons, Walter Jr. of Plymouth, David A. of Middleboro and Joseph L. of Visalia, CA; a daughter, Vicki Jean Sykes of Lancaster; three stepsons, John Ramos Jr. of South Dartmouth and Matthew and Russell Ramos of New Bedford; two stepdaughters, Leslie Montiero and Stacey Rose of New Bedford; and 13 grandchildren.

MADELEINE HEYMAN

A graveside service was held on

December 8 at Cambridge Cemetery for Madeleine Heyman, 92, of Boston, who died on December 4. She was a former technical assistant in meteorology and physical oceanography who started working at MIT in 1942 (after fleeing Nazi Germany) and retired in 1971. Survivors include a nephew, Hans Heilbronner of Durham, NH.

THADDEUS W. KOWILCIK

Thaddeus W. Kowilcik, 84, of N. Quincy, a former administrator in the Comptroller's Accounting Office, died on December 17. He retired from the Institute in 1977 after working here for 32 years.

Mr. Kowilcik is survived by his wife, Alice; three daughters, Victoria Cooper of Boston, Lisa Stott of Walpole and Kim Shepherd of Squantum; three sons, Thaddeus Jr. of Marshfield, Peter of Plymouth and Michael of Quincy; eight grandchildren and two great-grandchildren.

PATRICK J. MCALEAVEY

A funeral mass was held in the Church of St. Luke in Belmont on December 21 for Patrick J. McAleavey, 75, of Watertown, a former electric utilities worker for Physical Plant, who died on December 16. He retired in 1985 after working at MIT for 18 years.

Mr. McAleavey is survived by his wife, Rita M.; a brother, Edward of Malden; three sisters, Charlotte Burgess and Jane Abbott of Malden and Edith Wood of Maine; a son, Patrick J. of Watertown; a daughter, Maureen Novello of Leominster; and two grandchildren. He was buried in St. Patrick's Cemetery. Donations in his memory may be made to Health Care Dimensions, 254 South St., Waltham, MA 02454.



Ginger Taylor of the Office of Government and Community Relations rode on the FTD-sponsored float in the Rose Bowl Parade with actor and former football star Merlin Olsen.

Benefits Office answers questions on retirement funds

Following is another in an occasional series of question-and-answer articles about the changes in the MIT Retirement Plan first announced in the December 9, 1998 issue of MIT Tech Talk.

Should I stop my TDA/403(b) and increase contributions to my 401(k)?

MIT increased the amount you can contribute annually to a 401(k) plan to the lesser of 20 percent of pay or \$10,000. Most employees no longer

need both a 401(k) and a TDA, as they can contribute the full amount of their current combined contributions to the 401(k) plan. Increasing your contributions to the 401(k) plan and stopping your TDA/403(b) contributions is a convenient way to consolidate your retirement savings.

If you would like to learn more about the MIT 401(k) and TDA plans, the Benefits Office will be sponsoring a seminar on January 13th at noon and January 20th at 1pm. Both presenta-

tions will be in Twenty Chimneys in the Student Center.

Does the maximum 401(k) contribution "the lesser of 20 percent of pay or \$10,000" include MIT's match?

No, you can contribute the lesser of 20 percent of pay or \$10,000. The \$10,000 limit is the maximum you can elect to defer in both the 401(k) and the TDA/403(b) plans. This is an annual limit and is subject to an inflation increase.

When will information on the additional investment options be available?

You currently have three investment options: the Variable Fund, the Fixed Fund and the Money Market Fund. Additional options will be available in late spring. The Benefits Office will send you information on the new investment options in March and will sponsor educational seminars on the investment options.

When can I take a loan from my 401(k) plan?

It is estimated that the 401(k) loan feature will be made available in early summer of 1999. Loans will only be available to active employees and will be repaid through payroll deduction.

Can my Fixed Fund account balance both increase and decrease?

In the past, the Fixed Fund maintained relatively stable performance by spreading its gains and losses out over five years. As of January 1, 1999, the Fixed Fund is valued monthly based on the actual market performance of its underlying investments. Although members will see more fluctuations in their monthly Fixed Fund account balances, the Fund will continue to be a balanced fund with 70 to 90 percent of the portfolio invested in bonds and 10 to 30 percent of the fund invested in stocks.

How can I increase my contributions to the 401(k) plan?

Call 1-877-MIT-SAVE toll-free (1-877-648-7283). You will be asked to set up a Personal Identification Number (PIN) the first time you call. You will enter the percentage you want to contribute as a whole number between 0 and 20 inclusive. Your contributions will stop automatically once you reach the \$10,000 limit.

How frequently may I change my election?

You may change your election as often as you like or as frequently as once per pay period. The final election for monthly payroll is the 15th of the month and for weekly payroll your

election must be made on Thursday to be effective in the next week's pay.

How do I know my transaction was completed?

Upon completing a transaction on the phone system, you will be given a 13-digit confirmation number immediately following your transaction. A paper confirmation will be sent to your home three to five days later.

How can I review my elections?

You can call 1-877-MIT-SAVE at any time to review your latest elections.

When will I be provided with my 401(k) account balances?

Annual statements reflecting balances as of December 31, 1998 will be sent in February. A statement showing the one-time market value adjustment on your Fixed Fund account balances will be sent shortly after you receive your annual statement. Starting in April, you will receive regular quarterly statements on your balances in the Supplemental 401(k) Plan. Later this year, your account balances will be available on the phone system and also on the web for those who would like online access.

More sessions on retirement

Here is the January schedule for information sessions on changes to the MIT Retirement Plan. All campus sessions will be in the Stratton Student Center's Twenty Chimneys, and all Lincoln Laboratory sessions will be in the Auditorium.

TOPIC	CAMPUS	LINCOLN
Understanding the MIT Retirement Plans —A discussion of both the MIT Supplemental 401(k) Plan and the Basic Retirement Plan.	Jan. 20, 11am	Not available
Roth IRAs —A Fidelity representative will provide an overview of the pros and cons of Roth IRAs.	Jan. 13, 1pm Jan. 20, 2pm Jan. 26, noon	Jan. 28, 3pm
401(k) or TDA —Should you stop contributing to your TDA and increase your 401(k) contributions? This presentation will outline issues to consider.	Jan. 13, noon Jan. 20, 1pm	Jan. 27, noon
The Basics of Investing —An introduction to the fundamental concepts of investing.	Jan. 13, 2pm Jan. 20, noon Jan. 26, 1pm	Jan. 26, 3pm
Your Retirement Savings Options —A presentation to help you decide what retirement savings options may be best for you.	Jan. 26, 11am	Not available
Decisions, Decisions, Decisions —A presentation designed to help you decide how to take advantage of the changes in the MIT Retirement Plans.	Jan. 13, 11am	Not available

Sloan seeks contributions for 'digital time capsule'

What will life online look like in 2004? How would you encapsulate business on the Internet in 1999? What do you think the future holds for the Internet, business and education?

The Sloan School of Management is seeking ideas and contributions to its digital time capsule that will be "sealed" into Sloan's new web site, to be launched at a special event on February 4 in the Wong Auditorium starting at 5pm. The Digital Time Capsule Contest celebrates the role of the Internet in business and invites the entire MIT community to participate.

Entries can be examples of digital products, programs, people and ideas that capture the spirit and essence of the Internet and business and educa-

tion at the beginning of 1999. The capsule also will include predictions from alumni/ae and luminaries about what the world can expect from the Internet in the decade ahead. The capsule will be opened in the year 2004.

To submit a prediction or an idea, complete an entry blank at <http://web.mit.edu/sloan/www/contest.html> by Wednesday, Jan. 20. Entries will be judged by a panel of experts from industry, as well as students, faculty and staff from Sloan and other parts of MIT. Questions about the contest can be directed to <webmaster@sloan.mit.edu>. Participants and contributions will be recognized at the February 4 launch event and on Sloan's new web site.

MIT experts guides available

Guides to MIT experts on medically related research and on the environment are available through the MIT News Office.

The 1997-98 MIT Media Guide to Experts on Medicine, Physiology and Health features research descriptions and contact information for almost 200 MIT faculty and scientists involved in research ranging from aging to laser medicine to Z-DNA.

The MIT Media Guide to Experts on the Environment, published in 1995, features some 100 researchers working in fields ranging from air pollution to waste remediation.

The cross-indexed guides are available to members of the media and the MIT community. To obtain a copy, contact Myles Crowley of the News Office at x3-2700 or <mcrowley@mit.edu>.

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): <ttdads@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

Sega Genesis System and approx. 15 games, prefer to sell as package, asking \$150. Tony x3-3922.

