

TCC VISIT—President Charles Vest chats with Alexander Pietroforte, 4 1/2, (in stripes) at the Technology Children's Center. In the back, with raised hand, is Timothy Song, 4. In the background to the right is Olga Slocum, head of TCC.

Photo by Donna Coveney

25TH ANNIVERSARY

Children's Center to be Celebrated

■ By William K. Durfee
Mechanical Engineering

The Technology Children's Center, which is celebrating 25 years of providing childcare to the MIT community, will present a concert of music for children by Rick Charette and the Bubblegum Band at 2:30pm Sunday, April 28, in Kresge Auditorium. Proceeds will benefit the center.

MIT has been a leader in the establishment and growth of programs for children. Today, those programs include full-, half-, and extended-day preschool programs on the MIT campus for children ages two years, nine months to five years.

The center, originally called the Technology Nursery School, was incorporated as a nonprofit organization in April 1965. It resulted from the dreams and efforts of Mrs. Katherine Bitter who envisioned the need for permanent, formal child care on the MIT campus. Mrs. Bitter's husband was Professor Francis I. Bitter, for whom the National Magnet Laboratory at MIT is named.

Mrs. Bitter's work with a number of MIT administrators led to the estab-

lishment of cooperative nursery school classrooms located at Eastgate and Westgate, serving the children of graduate students, staff, and faculty. Signers of the original Articles of Association who are still at MIT include John P. Donahue, associate comptroller; Robert K. Weatherall, director of

the Office of Career Services and Preprofessional Advising; O. Robert Simha, director of planning, and Jacqueline A. Buck, social worker.

In 1972, a full-day child care program was added to the center, and the age range for children was extended to

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We're No. 1

For the second year in a row, MIT has been chosen as the top-ranking engineering school in the nation, according to the U.S. News & World Report's annual issue on "America's Best Graduate Schools."

In gaining a virtual clean sweep of different engineering categories, MIT led the list of the 193 largest engineering schools offering master of science and doctoral degrees. After MIT, the best engineering schools in the survey were Stanford University, the University of Illinois at Urbana-Champaign, the California Institute of Technology and the University of Michigan.

The schools were ranked using

two surveys based on reputation, as well as statistical data that measure important educational attributes of postgraduate education: student selectivity, faculty resources and research activity.

Under these criteria, MIT ranked first in the aerospace, chemical, computer, electrical/electronic, materials/metallurgical, mechanical and nuclear categories, and third in both the biomedical and civil categories.

In a separate ranking by professionals in different areas of engineering, MIT ranked first in all categories represented: aerospace, chemical, civil, electrical/electronic, materials/metallurgical and mechanical.

INDIRECT COSTS

\$731K Withdrawn Over 5 Fiscal Years

MIT, responding to an April 8 letter from Congressman John D. Dingell (D-Mich.), said today it has been conducting an ongoing review of indirect costs of research eligible for reimbursement from the federal government and other sponsors.

The university has withdrawn to date an average of \$146,000 a year in indirect costs over the five fiscal years—1986-1990—which are still subject to review and negotiation, pending a final audit. The total withdrawn is \$731,000. The vice president for financial operations noted that MIT has also saved the US government more than \$8 million in the past three fiscal years by not taking advantage of a standard government rate on one element of administrative indirect costs.

President Charles M. Vest commented, "We have a responsibility to American taxpayers, including ourselves, our own faculty and employees, to make sure that scientific research in the nonprofit university environment is being conducted economically. MIT has a long history of cooperation with the federal government in doing research projects of great importance to

the nation, dating back to the development of radar during World War II. Such a cooperative situation mandates a sense of fairness and a sense of responsibility," he said.

The \$731,000 withdrawn over a five-year period represents significantly less than one percent of the \$482,000,000 in indirect costs of MIT and Lincoln Laboratory research during that time. MIT on-campus research for those five years totalled \$1.36 billion, including \$978 million in direct costs and \$383 million in indirect costs. The indirect cost recovery amounts withdrawn, rounded to the nearest \$1,000, are: \$141,000 in Fiscal Year 1990; \$127,000 in 1989; \$145,000 in 1988; \$208,000 in 1987; and \$110,000 in 1986.

Vest, who has been president since October, noted that MIT's tradition of cooperation prompted the decision in 1988 not to take advantage of a standard government rate for one element of indirect costs within the category of "Departmental Administration."

James J. Culliton, vice president for financial operations, said, "We did not

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E-MAIL ACCESS

New Panel to Address Academic Responsibility

The five-person committee which is examining the ethos, policies and procedures of MIT on the conduct of academic research will seek a community-wide dialogue via electronic mail and an open forum, according to Professor Sheila E. Widnall, chair.

The Committee on Academic Responsibilities is composed of Dr. Widnall, of the Department of Aeronautics and Astronautics; Institute Professor Morris Halle of the Department of Linguistics and Philosophy; Professor of Physics Jerome I. Friedman; Associate Professor of Molecular Biology Richard C. Mulligan and Professor Gerald N. Wogan, director of the Division of Toxicology. Serving as

staff person to the committee is Charlene M. Placido, assistant to the vice-president for research. The group held its first meeting Tuesday.

In an interview Dr. Widnall said she would expect the committee would make a short report at the May faculty meeting, and would plan to finish by the end of the fall term. She said an open forum probably would be part of the plan. She noted that the National Academy of Sciences Panel on Scientific Responsibility and the Conduct of Research, on which she serves, expects to make its report in December.

The committee will establish an e-mail address to facilitate communication in the community.

"One of the techniques that can be used to illuminate difficult issues in the conduct of research is to construct scenarios of situations which can occur in the research community. I'd like to make such scenarios available to stimulate dialogue and debate," she said.

38 FINISHERS

MIT Makes Good Showing at Boston Marathon

■ By Elizabeth A. Thomson
News Office

Sidney Yip had a mile to go in this year's Boston Marathon and was feeling "kind of tired" when freshman Jed Macosko—one of his students—jumped in the race and escorted him to the finish.

"He had a little backpack with water and food for me," said the professor of nuclear engineering, who finished the race in 3 hours 20 minutes. "It was the highlight of my run."

And that is just one of several MIT stories from this year's marathon—at least 38 members of the community ran the 26.2 mile race, including faculty, students, staff and visiting scientists from Norway, Ireland and Germany.

Most agreed that the weather was

perfect. Cloudy with temperatures in the 50s, race day led to good runs for the majority of MIT participants. The top MIT finishers were Jim Garcia, a staff member at Lincoln Laboratory (and MIT grad, SB 1980, SM 1990) who ran a 2:29:53 for 81st overall out of more than 8,000 runners, and Mary Jane Boyd, a graduate student in electrical engineering and computer science who came in with a 3:02:39 for 1,629th overall. (Boyd's time was a personal best for the Boston.)

Garcia ran most of the race with Joan Benoit Samuelson (who came in fourth among the women) but had trouble over the last few miles. "I went out on a suicidal pace with Samuelson and Ingrid Kristiansen [sixth woman this year; winner in 1989]," he explained. It was also "a good 10 degrees

too cold for me," he said. As a result, about 20 people passed him over the last four miles.

Other runners found the nippy weather invigorating, but froze when it started to rain about three hours into the race. Olaf Bleck, a research scientist at the Artificial Intelligence Lab, and Carl de Marcken, a graduate student in electrical engineering and computer science, ran the race together and finished in about 4:30. "We got totally soaked and very cold," Mr. Bleck said. But when the two finished, they found that the YMCA and the Boston Athletic Association were giving out soup and had blankets in a tent nearby.

"They also had a couple hundred people in there giving massages," he said.

In addition to Bleck and de Marcken,

several other groups of MIT runners stuck together for most or all of the race. Lenny Rigione, Technician A at the Materials Processing Center, doubts that he would have finished if it hadn't been for his running partner Theresa Derderian, a junior in materials science and engineering. "From mile 22 to 24, I had serious stomach and leg cramps," he explained. "Theresa went off on these little missions and got me oranges and drinks from spectators along the road." They finished the course together in 3:58.

A group of six graduate students from the Chemistry Department was probably the largest MIT contingent. They were Ivan Lorkovic and Tim Oyer (both finished in 3:33); Marty Bollinger and Kurt Halverson (both finished in

(continued on page 4)

CSF Drive Extended

The MIT Community Service Fund will extend its annual fund drive through May. CSF coordinator Paul Parravano has announced. Some solicitors did not receive their packets promptly, he said, and so were delayed in distributing material to their groups.

Those who have not received solicitations may call Brenda Gernerzio in the CSF office, x3-1989, to find out the name of their solicitor.

To date the spring solicitation has raised \$17,000 to help support MIT people in their voluntary activities in the community.

Student Notices

* -Open to public
 ** -Open to MIT community only
 *** -Open to members only

ANNOUNCEMENTS

MIT Minority Community Events—Apr 24: "Black Perspectives," a discussion focusing on the issue of Blacks at "Black Schools" vs. Blacks at "White Schools," BSU Lounge, 6pm. **Apr 26:** National Society of Black Engineers New England Zone Social. Call Charisse Russell x5-8662 for more information.

Ceramics Sale—Apr 25-26: Sponsored by the Student Art Association, 9am-4:30pm, Lobby 10.

Theses Workshops on the Mac—Through May 1:** Free workshops for seniors and graduate students who are using the Macintosh computer to prepare their theses, sponsored by Information Systems. Wednesdays, 5-7pm, Rm 11-206.

Booksale—May 10:** Booksale sponsored by the MIT Libraries, 11:30am-2pm, basement of the Hayden Library (outside the library storage facility in building 14S). Books from a variety of subject areas will be included. Open to the MIT community only.

Free Museum of Science Admission for MIT Students—With MIT student ID, provided by Mass Beta chapter of Tau Beta Pi, the National Engineering Honor Society. Reduced admission to special exhibits.

MIT Student Furniture Exchange—**great bargains, used furniture and more, Tues/Th, 10am-2pm, 25 Windsor St (MIT Museum bldg, 1st fl). Donations welcome, x3-4293.

Arts Hotline—Recorded information on all art events at MIT may be obtained by dialing x3-ARTS. Material is updated every Monday morning.

Nightline—**a student-run campus hotline open every evening of the term, 7pm-7am. If you need information about anything or you just want to chat, give us a call. We're here to listen, x3-8800.

RELIGIOUS ACTIVITIES

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

Baptist Student Fellowship—**Weekly Worship and Bible Study each Tuesday at 6pm in the chapel; snack supper fellowship immediately preceding at 312 Memorial Drive, 5:15pm. Graduate Student Study every other Thursday at 1pm, 312 Memorial Drive. Info x3-2328.

Morning Bible Studies—**Fri, 7:30-8:30am, L-217, Ed Bayliss, x3456 Linc.

Noon Bible Study—**Every Wed, Rm 1-132, bring lunch. Ralph Burgess, x3-8121. (Since 1965.) (Graduate Christian Fellowship.)

MIT Bible Study Group*—The Economy of God, a look at God's eternal purpose to disperse Himself into man based on the revelation of the Bible, Fri, 8pm, Student Ctr Rm 407. Singing, prayer, Bible reading, fellowship.

Tech Catholic Community—**Masses: Sat, 5pm; Sun, 10am & 5pm. Tues & Thurs, 5:05pm, Fri, 12:05pm, MIT Chapel. Info x3-2981.

Chinese Christian Fellowship*—Join us for a discussion of what loving God practically means in our daily lives, Wednesdays 7-9pm. All English-speaking undergraduate and graduate students are welcome (you don't have to be Chinese!). Investigative Bible discussion is also offered at the same location and night, 7:30-8:30pm. For location and further info contact Carl Lim x5-7508.

MIT Christian Community—**Come and join monthly lunch and discussion on God and Christians at MIT with your fellow faculty, staff, administrators, and grad students. Info: Park x3-2875.

MIT Christian Impact*—The weekly meeting for the ministry of Campus Crusade for Christ. Wind up the week: relax, snack, sing, laugh through skits and gain practical insight from God's Word. Meets Friday 7:17pm, Student Ctr, 3rd fl.

United Christian Fellowship—**Large group meetings. Join us for worship, prayer, and Biblical teachings, Fridays, 7pm, Rm 6-321.

Christian Science Organization at MIT*—Weekly Testimony meetings, Thurs, 8pm, MIT Chapel.

Graduate Christian Fellowship—**Come join other grad students, faculty and staff in learning about and growing in the Christian faith. Activities open to both Christians and those interested in learning more about Christianity. Info: John Keen x3-7706, Dave Oris x3-2198.

MIT Orthodox Christian Fellowship—**The newly formed MIT OCF will meet every other Monday night at 8pm in the MIT Chapel. Vespers (Evening Prayer) will be followed by Fellowship/Discussion. Open to Orthodox Christians and those interested in learning about the ancient Christian Faith. Info: Arlene Lanciani Marge x3-3555.

Church of Jesus Christ of Latter-day Saints Student Association at MIT*—Apr 27: Fun Run, 5K or 10K Walk/Run. Starts at LDS chapel on corner of Brattle and Longfellow Sts, Cambridge, 9am. Breakfast will be served afterwards. Sunday services, Cambridge University Ward, meets every Sunday 3-6pm at the Cambridge Chapel, corner of Brattle Street and Longfellow Park. Meetings are for students and young single adults.

MIT Hillel*—Apr 24: Israeli Folk Dancing, 7:30pm. **Apr 25:** Twister Study Break, 9pm, Baker House. **Apr 26:** Shabbat Services, 5:30pm, 50-010. **Shabbat Dinner, 6:30pm, Walker Blue Rm. Apr 27:** Orthodox Shabbat Services, 9am, Walker 50-010. **Apr 28:** Softball Game & Picnic. More info: x3-2982.

MIT Muslim Students Association*—5 daily prayers in the prayer room, Ashdown House (Bldg W-1) west bsmt. **Friday congregation:** 1:10-1:45pm in Ashdown House (Bldg W-1) west bsmt. Info: x8-9755.

Lincoln Laboratory Noon Bible Studies*—Tues & Thurs, Kiln Brook III, Rm 239, Annie Lescard, x2899 Linc.

Lutheran Ministry and Episcopal Ministry—**Weekly Service of Holy Communion—Wed, 5:10pm, MIT Chapel. Supper follows at 312 Memorial Drive. For further info, call x3-2325/2983.

MIT Vedanta Society*—Meditation and discourse on the Bhagavad Gita. Swami Sarvagatananda, MIT Religious Counselor. Classes held Fridays 5:15pm, MIT Chapel.

INTERNATIONAL

MIT-Japan Program Orientation—May 8:** Goto Japan for a year of fun and excitement—all expenses paid—with the MIT-Japan Program. Meet the Program director, staff and former interns. Details and requirements of the Program will be explained, and there will be an opportunity for informal discussions as well. Japanese food and drink will be provided. Further info: x3-2839.

STUDENT JOBS

There are more job listings available at the Student Employment Office, Rm 5-119. The Student Employment Office has many "one time only" jobs. Many students find these jobs a good way to earn money fast.

Off Campus, Technical, Summer. Two summer interns are needed to do database programming. The work will be primarily FoxPro work in the political industry. Would prefer a senior. Hours are full-time. Contact: Dean Phillips of Aristotle Industries, 205 Pennsylvania Ave., S.E., Washington D.C. 20003. Phone: (202) 543-8345.

Off Campus, Technical, Summer. College students wanted for positions for Behavioral Research projects that study the effects of behavioral medicine treatments on stress related illnesses or illnesses complicated by stress. Position involves data entry into a computer and assisting in daily administrative tasks for the study. Training will be provided. The student will be working in a multi-disciplinary department with physicians, psychologists, nurses and a research methodologist. Hours: 8:30-5:00 (Mon.-Fri), 10-15 hrs/wk. Salary: \$6.25 up to \$6.75/hr, depends on experience. Contact: Ms. Tricia Zuttermeister of New England Deaconess Hospital, 185 Pilgrim Road, Boston MA 02215. Phone: (617) 732-9530.

Off Campus, Non-Technical, Summer. Beacon Press is looking for a part-time publicity assistant during the summer and through the 1990-91 school year. The publicity assistant will write press releases for new books, maintain regular contact with both print and electronic media, and coordinate miscellaneous clerical duties. Applicants should have excellent typing, writing, and telephone skills. To apply, please send a cover letter, resume, and writing sample (your latest ten-page paper will be fine) to address below. Hours: 15 hrs/wk. Salary: \$7/hr. Contact: Mr. Dan O'Connell, Beacon Press, 25 Beacon Street, Boston, MA 02108. Phone: (617) 742-2110 x573.

VOLUNTEERS

The MIT Public Service Center has compiled the following volunteer opportunities.

Renovate Brighton High School. The Sterling Community Service Foundation is organizing

a special cleanup/renovation project at Brighton High School. April 27 and 28: volunteers are needed to prepare the site for about 500 people who will be working May 4 and 5. Brighton High is T accessible. For more info or to volunteer contact Russell Pratt at (508) 582-9038, or Joanne Broadbent at 731-4585.

Walk for Hunger. The annual Boston Walk for Hunger will be held Sunday, May 5. This 20-mile walk around the Boston area will raise money to benefit Project Bread. Stop by the booth in Lobby 10 during the week of April 29 to get information and registration material. Questions: call David Carroll at x5-9145.

ARA Food Salvage. MIT's Hunger Action Group, in working with ARA, has started a program with ARA food services to donate leftover food to local shelters. Volunteers (especially those with access to cars) are needed one hour per week on Tuesday nights and/or Friday afternoons to transport food from the Faculty Club to the Albany Street Shelter. Contact Mursaleena Islam at x5-8436.

UROP

MIT and Wellesley students are invited to join with faculty members in pursuit of research projects of mutual fascination. Spring term projects are now posted on the bulletin boards in the infinite corridor by the Admissions Office and in our office. For further information, read details on procedures in the participation section of the directory.

Faculty supervisors wishing to have projects listed should send project descriptions to the UROP office. Questions? Contact UROP at x3-7306, 20B-140.

Summer is almost here! The deadline for summer UROP proposals requesting full or partial funding from UROP is April 17, 1991. UROP proposals wherein faculty supervisors are providing all of the student summer stipend should be submitted by May 31, 1991. Proposals must be submitted at the UROP office at 20B-140. Detailed information are posted on the UROP bulletin board in the infinite corridor.

Intelligent Engineering Systems Lab. The Intelligent Engineering Systems Lab is looking for a UROP student to work in its Air Traffic Control/Planning group. The group is currently developing a real time expert system to aid air traffic controllers with decision making and planning tasks. The system is being developed in C++, with an X windows based user interface. We are seeking a student to work over the summer on developing software for the project. A strong C background is required and knowledge of X, C++ and UNIX very desirable. Faculty supervisor: Jim Culbert, 1-253, x3-7134, email to culbert@iesl.mit.edu.

Concurrent Database System Project. There is a growing need for high performance database systems. The purpose of the J-BASE project is to investigate how the great processing potential of concurrent computer architectures can be successfully applied to the field of databases. The responsibilities of a UROP will primarily involve writing code to implement components of J-BASE. Coding will be in a high-level language called Concurrent SmallTalk (CST) and possibly some assembler. This work may lead to more advanced projects and/or thesis topics. For credit or pay. Part-time available. Additional information may be found in the UROP office (20B-140). Faculty Supervisor: John Keen, johnk@ai, 253-7706.

Building an Interactive Model to Predict Market Response. The focus of this project is on understanding, explaining and predicting the effect of marketing mix variables on sales and market share performance. Students will work with a structural modelling technique called partial least squares to build a market response model, which will allow managers to perform "What-if" analysis, (with the capability of changing marketing mix variables which can be used to predict their effect upon such market performance variables as sales, customer satisfaction, market share and profitability). Ideal UROP candidate understands statistics and regression analysis, has computer programming skills, and is independent. Project will continue through 1991-92 school year. Faculty Supervisor: William Qualls, x3-0492.

Summer UROP: Smoke-Wire Visualization. A UROP position is available for a Mechanical Engineering student. Research involves using smoke-wire visualization to study oscillating flow patterns in a pipe. We are currently studying the fluid flow and heat transfer within Stirling engines. In these engines, the working fluid undergoes large oscillations of pressure and velocity, and the flow patterns are poorly understood at present. Your role would be to construct a transparent test section for an existing apparatus and to use an electrically heated, oil-coated wire to introduce a smoke trail in the oscillating air flow. An SB thesis is possible. Courses 2.20, 2.671, and 2.70 are helpful, although not essential. Faculty Supervisor: Professor Lienhard, 3-164. Please submit your vita.

Evaluating Managerial Confidence in Marketing Decision Behavior: A Cross Cultural Perspective. The purpose of this study is to understand and explain the process by which managers make decisions and the degree of confidence they might exhibit in their judgments. The study attempts to compare the decision processes employed by managers from Asia, Europe, and the United States.

Forum Panelists Wanted

Volunteer panel members are needed for the May 6 Women's Forum on "Intervention for Recovery from Substance Abuse."

Individuals who have had experience with intervention in the workplace, school or home are urged to notify the Forum organizer, Eve Sullivan. Those interested are asked to drop a brief note describing their interest and experience to Ms. Sullivan, Rm 6-318A, by Friday, April 26.

Ideal UROP candidate has an interest in marketing, an understanding of behavioral experimental design, and the ability to work with survey data. It is also desirable that the candidate has had some exposure to the Chinese culture or the ability to speak and read Chinese. Faculty supervisors: Prof. William Qualls, x3-0492; Prof. France Leclerc, x3-7147.

Biophysics & Bioelectric Area: Computer Modelling of Electroporation. A Summer UROP is available for students at the junior level with a background in physics, electrical, mechanical and chemical engineering or astro/aero. Electroporation allows molecules of many different sizes to be put into cells, and is expected to have many biomedical applications. This project will involve use of an existing computer simulation (written in C), and requires that the student have a good understanding of electrostatics. The goal is to extend and apply the simulation in order to make important predictions of the transport of molecules across cell membranes. The summer project will provide the basis for beginning an excellent thesis in the fall, and will also lead to a scientific publication. Faculty Supervisor: Dr. James C. Weaver, 20A-128, x3-4194.

Astronomical Software Development. The CCD Laboratory in the Center for Space Research is looking for one or two responsible UROP students to develop software for the analysis of astronomical image data. The data are being generated nightly by an automatic sky survey instrument located on Kitt Peak, Arizona. The goal of the project is to use these data to find variable stars. The applicant should have a good working knowledge of "C" and some interest in astronomy. The potential for part of this work developing into a Senior Thesis is very high. Faculty supervisor: Dr. George Ricker, 37-535, x3-7532. Contact: Dr. Roland Vanderspek, 37-527, x3-8456, roland@blitz.mit.edu.

Astronomical Data Reduction. Summer UROP positions are available to students interested in astronomy. The project involves the use of existing software to reduce and analyze optical and x-ray astronomical data. The data were taken at the Michigan-Dartmouth-MIT observatory on Kitt Peak and by the ROSAT x-ray satellite. The applicant need not have any programming experience, although some familiarity with UNIX and "C" would be useful. A qualified student could extend either of these projects into a Senior Thesis. Faculty supervisor: Dr. George Ricker, 37-535, x3-7532. Contact: Dr. Roland Vanderspek, 37-527, x3-8456, roland@blitz.mit.edu.

Biomechanics of Human Tactile Sensing. UROP position open to all undergraduates is available in the area of human tactile sensing and information processing. Research involves experiments to determine mechanical properties of human fingerpad and computational work. No prerequisite course work required. However, previous computational experience and/or machine shop experience will be helpful. Faculty supervisor: Dr. M.A. Srinivasan, 36-763, x3-2512. Contact: Jyh-Shing Chen, 36-766, x3-8503, or Kiran Dandekar, 36-765, x3-2759.

Videomicroscopy of Human Finger. A summer UROP position is available for a student interested in interfacing a computer with a video system. Research involves setting up a force sensing system, and interfacing the system with video images of experiments with human finger. Primary work would be to help build and test the force sensor, set up the video system, and run experiments on finger. Knowledge of PC interfacing, programming, and data analysis is helpful. Faculty supervisor: Dr. M.A. Srinivasan, 36-763, x3-2512. Contact: Jyh-Shing Chen, 36-766, x3-8503, or Kiran Dandekar, 36-765, x3-2759.

Off-Campus Summer UROP in Virtual Reality. Summer position available for undergraduate interested in medical measurement technologies, clinical research, and virtual reality experimentation and development. This project is for the development of a demonstration of the Dexterous Hand Master hand measurement device in conjunction with the Private Eye virtual display for a simple task in a PC environment. Students must be familiar with Microsoft C, low level routines, and graphics. This project will be conducted entirely by the student hired and is potentially suitable for an S.B. thesis. Send resume to: EXOS, Inc., 8 Blanchard Rd., Burlington, MA 01803. Faculty supervisor: Mr. Nat Durlach, 36-709; contact: Dr. Beth Marcus, EXOS, Inc., 229-2075.

Space Plasma Summer UROP. Several summer UROP positions are available for juniors who

She hopes to have a student, a faculty member and an administrator as well as a support-staff panelist.

"This is a difficult topic but one I feel MIT must address," Ms. Sullivan said. "The concept of alcoholism as an individual disease or a lifelong physical condition something like diabetes, is fairly well established, but we need to look at it in a wider perspective, as a disease of families, organizations and society."

are interested in working on theory, field experiments, or laboratory simulation of nonlinear wave propagation and interactions with space plasmas. These summer research projects can potentially lead to the senior thesis research. A brief description of Dr. Lee's research areas can be found in the UROP Directory on page 63. Faculty supervisor: Prof. Min-Chang Lee, NW16-234, x3-5956.

Summer UROP in Language and Memory. Project in Human Cognitive Psychology: Reading, long- and short-term memory, sentence comprehension, and picture processing. Freshman welcome. Some computer experience preferred. Faculty supervisor: Prof. Mary C. Potter, E10-039, x3-5526; contact: Diane Stiefbold, E10-218, x3-5756, email: drs@psyche.

CABLE

For more information call Randy Winchester at x3-7431.

April 24: Channel 8: 11am-12:30pm—Live coverage of the MIT Optics and Quantum Electronics Seminar: "What Classical Optics can do for Optical Information Processing." A. Lohmann, U. Erlangen-Nuremberg and NEC Research Institute.

April 25: Channel 8: 3-4pm—Apple Education TV Series: "Multimedia 101: Getting Started." 4-5:30pm—Apple Education TV Series: "Multimedia 201: Beyond the Basics."

April 29: Channel 8: 4-5:30pm—Live coverage of the MIT EECSS Colloquium Series: "Recent Progress in Electronic Imaging." Dr. Conrad Biber, Polaroid.

April 30: Channel 8: 4-5:30pm—Live coverage of the MIT VLSI Seminar: "Message Routers for Scalable Multicomputers." Yuval Tamir, University of California, Los Angeles.

May 1: Channel 8: 11am-12:30pm—Live coverage of the MIT Optics and Quantum Electronics Seminar: "InGaAs/AlGaAs and AlInGaAs/AlGaAs Strained Quantum-well Diode Lasers." H.K. Choi, MIT Lincoln Laboratory.

May 3: Channel 8: 1:30-4pm—Jefferson Energy Foundation teleconference. "Risks and Benefits of Various Forms of Energy."

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'BUSINESS AS USUAL'

Sociologist Not Surprised
At LA Police Brutality

■ By Elizabeth A. Thomson
News Office

An MIT sociologist who has studied police behavior for 20 years was not surprised by the Rodney King beating in Los Angeles, and believes that police misconduct occurs routinely in cities across the country.

"What we as outsiders regard as misconduct turns out to be business as usual within these organizations," said John E. Van Maanen, Erwin H. Schell Professor of Organizational Studies at the Sloan School of Management.

However, he said, "the police don't see it as misconduct, they see it as a person, set of people, or category that's getting their just desserts. It's not a sense of meting out brutality, but of evening the score."

Professor Van Maanen, who began his studies on police behavior by working as a street officer in a large metropolitan city (which he will not name), further believes that public outrage over the LA incident will not have a major impact on reducing police violence. "It's been around for a long time, and will be around for a long time," he said, though officers may be a little more careful for a while.

If anything, Professor Van Maanen said, the incident will entrench police even more. The nature of the job, he explained, creates an "us against them" attitude, which has been reinforced by recent events. "They have a sense of being their own minority group," Professor Van Maanen said.

What factors lead to brutality? Professor Van Maanen believes that overall it's "built into the nature of the police role," just as violence is built into our society with the prevalence of weapons, division between the haves and have nots, and other social ills.

"There's a view that [brutality] is practiced by a few bad apples," Pro-

fessor Van Maanen said. "But the LA story categorically and very visually contradicts that—there were more than 20 officers on the scene and most stood around just watching."

One specific reason for police brutality in the United States, however, is a lack of accountability. "Because of the way manpower is deployed, an officer is really only accountable to the remote police dispatcher who sends him on a job. Most sergeants have no idea where their men are and what they're doing," Professor Van Maanen said. So when the officer actually performs a job, he does so in "splendid isolation."

Because police misconduct "happens more with officers who feel themselves unaccountable to anyone but themselves," Professor Van Maanen said, he believes that more supervision and public accountability could help reduce incidents.

"It made a difference when a few departments installed video cameras in booking rooms," he points out.

Professor Van Maanen also believes that Neighborhood Watches, Citizen Advisory Boards and observers posted in police stations would help. "They're viewed by our police as drastic measures, but they would have effects," he said.

However, Professor Van Maanen believes that the prospects for overall reform are "pretty remote" because police departments across the country are "very, very powerful and highly organized."

Eventually, he predicted, Los Angeles Chief of Police Daryl Gates will be forced out or will retire, but the problems will remain. Said Professor Van Maanen: "The police do our dirty work—the work no one else wants to do, which is essentially controlling people. We ask far more of them than they could possibly deliver, and they're bitter about it—understandably."



AT YOUR SERVICE—Members of the Undergraduate Association's Safety Committee and Provost Mark S. Wrighton invite the community to make use of a new transportation service—A Safe Ride. With Professor Wrighton are, from left, Jennifer B. Singer, Mia Sakata and Holly L. Simpson.
Photo by Donna Coveney

EVERY NIGHT

'Safe Ride' Van Service to Begin

For A Safe Ride call 253-2997 or 253-1212.

That's the news from the Undergraduate Association (UA) and the MIT administration whose jointly sponsored transportation program to enhance campus safety begins operating at 6pm Monday, April 29.

The UA's Safety Committee, the Campus Police and the Office of the Senior Vice President are co-sponsoring the program. It is funded by the Office of the Provost and Housing and Food Services.

Yesterday, the new Chevrolet van—white with a red stripe—that will launch

the service was on display outside the Student Center. Campus Police were handing out flyers with information on "A Safe Ride."

The service will operate on demand seven days a week between 6pm and 3am Sunday to Wednesday and 6pm to 4am Thursday to Saturday. It is available to anyone in the MIT community.

The Safe Ride van will have civilian drivers and will replace the previous escort service provided by Campus Police using police cruisers. The sponsors of the new service expect that the new arrangement will have dividends in two areas—faster response to

those in need of a safe ride and greater ability by police to respond swiftly in law enforcement and emergency situations.

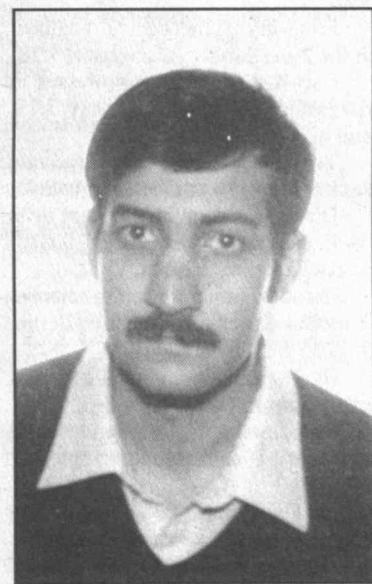
Police will, however, continue to meet requests for transportation after 4am until daylight.

Campus Police will maintain radio contact with the van and with the driver when he or she is outside the vehicle. The van will provide service between campus buildings, parking lots, some perimeter locations, such as Tech Square and Draper, and MIT living groups, including those in Boston.

1948 PROFESSOR

Kardar Receives Edgerton Award

Associate Professor Mehran Kardar of the Department of Physics, a condensed matter theorist whose research and publications have gained him wide recognition, has received the 1991 Harold E. Edgerton Award.



Professor Kardar

The announcement was made at the April meeting of the MIT faculty by Professor Ira Dyer, chairman of the selection committee for the award. Other committee members were Professors Jae Lim and Irwin Oppenheim and Associate Professor David Pesetsky.

The award, which carries an honorarium of \$5,000, was established in 1983 with contributions made by the faculty in honor of Professor Harold E. Edgerton. Professor Edgerton died January 4, 1990.

The faculty responded to the an-

nouncement with applause and Professor Kardar rose to make brief remarks thanking his colleagues for the honor.

The award recognizes young faculty members for outstanding achievement in research, scholarship and teaching.

"Mehran Kardar has established himself at a young age as a leader in physics," the citation read by Professor Dyer said. "His extraordinary talents and commitment in physics research are matched by his talents and commitment as a teacher, by his good citizenship within the Institute community, and by his general friendliness, selfless helpfulness and dignified modesty."

Dr. Kardar, 33, the Class of 1948 Professor, has focused his recent work on the static and dynamic properties of surfaces, interfaces, paths, and polymers. "By developing a continuum field theory for random manifolds, such as polymers and membranes, he established the roles of elasticity, rigidity, and interactions in determining the macroscopic phases of such objects," the citation said. This work, together with his research on interfaces and paths in random media and on evolving interfaces, "have received wide recognition, as seen by recent invited lectures by him in Belgium, Brazil, Colombia, France, Hungary, Italy and the Netherlands. . . ."

Professor Kardar, a recent recipient of a Presidential Young Investigator Award, has been a prolific writer. "His publications contain deep contributions in a variety of topics, appear in the top journals, and are mostly coauthored with the students who have studied with him. . . ."

"The graduate statistical mechanics courses that Kardar developed and now teaches are truly outstanding, in the view of many students and faculty

alike. He attracts an audience from the departments of physics and chemistry and chemical, electrical, and nuclear engineering, from both MIT and other institutions (Harvard, BU, Brown)," the citation continued. Professor Kardar was awarded the Graduate Student Council Departmental Teaching Award for this course sequence in 1990.

Professor Kardar is deeply involved with the Institute's community life at several levels. "For the past three years, he has served as a Fellow at the Ashdown House. He has been involved in diverse house activities and has arranged to take groups of students to symphonies, ballets and basketball games. He is very concerned and interactive with condensed matter theory students, from extensive conference-talk trainings to hikes and weekly participation in dinners and basketball games," the citation concluded.