Shark Multimedia 28.8 fax/modem for Windows 95 and Windows 3.1, never used, \$50 or bst. Contact: x3-0457 or <prklein@mit.edu>.

Furbys for sale, 2 left, make an offer. Contact: <cindy@nano.mit.edu>.

Free 3-cushion sofa (full size), off-white Haitian cotton. Jane x3-0325.

Free 3-piece sect sofa, old but perf, sm sofa, material torn 1 side otherwise perf; lamp table, office chr, recliner; Fast track machine & treadmill \$50 both. Contact x8-8018 or <prmarcus@mit.edu>.

Dishwasher and washer/dryer for sale in Porter Sq. (dishwasher & dryer portable & a little smaller than full-sz; washer full-sz), bst offer. Call x8-6862 ASAP.

Elec guitar & amp, Kramer ZX30H guitar, 3 pickups, soft case, Peavey amp, "Audition Plus," 20 watts, both in gd cond, \$150 or bst. Steve x3-9434 or <shyoung@mit.edu>.

Men's topcoat, sz 42 reg, navy blue w/lining plus zip-out pile lining, like new, \$35. Rosalie 617-776-3748.

ANIMALS

AKC reg. Golden Retriever pups, champion stock, hips, eyes & heart OK, 1st shot, mother & grandmother on premises. Call 617-332-8251.

VEHICLES

1987 Toyota Tercel hatchback, 96K, 4-sp manual trans, body fair shape, new alt, tim belt, batt, runs; many new parts, moving, must sell by Feb 1, \$300 or bst. Contact <letty@mit.edu> or 617-776-1685.

1991 Toyota Previa DX auto, pw, pl, cc, tilt, a/c, AM/FM/cass, garaged, orig owner, maintenance record,

in v gd cond, \$8750 or bst, reasonable offer. David, x3-7548 or <davek@mitvma.mit.edu>.

1991 silver Subaru Legacy sdn, auto, a/c, ps, exc cond, 96K, new parts, tires, avail end Jan 99, \$3600 or bst. Contact <zimmels@mit.edu>, 781-642-9568 (mornings), 617-252-1455 (aft).

1992 Saab 9000, auto, exc cond, low mileage (62K), orig ownr, \$15,000. Carol 617-965-9500 or 508-877-2473.

1992 Honda Civic VX, standard, 90K, gd cond, \$4750. Contact x3-7069 or <bazeia@ctp.mit.edu>.

1993 Toyota Corolla, 4-dr sdn, auto, a/c, ps, new brake, front trs, AM/FM/cass, 88K, exc cond, ask \$5700. Contact 617-731-1641 or <ahn@mit.edu> or <jhan@fas.harvard.edu>.

1993 Ford F-150, exc cond, lightly used, 47K, long-bed, anti-locks, standard 5-sp, \$10K or bst. Dana 666-8378 or <kirsch@mit.edu>.

1994 Nissan Pathfinder SE, 4x4, V6, 4-dr, dk green/grey int, 5-sp, loaded, brush guard, Yakama roof rack, sunroof, tow package, 110K hwy miles, \$11,800. Call x3-3096 or <janine@mit.edu>.

1995 Chevy 1500 Silverado pickup, only 23K, exc cond, Dad was orig owner, V8 eng, ext cab, 6' bed, locking cap, auto trans, 2WD, CD/cass stereo, \$17,250. Contact x8-0759, <stepheng@mit.edu>.

HOUSING

Cambridge, Kendall Sq: furn rooms for rent in single home, conv to MIT, subway, restaurants, \$250/wk, \$800/mo, \$65/night+utils. J. Blair, Draper x8-2843 or 617-576-5125.

Camb/Somerville: nice, fully furn 2BR apt nr MIT/Hvd, conv to almost everything, hdwd fl, a/c, elev, home theater, bikes, ideal for visiting staff, avail 3/1/99. Call 617-469-4218.

Cambridge, N: short-term or long-term rooms avail for MIT visitors in priv home, rate depends on length of stay. Eve, <annals@mit.edu>, x3-7182.

Cambridge: 2BR, completely & v nicely furn, lrg sunny ktchn, porch, encl yd, 11 minute walk to Kendall Sq, avail 2/1, \$1400/mo. John 781-721-7725 or <johnnatale@aol.com>.

Chelsea/Revere line: 4 rms, very clean, updated apt in 3-fam, avail immed, \$700+utils. Call 617-389-8174.

Malden: 3BR in 2-fam house, 1st fl, comp renov, nice yd, prkg, laundry hookup, storage space, near T & shopping, \$1,200 unhtd. Call x3-8441 or 781-322-6160 eves.

Martha's Vineyard: beaches, trails & golf near this 4BR, full bath Chappaquiddick house, only 4 wks left, July-Sept, \$700-\$850/wk. David, 781-981-3863 or 603-679-8849.

Rm for rent in lg priv home, fully furn, own TV, refrig, kitchen priv, w/d, off-st & garage prkg, nr bus to Red Ln, routes 2, 3, 93, 128 & Mass Ave, avail 2/1. Hansi Durlach, 781-648-7425.

Ski Sunday River, Maine: Luxury lakefrt condo, 2BR, fplc, 12 mi to Sunday River ski area for downhill, x-c skiing, \$500/wk, \$1200/mo. Cheryl 252-1111 or 978-664-3646.

Somerville/Camb line: 2BR+, nr Harvard/Inman Sq, comp renov, washer/dryer, yd, prkg, \$1275/mo. Call 623-1377; <ahmed@il.mit.edu>.

Somerville: apt, 1st floor, 3 rooms, 1 BR, 1b, hdwd flrs, 7 minute walk to Porter & Davis T,

\$700+. Leave message or call after Jan 16, 617-666-0534.

Somerville: Davis Sq area, 5-rm apt for rent, recently renov, closed-in porches, w/d, 10 min walk from Davis Sq, no pets, rent negot. Roger x3-7144 or 776-6871.

WANTED

December 1998 issue of "Astronomy" magazine wanted, will pay full price. Tanya Bresinsky, x3-7342 or <tanyab@mit.edu>.

Seek 2BR apt in Brookline w/heat & prkg for year. Shlomi, x3-6113 or <shlomi@corton.mit.edu>.

Visiting PhD student is looking for a room or apt convenient to MIT for the spring term. Contact 410-243-2832, <roman@jhu.edu>.

ROOMMATES

W. Newton: M/F to share 8-rm house, lrg furn bedrm, prkg, train, Mass Pike, w/d, \$650 + 1/2 utils. Merlene x8-5875.

CHILDCARE

Seeking full-time nanny for infant, live-in/out; salary \$1100-1300/mo (live-in), lrg rm w/TV, phone, fplc, bath, sep entr, grad student or postdoc couple welcome, car helpful. George Daley x8-7209.

MISCELLANEOUS

Guitar lessons from Ken Barclay, 21 years experience, now accepting students at all levels; blues, classical, rock, improv, jazz; located in Newton Corner area, accessible by T. Call 617-926-4493.

University patents support 246,000 jobs, contribute billions to economy

University research is increasing and generates approximately \$29 billion of economic activity and 246,000 jobs through the commercialization of discoveries, the Association of University Technology Managers (AUTM) estimates in its seventh annual Licensing Survey.

"The survey confirms that research universities are an important seeding ground for new science that has practical application," said Karen Hersey, AUTM's president and MIT's intellectual property counsel. "The volume of technology transfer activity demonstrates that industry not only needs the creativity and innovation of academic research, but values our active participation in the process of finding new discoveries that may lead to new products."

Precise survey data included reports from 175 institutions, including 132 US universities, plus teaching hospitals, research institutes, patent commercialization companies and Canadian universities. The US universities include 90 of the top 100 universities receiving Federal grants.

At these institutions, in fiscal 1997 alone, faculty members reported 11,303 new discoveries from their research activities, up 11 percent from 10,178 in fiscal 1996. A total of 4,267 patent applications were filed on these discoveries, an increase of 31 percent. The US Patent Office issued 2,645 patents to these institutions in fiscal 1997, an increase of 26 percent.

A total of 333 startup companies were reported in the survey, an increase of 34 percent. The University of

Washington had 25 startups, MIT had 17, Stanford had 15 and the University of California system had 13. Eighty-three percent of all start-ups were located in the same state as the research university or other patent generator. Since 1980, 2,214 new entrepreneurial ventures have been created to commercialize university technologies. Of these, nearly half (1,045) have been formed in the past four years.

In fiscal 1997, academic institutions signed 3,328 new licenses and options with industrial companies (up 21 percent from fiscal 1996). Fifty-nine percent of these licenses and options were granted to small companies with less than 500 employees.