Professor Kardar received the bachelor of arts in natural sciences (1979) and the master of arts (1983) from Cambridge University, England, and the PhD from MIT (1983). He was a junior fellow at the Harvard Society of Fellows from 1983-86 and was appointed to the MIT faculty as assistant professor of physics in 1986. He became an associate professor in 1990.

It's a Fact

Elmo/MIT, a five-and-a-half-foot bronze sculpture by Dimitri Hadzi commissioned in 1963, initiated an extensive public art collection at MIT that now includes outdoor installations of works by Henry Moore, Louise Nevelson, Alexander Calder and Pablo Picasso, among others.

ONE SEMESTER

Faculty Considers Adding
Biology Requirement

A motion to add one semester of modern biology to the Science Core of the General Institute Requirements, effective with the first-year class entering in 1993, was discussed by the MIT faculty last week and is scheduled for a vote at the meeting in May.

The proposal was outlined by Professor Thomas J. Greytak of physics, chairman of the Committee on the Science Requirement. Professor Margaret L.A. MacVicar, dean of undergraduate education, placed the motion before the faculty.

In April 1989 the faculty endorsed the recommendation of the Science-Engineering Working Group to include biology in the General Institute Requirements and the formation of the Committee on the Science Requirement to develop recommendations.

President Charles M. Vest, saying he looked forward to the debate on the proposal, said it was his personal belief "that it would be a strong leadership statement if we choose to do this. . . ."

The motion currently before the committee calls for reducing from three to two the number of subjects in what is now called "science distribution." The motion proposes changing that name to "restricted electives in science and technology." Also included in the motion are the changes in the Rules and Regulations of the Faculty that would be necessary if the requirements are changed as proposed.

The motion also calls for an ad hoc committee, appointed by President Vest, to "review the scope and balance of the General Institute Requirements as well

as the Institute calendar and its implications for the academic program." That committee would report to the faculty next academic year.

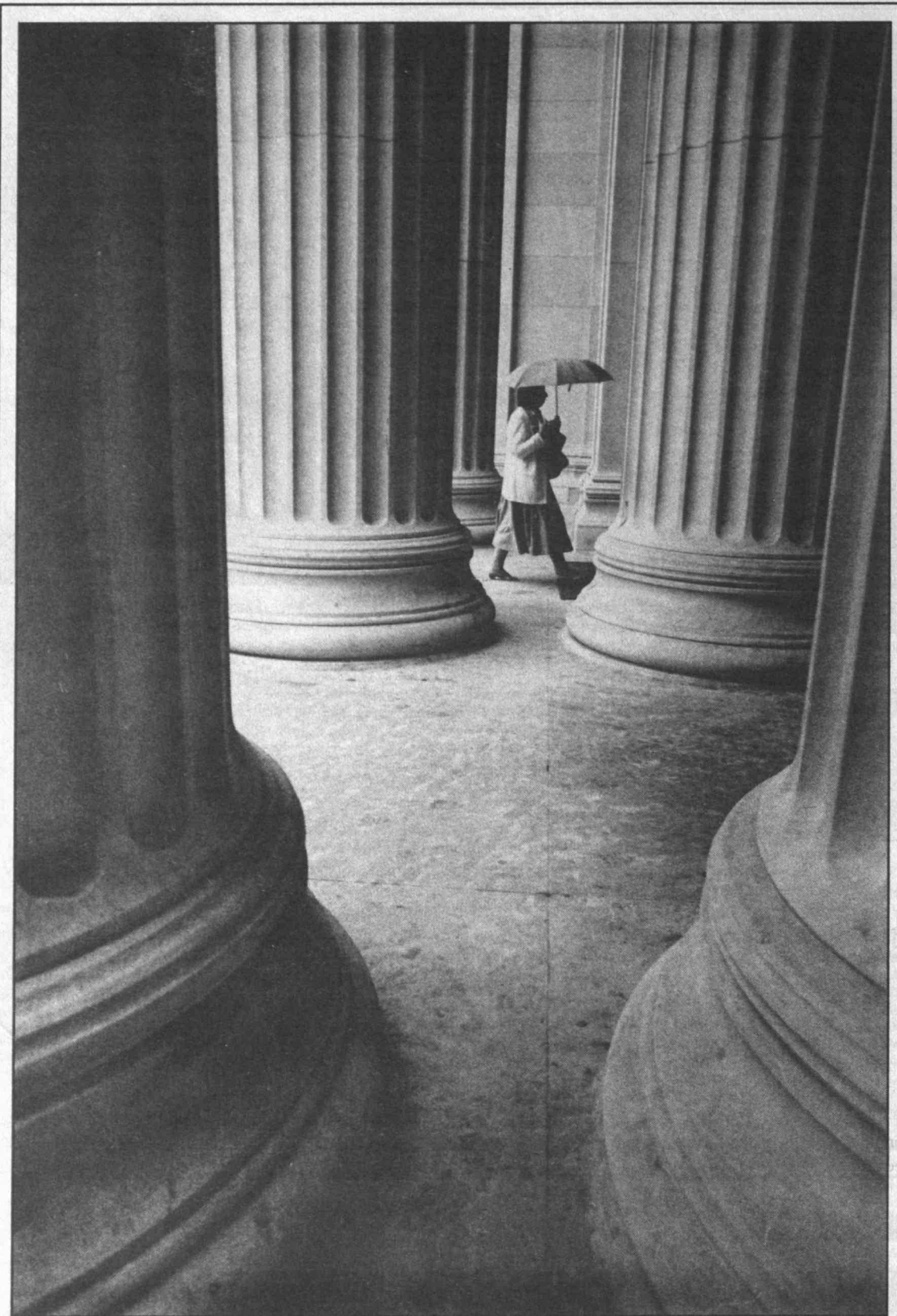
Provost Mark S. Wrighton and Professor Joel Moses, dean of the School of Engineering, spoke in favor of the proposal. Professor Wrighton said that since many of MIT's incoming students achieve advanced placement, a number would likely meet the new requirement.

Professor Richard O. Hynes, head of biology, speaking in favor of the proposal, said biology would be "very valuable for most of our students and invaluable for many of them." Biology has undergone vast changes in the last 20 years, he said, "and I think it is valuable for students to understand the intellectual basis for this revolution in biology."

Professor Paul L. Penfield Jr., head of electrical engineering and computer science, said he was concerned that first-year students would be overloaded with requirements. Professor Alvin W. Drake, also of EECS, said he was worried that making the subject a requirement would take away some of the choices now available to engineering students.

Professor Hynes commented that not all students would have to take the subject in the first year.

In other matters the faculty approved two changes in its Rules and Regulations, allowing the Committee on Discipline to turn to an immediate past member to provide a quorum at a hearing and extending speaking privileges at faculty meetings to the vice president of the Graduate Student Council.



APRIL SHOWERS—This was a familiar sight last week when the drizzle seemed interminable. Photojournalist Donna Coveney caught this woman entering the Institute at 77 Mass. Ave.

At Least 38 Run the Marathon

(continued from page 1)

3:38); Blain McKee (4:05), and Johannes Rudolph (4:25).

All the runners praised the crowds. "So many people stayed out there to cheer us on, even in the rain," said Tony Frost, a graduate student in management at the Sloan School who ran the race in 3:35. "The best part was in the early stages of the race, when people were cheering madly and giving us 'the wave,'" said Jim Azzola, a graduate student in mechanical engineering who also finished in 3:35.

The kids were especially fun. "One little girl offered me a hotdog along the way, and kids no taller than your knee were holding out their hands so you could slap them five," Azzola said.

Several MIT people wore MIT T-shirts, which gave spectators something to cheer for. Steve Laughton, a

graduate student in management at the Sloan School who finished in 3:18, was running in an MIT T-shirt when he heard "Go, MIT" from the crowds about 50 yards ahead of him. "I thought, they can't read my shirt at this distance," he said, so he ran a little faster and caught up with three other runners wearing MIT T-shirts (he doesn't know who they were).

The same thing happened to Jean-Pierre Revol. "I heard a crowd of people shouting 'MIT,' and the guy next to me was wearing an MIT T-shirt," said the associate professor of physics, who ran a 3:37. Revol points out that he, too, wanted to wear an MIT shirt, but couldn't find one light enough. "They sell T-shirts and very heavy shirts, but no light shirts that you want to wear if you're running," he said. (Take note, local clothing stores.)

Other MIT finishers include:

Bruce Brown, administrative officer at the Division of Comparative Medicine, 3:01:55 for 1,566th overall.

Dwight Caldwell, graduate student in aeronautics and astronautics, 2:49.

Andy Dobrzeniecki, graduate student in nuclear engineering, about 3:13.

Dennis Duffy, administrative assistant at Graphic Arts, 2:59:30 for 1,367th.

Jerry Dwyer, visiting scientist in mechanical engineering from Ireland, 2:53:31 for 864th.

Ann Frost, graduate student in management at the Sloan School, 3:38.

Roger Glovsky, graduate student in management at the Sloan School, 4:34.

Andrea Hatch, financial adminis-

trator in brain and cognitive sciences, 3:40.

Ernie Ihloff, mechanical engineer at the Bates Linear Accelerator, 4:28.

Dag Kavlie, visiting professor in ocean engineering from Norway, 3:19, and his wife Kari Kavlie.

Tugrulbey Kiryaman, graduate student in nuclear engineering, 4:49:45.

Diane McLaughlin, assistant dean for finance and administration, School of Architecture, 3:22:49.

Bernd Mittmann, visiting scientist in mechanical engineering from Berlin, 2:45:55 for 434th.

Harihar Rajaram, graduate student in civil engineering, 3:15.

David Shoots, senior in electrical engineering and computer science, 3:14:44.

Freddy Suarez, graduate student in management at the Sloan School, 4:01.

Jim Terry, research scientist at the Plasma Fusion Center, 2:57:05 for 1,138th.

John Van Maanen, Erwin H. Schell Professor of Organizational Studies at the Sloan School, 3:09:59 for 2,375th.

Graham Walker, professor of biology, 3:18.

Lead Wey, undergraduate in physics.

Ray Ausrotas, a research engineer in aeronautics and astronautics; Laura Moore, a senior in chemical engineering, and Bob Ludwig, an electronics technician for Lincoln Laboratory, couldn't run at the last minute because of injuries. "I'll be angry all year long, train harder, and do it next year," Ludwig said.

CAMBRIDGE BASE

NASA Awards AXAF Science Facility

By Eugene F. Mallove
News Office

MIT will play a leading role in a new worldwide science support center for the orbiting Advanced X-ray Astrophysics Facility (AXAF).

The Smithsonian Astrophysical Observatory (SAO) in Cambridge has been selected by NASA to plan, develop, and operate the Cambridge-based center, in which MIT will have major responsibilities. NASA's Marshall Space Flight Center made the announcement last month.

Scheduled to be launched in 1998 and to operate through 2013, the 12-ton AXAF will be the third of four Earth-orbiting telescopes planned by NASA to study the universe in all major regions of the electromagnetic spectrum. The first of these "great observatories" is the now operational Hubble Space Telescope. Next will be the Gamma Ray Observatory, slated for launch this month.

MIT has played a key role in X-ray astronomy ever since the X-ray window on the heavens was opened by Professor Emeritus Bruno B. Rossi and his colleagues. For example, MIT built the entire scientific payload of X-ray sensors in the satellite SAS-3, which operated in the mid-1970s and was controlled from MIT on a round-the-clock basis.

The first US X-ray satellite, the Einstein Observatory (HEAO-2), was launched in 1978 and functioned magnificently for three years, imaging the sky at X-ray frequencies.

X-rays emanate from a large group of different astrophysical sources, including the Sun, remnants of supernova explosions, neutron stars, black holes, hot intergalactic gas, quasars, and even a diffuse cosmic background of unknown origin.

AXAF will be a major advance over all that has gone before. It will be 100 times more sensitive as a detector of point-like sources and about 1000 times more sensitive as a high resolution spectrometer—able to resolve detailed features (emission lines) in the X-ray energy spectrum. It will thus be capable of identifying and quantifying specific atomic species in space. AXAF will have the ability to observe tiny 0.5 arc-second features—ten times better than the Einstein Observatory's resolution.

The proposed value of the AXAF Science Center contract, to be awarded after final negotiations through NASA's Marshall Space Flight Center in Huntsville, Alabama, will be nearly \$90 million over a 10-year period. "The main function of the science center will be to provide a bridge between the international scientific community and the orbiting X-ray telescope," said Dr. Harvey Tananbaum ('68 MIT PhD), associate director for High-Energy Astrophysics at SAO and director-designate of the new Science Center.

Professor Claude R. Canizares, di-

rector of the MIT Center for Space Research, will serve as associate director of the ASC and, initially, as head of the Science Support Division. "MIT and SAO have a long history of fruitful collaboration in X-ray astronomy and we are delighted to join our colleagues in this exciting enterprise," said Professor Canizares. "This Center guarantees that Cambridge will be the world capitol for X-ray astronomy well into the next century."

When fully developed, the AXAF Science Center will receive, analyze, and archive data from the space-based telescope and function as a central clearinghouse of information and support for astronomers using the facility. In particular, members of the Science Center team will provide assistance in reviewing observing proposals, in planning the best observing strategy for the study of specific celestial objects, in the timely processing and distribution of scientific data, and in providing appropriate software and computer resources for the most effective and efficient use of data.

The Science Center will also provide support during the construction of AXAF and its complement of sensitive instruments for testing and verification of ground support systems, for calibration of the instruments, and for orbital operations that relate to the science instrument data.

In addition to Dr. Canizares, other key individuals from MIT CSR who were involved in preparing the winning proposal are: Dr. Mark Bautz, Dr. Joseph Binsack, Professor George Clark, Dr. Daniel Dewey, Mr. Gene Galton, Dr. George Gordon, Dr. Alan Levine, Dr. Thomas Markert, Dr. Edward Morgan, Professor Saul Rappaport, Dr. George Ricker, and Ms. Patricia Greer of the Office of Sponsored Programs.

"Since the initial discovery in 1962 of cosmic x-rays, high energy astrophysics has developed into an exciting field of research where exploding stars, black holes, and general cosmic violence are the targets of investigation," said Dr. Tananbaum of SAO. "The space-based AXAF Observatory will be the primary facility in X-ray astronomy for the coming generation of astronomers, and the AXAF Science Center, in turn, will ensure that researchers are able to get the utmost information from their satellite investigations."

The AXAF Science Center (ASC) headquarters will be at SAO, but the MIT activities will occur in MIT's Center for Space Research, which is already responsible for developing nearly half the scientific instruments for AXAF. The Science Center in toto will comprise approximately 100 scientific and technical personnel.

SAO and MIT are joined in the project by TRW, the Association of Universities for Research in Astronomy (AURA), the University of Chicago, the University of Hawaii, and Stanford University.

Balancing Family, Academic Careers

A panel discussion on balancing family life and academic careers will be held Tuesday, April 30, at 4pm in the Emma Rogers Room (10-340).

The program will explore the options for students, researchers and faculty members who have children or are considering or expecting them. Questions such as "When is the best time to have a child? What is the impact on one's career? and What will make the balancing process easier?" will be addressed.

Panel members will include, Katherine Freese, assistant professor of physics; Carol Espy-Wilson,

a visiting scientist in the Research Laboratory of Electronics; Jenny McFarland, postdoctoral fellow in brain and cognitive sciences; Michelle Hutnik, a graduate student in materials science and engineering, and Mary Rowe, special assistant to the president and adjunct professor of management.

All members of the community are welcome to attend. The program is jointly sponsored by the Office of the Dean for Student Affairs and the Child Care Office.

Call Lynn Roberson, staff assistant for women students, x3-7979, for further information.

Book Delivery

If you need a book from a library on the other side of campus and don't have the time to pick it up, you can use the Library Institute Delivery Service to have it delivered to the library closest to you.

Requests for delivery can be made at the reference desk of any library and, if the material is available for loan, it will be delivered to the requested library within 48 hours. Only materials on four-week loan can be delivered through this service.

CONTROVERSIES

Panel to Address Cultural Diversity in Art

The first annual Max Wasserman Forum on Contemporary Art will feature noted scholar W.J.T. Mitchell and a panel of prominent arts leaders speaking on "Quality Control: The Challenge of Cultural Diversity," Thursday, May 2, at 8pm in the Bartos Theatre of the Wiesner Building.

Editor of the highly regarded journal, *Critical Inquiry*, and Donnelly Professor of English and Art at the University of Chicago, Dr. Mitchell will examine current controversy over establishing the relationship of quality and diversity in the programs of cultural and educational institutions. This issue has gained particular significance at a time of diminished funding for the arts.

His remarks will be addressed by respondents Kimberly Camp, director of the Experimental Gallery at the Smithsonian Institution; Trevor Fairbrother, recently appointed Beal Curator of Contemporary Art at Boston's Museum of Fine Arts, and Catherine Lord, chair of the studio arts department at the University of California-Irvine and former dean of the California Institute of the Arts.

Among the questions Dr. Mitchell

and the panelists will consider are: Does the traditional emphasis upon quality mask systematic prejudice in the art world? Will promotion of "cultural diversity" diminish formal standards of artistic achievement? Is there such a thing as "politically correct" art? What evaluative criteria might be developed to comprehend the creative expressions of a multicultural nation?

Presented by the Office of the Arts, the program was developed by Mark Palmgren, director of the Council for the Arts at MIT, who will serve as moderator.

Max Wasserman, a member of the MIT Class of 1935, was a founding member of the Council for the Arts and a collector and advocate of contemporary visual art. As a student he patented a copper-bonded flashing (waterproofing) material and was later an innovator in plastic skylights. He died in 1986 at the age of 72. The Max Wasserman Forum on Contemporary Art was endowed in his memory and will annually address issues in contemporary art through an exchange of viewpoints and perspectives by scholars, artists and critics.



MILNE SALUTED—Walter L. Milne, right, his wife Ruth at his side, was the guest of honor at a retirement party April 16 at the Faculty Club. Mr. Milne has served MIT for 40 years in varied and important posts. Those attending or who sent greetings represented Mr. Milne's many constituencies during those years, including: The Massachusetts congressional delegation; top officials of MIT and the City of Cambridge; MIT's Cambridge neighbors, ranging from large corporations to individual citizens; members of the Cambridge Rindge and Latin High School Music Department, who presented a special musical salute; faculty and staff colleagues from MIT, and members of the press. For many years Mr. Milne has been a key aide to the presidents of MIT and to the Chairmen of the Corporation. In addition, since 1966 Mr. Milne has been responsible for government and community relations. He has also been the prime staff assistant to the selection committees which recommended the appointments of President Charles M. Vest and the two immediate past presidents of MIT—Paul E. Gray and Jerome B. Wiesner. Seated next to Mrs. Milne in the photo are President Vest and his wife Rebecca M. Vest. In brief remarks, President Vest praised Mr. Milne for his long and varied service to MIT. He also extended a personal "thank you" to Mr. Milne for his assistance to the Vests in making the transition from the University of Michigan to MIT last summer.

Photo by Donna Coveney

COMMUNICATIONS

Haller Takes Arts Post

Mary L. Haller, who has wide experience in promoting cultural activities in the Greater Boston



Ms. Haller

area, has been appointed director of communications in the Office of the Arts. Announcement of the appoint-

ment was made by Professor Ellen T. Harris, associate provost for the arts.

Ms. Haller will be responsible for all internal and external arts communication and publicity at MIT, including supervision of the weekly arts page in MIT Tech Talk. She will work closely with Professor Harris in promoting coverage of the activities of the Office of the Arts, the Council on the Arts and the Artist-in-Residence program. Ms. Haller succeeds China Altman, who has left the office.

Most recently Ms. Haller was associate director of public relations and communications in Northeastern University's Division of Performing and Visual Arts. From 1986-88 she worked for the Boston Symphony Orchestra in a variety of promotional capacities. She has also worked with the Greater Boston Youth Symphony Orchestra and as a freelance writer on arts and cultural events.

Ms. Haller is a graduate of the University of Michigan and has done graduate study in business, communications and public management. A flutist, she is a member of the Civic Symphony.

Altshuler to Speak Friday

Alan Altshuler, Director of the Taubman Center for State and Local Government at the Kennedy School of Government, will speak at MIT Friday, April 26, on the pros and cons of developer provision of public infrastructure. The seminar will be held at 12:45pm in the Bush Room, 10-105.

During the 1970s, developers were compelled to accept financial responsibility for public infrastructure needs—such as roads—beyond their own site limits. Today these responsibilities, or exactions, are often thought to be needed because of increased demands generated by new development.

Exactions are a flexible instrument for crafting compromises and for responding to public concerns about infrastructure shortfalls. But they may be a less equitable and possibly less efficient way to pay for growth than traditional methods of raising taxes and fees. Professor Altshuler's Friday talk will consider the underlying dynamics

of developer exactions, and their merits as a tool for regulating land use and for financing public infrastructure.

Professor Altshuler is the Ruth and Frank Stanton Professor of Urban Policy and Planning at Harvard University, with appointments in both the Kennedy School of Government and the Graduate School of Design. A former MIT faculty member—in the departments of political science and urban studies and planning—he served as chairman of MIT's Political Science Department from 1977 to 1982. While on leave from MIT, he also served as Massachusetts' first Secretary of Transportation and Construction.

The Friday seminar is one of a series sponsored each semester by the Center for Transportation Studies. An optional luncheon will be offered at noon—\$2 for students, \$5 for others—in the same location. The seminar is free and open to the public. For more information, call Terri Lehane at x3-5321.

INSTITUTE WIDE

Computing Council Is Named

Appointments to the Academic Computing Council, which will be a focal point for the educational computing needs of the faculty, have been announced by Provost Mark S. Wrighton.

The council, headed by Professor Steven R. Lerman, director of the Center for Educational Computing Initiatives, includes representatives from the MIT Library System, the faculty, staff and students. Student members will be named later.

The other members are:

Associate Professor Hal Abelson, Department of Electrical Engineering and Computer Science.

Dr. Edward C. Barrett, MIT Writing Program.

Assistant Professor Edmund W. Bertschinger, Department of Physics.

Associate Professor Joseph Ferreira Jr., Department of Urban Studies and Planning.

Professor David S. Jerison, Department of Mathematics.

Dr. Jay K. Lucker, director of libraries.

Professor Thomas W. Malone, Sloan School of Management.

Dr. Janet H. Murray, Foreign Languages and Literature.

Associate Professor Peter C. Perdue, History.

Professor Thomas F. Weiss, Department of Electrical Engineering and Computer Science.

The council's responsibilities include:

—Advising the provost, the vice president for information systems and the director of academic computing on the evolution of MIT's academic computing environment.

—Proposing and reviewing academic computing policies and changes.

—Soliciting opinions from faculty, staff and students on academic computing.

—Advising the director of academic computing on major decisions such as charges, changes in facilities and ser-

vices, system-use policy and changes in disk quotas and operating hours.

—Assisting the director of the Center for Educational Computing Initiatives in forming and implementing new research programs and determining how the MIT academic computing system might be adapted to permit widespread use of results of the research programs.

Aides Needed

Community volunteers are needed to assist at Commencement Exercises Monday, June 3, 8:15-9:45am.

Aides are needed to assist the marshals of the graduates, Professors Kerry Emanuel and Eric Grimson, in assembling the degree recipients' section of the procession on the second floor of the Johnson Athletics Center.

Those who would like to help are asked to sign up by Friday, May 17, with Donald Ferland or Mary Morrissey, Rm 7-121, x3-1475.

4 MILES LONG

The Vest Road Race Is Coming

Attention runners. The four-mile Charles B. Vest Inaugural Road Race will take place Saturday, May 11, starting at 9:30am (check-in runs from 7:45-9am).

The race, this year's version of the annual Community Service Fund Road Race, will begin at the Walter C. Wood Sailing Pavilion on Memorial Drive, proceed along the river to the Museum of Science, and return along Storrow Drive and over the Harvard Bridge. It ends in McDermott Court. People are welcome to participate at any speed.

All members of the MIT, Lincoln Lab, Wellesley College and Draper Lab communities are eligible to participate. T-shirts will be given to the first 400 entrants. In addition, prizes will be awarded to the overall male and female winners and Masters champions (male and female finishers over 40). A trophy will be given to the living group with the highest percent participation, and drawing prizes will be selected.

The entry fee for the race is \$7 (\$8 for post-entry). Pre-entry closes Wednesday, May 9. A registration form for the race is scheduled to appear in the May 1 Tech Talk; forms will also be available in Room 5-208 and on tear-off posters around the Institute. Return or mail the completed form with entry fee to Paul Parravano, Rm 5-208, by May 9.

All proceeds from the race will go to the MIT Community Service Fund, which was formed in 1968 to provide funds to support the work of MIT volunteers in community service projects in Cambridge.

Race sponsors this year are Draper Lab, the MIT Credit Union, MIT Dining Service, BayBank Harvard Trust, MIT Graphic Arts Service, Au Bon Pain, and Hanover Sales, Inc. Drawing prizes were donated by Marathon Sports, Toscanini's Ice Cream, New Balance, University Stationery Company, and The Bicycle Workshop.

In a final note, Mr. Parravano of the CSF staff says that volunteers are needed now and on race day. Call him at x3-3873 if you'd like to help.

Talbot House

Some May weekends are still available at Talbot House, MIT's retreat in Woodstock, Vt.

The House is reserved for groups of 15-27 at a cost of \$50.50 for students and \$59.50 for others, which includes two nights lodging, two breakfasts and one dinner. Spring activities in the Green Mountains include hiking, canoeing, biking, and horseback riding.

Applications are being accepted for June, too. Reservations are made on a first come, first served basis. Call Diane Gilbert, x3-4158, for information.

Institute Calendar

* - Open to public
** - Open to MIT community only
*** - Open to members only

April 24 - May 5

■ SPECIAL INTEREST

Awards Convocation—May 1:** Henry Jacoby, Faculty Chair, will preside over annual presentation of Institute-wide awards to members of the community, 3:30pm, Rm 10-250. Reception will follow in Bush Building Lobby (Lobby 13).

MIT Community Summer Softball 1991—May 1:** Organizational meeting for new and old team entries, 5:30pm, MIT Student Center, Twenty Chimneys. For additional information contact Marino Tavarez, MITCSS 1991 Commissioner, at 262-9032 (w) or 625-4368 (h).

Crafts Faire*—May 2-3: MIT community members will be selling handmade crafts including jewelry, quilts, pottery, toys and edible goodies in Lobby 10 from 9am-5pm. Sponsored by the Tech Community Women.

Johnson Games & Inaugural Picnic—May 4:** In honor of Chuck and Becky Vest. Join the fun and excitement with 63 registered teams (almost 2,500 people!) for this friendly competition which will combine mental and physical activities for all members of the MIT community. Children's area, picnic featuring "Redbones" of Davis Square, festive cake-cutting ceremony. Games: 10:30am - 2:30pm, Steinbrenner/Barry Fields (participants should arrive at 9:30). Picnic: 2-4pm, Kresge Oval. The Games and Picnic will be held rain or shine.

■ SEMINARS & LECTURES

Freshmen are encouraged to attend departmental lectures and seminars. Even when these are highly technical they provide students one means to learn more about professional work in a department and field.

WEDNESDAY, APRIL 24

What Classical Optics Can Do for Optical Information Processing—A Lohmann, U Erlangen-Nuremberg and NEC Research Institute.** EECS/RLE Seminar Series on Optics and Quantum Electronics, 11am-12pm, Rm 34-401B.

The Safety of Nuclear Weapons in the US Arsenal*—Prof. Sidney Drell, Stanford Linear Accelerator Center. Seminar on Technology, Defense, and Arms Control in a Changing World, CIS, 12-2pm, Rm E38-714.

Acoustic Tomography in the Gulf Stream Southern Recirculation Gyre*—David Chester, WHOI. Oceanography Sack Lunch Seminar, 12:10pm, Rm 54-915.

On Very Low Energy Hydrogenic Nuclear Reactions*—Dr. Frederick J. Mayer and Dr. John R. Reitz, Mayer Applied Research, Inc. Sponsored by the departments of Nuclear Engineering and Electrical Engineering and Computer Science, 2:30-4pm, Rm 66-110.

Higher-order Boundary Elements in Potential Flow Problems*—Hongbo Xu, MIT. Informal Hydro-dynamics Seminar, Dept. of Ocean Engineering, 3:30pm, Rm 5-314.

Magnetic Resonance and Computerized Tomographic Imaging for Petrophysical Rock Analysis—Dr. Harold Vinegar, Shell Development Co.** Special Seminar Series on the Scientific and Industrial Applications of Radiation Technology, 4-5pm, Rm NW12-222.

Changed Perceptions about Development Policy*—Prof. Stanley Fischer, MIT. The MacArthur Workshop on Development, Security, and International Cooperation Seminar Series, CIS and Dept of Urban Studies and Planning, 4-6pm, Rm E38-714.

Deconstruction of the (110) Face of Gold and Platinum*—Dr. Jacques Villain, Centre d'Etude Nucléaire de Grenoble, France. Center for Materials Science and Engineering Colloquium, 4pm, Rm 1-190.

THURSDAY, APRIL 25

Development of the Contra-rotating DUOPROP at Volvo-Penta—Lennart Brandt, AB Volvo-Penta, Sweden.** Hydrofoil and Propeller Seminar, 12-1pm, Rm 5-314. Bring your lunch, coffee provided.

Alaska and the Opening of the Arctic Ocean Basin—Dr. Scott Cameron, Shell Off-shore Inc.** EAPS Spring Department Lecture Series, 2pm, Rm 54-915.

In-Process Monitoring and Control of Weld Nugget Geometry for Resistance Spot Welding Process—Hee Seok Chang, Myong Ji University, Seoul, Korea; Visiting Professor, MIT.** Laboratory for Manufacturing and Productivity Seminar, 3-4pm, Rm 35-520.

China, Vietnam and Cambodia: Is There a Solution?—Lucian Pye, MIT. MIT Defense and Arms Control Studies Program Seminar Series, 3:30-5pm, Rm E38-714.

Construction 2000: Technology as a Road, Not a Destination*—Howard B. Stussman, Editor-In-Chief, Engineering News-Record. Hendersons Memorial Lecture, sponsored by the Center for Construction Research and Education, 4pm, Rm 1-190.

Information Services: Who is Going to Provide Them?—R. Gerard Saleme, Sr. Telecommunications Policy Analyst; Paul Cianelli, Pres., New England Cable Television Assoc.; Daniel Behuniak, Bell Atlantic; Jules Tewlow, Independent Consultant; Timothy Regan, Corning Inc. Sponsored by the MIT Communications Forum, 4-6pm, Bartos Theatre.

Auto-Correlated Arrivals in Queueing*—Ralph Disney, Texas A&M. Sponsored by the Operations Research Center, 4pm, Rm E40-298. Refreshments following, E40-162.

Analysis of TFIID and Other Transcription Factors of yeast—Dr. Fred Winston, Harvard Medical School.** Whitehead Institute Seminar, 4pm, Whitehead Auditorium.

Clusters: Melting, Freezing, Potentials, and Dynamics—Prof. Steve Berry, Univ. of Chicago.** Physics Colloquium, 4:15pm, Rm 10-250. Refreshments, 3:45pm, Rm 26-110.

FRIDAY, APRIL 26

Particle Physics and the Schrodinger Equation—Prof. Andre Martin, CERN.** LNS Special Seminar, 12pm, Bldg 6, 3rd fl. CTP Seminar Rm.

Nonlinear Spatial Equilibration of a Free-Shear-Layer Instability Wave—Dr. Lennart S. Hultgren, NASA Lewis Research Center.** Sponsored by the Dept. of Aeronautics and Astronautics, 12pm, Rm 33-206.

Roughness of Growing Surfaces*—Dr. Jacques Villain, Centre d'Etude Nucléaire de Grenoble, France. Center for Materials Science and Engineering Colloquium, 12:15pm, Rm 12-132. Lunch available.

Developer Provision of Infrastructure—Alan Altschuler, John F. Kennedy School of Government, Harvard.** Luncheon Seminar Series sponsored by the Center for Transportation Studies, 12:45-2pm, Rm 10-105. Luncheon optional, 12-12:45pm, \$2 students, \$5 non-students.

Aerosol Processing of Materials: Ceramic and Photonic Materials—Richard C. Flagan, California Institute of Technology.** Sponsored by the Chemical Engineering Department, 3pm, Rm 66-110.

Stratigraphic Modeling of the Permian Basin: Third and Fourth Order Cyclicity Sequence Analysis—Dr. Mark Shuster, Shell Development Co.** EAPS Spring Department Lecture Series, 4pm, Rm 54-915.

SATURDAY, APRIL 27

Swiss Poster Art: Origins and Design*—A symposium accompanying the opening of the MIT Museum exhibit, "A Contextual View of Graphic Design and the Poster." Prof. Roger Remington, Rochester Institute of Technology; "Six Posters I Wish I Had Designed and Why," Chris Pullman, WGBH-Boston, 2pm, MIT Museum. Swiss refreshments served.

MONDAY, APRIL 29

Software Tools for Product Design: A New Generation is Needed—David C. Smart, Eastman Kodak Co.** Sponsored by the Dept. of Mechanical Engineering, 10:30am, Rm 3-442.

The Biochemistry Behind the Cell Biology of Serine Protease Inhibitors—Harvey Rubin, Univ. of Pennsylvania School of Medicine.** Whitehead Institute Seminar, 12pm, Whitehead Institute Auditorium.

Trends in Aeroelastic Control—Charrissa Lin, MIT.** Materials, Structures and Aeroelasticity Seminar Series, 3pm, Rm 33-206.

Commercial Nuclear Electricity Generation—Where Have We Been; Where are We Going?—Sol Burstein, NRC. Sponsored by the American Nuclear Society, MIT, 3:30pm, Rm NW12-222.

The Heard Island Feasibility Test for Monitoring Ocean Warming—A Baggeroer, MIT.** EECS Colloquium Series, 4-5pm, Rm 34-101. Refreshments, 3:30pm.

Hydrodynamics of Multiple Tidal Inlets: The Chatham Example—David Aubrey, Woods Hole.** Sponsored by the Ralph M Par-

sons Laboratory for Water Resources and Hydrodynamics, 4pm, Rm 48-316.

Algorithmic Lovasz Local Lemma—Jozsef Beck, Rutgers Univ.** Applied Mathematics Colloquium, 4pm, Rm 2-338. Refreshments, 3:30pm, Rm 2-349.