In fiscal 1997, academic institutions received \$611 million in royalties and fees (up 19 percent from the previous year) from 6,974 active licenses.

American universities received \$446 million in royalty income—an increase of 33 percent. Twenty universities accounted for two-thirds of that total, or \$296 million.

The top earners included the nine-campus University of California system (Berkeley, Davis, Irvine, Los Angeles, Riverside, San Diego, San Francisco, Santa Barbara and Santa Cruz) with \$61.3 million; Columbia, \$46.1 million; Stanford, \$34 million; Florida State University, \$29.9 million; MIT, \$19.8 million; Michigan State University, \$18.3 million; the University of Wisconsin, \$17.2 million; Harvard, \$13.4 million; Carnegie Mellon, \$13.4 million; Yale, \$13.1 million; and the University of Washington, \$11.5 million.

Dan Massing, AUTM licensing survey chair, suggests that "income from technology transfer licensing is small, percentage-wise, when compared with universities' overall research budgets." While revenues derived from university licensing help to underwrite expenses related to the patenting and licensing of university discoveries, universities reinvest the major portion of their licensing revenues into teaching and research activities.

In patents, MIT was the single university with the largest number—134. The University of California system reported a total of 206. Wisconsin had 69 patents, Minnesota had 66, Stanford had 65 and Cornell had 62.

In licenses, the University of California system had 528, Stanford had 272, MIT had 255, Harvard had 232, Columbia had 201, Rutgers had 191, the University of Iowa had 186, Purdue had 182, Cornell had 147 and the University of Washington had 142.

These institutions in fiscal 1997 had \$22.7 billion in research, up 6 percent from \$21.4 billion the year before. They reported US government research of \$14.6 billion, up five percent from \$13.9 billion the previous year. Industry funded \$2.2 billion of research, up 6 percent from \$1.9 billion.

The survey reports that 70 percent of the 15,328 active licenses of responding institutions are in the life sciences, yielding products and processes that save lives, diagnose disease, and reduce pain and suffering. Examples of technologies and products originating from university discoveries include:

- Artificial lung surfactant for use with newborns, University of California
- Cisplatin and carboplatin cancer therapeutics, Michigan State University
- Citracal® calcium supplement, University of Texas Southwestern Medical Center
- Creatine-kinase antibody used in diagnosing heart disease, Washington University
- Haemophilus B conjugate vaccine, University of Rochester
- Hepatitis B vaccine, University of California and University of Washington
- Human growth hormone (genetically engineered), City of Hope Medical Center
- Leustatin® chemotherapy for hairy cell leukemia, Brigham Young University
- Metal alkoxide process for taxol production, Florida State University
- Neupogen® used in conjunction with chemotherapy, Memorial Sloan Kettering Cancer Institute
- Osteomark® osteoporosis diagnostic, University of Washington
- Prostate-specific antigen test, HRI/Roswell Park Cancer Institute
- DNA technology, central to biotechnology industry, Stanford and University of California
- Recombinant engineering co-transformation process, Columbia
- Retin-A, University of Pennsylvania
- Synthetic penicillin, MIT
- TRUSOPT® (dorzolamide) ophthalmic drop used for glaucoma, University of Florida
- Vitamin D, University of Wisconsin

Further information is available at AUTM's web site at <<http://autm.rice.edu/autm>> and to subscribers to the Chronicle of Higher Education at <<http://chronicle.com/weekly/v45/i18/licensing.htm>>.

Kenneth D. Campbell

Notes from the Lab

COAL MINING PRODUCTIVITY: THE WHOLE STORY

Coal plays an important role in our national well-being: it provides more than a fifth of the energy and half of the electricity consumed in the United States. Much attention therefore focuses on coal mining productivity: how much coal can be mined for each hour of labor spent? National statistics on coal mining productivity show that—except during the 1970s—coal mines have become steadily more efficient.

However, an Energy Laboratory study by Dr. A. Denny Ellerman and Professors Thomas Stoker and Ernst Berndt suggests that those national statistics do not tell the whole story. When the researchers analyzed productivity data for more than 19,000 mines from 1972-95, they found that some regions and some technologies lagged far behind others. Thus, while western longwall mines were five times more productive in 1995 than in 1972, other types of mines improved by less than half as much.

Detailed analyses of why productivity changed brought some unexpected results. For example, even after accounting for geology and technology, bigger mines were more productive than smaller ones. Also, prices affect the national aggregates. When coal prices increase relative to labor prices, companies open smaller mines with less favorable geology and overall productivity drops. Indeed, according to the analysis, price increases were more important than new regulations in causing overall productivity to plummet in the 1970s.

The study shows that aggregated national productivity data do not provide an accurate picture of the efficiency with which an industry uses its resources or of the causes of changes in overall productivity.

Dr. Ellerman is a senior lecturer at the Sloan School and executive director of the Center for Energy and Environmental Policy Research (CEEPR). Professor Stoker is the Gordon Y Billard Professor of Applied Economics; Professor Berndt is the Louis E. Seley Professor of Applied Economics. Their research was supported by CEEPR.

Nancy Stauffer, Energy Laboratory

REDUCING DOWN TIME IN NUCLEAR POWER PLANTS

Today, the typical US nuclear power plant spends almost two out of every 18 months shut down for refueling. As owners of such plants face new competition for customers, they're looking for ways to reduce costs, and refueling less often is one option.

Working closely with power plant operators, MIT Energy Laboratory researchers have designed reactor cores and operating procedures that would enable power plants to run for up to about four years before needing to refuel. Because of the extra cost of the necessary enriched fuel, adopting a four-year "extended operating cycle" under today's economic conditions would be cost-effective at plants that now experience relatively long down times for refueling and forced shutdowns, but not at plants that operate more efficiently.

A three-year operating cycle requiring less highly enriched fuel would bring savings at many more plants. And if laser-based technology now being developed reduces the cost of enriched uranium, the economics of the extended cycles would improve significantly.

Perhaps most important, the MIT team identified strategies that plant operators can use to reduce forced shutdowns and to perform more maintenance procedures while their plants are on line. The researchers emphasize that any reduction in down time will not only reduce costs but also prevent possible long-term damage to plants caused by repeated stopping and starting.

The team is led by Neil Todreas, the Kepco Professor of Nuclear Engineering, who holds appointments in the Departments of Nuclear Engineering and Mechanical Engineering. The research was funded by the DOE's Idaho National Engineering and Environmental Laboratory University Research Consortium.

Nancy Stauffer, Energy Laboratory

This column features summaries of MIT research drawn from several sources. If you have an item to suggest, send it to Elizabeth Thomson, News Office assistant director for science and engineering news, Rm 5-111, or <thomson@mit.edu>.

Libraries' IAP hours

On Martin Luther King Jr. Day (Monday, Jan. 18), the Barker, Dewey, Humanities, Rotch and Science Libraries and the Reserve Book Room will follow their regular IAP schedule. All other libraries will be closed that day.

Libraries' IAP hours though February 1 are:

- Administrative offices—Mon-Fri, 9am-5pm; Sat-Sun, closed.
- Aero & Astro—Mon-Fri, 9am-5pm; Sat, 11am-5pm; Sun, 1-5pm.
- Barker—Mon-Thurs, 8:30am-9pm; Fri, 8:30am-6pm; Sat, 11am-6pm; Sun, 1-9pm.
- Computerized Literature Search Service—Mon-Fri, 9:30am-5:30pm; Sat-Sun, closed.
- Dewey—Mon-Thurs, 8:30am-9pm; Fri, 8:30am-6pm; Sat, 11am-6pm; Sun, 1-9pm.
- Document Services—Mon-Fri, 9am-5pm; Sat-Sun, closed.
- Humanities—Mon-Fri, 7am-midnight; Sat, 8am-midnight; Sun, 10am-midnight.
- Institute Archives and Special Collections—Mon-Fri, 11am-4:30pm; Sat-Sun, closed.
- Lewis Music—Mon-Fri, 9am-6pm; Sat-Sun, 1-5pm.
- Lindgren—Mon-Fri, 9am-5pm; Sat-Sun, 1-5pm.
- Reserve Book Room—Mon-Fri, 9am-5pm; Sat-Sun, 1-5pm.
- RetroSpective Collection—Mon-Fri, 9am-5pm; Sat-Sun, closed.
- Rotch—Mon-Thurs, 8:30am-9pm; Fri, 8:30-6pm; Sat, 11am-6pm; Sun, 2-9pm.
- Rotch Visual Collections—Mon-Fri, 9am-5pm; Sat-Sun, closed.
- Schering-Plough—Mon-Fri, 9am-5pm; Sat-Sun, closed.
- Science—Mon-Fri, 7am-midnight; Sat, 8am-midnight; Sun, 10am-midnight.