Jesuit Arms Salesmen in the 17th Century World—Peter Perdue, MIT.** STS Spring Colloquium, 4-6pm, Rm E51-004.

Characterizing Singularities for 6-DOF Manipulators—Dr. Karl Flueckiger, Draper.** MIT/Draper Joint Seminar Series in Dynamics, Guidance and Control, 4:15pm, Rm 33-206.

TUESDAY, APRIL 30

The Ultimate Limits to Laser Cooling—Jean Dalibard**—NIST and Ecole Normale Supérieure, Paris.** Seminar on Modern Optics and Spectroscopy, 11am-12pm, Rm 37-252. Refreshments follow lecture.

What are the Chances for Ecologically Sustainable Development?—Arne Naess, founder of "deep ecology." Sponsored by the MIT Hazardous Substances Management Program, 3pm, Rm E40-212.

Message Routers for Scalable Multicomputers*—Yubal Tamir, UCLA. VLSI Seminar, 4pm, Rm 34-101. Reception, 3:30pm.

Where Have the Designers Gone*—Willis M. Hawkins, Sr. Advisor to the Lockheed Corp. The 23rd Lester D. Gardner Lecture, sponsored by the Dept. of Aeronautics and Astronautics, 4pm, Rm 9-150.

Realities behind the Quality Hype*—John Reeve, Principal, Temple, Barker & Sloane, Inc. Sponsored by the International Shipping Club, 4:15pm, Rm E51-307. Refreshments.

Spectral Evolution of Galaxies in Clusters*—Alan Dressler, The Observatories of CIW. Astrophysics Colloquium, sponsored by the Center for Space Research, 4:15pm, Rm 37-252. Refreshments, 3:45pm.

WEDNESDAY, MAY 1

InGaAs/AlGaAs and AlInGaAs/AlGaAs Strained Quantum-well Diode Lasers—H K Choi, Lincoln Laboratory.** EECS/RLE Seminar Series on Optics and Quantum Electronics, 11am-12pm, Rm 34-401B.

What Can Be Done to Prevent Accidental Missile Launches?—Prof. Henry Kendall, MIT. MIT Seminar on Technology, Defense, and Arms Control in a Changing World, 12-2pm, Rm E38-714. Bring a lunch, drinks provided.

Searching for Opportunities: Women, Cooperatives and Development Projects in Rural Nicaragua—Suzanne Baker, Lecturer in Anthropology.** Sponsored by the Anthropology/Archaeology Program, 12pm, Rm 20B-136.

Finding a Steady-State Best Fit of an Oceanic Circulation Model to Observed Data*—Dr. Jochem Marotzke, MIT. Oceanography Sack Lunch Seminar, 12:10pm, Rm 54-915.

The Free Surface Discontinuity Due to Flow Past a Surface-Piercing Yawed Flat Plate: An Experimental Investigation*—Hiren Maniar, MIT. Informal Hydro-Dynamics Seminar, 3:30pm, Rm 5-314.

Commercialization of Agriculture and the Transformation of Rural Labor Institutions*—Julie Anderson, Stanford Univ. MacArthur Workshop on Development, Security, and International Cooperation Seminar Series, 4-6pm, Rm E38-714.

The Electrodynamic Balance: Selected Application—Prof. A.F. Sarofim, MIT.** Thermal Science Seminar, 4-5pm, Rm 5-234. Refreshments, 3:45pm.

THURSDAY, MAY 2

The Impact of the Exxon Valdez Oil Spill on Alaskan Native Communities—Gregory Button, Brandeis Univ.** Sponsored by the Anthropology/Archaeology Program, 1-2:30pm, Rm 20B-136.

Swiss Poster Art: A Mirror of 20th-Century Painting—Dr. Anneliese Harding.** Gallery Talk in conjunction with the current MIT Museum exhibit, 2pm, MIT Museum.

Design and Processing of Low-Dielectric-Constant Cellular Composites—Dr. Nannaji Saka, MIT.** Laboratory for Manufacturing and Productivity Seminar, 3-4pm, Rm 35-520 (rescheduled from April 18).

Hydrocarbon, Oxidation and Engine Knock—Dr. Charles Westbrook, Lawrence Livermore Labs.** Hotel Lecture Series, sponsored by the Sloan Automotive/Gas Dynamics Laboratories, 4:15-5:15pm, Rm 66-110. Refreshments, 4pm.

An Underlying Equation that Links Magnetoconductance, Optimized Paths, Growth Fronts, ...—Prof. Mehran Kardar, MIT.** Physics Colloquium, 4:15pm, Rm 10-250. Refreshments, 3:45pm, Rm 26-110.

The Impact of Ethnicity, Nationalism, and Fundamentalism on International Relations*—Prof. Myron Weiner, MIT. Sponsored by Peoples and States: Ethnic Identity and Struggle, 4:30-6:15pm, Rm E38-714. Refreshments.

Quality Control: The Challenge of Cultural Diversity*—W.J.T. Mitchell, Univ. of Chicago. Panel respondents. The First Annual Max Wasserman Forum on Contemporary Art, 8-10pm, Bartos Theatre.

FRIDAY, MAY 3

Anti-Science and Anti-Technology Trends in the US and USSR*—May 3 & 4 workshop with Soviet and American scholars. Both days' sessions from 9-11:30am and 2-4:30pm, Bartos Theatre, E15-070. Simultaneous translation provided.

Boundary Plasma Behavior in TFTR*—C.S. Pitcher, Univ. of Toronto. Plasma Fusion Center Seminar Series, 1pm, Rm NW17-218.

Melodrama Across Cultures*—Lisa Rofel, MIT, and Society; Jane M. Gaines, Duke Univ. Respondent: Robert C. Allen, Univ. of North Carolina. Sponsored by the MIT Communications Forum, 4-6pm, Killian Hall.

Some Possibilities for Measuring Local Plasma Parameters in the Edge Plasma by Impurity Injection*—P.C. Stangeby, Univ. of Toronto. Plasma Fusion Center Seminar Series, 4pm, Rm NW17-218.

SATURDAY, MAY 4

Anti-Science and Anti-Technology Trends in the US and USSR*—See May 3.

■ READINGS

Poetry Reading*—Apr 24: William Corbett. Sponsored by the MIT Writing Program, 8pm, Rm 14E-304.

Poetry at the Media Lab*—Apr 25: Stanley Kunitz, whose prizes and honors include the 1959 Pulitzer Prize for Poetry and the Consultanship in Poetry to the Library of Congress in 1974 and 1975. 7:30pm, Bartos Theatre.

■ FILMS

Monday Night Urban Design Video Series—Apr 29:** Tokyo-Ga, Wim Wenders, 1985, Bartos Theatre, 6:30pm.

Malcolm X—May 3:** Gil Noble, producer, 7-9pm, Black Student Union Lounge, Walker Rm 50-105.

■ COMMUNITY INTEREST

Alcoholics Anonymous (AA)—Meetings every Tues, 12-1pm; Thurs, 12-1pm, Rm E23-364.** For info call Alice, x3-4911.

AI-Anon—Meetings every Fri, noon-1pm.** Health Education Conference Rm E23-297; every Tues, noon-1pm, Rm 1-246; and every Mon, 12-1pm, Lincoln Lab Bldg 1218, Family Support Ctr. The only requirement for membership is that there be a problem of alcoholism in a relative or friend. Call Alice, x3-4911.

Alcohol Support Group—Meetings every Wednesday, 7:30-9am,** sponsored by MIT Social Work Service. For info call Alice, x3-4911.

Co-Dependents Anonymous (CoDA)*—Meetings every Thurs, 6:30-8pm, Rm 66-156. Info: Alice, x3-4911.

Eldercare Support Group—Meetings every Monday 12-1pm, Rm 8-219.** For info call Carole x3-9368 or Maria x3-8820.

Having It All? Family and Academic Careers—April 30:** with Katherine Freese, Carol Espy-Wilson, Jenny McFarland, Michelle Hutnik, Mary Rowe. A panel discussion on balancing family life and academic careers. Co-sponsored by the Office of the Dean for Student Affairs and the Child Care Office, 4-5:30pm, Rm 10-340.

Honorary Matrons of MIT—Apr 25:** The Honorary Matrons will be joined by the Emerit Professors for lunch at the MIT Faculty Club. President Charles M. Vest and Mrs. Rebecca Vest will address the group. Sherry at 12pm, luncheon at 12:30pm.

Informal Embroidery Group—MIT Women's League, 10:30am-1:30pm, Rm 10-340.** Upcoming dates are: May 1 & 15, June 12. Info: x3-3656.

Graduate Student and Postdoc Parents Support Group*—Co-leaders: Dawn Metcalf, MIT Social Worker, and Rae Goodell, MIT Coordinator of Parent Programs. Ongoing, meets weekly. Info: Dawn Metcalf, x3-4911, Rm E23-344, or Rae Goodell, x3-1592, Rm 4-144.

Boston Mutagenesis Group*—Meetings are held the first Wednesday of the month in the 6th floor conference room, E17, 7pm. Speakers from MIT, Harvard and other local schools discuss their research; related topics include mutagenesis, carcinogenesis, cellular repair systems and DNA damage in prokaryotic and eukaryotic cells. Info: Kara Best x3-6729.

Narcotics Anonymous—Meetings at MIT,** every Mon, 1-2pm, Rm E23-364 (MIT Medical Dept). Call 569-0021.

Overeaters Anonymous (OA)—Meets Thurs, 1-2pm, Rm E23-364.** Only requirement for membership is the desire to stop eating compulsively. Info: Alice, x3-4911.

Parenting Programs*—Apr 30: "Beyond Boobies: A Checklist for a Child-Safe Home." A safety check you can perform in your own home, 12-1:30pm, Rm E23-297. May 2: "Time Management for Parents," 12-1:30pm, Rm 6-233.

Parenting Support Groups—New Parents Support Group:** Tuesdays, 12-1:30pm, contact Rae Goodell, x3-1592. For parents of children up to 6 months old or expected by 4/15. **Parent Support Group*:** Wednesdays, 12-1:30pm, call 1-800-882-1250. **Parenting After Divorce Support Group**:** Biweekly Fridays, 12-1pm, contact Rae Goodell x3-1592. **Child Care Briefings**:** Introductory seminars, 12-1:30pm, Rm 4-144 on May 1, 15 & 20, June 12 & 26. **Breastfeeding: The Video**:** Apr 18, May 30, 7-9pm, Rm E23-297.

Wives' Group—Apr 24:** "Stress: How to Understand and Cope With It," Marcia Yousik, RN, Medical Department. May 1: "Touring in New England: Planning Rewarding Trips," Tunie Hamlen, New England Sights, Inc. Meetings are from 3-4:45pm, Rm 491 Student Ctr. Babysitting in Rm 407. All women in MIT community welcome. Info: x3-1614.

■ HEALTH EDUCATION

Aging Successfully Seminar*—Apr 25: "Depression in the Elderly—Causes and Solutions," moderated by Dr. Peter Reich, MIT, with Dr. Carl Salzman, Harvard Medical School, and Dr. Eric Chivian, MIT. Seminars meet 9:45am-12pm, Bartos Theatre.

Nursing Mothers' Support Group—Pregnant and breastfeeding women at MIT meet to gain confidence and share info and practical tips.** First Tues of each month, 10-11am and third Weds of each month, 4-5pm, Rm E23-297. Babies welcome. Info: Margery Wilson 868-7218.

Working Mothers Support Group—An ongoing support group that meets to discuss parenting-related issues in a casual atmosphere.** Meets every other Thursday, 12-1:30pm (drop in anytime), Rm 18-591. Info: Therese Henderson, x3-7492.

■ MITAC

Ticket locations and hours: Tickets may be purchased at the MITAC Office, Rm 20A-023 (x3-7990), 10am-3pm Monday-Friday. Lincoln Lab sales in Rm A-218, 1-2pm Tuesday-Friday. Friday ticket sales in Lobby 10 and E19, 12-1:15pm. Further details on events are included in MITAC's monthly flyer. To avoid disappointment, make reservations and purchase tickets early. Because MITAC is nonprofit, refunds are not available.

MITAC, the MIT Activities Committee, offers discount movie tickets for General Cinema and Loews Cinemas, both are \$4/ea (Loews tickets are not valid the first 2 weeks a movie is released). Tickets are good 7 days a week, any performance. Showcase and Entertainment cinema tickets have been discontinued.

A Sunday Stroll Along Tory Row—May 5: The Cambridge Historical Society presents a walking tour along Tory Row. Depart from Christ Church, zero Garden St., Cambridge, 2pm. Tkts \$3/pp. Reservations and full payment by May 1.

Dogwood Festival—May 11: Day trip to Fairfield, Conn., sponsored by the Women's Guild. Bus lvs Hayward Lot at 8am, returns approx. 6pm. Cost: \$18.50/pp. Reserve by May 3.

A Spring Evening at Wonderland—May 17: Includes buffet style dinner, program, tips & gratuities, race dedication. Dinner, 6:30pm; racing, 7:30pm. \$18/pp. Reservations and full payment by May 3.

Travesties—May 23: By Tom Stoppard. Huntington Theatre, 8pm. Tkts \$16/ea (reg. \$25/ea), must be purchased by May 9.

Whitewater Rafting in Calumet, Quebec—June 21-23: Price options: 2 days of whitewater rafting, \$153/pp; 1 day rafting and 1 day mountain biking, \$147/pp; 1 day rafting and 1 day relaxing/sunbathing, swimming, etc., \$120/pp. Price also includes round-trip bus, 2 breakfasts, 2 lunches, 2 huge dinners, rustic camping. Bus lvs West Garage 12pm 6/21, returns approx. 12am 6/23. Reservations by May 15.

Summer Weekend Escapes at Talbot House—July 12-14; 19-21; August 2-4; 9-11: \$58/pp/adult; \$29.50/child (3-10—under 3 free). Incl 2 nights' lodgings, 2 breakfasts, 1 dinner. Dorm style accommodations in a cooperative living environment. Room sizes for 4, 5, and 6 people. You provide transportation. One room per customer with MIT I.D. Reservations and full payment by June 28.

Museum of Fine Arts—The Council for the Arts has 10 passes employees may borrow for free admission. Call the MIT libraries, x3-5651, for availability. At Lincoln Lab, MFA passes are available in A-150.

Arlington Capitol Theatre discounts! Commercial, 2nd run, and art-type films, only \$3/pp with MIT ID (reg. \$4/pp). Located at 204 Mass Ave, call 648-4340 for more info.

The new **City Books** are here, only \$1/ea (reg \$7.50), terrific discount coupon book for the Boston area.

Ferry Discounts to Martha's Vineyard and Nantucket, approximately 20% off regular ferry fees, valid through Oct 14, 1991.

Just arrived: Discounts for **Whale Watch and Cape/Provincetown Cruises** (2-for-1 coupons via Bay State Cruises) and **Kay Jewelers** (10% off, some restrictions apply).

Coming soon: \$5 discounts for **Water Country**.

Check the MITAC office for a complete listing of other discounts currently available (i.e., **Magic Kingdom Club Card** for Disney World discounts).

ALUMNI ACTIVITIES

MIT Club of Boston Dinner Meeting—Apr 25:** Dr. Charles M. Vest will present his vision for MIT at the dawn of the 21st century. Reception, 6pm; dinner, 7pm; Dr. Vest's talk, 8:30pm. Cambridge Marriott, Kendall Square. Cost \$33.95/person. Call x3-8222.

SOCIAL ACTIVITIES

French Lunch Table—Come to lunch and speak French:** every Tuesday from 1-2pm in Walker dining hall. Look for the table with the tablecloth. All levels welcome. Sponsored by the Foreign Languages & Literatures Section.

German Lunch Table—Come to lunch and speak German:** every Monday from 1:15-2pm in Walker dining hall. Look for German flag. All levels welcome. Sponsored by the Foreign Languages & Literatures Section.

Japanese Lunch Table. Bring a bag lunch and talk with native Japanese speakers. Special cultural event each month. Beginning Japanese speakers especially welcome. Sponsored by the MIT Japan Program, the Dept of Foreign Languages and Literatures, and the MIT Japanese Wives' Group. Meets Tuesdays at 1pm in Walker 220. More info: Susan Sherwood x3-8095.

MOVIES

Ad Hoc Committee on Lesbian and Gay Studies at MIT*—Apr 25: *Silence=Death and This is not an AIDS Advertisement...* **May 1:** *Fun Down There and Beauties Without a Cause*. Screenings at 7:30pm, Rm 66-110. Info x3-3599.

Admission to below Lecture Series Committee Movies is \$1.50, and MIT or Wellesley identification is required. For the latest Lecture Series Committee movie and lecture information, call the LSC Movieline, x8-8881.

LSC Movies—Apr 26:** *The Russia House*, 7 & 10pm, Rm 26-100. *Laura*, 7:30pm, Rm 10-250. **Apr 27:** *Air America*, 7 & 10pm, Rm 26-100. **Apr 28:** *Buckaroo Banzai*, 7 & 10pm, Rm 10-250. **May 3:** *Home Alone*, 7 & 10pm, Rm 26-100. *The Band Wagon*, 7:30pm, Rm 10-250. **May 4:** *Kindergarten Cop*, 7 & 10pm, Rm 26-100. **May 5:** *Mystic Pizza*, 7 & 10pm, Rm 10-250. **May 10:** *Hamlet*, 7 & 10pm, Rm 26-100. *The Lady From Shanghai*, 7:30pm, Rm 10-250.

MUSIC

For recorded information on upcoming concerts and lectures call the MIT Music and Theater Arts Concert Line, x3-9800. Updated weekly.

Music at Noon Series Seeks Performers. The MIT Summer Session is once again presenting its Music at Noon Series to be held on Tuesdays and Thursdays in front of the Stratton Student Center from mid-June through early August. Student, staff, and faculty performers and groups in all genres are invited to apply. The series seeks a mix of classical, folk, jazz, pop, rock and other types of music. Contact Mark Harvey, x3-8778.

MIT Chapel Series*—Apr 25: Michal Schmidt, cello, 12pm, MIT Chapel.

Advanced Music Performance Concerts*—Apr 26: Two Solo Recitals: Eran Egozy '93, clarinet; Graduate student Michael Valdez, jazz piano. **May 3:** Two solo recitals: Dawn Watkins, harp; Karen Lee, 'cello, 12pm, Killian Hall.

MIT Faculty Series*—Apr 26: Aardvark Jazz Orchestra, directed by trumpeter Mark Harvey, 8pm, Kresge.

MIT Concert Band Spring Concert*—Apr 27: Works by Beversdorf, Dukas, Flagello, Jarrett, St. Clair, Siegmeyer, John Corley, director, 8pm, Kresge.

Rick Charette and the Bubblegum Band*—Apr 28. Music for Children. Sponsored by Technology Children's Center, 2:30pm, Kresge. Tickets, all seats, all ages, \$6. Tickets available at the door or call x3-5907 for more information.

Columbia University Orchestra*—Apr 28: George Rothman, conductor. Performing at MIT as part of an exchange program with the MIT Symphony Orchestra, 8pm, Kresge.

MIT Student Senior Recital*—Apr 28: Erika Anderson, bassoon, plays Bach, Beethoven, Francaix, Villa-Lobos, 8pm, Killian Hall.

MIT Jazz Bands*—May 3: Jamshied Sharifi and Everett Longstreth, Directors, 8pm, Kresge Auditorium. Tickets: \$1 at door.

MIT Chamber Orchestra Spring and Season Finale Concert*—May 4: Jonathan Pasternack, conductor. Program includes a new work written especially for the orchestra by an MIT freshman; Samuel Barber's *Knoxville: Summer of 1915* with soprano Kathleen Allen, MIT Music and Theater Arts, 8pm, Kresge Auditorium.

MIT Chamber Music Society*—May 5-8: Killian Hall. Call for times and programs: x3-9800.

THEATER

Call the Theatre & Dance Performance Hot-Line at x3-4720 for complete up-to-date information on theatre and dance performances at MIT.

When the Cold Wind Burns—Seeking technical help for production. Designers, crew, and other positions available. Production opens May 17. Sponsored by MIT Community Players. Call Paul Linton, Linc x5023.

Merrily We Roll Along*—Apr 25-27: The MIT Musical Theater Guild, 8pm, Sala de Puerto Rico, Student Center. Tkts: \$8; \$6 seniors & MIT community; \$4 students.

Scene Night*—Apr 26-28: MIT Shakespeare Ensemble presentation of student-directed scenes from plays by Shakespeare and others, 8pm, Killian Hall.

The Hapless Heroine*—Apr 26-28, May 2-4: Artistic License presents a Student Workshop Production of an original student written melodrama, 5:30pm, Kresge Side Lawn.

Student Written One-Acts*—May 2-4: Presented by Dramashop, 8pm, Kresge Little Theater. Tickets \$6, \$5 students, seniors.

Love Is Blind—May 2:** Theater Workshop for Minority Students. Original student-written play by melanie Lazaro '92. 7pm, Rm 6-120.

DANCE & MOVEMENT

MIT Dance Workshop*—May 3-4: Concert of student works with choreography by Lodi McClellan and Catherine Musinsky, members of Beth Soll & Co. 8pm, Sala de Puerto Rico.

MIT Ballroom Dance Club Workshops*—Apr 28: Beginning Samba, 1-2pm; Intermediate Quickstep, 2-3:30pm; Professional Swing 4, 4:30-5:30pm. **May 5:** Beginning Polka, 1-2pm; Intermediate Samba, 2-3:30pm; Professional Swing 4, 4:30-5:30pm. General Dance: 3:30-4:30pm, free. Membership through June 1991: Students, \$3, MIT/Wellesley affiliates, \$5; others, \$10. Workshop admission fees range from 50¢ to \$4 depending on membership and level. No partner necessary, info x8-6554.

MIT Folk Dance Club*—Three nights of dancing. Sunday: International Dancing, 7-11pm, Lobby 13, with Early Teaching from 7-7:30pm. Tuesday: Advanced Balkan Dancing, 7-11pm, Rm 491, Student Center. Wednesday: Israeli Dancing, 7-11pm, Lobby 13, with Early Teaching from 7-7:30pm. Info: x3-FOLK.

Aerobics Classes*—Sponsored by the MIT Dance Club. Every Mon, Wed, Fri, 6-7pm, Bldg W31 Dance Studio. \$4/class, beginners welcome. More info: Julia, 492-1369.

Yoga*—Ongoing classes in traditional Hatha and Iyengar style. Beginners: Mon, 5:10pm; Intermediate/Advanced: Mon, 6:30pm, Rm 10-340. For information call Ei Turchinetz, 862-2613.

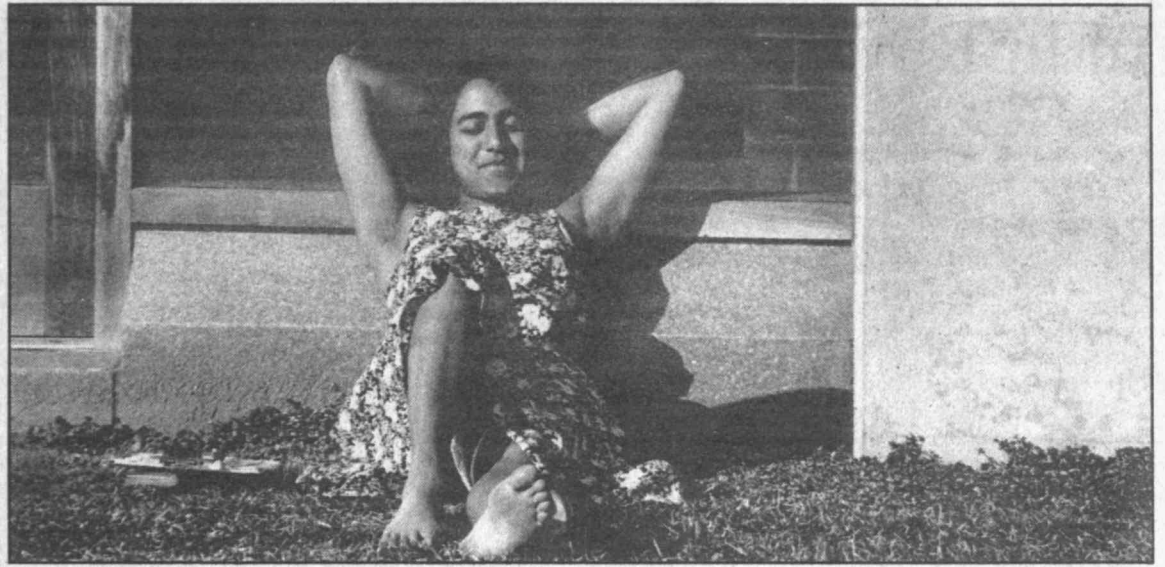
Kundalini Yoga*—Monday classes, 6-7pm. Rm 1-136. Beginners welcome. \$1/class. For information call Andy Rothstein 232-9961.

MIT Dance Workshop Classes*—An activity of the Theatre Arts program taught by members of the Beth Soll & Co. MIT's resident dance company. Beginning Modern Technique, M,W, 3:30-5pm, T-Club Lounge, Dupont Ctr; Intermediate Modern Technique, Tu,Th, 5:30-7pm, Walker-201; Composition/Improvisation, Tu 1-2:30pm, Walker-201; Technique/Repertory/Improvisation, Wed 11-12:30, Walker-201. Tap, Fri 12-1:30pm, Walker-201. Info: x3-2877.

EXHIBITS

LIST VISUAL ARTS CENTER

Mark Tansey: Art and Source. Four large-scale oils, together with numerous preparatory studies and source materials, form complex meditations on reality, illusion and representation. **Warren Neidich, historical inter)ventions.** Concerned with the implications of an unquestioning acceptance of photography's apparent neutrality, Neidich subverts historical accuracy by creating his own fictitious photo-documents which look



SUNNY REVERIE—Hemai Parthasarathy, a graduate student in brain and cognitive sciences, basks near the Whitaker Building. Photo by Donna Coveney

and read like the real thing. **Tourisms: suitCase Studies.** An installation by Elizabeth Diller and Ricardo Scofidio. A playful, inventive and challenging installation on the subject of travel and tourism in the electronic age. Exhibits run May 4 - June 30. **May 3:** Public Reception (for all three exhibits), 5-7pm. Open M-F 12-6pm, Sat, Sun 1-5pm.

THE MIT MUSEUM

MIT Museum Bldg (N52)—Affissi! Affiches! Plakate! Posters! Swiss Poster Art 1906-1990: Exhibit includes 90 posters for consumer products, tourism, art exhibitions, and public service by Swiss designers, reflecting the three dominant cultures of Switzerland. **Apr 26:** Opening reception, 5-7pm. **Apr 27:** Symposium: Swiss Poster Art: Origins and Design, 2pm. **Apr 27 - June 13.** **May 2:** Gallery Talk, see Seminars and Lectures. **Watercolors by Freddy Homburger:** Landscapes, primarily of Mexico and Maine by Freddy Homburger, physician, scientist, diplomat, artist. **Apr 26 - Sept 12.** **Doc Edgerton: Stopping Time.** Photographs, instruments, and memorabilia documenting the late Harold Edgerton's invention and use of the strobe light. Ongoing. **Light Sculptures by Bill Parker.** Vivid interactive light sculptures, each with its own personality and set of moods. Ongoing. **Holography: Types and Applications.** Scientific, medical, technical and artistic imaging drawn from the work of the Spatial Imaging Group at MIT's Media Lab. Ongoing. **Math in 3D: Geometric Sculptures by Morton G. Bradley, Jr.** Colorful revolving sculptures based on mathematical formulae. Ongoing. Tues-Fri 9-5; Sat-Sun 1-5.

HART NAUTICAL GALLERY

Ongoing exhibits: George Owen '94: Yacht Designer—Ship Models, Half Models in Naval Architecture. Ongoing. 77 Mass Ave, Mon-Sun 9am-8pm.

CORRIDOR EXHIBITS

Corridor Exhibits: Bldg 1 & 5, 2nd floor: **John Ripley Freeman.** Lobby, Bldg 4: **Norbert Wiener, Karl Taylor Compton. Community Service Fund, Ellen Swallow Richards. Women at MIT.** An overview of the admission of women at MIT. Five photographic panels with text documenting the circumstances that increased the number of women in the classroom since Ellen Swallow Richards. Bldg 6: **Laboratory for Physical Chemistry.** Bldg 4: **Edgerton's Strobe Alley:** Exhibits of high-speed photography. (Corridor Exhibit).

COMPTON GALLERY

Crazy After Calculus: Humor at MIT. Photographs, cartoons, and a collection of artifacts documenting a rich history of MIT wit and wizardry shown through "hacks,"—elaborate practical jokes involving humor and/or engineering technique. Through Sept 13. Hours 9-5 weekdays.

OTHER EXHIBITS

Institute Archives and Special Collections—Jerome C. Hunsaker, Father of Aeronautics at MIT: Chronicles his founding of aeronautics at the Institute; his design and construction of Navy airships and NC-4, the first airplane to cross the Atlantic, and his role in leading the Dept of Aeronautical Engineering from 1939-51. **The Tech Show:** "Engineering is interfering with fun...Wish my four year stretch were over and done." That's from 1947 but it could be sung today. Portrays an MIT institution with a 92 year history.

WELLESLEY EVENTS

LECTURES & EVENTS

Apr 25: "Berthe Morisot: Conversations with Faculty Authors," Anne Higonnet, Wellesley, Asst. Professor of Art, 4:15pm, Clapp Library Lecture Rm.

Send notices for Wednesday, May 1, through Sunday, May 12 to Calendar Editor Rm 5-111, before 12 noon Friday, April 26.

Awards & Honors

Two faculty members and a visiting scientist are among 143 artists, scientists and scholars to receive Guggenheim Fellowships for 1991-92. They were selected from nearly 3,100 applicants for awards totaling \$3.8 million. MIT recipients are:

Dr. Edward A. Boyle, professor of chemical oceanography in Earth, Atmospheric and Planetary Sciences, who will be on sabbatical at Gif-sur-Yvette, France, studying the global carbon cycles during ice ages.

Dr. Richard M. Dudley, professor of mathematics, who will make trips to the Mathematical Science Research Institute at Berkeley to pursue his interest in empirical processes.

Dr. Nancy Harrison Kolodny, professor of chemistry at Wellesley College and a visiting scientist at the Francis Bitter National Magnet Laboratory, who will carry out magnetic-resonance studies in ocular physiology.

Each year as May approaches, **Joseph S. Collins,** managing director of the Alumni/ae Association, makes his way around the Institute signing up sponsors for the Walk for Hunger. So successful was he last year that he raised more than \$1,000, one of fewer than 100 walkers to achieve that level of support. As a reward he was invited to the Walk's recent second annual "Thank-You Breakfast" donated to the Walk by the Bostonian Hotel.

Mr. Collins estimates that he has completed at least 15 of the 21 Walks for Hunger, and one or more of his children has accompanied him about 10 times. Mr. Collins will miss the Walk this year because he will be away on business. But his son Tim, a 1989 MIT graduate in management, will be carrying on the family tradition. Any Collins supporters who would like to sponsor Tim may call Mr. Collins, x3-8210, to make a pledge.

The STEPS (Science, Technology, Engineering and Pre-College Studies) program offered by the MIT chapter of the **National Society of Black Engineers** to minority high school students in Cambridge has won a League Leader award from the national Campus Outreach Opportunity League (COOL). The program enhances skills in math and science and is designed to show that science can be fun. The award—the only one given in the Exemplary Projects category this year—was received by **William Bankhead,** a senior in aeronautics and astronautics, at COOL's recent conference in New Orleans.

Jay R. Johnson, who is completing research for his PhD in physics, has received an award for the Outstanding Student Paper from the American Geophysical Union.

Mr. Johnson is working with Dr. **Tom T.S. Chang,** director of the Center for Theoretical Geo/Cosmo Plasma Physics in the Center for Space Research. His thesis work has centered on understanding the origin and characteristics of waves associated with ion conics in the Central Plasma Sheet.

Several MIT faculty members and former students received awards at the American Welding Society convention.

Dr. Koichi Masubuchi, Kawasaki Professor of Engineering and professor of materials science and ocean engineering, was elected a Fellow of the society in the first group ever of such fellows. He was honored for his contributions in the fields of welding of marine structures, analysis of residual stresses and underwater welding.

Dr. J.W. Elmer, a former graduate student at MIT, and **Dr. Thomas W. Eager,** Richard P. Simmons Professor of Metallurgy in the Department of Materials Science and Engineering, received the William Spraragen Award for the best research paper in the Research and Development Supplement of the Welding Journal during 1990. The paper, "Measuring the Residual Ferrite Content of Rapidly Solidified Stainless Steel Alloys," was the outgrowth of work done by Dr. Elmer for his doctoral degree at MIT.

In addition, Professor Eager and **Dr. Steven A. Gedeon** received the Warren F. Savage Award for original and innovative research resulting in a better understanding of the metallurgical principles related to welding. The award was given in recognition of a paper which was an outgrowth of Dr. Gedeon's doctoral thesis at MIT.

Professor **János M. Beér** of the Department of Chemical Engineering, scientific director of the MIT Combustion Research Facilities, has been honored recently by two groups.

The newly established Hungarian Academy of Engineering has elected him an Honorary Member. Professor Beér, a native of Hungary, was elected an Honorary Member of the Hungarian Academy of Science in 1986.

In addition, his colleagues in the International Flame Research Foundation have elected him Honorary Superintendent of Research. The foundation, a nonprofit applied research organization with nine national committees, including the US committee, supports combustion research at the organization's research center in the Netherlands. Professor Beér has had a long association with the foundation as research superintendent. In that post he has been responsible to the foundation's board for planning the organization's research program.

Audit Reviews Continue for Fiscal Years 1986-90

(This is the second article in an occasional series on indirect cost matters.)

■ By James J. Culliton

Vice President for Financial Operations

MIT, as a major research university, conducts research for the government and other sponsors under "Cost Principles for Educational Institutions," issued in 1979 by the Office of Management and Budget (OMB) in Circular A-21. This document provides the principles for determining the costs applicable to research and development, training, and other sponsored work performed by colleges and universities under grants, contracts, and other agreements with the federal government.

The federal agency responsible for the negotiation and approval of MIT's direct and indirect costs to government grants and contracts is the Office of Naval Research (ONR), and these costs are audited by the Defense Contract Audit Agency (DCAA). This circular (A-21) and responsibilities for governmental review have been in effect at MIT for many years.