Libraries' IAP hours are also available on the web at <<http://libraries.mit.edu/admin/iap.html>>.

MIT buys building in Kendall Sq.

(continued from page 1) ing airbag sensors there—and is across Albany Street from MIT's High Voltage Research Laboratory and its Albany Street Garage.

Bounded by Osborn, Main, Portland and Albany Streets, the 28 Osborn property includes buildings totaling 118,000 square feet, which will continue to be occupied in part by Polaroid. The purchase was made with the long-term potential of using the property for academic and research facilities. It will remain on the tax rolls for the foreseeable future.

Get MIT news on line!

Point your Web browser to the MIT News Office home page at <<http://web.mit.edu/newsoffice/www/>> for all the latest Tech Talk articles and MIT news releases.

Media Lab mover?



Mark Klein, a research associate at the Sloan School, practices tai chi on a chilly afternoon.

Photo by Laura Wulf

Efforts to improve diversity in science arena must continue

(continued from page 6)

Kent State killings in 1970. Many young scientists became part of the strike leadership, leaving the protected sanctity of their classrooms and laboratories to organize, march and fight for justice.

This experience heightened their awareness of the role of science and academic institutions in perpetuating past inequities, and of their responsibility to stimulate transition to a fairer and more equitable society. While some potential scientists from this group were ultimately lost to the profession through disillusionment and other reasons, others were able to balance politics and career, pursuing productive change within their fields on matters of race, access and diversity.

Beginning in the early 1970s, American scientists and administrators attempted to increase the number of minorities in science and engineering fields, and intervention programs were initiated to further this mission. These national, regional and local programs, many of which have survived into the 1990s, have sought to open the door for more African Americans, Hispanics and Native Americans to share in the scientific endeavor. Individually conceived and implemented, each program has a story that needs to be told.

In 1992 Walter Massey, the second African-American director of the National Science Foundation (NSF), declared that "a host of programs have been conceptualized, touted and funded—and largely, they have not made much of a difference." He, and especially his colleague Luther Williams, asserted that these programs had failed.

Their characterization, perhaps correct as it relates to increasing the number of blacks in science, seems not to speak to a qualitative assessment of the intervention programs—how they related, for example, to the experiences of individual participants. To determine this, educators and policy makers need first to know exactly what happened, when and to whom. Fortunately, because a number of these programs still exist and are ongoing, we are able to capture both their past and current status, and shape their future.

Since the 1970s, scientific organizations, universities and learned societies have opened their membership to include more minorities. The AAAS, for example, established the program "Opportunities in Science" in 1972 to tackle the problem of minority underrepresentation. Still, the representation of African Americans in scientific careers hovers around 2 percent, which leaves much to be desired.

We now realize that there is no quick fix. The systematic and comprehensive development of a scientific legacy for African Americans will require time and a concerted effort all along the educational pipeline, from preschool through

graduate school. Unfortunately, counselors and teachers—not all white—sometimes steer young black students away from the rigorous scientific and mathematical courses required for future training in science. When these students do survive elementary and high school and find themselves at prestigious white institutions, some are confronted with professors with lower expectations for their performance than for that of white students. Such paternalism is detrimental not only to African Americans, but to whites as well.

Universities have a special role to play in bringing blacks into scientific fields, since these institutions serve as filters for entry into the professional world of science. At the undergraduate level, college admissions are carried out by administrators who, guided by institutional goals of producing a diverse student body, have had some success in increasing the potential pool of African-American students for careers in science. At the graduate level, however, admissions are handled by faculty in the academic science departments who are not necessarily motivated by the same institutional commitment and who produce less impressive recruitment results.

FACULTY LEVEL 'MOST DISAPPOINTING'

At the highest professional level, as faculty, the recruitment, appointment and promotion of African Americans is the most disappointing of all. The reasons are complex and varied, ranging from lack of faculty expertise in performing the necessary recruitment tasks to a reluctance by some to change the complexion of science at the most exalted level. This juncture is a focal point along the career pipeline, perhaps the only remaining place where total and absolute self-selection into a bastion is still practiced.

The decisions of science faculty are therefore critical in diversifying science and engineering fields. In order to invigorate initiatives to build and sustain a critical mass of African-American students in science at both the undergraduate and graduate levels, more African-American science and engineering faculty need to be recruited. Since recruitment efforts for such faculty are often driven by central-office administrators with less than enthusiastic support from faculty, these efforts are frequently doomed from the start because they create tensions between faculty prerogatives and administrative goals.

Because appointment, promotion and tenure are faculty matters, an increased presence of African Americans and other minorities in academic departments depends principally on decisions made by majority faculty. Science faculty members must, therefore, be convinced of the appropriateness and rich advantages of bringing into their fields members who are not necessarily reflec-

tions of themselves.

When Dr. Massey was guest speaker at the MIT Commencement ceremony in June 1991, three years after he had served as president of AAAS, I eagerly awaited his views on the subject of race and science. But he said nothing in this speech about opportunities—or the lack thereof—for African Americans in science. As the second African-American director of the NSF addressing a captive audience of scientists, students and parents, he missed a unique opportunity. Silence on the topic left the impression that all was well in the world of science.

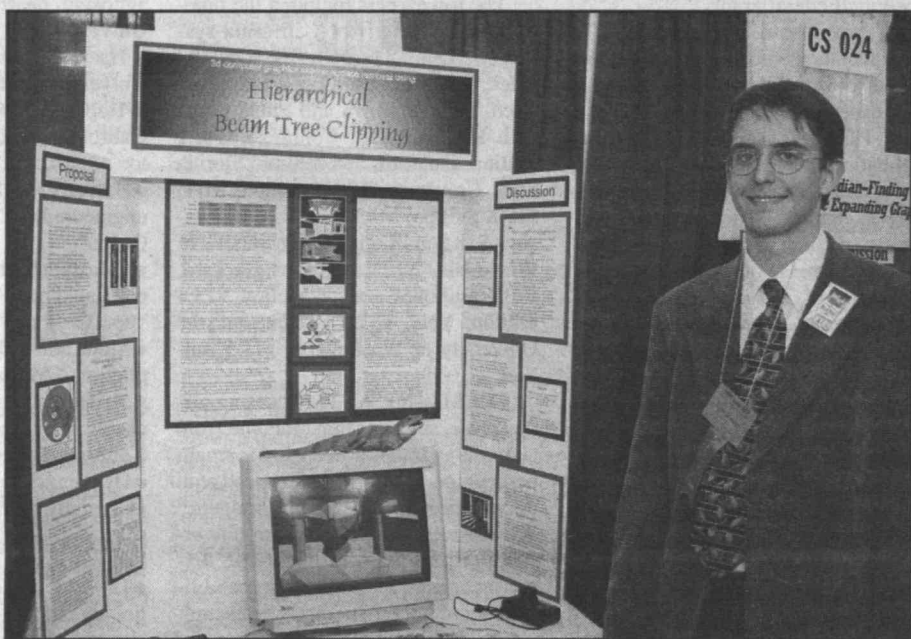
A year later a special issue of Science magazine entitled "Minorities in Science: The Pipeline Problem" was published. Devoted to the subject of increasing the pool of African-American scientists, it featured the success story of Massey and others who had benefitted from special mentors in their early education. Here Massey wrote forcefully and eloquently on the subject of blacks and their ongoing struggle for opportunities in science.

The efforts of individual scientists, univer-

sities and professionals are essential if we are to approach the 21st century with any hope of creating a diverse scientific community. Despite the current political atmosphere and the arguments against interventive efforts emanating from recent works such as Richard J. Herrnstein and Charles A. Murray's *The Bell Curve* (1994), and Stephan and Abigail Thernstrom's *America in Black and White* (1997), we must continue the struggle to diversify the world of science and to encourage and enable all who wish to enter it. Increasing diversity will require time and commitment beyond lip service, and courage in the face of political detractors.

Dr. Manning is the Thomas Meloy Professor of Rhetoric and of the History of Science at MIT. His biography, *Black Apollo of Science: The Life of Ernest Everett Just* (Oxford University Press, 1983), won the Pfizer Award of the History of Science Society. He is writing a social history of African-Americans in medicine. He dedicates this essay to Leonard M. Rieser, president of AAAS from 1971-74.

Awards & Honors



Geoffrey Schmidt with the exhibit for his prize-winning project at the Intel International Science and Engineering Fair.

■ Freshman **Geoffrey Schmidt** attended last month's Nobel Prize ceremonies in Stockholm as part of his award for being a top winner at the Intel International Science and Engineering Fair in Ft. Worth, TX in May 1998. The native of Little Rock won one of two ISEF Glenn T. Seaborg Nobel Trip Awards for his project entitled "3-D Computer Graphics Visible-Surface Determination Using Hierarchical Beam Tree Clipping," which makes it possible for computer graphics imaging software to render larger, more complex 3-D models in less time than with applications now on the market.

At the fair, which featured 1,200 participants from 34 countries, Mr. Schmidt was also one of three winners of a \$40,000 Intel Young Scientist Scholarship, and one of four Pinnacle Award winners whose projects were sent to international fairs.

■ Professor **Robert S. Langer** is one of 50 "R&D Stars To Watch" selected by Industry Week magazine. Those chosen are people "whose achievements are shaping the future of industrial culture and technology policy," the magazine wrote in its December 21 issue. "The recipient of this year's Lemelson-MIT Prize, Langer is considered a pioneer in biomedical and chemical engineering. As the holder of 320 patents, his discoveries are at the heart of the emerging technology of tissue engineering. Langer's findings at the Children's Hospital in Boston have revolutionized biomaterials research and technology," the authors wrote.

■ Professors **Joshua Angrist** and **Ricardo Caballero** of the Department of Economics

have been elected Fellows of the Econometric Society, an international society dedicated to the advancement of economic theory in its relation to statistics and mathematics. Professor Angrist studies human capital, schooling, and the economics of the family, evaluation research methodology, and program and policy. Professor Caballero's research interests include macroeconomic implications of transactional problems in labor and financial markets; restructuring, productivity and technological unemployment; and capital flows.

■ The Whitehead Memorial Lecture of the 1998 Conference on Electrical Insulation and Dielectric Phenomena, which annually recognizes the most sustained and significant work in the field of electrical insulation and dielectrics, was given this year by Professor **Markus Zahn** of electrical engineering and computer science (EECS). His lecture was entitled "Optical, Electrical and Electromechanical Measurement Methodologies of Electric Field, Charge and Polarization in Dielectrics."

■ Two graduate students, **Alexander V. Mamishev** and **Matthew R. Tate**, have received 1998 American Vacuum Society Graduate Student Research Awards of \$1,000 each. Mr. Tate, a PhD candidate in chemistry, is studying the chemical reaction dynamics of gas-surface systems related to semiconductor etching. Mr. Mamishev, a PhD candidate in EECS, is researching development of instrumentation and algorithms for characterization of bulk and surface properties of dielectric materials.

MLK celebration to feature exhibit

(continued from page 1)

mechanical engineering and a Dr. Martin Luther King Jr. Leadership award winner last year. The exhibit will be installed from February 1-4. Musical events are planned for Lobby 7 at noon and 5pm on February 4, the day of the breakfast. A panel discussion involving the designers will be held on February 5. It will be open to the MIT community.

"The MLK Design Seminar will encourage interaction and foster communication between members of the MIT community and members of diverse backgrounds," said Mr. Otitigbe, the project coordinator. "The installation will be designed to confront all who navigate through Lobby 7 each day. This unavoidable confrontation and the notion of physically being stopped will make people deal with the issues that the installation represents."

The seminar's participants will meet daily during IAP in the design studio to discuss concept, modeling, design, construction and installation. The exhibit will be shaped, in part, by discussions among the 15 students working on the project and social activists and artists from MIT and the surrounding community.

The students participated in a "mini-course" on the civil rights movement last week, directed by Tobie Weiner of political science, the Lobby 7 event coordinator for the Dr. Martin Luther King, Jr. Celebration Coordinating Committee.

"They watched some of the *Eyes on the Prize* videos and a selection from the *Chicano* series and completed readings on the civil rights movement as well as on other struggles for civil and human rights in the US and other parts of the world," said Ms. Weiner, an MLK Leadership Award winner in 1998 along with Mr. Otitigbe.

"The seminar and installation will assemble many people around the theme of remembrance of Dr. King's struggle," Mr. Otitigbe said in describing the project. "It will focus on the prin-

ciples of social justice, economic justice and human rights—three pillars that Dr. King used as a foundation for his struggle. It is important to bring in various members of the MIT community and the Cambridge/Boston community to aid in the development of this task. The invited guests will be people who through their work have sought to communicate ideas similar to those Dr. King lived by."

Graduate student Lawrence Sass of architecture is the design advisor for the installation. Associate Dean Arnold Henderson Jr. and Gertrude Morris of housing are also involved in the project.

A. LEON HIGGINBOTHAM JR.

US Court of Appeals Chief Judge Emeritus A. Leon Higginbotham Jr., 70, keynote speaker at the 1983 and 1995 MLK celebrations at MIT, died on Dec. 14 at Massachusetts General Hospital after suffering a stroke.

He was an important voice in support of MIT in its 1993 appeal of the antitrust action against MIT and Ivy League schools brought by the US Justice Department in federal court in Philadelphia in 1992, alleging collusion in the awarding of financial aid. Judge Higginbotham, who had retired from the court in Philadelphia before the action reached the appeals level, was acting as the lawyer for the school district of Philadelphia, one of several groups which filed briefs for MIT in the case. The matter was eventually settled to MIT's satisfaction.

Judge Higginbotham framed his 1995 speech at MIT as an imaginary letter from Dr. King to Rep. Newt Gingrich of Georgia, then speaker of the US House of Representatives. He concluded by reciting a poem by Langston Hughes, which ends:

*This dream today embattled,
With its back against the wall—
To save the dream for one
It must be saved for all.*

Throwing it away?

Post it on the "reuse" e-mail list, where everything from old computers to kittens can be given away. For more information, send e-mail to:

<reuse-request@mit.edu>

HyperSoap uses hyperlinks to mix shopping, entertainment

■ By Alexandra Kahn
Media Laboratory

The TV soap opera you watch may soon be a home shopping program, thanks to researchers at the Media Laboratory. The lab recently produced a soap opera which lets viewers select clothing and furnishings with a special remote control, and see an item's price and purchase information on a pop-up screen display.

The program, called HyperSoap, offers an engaging form of interactive shopping and an alternative to the printed product catalogs that stores and manufacturers mail and distribute to customers.

Produced in association with Media Lab sponsor JCPenney, HyperSoap lets viewers interact with the program at the click of a button—in much the same way that a person can click on words and pictures in a web document for links to additional content.

The technology behind the HyperSoap project enables a broad new range of applications well beyond product placement. "We believe it could be a way of creating entirely new forms of programming which engages the viewer in unprecedented ways," said Associate Professor V. Michael Bove Jr., head of the Media Lab's Object-Based Media group.

"For example, new kinds of documentaries and educational programs can be created, such as a nature program that lets children go on safari and collect specimens with their remote control. Other programs might provide instruction on everything from flying an airplane to surgery."

HyperSoap was created with authoring software developed at the Media Lab. The software allows a producer or graphic artist to quickly indicate desired regions or objects in a video sequence, and thereafter the system tracks those objects automatically, and with high precision. This is a significant advance over existing technology, which either requires manually marking object locations in each and every video frame, or which tracks so coarsely that only one or two moving regions can be identified in any scene. By automating and improving the process of object recognition, the Media Lab's technology reduces the manual work of interactive content creation, while improving the quality. As a result, literally dozens of items—ranging from an actress' blouse, skirt, necklace and earrings to the knickknacks on her desk—are selectable during a program.

"While it is easy for people to look at the world and instantly recognize objects—a person, a table, an animal—getting a computer to recognize objects is a tricky problem," said Professor Bove. "Our new software works by 'training' the computer to recognize what each object looks like in terms of the way it moves and its colors and

textures."

Exploring new video production methods in addition to designing the underlying video processing technology, the Media Lab team was also interested in understanding how additional aspects of TV production are affected when creating programs with hyperlinks.

"A traditional soap opera is created with very specific timing and flow, which does not lend well to hyperlinks and viewer interruptions," Professor Bove said. "In HyperSoap, scripting and directing were modified to allow and even encourage interaction with the products as part of the viewing experience." Dynamic graphic design experiments were also conducted to determine the best way of showing the additional product information.

"This innovative research breaks the boundaries of traditional advertising methods, and offers a whole new scope to marketing goods and services," said Michael Ponder of JCPenney's Internet commerce research division. "In addition, it adds an important new dimension to the ways in which people can learn and access information."