DEVELOPMENT OF MIT'S INDIRECT COST RATE

MIT traditionally submits a proposed indirect cost rate (to pay for charges not easily allocated to each research project, such as costs for utilities and space, academic administration, general administrative costs, etc.) for the next year to ONR and DCAA and final approval is given for an indirect cost rate to be used by MIT in contracts and grants for that year. At the conclusion of the year, the actual costs are submitted to ONR, audited by DCAA, and approval is given to these costs when the audit for that year is completed. If there is a difference between the cost used to submit the proposal and the final audited cost, this difference is "carried forward" into the next year. Thus, *there is no financial windfall to either MIT or the government because of any differences in actual and proposed costs.* This procedure in collecting indirect costs is termed a "fixed rate, with carryforward provision". As an example, MIT's campus indirect cost rate for Fiscal 1991 and 1992 has been proposed, and accepted by ONR, at 57.5 percent of modified total direct costs (MTDC). At the end of each year, ONR and DCAA will review and audit actual costs to determine what amount needs to be "carried forward" to adjust the rate in future years. For Fiscal 1990, the indirect cost rate used was 62 percent of the MTDC; at the completion of the year and analysis of expenses by MIT, the proposed final rate to DCAA and ONR was 62.36 percent. This analysis is presently being audited by DCAA.

It is important to note that the 62 percent rate does *not* mean that for each dollar of research, MIT spent 62 cents for indirect cost in Fiscal 1990. Because of governmental mandate, certain direct expenses are not charged with indirect costs, therefore, actual indirect costs amount to only 30 cents for each dollar of research.

The amount of indirect cost recovered from research sponsors for MIT expenses also depends on the nature of the expense and who benefits. Recovery ratios for specific cost items are developed in certain mandated pooled costs in accordance with circular A-21. These eight cost pools at MIT (and the allocated percent of MTDC to each pool constituting the 62 percent rate in Fiscal 1990) are: building use (6.5 percent); equipment depreciation (6.6 percent); operations and maintenance (23.5 percent); departmental administration (7.7 percent); general administration (10.1 percent); sponsored projects administration (2.3 percent); library (2.8 percent), and student administration (2.5 percent). The recovery ratio of each cost pool also varies; for example, general administration is allocated on a ratio of research dollars to instructional dollars (since MIT has significant research effort, the general administration allocation is approxi-

mately 68-70 percent to research, the Registrar's Office is allocated at 24.5 percent to research, while faculty residence accounts in the dormitories, as a subset of student administration, is allocated only at 5.4 percent to research at MIT).

AUDIT BY DCAA AND REVIEW BY DINGELL COMMITTEE

Primarily because of budgetary pressures on DCAA staffing levels, the audits of MIT's cost submissions since Fiscal 1986 had not been completed by DCAA by the end of calendar year 1988. This backlog in DCAA audits is not unique to MIT. DCAA and ONR recognized the problem caused by staffing levels and jointly sponsored a national University Coordinated Audit Program (UCAP) to test and demonstrate the feasibility of coordinating audits performed by various federal, state, internal and external audit organizations. MIT was chosen as one of the pilot universities in this project in March 1989. This program has been working very well at MIT, and while the focus has been to assure comprehensive and coordinated audits in the future, DCAA established a priority of completing its audits at MIT for the five-year period Fiscal 1986-1990 by May 31, 1991.

In 1990, the Subcommittee on Oversight and Investigations of the US House of Representatives Committee on Energy and Commerce, chaired by Representative John D. Dingell of Michigan, began reviewing indirect cost recovery practices on federal research contracts at US universities. An in-depth review of these practices was conducted at Stanford University, and MIT has been informed in a letter from Representative Dingell, dated April 17, 1991, that the Committee has begun a similar in-depth review at MIT.

MIT, along with certain other universities, was also asked by the Committee on March 21, 1991, to provide information on amounts paid by MIT to the Association of American Universities (AAU), and the extent that this payment had been allocated to federal research. MIT replied, with the information requested, on April 9, 1991. The dues to AAU have always been considered by MIT as allowable costs (and have been so audited in the past); during the five-year period requested by the Committee, 1986-1990, \$88,100 of these payments was allocated to research sponsors.

An April 8, 1991, letter to MIT from Representative Dingell also requested MIT to provide a description of audits and reviews begun on overhead accounts to identify and remove inappropriate items similar to those found in the Stanford review, the scope of these reviews, and any interim findings. Additionally, the committee has asked for a description of reviews begun by MIT to ensure that present and future allocations of costs to the government are or will be accurate, reasonable, and adequately supported. MIT provided this information to the Committee on April 22, 1991.

Although MIT officials had been meeting extensively with DCAA auditors in the process of completing audits in the timetable established by DCAA in the UCAP process, MIT was contacted by DCAA on March 15, 1991, to review specific accounts and items considered inappropriate (even if allowable) as a result of the ongoing Congressional review of reimbursement procedures and practices. MIT agreed, in consultation with DCAA, to withdraw these charges for the years under audit whether or not these costs are permitted under previous standards or circular A-21 interpretation.

An extensive review of specific MIT accounts was expeditiously conducted by MIT and we have provided DCAA with the findings and certain other documents, i.e., a listing of accounts and expenses that MIT has agreed to withdraw for the Fiscal years 1986-1990, plans for development of a methodology of ensuring further cost disallowances based on sampling techniques, and a policy statement on how

MIT will account for new definitions of unallowable or inappropriate charges for MIT. Additionally, we have withdrawn a number of other accounts which, although not specifically requested for review by DCAA, could be interpreted similar to those now deemed inappropriate, such as senior officer expense accounts, faculty residence program accounts, etc. This material has been provided for DCAA review and has been included in our response of April 22, 1991, to the Congressional committee.

MIT agreed to withdraw these charges for a number of reasons, such as the fact that negotiation, that may involve the withdrawal of costs, is a regular part of an ongoing audit process; that the Congressional committee had specifically requested universities to review their charges to the government and remove any of these inappropriate costs; that the percentage of the total costs removed is not large in relation to total cost reimbursement; and, most importantly, the desire to avoid any risk of continued damage to the long-standing government-university partnership so vital to national research by not withdrawing these charges identified by the Congressional committee as inappropriate or by arguing what specific costs should, or should not, be considered allowable expenses under circular A-21 rules.

In the five-year period under audit, Fiscal 1986-1990, MIT received \$3.2 billion from research sponsors on and off campus including Lincoln Laboratory; \$2.7 billion for direct expense reimbursement and \$482 million for indirect expense reimbursement. Our initial review of accounts for these five fiscal years has resulted in items to be withdrawn from sponsor reimbursement totaling \$731,000 as of April 22, 1991 (amounting to less than \$150,000 per year and significantly less than one percent of the total indirect cost reimbursed over the period). This review of accounts will continue.

Additionally, we will review with DCAA, for their input and concurrence, a validated process being developed by the MIT Audit Division to apply to all overhead accounts based on statistical sampling. Standard accounting practice establishes expense control procedures on items of major cost impact, and standard auditing practice establishes the same, along with sampling techniques to assure that mistakes and errors are minimized. This process in accounting and auditing has been used by MIT, DCAA, and other audit agencies to assure adequate financial control with a minimum of administrative cost. It is administratively very expensive to review every single entry in an organization such as MIT with an operating budget of over \$1 billion and approximately 17,000 accounts.

Financial control at MIT is exercised jointly by Academic and by Support Services Departments and by the Comptroller's Accounting Office (CAO) for many costs by use of proper object code listing. Certain other costs, which are specifically excluded from reimbursement by federal regulation or MIT policy, are the responsibility of the CAO to exclude prior to submission for reimbursement.

DESCRIPTION OF COSTS TO BE WITHDRAWN

Some of the items found in the detailed review of accounts were errors: items that should not have been submitted for reimbursement, such as object code misclassifications, and foreign travel (even if properly allocable to research there is a requirement for prior approval for all foreign travel).

The remainder of expenses withdrawn were of a category newly defined as inappropriate. This expense category includes receptions, memorabilia, farewell functions, gifts, flower arrangements and catering charges. In some cases, entire accounts were withdrawn, such as senior officer expense accounts. Additionally, all expenses related to catering, flower arrangements, service, etc. for the MIT

President's house were also withdrawn. Statistical sampling will be used to determine additional withdrawals for the entire universe of overhead accounts after review with DCAA.

Unquestionably, accounts at MIT also contain errors where valid and allocable expenses have not been charged to research sponsors. Our review of the accounts as indicated above has been directed only to respond quickly to the requests of DCAA and the Congressional committee to determine charges in the inappropriate category that we have decided to withdraw.

MIT COST SAVING TO RESEARCH SPONSORS

While MIT research policy has always been to assure full cost recovery for properly allocable research expense, we have also consistently not established or used procedures that would take advantage of latitude in interpreting A-21 or other government rules. An example of MIT not taking advantage of a regulation that would have favored a higher reimbursement relates to the allocation of cost for one element of indirect cost, departmental administration (DA). In 1988, the government, in an effort to reduce costs to the government, set a fixed rate for faculty administrative effort in one of the elements of indirect cost, DA, at 3.6 percent of MTDC. If we had implemented this rate (which required no documentation), instead of a lower DA rate applied by MIT, we would have experienced a windfall increase in recovery of over \$2 million at the time of implementation. We did not implement the fixed rate because it did not appear proper to take advantage of a government change designed in principle to save costs of research paid by the government. To date, this decision by MIT has meant that more than \$8 million of allowable expense has not been recov-

ered from research sponsors for the Fiscal years 1988, 1989 and 1990.

MIT's agreement not to recover this cost is outlined in a Memorandum of Understanding (MOU) between MIT and ONR, one of the six active MOUs between MIT and the government. The number of MOUs between each university and the government and the issue of who benefits from each MOU were major topics of controversy during the Stanford investigation.

MIT INITIATIVES AND FUTURE ACTIONS

MIT has begun a number of initiatives to ensure that allocations will be accurate, reasonable, and adequately supported, as requested by the Congressional Committee. These measures include the issuance to all account supervisors of an update on the process for identifying and screening unallowable costs as now defined in the November, 1990 amendment to the Defense Federal Acquisitions Standards (DFARS), which most likely will be incorporated into other agency acquisition standards and circular A-21, the revision by the MIT Audit Division of its audit procedures to include a screening process for unallowable costs in its program of departmental reviews, and the undertaking of a series of instructional programs to employees responsible for processing transactions to assure understanding and compliance with the enhanced screening and processing methodology.

MIT will continue to interact cooperatively with DCAA, other agencies, and congressional committees to resolve issues of past year audits and definitions of inappropriate expenses. We will also work with these groups to improve and assure financial controls and audits are exemplary in safeguarding public funds for future cost submissions.

Sports at MIT

TENNIS

The men's tennis team has had a great deal to celebrate recently. The team captured the first Constitution Athletic Conference title recently by defeating WPI and Coast Guard. The team is currently the number one ranked team in New England Division III (tied with Amherst), and number one singles player Alexis Photiades, a senior from Nicosia, Cyprus, is ranked third in New England. Photiades has been featured in articles in both the Intercollegiate Tennis Coaches Association Newsletter and in the upcoming May issue of World Tennis Magazine for his skill as both a tennis player and as a member of the Cyprus National Ski Team.

TRACK AND FIELD

For the second consecutive week, MIT pole vaulter Matt Robinson of Olympia Fields, Ill., has broken the Institute freshman record in the event. Robinson cleared 15'0" in a recent junior varsity meet against the Naval Academy Prep School. Robinson bettered his personal best 14'8" which he had set only two days earlier in a triangular meet victory over Bates and Bowdoin. The Engineers lost an outdoor meet for the first time since the opening meet of the 1983 season recently when they placed second to the University of Connecticut in a triangular meet with the University of Massachusetts. The loss to Division I UConn is the first since the team lost to the University of New Hampshire in April, 1983. The Engineers have not lost to another Division III school outdoors since a defeat by WPI in 1980.

BASKETBALL

MIT senior basketball star David Tomlinson has been awarded a prestigious NCAA Postgraduate Scholarship. Tomlinson, a senior from Colorado Springs, Colo., is the only New England player, and one of only 15 male players nationwide, to receive the honor. Tomlinson will attend medical school at the University of Colorado in the fall. In the recently released NCAA Division III Basketball Record Book, it has been discovered that the MIT men's team holds the national record for rebound margin in a single game. In a February 21, 1990, game against Emerson College, the Engineers outrebounded Emerson by a margin of 56 caroms (74-18). This is believed to be the only national record held by an MIT team, although swimmer Yvonne Grierson's 100 yard butterfly national record of 56.18 seconds set in 1988 still stands.

BASEBALL

MIT baseball coach Fran O'Brien is listed among the Division III leaders in wins by an active coach. O'Brien's 211 wins entering the 1991 season placed him 34th on the list. O'Brien has piloted the 1991 edition of the Engineers to the finals of the first Constitution Athletic Conference Baseball Tournament. MIT defeated Norwich University (3-2) and WPI (5-4) with game winning rallies in the bottom of the last inning in each game. Rain washed out the finals which were scheduled for April 21. The game will be played either April 27 or May 2 depending on the outcome of a semi-final game between WPI and Babson.

Roger Crosley

Indirect Costs: \$731K Withdrawn Over 5 Fiscal Years

(continued from page 1) implement the fixed rate because it did not appear proper to take advantage of a government change designed in principle to save costs of research paid by the government." Applied to the unique situation of MIT, this national standard rate would have provided MIT a windfall. Mr. Culliton said, "To date, this decision by MIT has meant that more than \$8 million of allowable expense has not been recovered from research sponsors for the fiscal years 1988, 1989 and 1990." The agreement to limit MIT's recovery of this portion of indirect cost is outlined in one of the six Memoranda of Understanding (MOU) which are currently in effect between MIT and the government.

Mr. Culliton said, "Although MIT research policy is to assure full cost recovery for properly allocable expense, we have consistently not established or used procedures that would take advantage of latitude in interpreting government accounting rules."

President Vest on April 22 wrote to Congressman Dingell, who is the chairman of the House Energy and Commerce Committee and its subcommittee on oversight and investigations. In addition to removing accounting errors, Dr. Vest said the ongoing review will remove, for the full five years, costs (such as alcohol) that are unallowable under the Department of Defense accounting regulations as revised in November, 1990.

The review will also remove costs that now are considered inappropriate even though allowable under the regulations in existence at the time. Dr. Vest said a further review will be made in order to extrapolate the findings statistically to the overhead recovery

accounts. The plan will then be reviewed with the federal auditors in the Defense Contract Audit Agency (DCAA).

Rep. Dingell informed MIT in an April 17 letter that the sub-committee has begun the in-depth review of MIT accounts which has been anticipated for some time.

Dr. Vest said that MIT has made "substantial progress" in updating the process for identifying and screening unallowable cost. "We have also asked the MIT Internal Audit Division to revise its audit procedures to include a review of the screening process for unallowable costs. Additionally, we plan to offer a series of instructional programs to employees and staff responsible for processing financial transactions to ensure understanding of and compliance with the enhanced screening and processing methodology," Dr. Vest wrote.

Vice President Culliton, in a separate statement, said MIT agreed to withdraw the charges for a number of reasons. He noted that negotiations that may involve the withdrawal of costs is a regular part of an ongoing audit process, and that the Dingell Committee had specifically requested universities to review their charges, following the March hearing involving Stanford University. The most important point was "the desire to avoid any risk of continued damage to the longstanding government-university partnership so vital to national research," he said.

Mr. Culliton said some of the items found in the detailed review of accounts were errors that slipped through—items that were intended to be blocked in the accounting process, such as some legal costs, or that should not have been

submitted for reimbursement. These included technical errors such as some carryforward funds which were misclassified, and foreign travel. Foreign travel is only allocable to research if there is formal prior approval. A number of small accounts of senior officers were withdrawn.

The remainder of the expenses withdrawn were of the allowable but inappropriate category, such as receptions, functions, memorabilia or gifts, flowers, and catering charges. These are costs that were allowable and approved by the government in the past as indirect expenses of research under the A-21 regulations, but have now been called into question.