REACHING THE MARKET

The Object-Based Media group is also working with JCPenney to explore other programming venues. These could include a CD or digital video disc that customers could receive in the mail instead of a printed catalog and view on their personal computers. In the future, the ability to view hyperlinked video programs may be

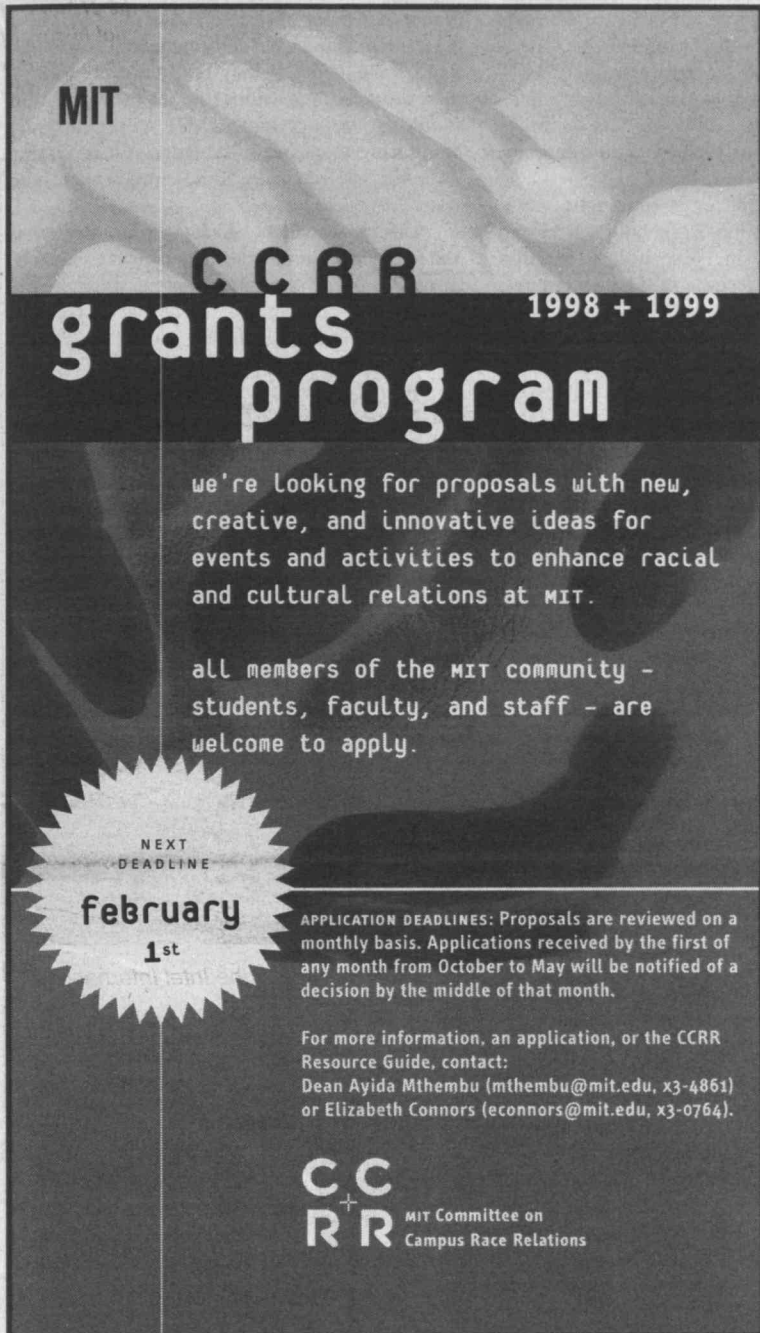
built into digital television sets, or set-top boxes for cable or satellite services.

In another application, department stores could have TV-equipped kiosks that would engage customers in a drama and allow them to view and select products of interest by simply touching the screen. The kiosk could also provide information about products, such as sale prices, or directions to the departments in which the items are displayed.

The Object-Based Media group seeks to change the way in which digital video and audio are produced and used. Instead of concentrating simply on data compression for more efficient transmission of signals, the group looks at ways in which the outputs of cameras and microphones can be subjected to an "understanding" process which results in a collection of audio and video "objects" and a "script" describing their behavior.

Examples of this process include automatically separating video images into people and background portions, extracting individual voices from mixed audio signals, and merging the observations of several ordinary cameras into a single three-dimensional model of a scene. These new methods enable both new creative directions for content producers and more responsive media forms for viewers.

Support for this research was provided by the Digital Life Consortium of the Media Lab. Additional information about HyperSoap and the Object-Based Media group is available on the web at <<http://www.media.mit.edu/hypersoup>>.



MIT

CCRR

grants program 1998 + 1999

we're looking for proposals with new, creative, and innovative ideas for events and activities to enhance racial and cultural relations at MIT.

all members of the MIT community - students, faculty, and staff - are welcome to apply.

NEXT DEADLINE

february 1st

APPLICATION DEADLINES: Proposals are reviewed on a monthly basis. Applications received by the first of any month from October to May will be notified of a decision by the middle of that month.

For more information, an application, or the CCRR Resource Guide, contact:
Dean Ayida Mthembu (mthembu@mit.edu, x3-4861) or Elizabeth Connors (econnors@mit.edu, x3-0764).

CCRR
MIT Committee on
Campus Race Relations

Arts News

■ Professor Peter Child's *Estrella: The Assassination of Augusto César Sandino* is included on the Cantata Singers' concert of "old and new works of dark nobility and grandeur" on Friday, Jan. 29 (8pm) and Sunday, Jan. 31 (3pm) at the New England Conservatory's Jordan Hall. *Estrella*, based on Sandino's guerilla war against the US Marines and his eventual murder in 1934, was commissioned by the Cantata Singers in 1988, in the heat of political strife in Nicaragua. Professor Child will deliver pre-concert talks an hour before the concert in the Keller Room on Friday and in Williams Hall on Sunday. Ticket prices range from \$14-\$38. For more information, call 267-6502.

■ "In just a short time Sonos has achieved brand-name status," wrote the Boston Globe's Richard Buell, reviewing the ensemble's December 6 concert in Kresge Auditorium. "Etioiations, half-tints, and inwardness they can handle just fine... but the main impression you're likely to carry away from one of their concerts is of zest, extroversion, physical exuberance." Sonos is composed

of faculty from MIT (Professor Marcus Thompson, viola, and Senior Lecturer David Deveau, piano) and Boston University (Bayla Keyes, violin, and Michael Reynolds, cello).

■ The Philadelphia Inquirer named Edward Baron Turk's *Hollywood Diva: A Biography Of Jeanette MacDonald* one of "the best movie books to appear in the last 12 months" in its year-end book roundup. Carrie Rickey, the Inquirer's film critic, praised the book as "an evenhanded, even-tempered account of a life that might be called, after one of [MacDonald's] movie triumphs, *Bitter Sweet*." The book, which is already in its second printing, also earned a rave from Opera News, where Brooks Peters called it a "scrupulously researched work of scholarship that reads like a novel... The book's breathless pace is scintillating, but don't let the rhapsodic tone fool you. *Hollywood Diva* is an incisive look behind the scenes... [which] goes a long way toward securing [MacDonald's] reputation as celluloid's greatest prima donna."

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

January 13-31

MUSIC

MIT Women's Chorale's first rehearsal*—Jan 28. Since 1933, the Women's Chorale has given women in the MIT community an opportunity to sing together and has provided a cultural and social setting for making friends. Nancy K. Wanger directs the 40-voice choir specializing in classical repertoire. Rehearsals held Thursday evenings. Chorale open to women from Harvard and MIT communities who can read music. New members welcome until Feb 25. 7:45pm, Emma Rogers Rm (10-340). Jennifer Recklet, x3-1614.

Aurelius Ensemble: Poulenc Potpourri*—Jan 29-30. The Aurelius Ensemble, comprised of MIT students and staff and named in honor of Prof. Marcus Aurelius Thompson for his commitment to MIT's chamber music program, celebrates the 100th birthday of Francis Poulenc. 8pm, Killian Hall. x3-2906 or <<http://web.mit.edu/mta/www/music/aurelius/>>.

MIT Guild of Bell Ringers*—Change ringing on hand bells. Beginners always welcome.

Will also ring for occasions. Meets Mondays, 6:30pm, 2nd floor balcony of Lobby 7. Roberta Young, x3-3573, <rey@mit.edu>, or <<http://web.mit.edu/bellringers/www/>>.

THEATER

Roadkill Buffet: The International Anatomical Proliferation Show*—Jan 16. IAP show by MIT's improv comedy troupe. 8pm, Rm 6-120. More info: <rkb@mit.edu> or <<http://www.mit.edu/activities/roadkill/home.html>>.

EXHIBITS

List Visual Arts Center* (E15):

Alfredo Jaar: Lament of the Images. Three photography-based installation works derived from the artist's experiences in Rwanda in 1994, where he travelled to record the testimonies of the survivors of a genocide that claimed the lives of one million.

William Kentridge: Weighing... and Wanting. Installation of charcoal and gouache drawings and a film transferred to laser disc, based on the drawings. Kentridge's homeland, South Africa, figures largely in his artwork, which allegorically deals with the charged relationship between oppressor and the oppressed in reference to South Africa's apartheid era.

Kiki Smith: Recent Photographic Work. Reflections of the artist's burgeoning interest in the natural world, extending her explorations of the human form to the interrelationship that exists between humans, animals, the environment, and the cosmos. The recent work, created during 1997-98, also joins Smith's sometimes morbid tendencies with an optimistic belief in a state of nature or grace. **Artist Talk: Kiki Smith***—Jan 17. Discussion, with slides, of the artist's work. 2pm, Bartos Theater (E15, lower level). x3-4680 or <http://web.mit.edu/lvac/www>

Opening Reception—Jan. 15, 5:30-7:30pm. Smith and Jaar will attend. Shows run through March 28. Hours: Tues-Thurs & weekends 12-6pm; Fri 12-8pm; closed holidays. Curatorial Office Hours—Meet the curatorial staff for informal discussions and questions about art—Weds, 12:30-1:30pm. x3-4680.

MIT Museum* (N52):

Flashes of Inspiration: The Work of Doc Edgerton. Long-term installation celebrates the life and work of Prof Harold ("Doc") Edgerton (1903-1991), whose work with stroboscopic light redefined photography. Doc first came to MIT as a graduate student and remained for 60 years, as professor in the Department of Electrical Engineering and Computer Science.

Ongoing Exhibits. Gestural Engineering: The Sculpture of Arthur Ganson; LightForest: The Holographic Rainforest; Holography: Artists and Inventors; MIT Hall of Hacks;

Light Sculptures by Bill Parker; Math-in-3D: Geometric Sculptures by Morton C. Bradley, Jr.; MathSpace. 265 Mass Ave. Tues-Fri 10-5, Weekends 12-5. x3-4444.

Hart Nautical Gallery—Ships for Victory: American Shipbuilding's Finest Hour. Shipbuilding production during World War II. **Ship Models: The Evolution of Ship Design.** Ongoing. Daily 9am-8pm. x3-5942.

Compton Gallery—Solar Energy in Architecture and Urban Planning and The Work of Thomas Herzog. Architects were first made aware of the need to reinterpret the function of buildings during the energy crisis of the mid-1970s, developing new products and systems for outer skins, new types of glass and new forms of construction to conserve energy and use it more effectively. Organized by the Deutsches Architektur-Museum, Frankfurt. Compton Gallery (Rm 10-150). Through Jan 15. Weekdays 9am-5pm. Info: x3-7791.

The Dean's Gallery—Donna Hamil Talman: Signs of Life. Earthy figurative images from a primitive culture in which the natural world, the feminine, and the spiritual were revered are combined with symbols from nature or markings resembling ancient cave paintings. Through Jan 22. The Dean's Gallery, Sloan School of Management, Rm E52-466. Weekdays 9-5pm. Info: x3-9455 or <<http://web.mit.edu/deans-gallery/www/>>.

Wiesner Student Art Gallery—Finding Nature in the City. Black and white photos by

Kim Eng '99. January 4-29. Wiesner Student Art Gallery (2nd floor Student Ctr). Info: x3-3913.

Women's Studies. Permanent exhibition of archival photographs documenting the role of women at MIT over the decades. Rm 14E-316. Info: x3-8844.

Strobe Alley—Never Stop Learning: The Life and Legacy of Harold Edgerton. Photographs, instruments and memorabilia documenting the life of Harold Edgerton, inventor of the strobe light. Bldg 4, 4th floor corridor. Info: x3-4444.

OTHER

Potluck Performance Art Party*—Jan. 15. AKA show+tell. Bring video, poetry, slides, anything to read, show, perform and/or consume. Sponsored by MIT Electronic Research Society. Bring something to perform/consume to get in for free. Others \$4 donation requested for selected charity. 9pm, Rm N52-115 (enter via handicapped access ramp in rear of building). Info: x3-2060.

Arts Grant Deadline*—Jan 22. Second of three deadlines for 1998-99 Council for the Arts funding. Forms available at the Office of the Arts, E15-205. Info: x3-4005

Applications for Wiesner Student Art Gallery** All students welcome to apply to put up an exhibit. Info: x3-7019.

Dying stars leave legacy more exotic than previously believed

(continued from page 1)

be spinning neutron stars that have jets of particles streaming at the speed of light out of their two magnetic poles. These jets produce a powerful beam of light that sweeps around like a beam from a lighthouse as the pulsar rotates. If the pulsar is oriented just the right way, we see it turn on and off as the beam sweeps over the Earth.

Pulsars, only 20 kilometers across and extremely dense, are like rapidly spinning magnets. Their incredibly strong magnetic fields accelerate particles around them to tremendous energies.

Pulsars are most easily observed using radio telescopes, because, although no one knows why, their emission is brightest in radio waves.

Professor Kaspi is most interested in young pulsars, mere babies that are tens of thousands—as opposed to millions—of years old. She is involved in numerous efforts to search for young pulsars in the Milky Way. This is no

simple task when, of the more than 1,000 known pulsars, only a couple of dozen are fewer than 100,000 years old.

ASTRO-ARCHEOLOGY

A veritable newborn is the famous Crab pulsar. As recorded by ancient Chinese, Korean and Japanese civilizations in 1054 AD, a star's last gasp created an explosion of heat and light so intense that it was clearly visible from Earth in the daytime. Such an explosion is called a supernova.

Today, the remains of that supernova, in the form of a rapidly expanding nebula of gas, has been dubbed "the Crab" because gaseous filaments resemble, to some, a crab's legs. It is among the best-studied objects in the heavens.

A rapidly spinning pulsar, the Crab pulsar, lives at the Crab nebula center. The Crab pulsar rotates some 30 times per second.

Unlike the Crab pulsar, which is clearly linked by birth to the Crab nebula, not all young pulsars can be associated with certainty to a specific nebula, Professor Kaspi said.

Even if a pulsar is in the vicinity of a nebulous supernova remnant, its birthplace may not have been the remnant's center. When pulsars are born, they sometimes shoot off at a tremendously high velocity, so they may be propelled far from the site of their birth.

"Pulsars are among the fastest objects in the galaxy. They move much faster than other stars," Professor Kaspi said. In fact, the highest speed pulsars are moving so fast that they will ultimately escape the confines of the Milky Way itself.

THE BIRTH OF NEUTRON STARS

Stars that are between five and 15 times as massive as our Sun end their lives in cataclysmic explosions called supernovae. Supernovae provide one of the most spectacular explosions in nature, equivalent to a 1,000-megaton bomb.

A supernova occurs when fuel for fusion in the star's core runs out. The star can no longer create outward pressure to combat the inward gravitational pull of its great mass, so the core begins shrinking, growing hotter and denser in the process.

When only iron is left in the core, it has nothing left to fuse and the star begins the final phase of gravitational collapse. The core temperature shoots up to more than 100 billion degrees as the iron atoms are crushed together.

At the same time, the nuclei repel each other so forcefully that they overcome gravity and the core bursts from the heart of the star in an explosive shock wave, propelling matter into space. The material that is exploded away from the star is known as a supernova remnant. (Stars with more than 15 times the Sun's mass have so much inward gravitational pull that the neutrons can't survive the collapse of the core. These end up as black holes.)

All that remains of the original star is a small,

super-dense core composed almost entirely of neutrons—a neutron star. Until recently, discovering radio pulsations was the main way to find newly formed neutron stars.

WHERE ARE THE MISSING PULSARS?

There are more than 200 known remnants of supernova explosions, but very few of these seem to have left behind radio pulsars. Professor Kaspi said that according to current theories, most of them should have.

Astronomers are now finding evidence that young neutron stars need not only be radio pulsars.

For example, some of the missing pulsars might be isolated, cooling neutron stars that are not pulsars because they are not "turned on," Professor Kaspi said. These neutron stars have only recently begun to be noticed and studied because they are invisible at practically all parts of the electromagnetic spectrum except X-rays. This is because their surfaces are extremely hot—some millions of degrees—so that they glow in X-rays, much in the way our own Sun's surface temperature (a relatively chilly 6,000 degrees) causes it to glow in visible light.

X-ray astronomy, one of the most active areas of research today, promises to hold the key to identifying otherwise invisible isolated neutron stars and possibly find some of the missing pulsars.

In fact, recent observations, also in the X-ray regime, are showing that the young neutron star population may include objects even more exotic than regular radio pulsars and the quiet, isolated neutron stars.

Another class of what were thought to be unrelated objects are X-ray pulsars that spin relatively slowly, once every five to 10 seconds compared with more than 10 times a second for their speedier cousins. These have been dubbed "anomalous X-ray pulsars" and may be young neutron stars as well, possibly accounting for some of the missing pulsars.

The anomalous X-ray pulsars have long

been thought to be binary stars—the X-rays emerging from matter falling onto a neutron star, one member of the binary. But a perplexing problem with this explanation has been the absence of any evidence for the other member of the binary.

Recent X-ray observations appear to have resolved this dilemma by showing that these objects can be found in supernova remnants. This suggests that the anomalous X-ray pulsars may be young, isolated neutron stars.

"The existence of these slowly rotating X-ray pulsars, if they are young neutron stars, is a big surprise, given all that we thought we knew about pulsars," Professor Kaspi said. "Their slow spin rate is a challenge to models of how pulsars spin."

Their strange properties can be explained if these objects have magnetic fields 10 to 100 times higher than those of regular pulsars. "This is how the term 'magnetar' recently came into astronomy lingo," she said. "If they really are magnetars, there are clear predictions for how their spin rates should evolve over time. At MIT, we are currently monitoring them using the Rossi X-ray Timing Explorer Satellite to see if these predictions hold water."

Additional evidence in favor of magnetars is that another seemingly unrelated class of objects, so-called soft gamma-ray repeaters, were already proposed to be magnetars. They have recently been shown to exhibit slow X-ray pulsations like the anomalous X-ray pulsars.

The magnetar and isolated cooling neutron star theories may soon be proved or disproved by the massive amounts of data streaming in from increasingly sophisticated X-ray detectors.

Although the heavens seem to be a puzzle filled with missing pieces that may never be found, Professor Kaspi said that every time a clue appears, "it's great. With the new X-ray satellites being launched, this is a very exciting time for astronomers. If there ever was a time when these basic questions can get answered, it is now."



Kaspi

Shirley Jackson named new president of RPI

(continued from page 1)

holders, and to make and take responsibility for difficult decisions while valuing all members of the community. And finally, at this time in history, a leader must have and must be able to instill in others a global consciousness, an awareness of how the decisions we make and the direction we take can be of benefit not only to our immediate society but to humankind worldwide."

Jerome I. Friedman, Institute Professor and 1990 Nobel laureate in physics, taught Professor Jackson when she was a sophomore at MIT.

"Shirley Jackson will provide outstanding leadership and vision as president of RPI. She is a remarkable physicist as well as a remarkable person who has made significant contributions to industry, academia and government," he said.

Paul Gray, president emeritus (1980-90) and professor of electrical engineering and computer science, has known Professor Jackson since 1968, when they participated in the Task Force on Educational Opportunity.

"It was apparent from her first years at MIT as an undergraduate that Professor Jackson is a person of extraordinary qualities of character and intellect.

"Her ability to analyze complex issues, to introduce important ideas, and to exercise sound judgement were extraordinary. The tenfold increase in minority student enrollment in the '70s is a testament to her creative influence. She will be a very strong leader for RPI—an important science and technology based university—just as she has been for MIT in her several roles here, including that of life trustee," said Professor Gray.

Professor Jackson has been chairman of the Nuclear Regulatory Commission (NRC) since 1995. She was the first African-American woman to serve in that role.

The chairman is the principal executive officer and official spokesperson for the NRC. Professor Jackson has

been responsible for the administrative, organizational, long-range planning, budgetary, and certain personnel functions pertaining to an emergency involving an NRC licensee.

As chairman of the NRC, Professor Jackson has articulated a vision that reaffirmed the agency's commitment to public health and safety. She has enhanced its regulatory effectiveness and initiated a bottom-up strategic assessment to examine all NRC activities.

Prior to joining the NRC, Professor Jackson had extensive experience as a university professor, research scientist, consultant and corporate director. From 1991-95, she was professor of physics at Rutgers University, serving concurrently as consultant in semiconductor theory to AT&T Bell Laboratories. From 1976-91, she conducted research in theoretical physics, solid-state and quantum physics and optical physics at Bell Laboratories.

Professor Jackson has also conducted research at the Fermi National Accelerator Laboratory, the European Organization for Nuclear Research, the Stanford Linear Accelerator Center and the Aspen Center for Physics.

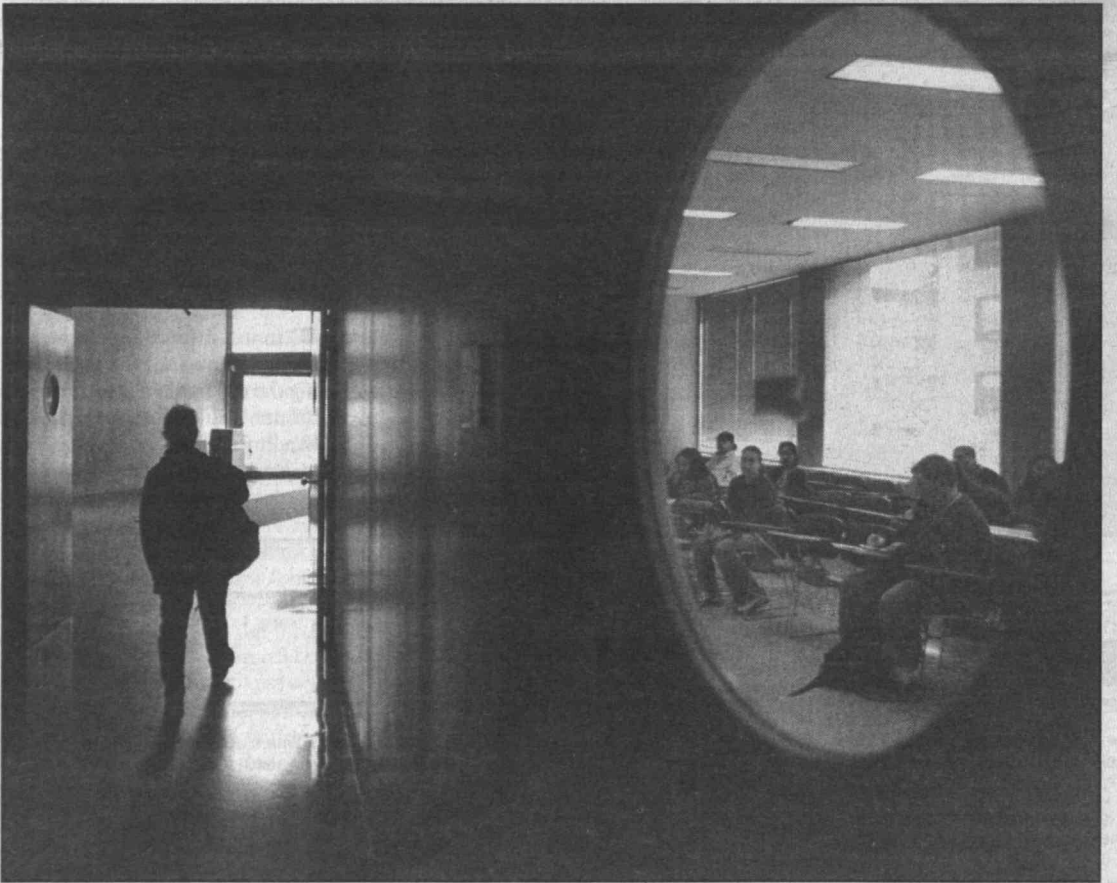
Professor Jackson was inducted into the National Women's Hall of Fame in 1998. She is a Fellow of the American Academy of Arts and Sciences and a Fellow of the American Physical Society.

She has served on an advisory panel to the Secretary of Energy on the future of the Department of Energy National Laboratories, on research councils of the National Academy of Sciences, and on the Advisory Council of the Institute of Nuclear Power Operations. She was elected first chairperson of the International Nuclear Regulator's Association, formed in 1997.

A native of Washington, DC, Professor Jackson is married to Professor Morris A. Washington, a physicist at Bell Laboratories. They have one son.

Sarah H. Wright

Inside and out



A circle and square frame students in a Building 66 classroom and another heading outside.

Photo by Laura Wulf

501 freshmen admitted early

(continued from page 1)

47 in the Department of Biology.

Last year, the early acceptances included 216 women (42 percent) and 301 men.

African Americans were 5 percent of the early acceptances, compared to 6 percent a year ago. This year's group is 8 percent Mexican American, Native American and Puerto Rican, compared to 9 percent a year ago. Applicants who did not identify their racial or ethnic background comprised 13 percent of the pool in both years.

Robert J. Sales

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