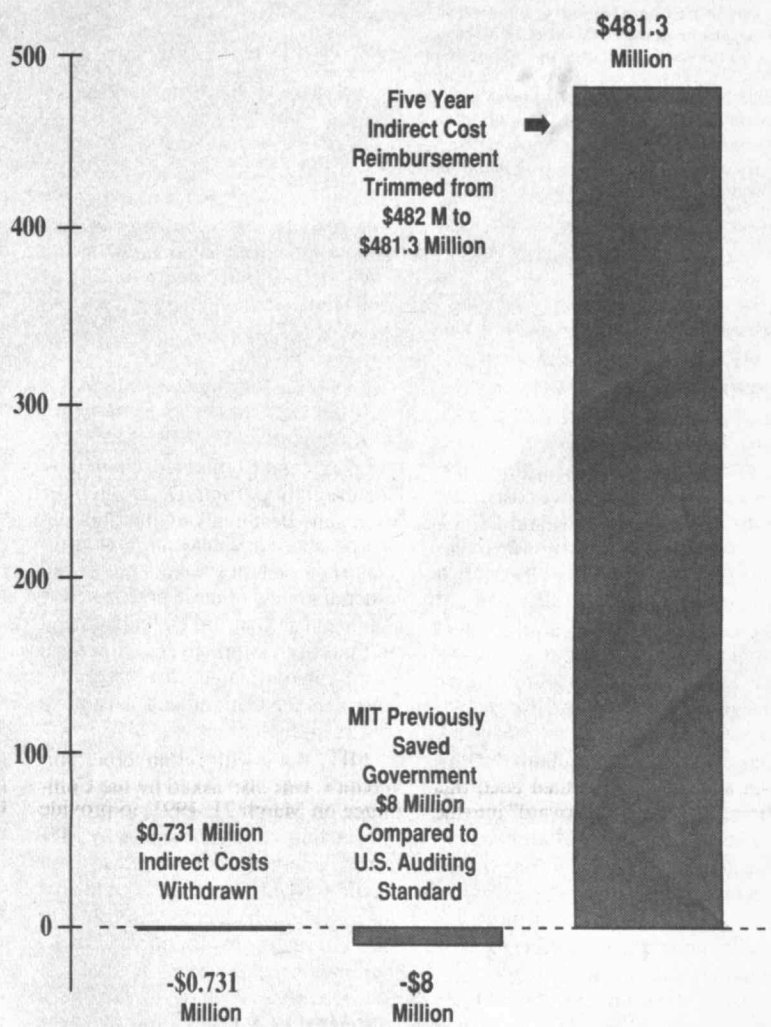
Reimbursement for the costs of official functions—dinners, dinner meetings and receptions—at the president's house was withdrawn. The savings average \$24,000 a year, a total of \$120,500. Costs withdrawn from the President's House involved catering, food, flowers, liquor, rental of chairs and printing of programs for official functions. The total included an average of \$2,700 a year—about \$13,600 over five years—for flowers for the public meeting and reception areas downstairs in the President's House. The president's living quarters are in a private apartment upstairs.

MIT withdrew from reimbursement—as it had intended to do voluntarily except for an accounting error—a sum of \$27,317 in legal expenses for the law firm of Kirkpatrick and Lockhart, which was retained by MIT to assist MIT officials in the Congressional hearings before Rep. Dingell involving former Professors David Baltimore and Thereza Imanishi-Kari.

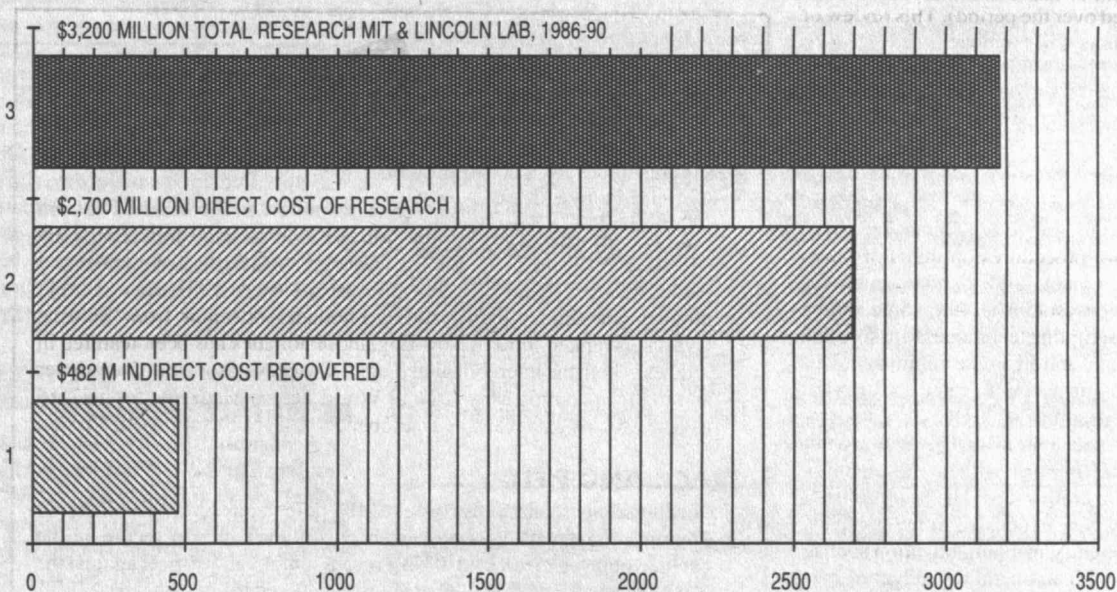
Expenses that have been allowable under federal regulations but were deemed inappropriate by MIT were withdrawn, including a 1990 MIT Corporation (Board of Trustees) reception (\$13,751 withdrawn); several foreign trips, including one trip regarding insurance negotiations with a Barbados-based firm (\$1,535 withdrawn); various memorabilia and gifts (about \$2,000 a year, totaling about \$10,000 over five years).

Mr. Culliton commented, "Unquestionably, accounts at MIT also contain errors where valid and allocable expenses have not been charged to research sponsors. Our review of the accounts... has been directed only to respond quickly to the requests of DCAA and the Congressional committee to determine charges in the inappropriate category that we have decided to withdraw."

MIT WITHDRAWS \$731,000 OF \$482 MILLION INDIRECT COST RECOVERY OVER 5 YEAR PERIOD; PREVIOUS STEPS SAVED GOVERNMENT \$8 MILLION



MIT & LINCOLN LAB RESEARCH 1986-90 TOTALS \$3.2 BILLION; INCLUDES \$482 MILLION FOR INDIRECT COST



Children's Center to be Celebrated

(continued from page 1) five years. This raised the capacity of the combined Eastgate and Westgate facilities to 75 children and motivated changing the name in 1973 to Technology Children's Center to reflect the broadening of services. An administrative restructuring of the MIT child care programs in 1981 led to a closer working relationship and greater resource sharing between the center and the Child Care Office.

Today, the center services 69 children from 67 families. Of the 63 families affiliated with MIT, 28 are staff, 21 are graduate students, 10 are faculty, and four are postdoctoral associates. Because of the international nature of the MIT community, the center's children come from all corners of the world, including Korea, Japan, Canada, Spain, France, India, Turkey, Pakistan, Brazil, and China. For many of those children, the center provides their first immersion experience in the English language, while for most of the American children, the center provides their first glimpse of cultures from other

countries.

The center's philosophy is based on respect for children, their cultural background, developmental level, natural curiosity, and eagerness to learn. The center strives to provide children with opportunities to watch, to touch, to take part in, and to experience with their whole being. Interested parents may contact Olga Slocum, the director of the center, at x3-5907 for more program information.

Additional MIT parent support services are available through the MIT and Lincoln Laboratory Child Care Offices which provide child care resources and referrals, parent-child activity programs and parenting workshops, and coordinate a network of on-campus, home-based family day-care providers.

Mr. Charette, the singer to be presented at the 25th Anniversary Celebration Concert, is an award-winning children's musician who has been performing throughout the nation for the last 15 years. His sixth album, "Chickens on Vacation," which takes

listeners on an adventure with some thrill-seeking chickens, will be released this year. Mr. Charette was recently featured in a prize-winning one-hour television broadcast entitled "An Evening with Rick Charette." He has appeared with the Bubblegum Band in concerts such as Riverfest, a major festival in Little Rock, Ark., and Imagination Parade, a live radio broadcast from New York City, and has toured extensively throughout the eastern US and Canada. His albums have been featured in Entertainment Weekly and Billboard Magazine.

Tickets for the concert are \$6 (all seats, all ages), and are available at the MIT Museum Shop in the Student Center as well as at the door. For more information call x3-5907.

(This article was prepared by Associate Professor William K. Durfee of the Department of Mechanical Engineering, whose two children attend the Technology Children's Center. Professor Durfee is also coordinating arrangements for the center's 25th anniversary concert.)

ANOTHER FLIGHT

Daedalus Soars in Space

An earlier Tech Talk story about the recent space shuttle Atlantis flight that carried astronaut Dr. Jerome Apt, III, (MIT PhD, physics, 1976) into space, failed to mention that another MIT graduate was also aboard—the shuttle pilot, Lt. Col. Kenneth D. Cameron, USMC. He received both his SB and SM degrees from the Department of Aeronautics and Astronautics. Before his flight Col. Cameron contacted Professor Eugene E. Covert, one of his former teachers in the Department, to request a small item from the Department to take with him on the mission. Professor Covert and Assistant Professor Mark Drela decided on a small plastic fragment from the wing of MIT's human-powered Daedalus aircraft that flew over the Aegean Sea from Crete to Santorini in 1988.

Now that Atlantis has returned, leaving the 17-ton Gamma Ray Observatory in orbit, the historic MIT token from space will be displayed in a suit-

able place within the Department. Little did its designers know that at least part of Daedalus would travel so far.

Col. Cameron graduated from Rocky River High School, Ohio, in 1967. While attending MIT, he enlisted in the Marine Corps in 1969 and was assigned to Vietnam for one year as a platoon commander with the 1st Battalion, 5th Marine Regiment, and later with the Marine Security Guards at the US Embassy in Saigon.

An experienced pilot, Col. Cameron has logged more than 3,000 hours flying time in 46 different aircraft. He received his wings in 1973 at Pensacola, Fla., and was assigned to Marine Attack Squadron 223, flying A-4M Skyhawks. In 1983, he graduated from the Navy Test Pilot School; he was assigned as project officer and test pilot in the F/A-18, A-4, and OV-10 airplanes with the Systems Engineering Test Directorate at the Naval Air Test Center.

Eugene F. Mallove

Egypt Conference Set for Boston

Several speakers from MIT will participate in the annual meeting of the American Research Center in Egypt being held in Boston on April 26-28.

One of the host organizations is The Aga Khan Program for Islamic Architecture at Harvard and MIT. Its director, Dr. Barbro Ek, is one of the organizers for the conference, which focuses on the study of ancient and modern

Egypt and where the latest archaeological field reports of work in Egypt are given.

MIT speakers will include Nasser Rabbat on the "Concept of Qasr in Medieval Cairo"; Sherifa Zuhur on "Politicizing Gender in Contemporary Egypt," and Khaled Asfour on "Westernization within a Traditional Context."

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 approximately 30 words) per issue and may not be repeated in successive issues. All must be accompanied by full name and extension. Persons who have no extensions or who wish to list only their home telephone numbers, must come in person to Rm 5-111 to present Institute identification. Ads using extensions may be sent via Institute mail. Ads are not accepted over the telephone.

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

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

Deadline is noon Friday before publication.

■ FOR SALE

Apple ImageWriter in gd cond, dust cover incl. \$175. Eulalia x3-4140 or 864-6838.

Glass hutch, 43"x18"x78" pine, early Am. finish, adj shelves, pd over \$400, will sell for \$250 or bst. Aline x3-5393.

Clarinet, Signet, rarely used, gd cond, \$90. Ryan x5-6664.

Mt. Auburn Club membership: tennis, squash, pool, exercise mach, aerobics, etc., on Watertown/Cambline, moved, must sell, \$150 (save \$113 off reg). Meredith x3-1675 or 617-494-1533.

Antique solid mahog glassed-in bkcase w/elegant detail, ball & claw ft, 63"hx36"wx20"d, exc cond, photo avail, \$850. Kathy x3-8403.

Sofa, hide-a-bed in gd cond, for pick-up after 4/29, \$20 or bst. John x3-5271.

Acoustic guitar: Ovation custom Balladeer, passive electronics, mint cond w/Ovation hard shell case, exc buy at \$400 or bst reas offer. Call 617-233-1690.

Black & red bar w/2 stools, 14"x48"x38", \$30 or bst. Fran x3-0424.

Brand new contemp white camel back sofa & beige leather chair & ottoman, orig \$2800, ask \$1000. Terry, Draper x8-4062.

Sears Kenmore elec dryer, hardly used, \$350 or bst. Call x8-6435.

11-mo purebred Norw Elkhound, exc watchdog, grt w/kids, all shots & papers, ft student must sell, best home/offer combo will take "Duke." John, Linc x3541 or 617-862-4809 or Rich 413-549-6951.

Lufthansa airline ticket 1-way Boston to Frankfurt, Germany, May 13, \$300 or bst. Erika x3-6138.

Carpet, lt blue, gd cond, 11x12, \$65. Paul, Linc x3155 or 893-2841.

Cosco infant car seat, \$15 or bst; humidifier, \$15 or bst; 19 quart 10W40 Havoline oil, all for \$10. Dominique x3-3416 or 864-6637.

Persian rugs: Hamadan 2'6" x 4'2", \$250; Hamadan 2'8" x 3', \$225; Dargazine 8' x 5', \$675; Indian Oriental 5' x 3', \$50; child carrier for bikes, \$15. Call x3-6081.

M's 10-sp bike, \$35; F's 10-sp, \$55; air cond, casement, \$125; air cond, reg, \$55; sm desk, \$45; coffee tbl, \$35; twin mattress, \$15; misc chairs, \$5-15; ktchn tbl, rd, \$35. Call x3-3175 or 332-8251.

Sharp stereo cassette system, 2 spkrs, \$50. Joan x3-4080 or 942-7105.

Multitech 1200 baud ext modem, \$60; mouse, \$20; PC Tools v6.0, \$60. Call 497-1479 aft 5pm.

Two 1-way tickets to San Francisco (1M, 1F), \$100 ea. K. Konner x3-6474.

HR16 drum mach, \$250; Kawai R-100 digtl drum mach w/CP2 electron drum ROM chip, \$250; Simmons MTx9 drum expndr, trigger in/out & midi, \$200. Rick, Draper x8-2919 or 254-3446.

Serta Premium Pedic 1000 mattress, box spring, frame, \$70. Call 266-5318.

Leaving country, must sell! Apt-szd refrig, \$100; Q-sz futon w/frame, \$150 or bst; sm tbls, \$10; ktchn tbl & folding chrs, \$40. Call 484-7422 aft 8pm.

Panasonic answering mach, \$50; Panasonic programmable phone, \$20; other items incl luggage & camping gear. Mark 492-1341 (a.m. bst).

■ VEHICLES

1968 Chevy Nova, 2-dr, 6 cyl, auto, green, nw batt, recent tune-up, gd tires w/nw spare, gd cond, v little rust, \$1200 or bst. Call 924-4488 or 924-7692 aft 5pm.

1973 Honda CL 360, 6-sp, black, runs well; same parts bike; 1973 CL 350 blue parts bike (some parts interchangeable); \$200 takes all. Rick 395-6496 lv mssg.

1981 Chevy C10 pickup, 3-sp, 6 cyl, 59K, beige w/matching Glasstite cap, runs exc, \$2200. Stu, Linc x2116 or 603-895-9463.

1982 Corolla, 4-dr, 4-sp, AM/FM stereo, 86K, \$650 or bst. Call x3-4911.

1985 Dodge Omni, 61K, standard, ps, white, 1.6l engine, avail end April, \$1300. Damien x3-3146 or 623-0103.

1985 Renault Encore, 68K, standard, Sony AM/FM/cass, nw batt, well maint, \$1700. Call 241-5182.

1985 VW Golf, 2-dr, ps, sunfr, high mileage, exc cond, 1-ownr, \$2700. Polly x3-7190.

1985 Toyota Corolla LE, 4-dr sedan, 5-sp, a/c, ps, pb, cc, tilt wheel, AM/FM/cass, Z-lok alarm sys, well-maint, 106K, \$2000 or bst. Jeff x3-9487.

1986 VW Jetta, 4-dr, 5-sp, 45K, sunfr, removable JVC, brand new exh, new Michelin r trs, exc cond, \$4300 or bst. Heather x3-4861.

1987 Mazda 626 LX coupe, 5-sp, 56K, a/c, Chapman lock, AM/FM/cass, pw, pl, ps, pb, cc, white w/lt blue int, great cond. Call x3-8707 or 617-662-7168.

1988 Suzuki Samurai, 32K, grt shape, nw exh, Alpine A/D.S Blaupunkt stereo, 4x4 convert ski rack, 1 ownr, well maint, \$4500 or bst. Jonathan 787-5821 aft 7pm.

1989 Honda CRX Si, 12K, bought nw 5/90, silver, 4-spkr, removeable stereo, UNGO alarm, 5-sp, pwr sunfr, alloy wheels, exc cond, moving must sell, \$9100 or bst. Alan 267-8670.

1990 Mitsubishi Galant 4-dr sedan, bought 6/90, 2l, 4 cyl, auto, overdrive, a/c, auto seat belts, AM/FM/cass stereo w/6 spkrs, nose mask, 17K, \$10,900. Call 237-6084.

1990 Kawasaki EX 500, grt cond, v low miles, blue/white, pd \$3400, will sell for \$2500. Call 868-6369.

■ HOUSING

Arlington: rm for rent in lrg home nr lake & golf course, 15 min Hvd Sq, furn, linens, own TV & refrig, use of ktchn, w&d, prkg, avail now, bus to Alewife. Call x3-2534 or 648-7425.

Arlington, E: 6 sunny rms, completely renovated, 5 min from T, off-st prkg, \$975+. J. Pavone, x3-1322.

Arlington, E: 2 apts: 1) 9 rms, 2nd & 3rd flrs, 5BR, nr Mass Ave & bus, \$900+; 2) 5 rms, 1st fl, 2BR, nr Mass Ave & bus, \$700+. Both avail immed. Call 321-2078 aft 5pm.

Back Bay: eleg 1BR duplex condo, stained glass, fpic, d/w, hdwd, laundry, \$900. Camb: sunny, v lrg beau 2+BR, 2b, deck, w/d, hdwd, prkg, \$1750. Avail 6/1. Call 547-6862 or 267-4794.

Beacon Hill: studio summer sublet, 6/1-8/31, v nice main rm, sep ktchn, priv entry, sep hall w/ storage, bath, freshly ptd white, hdwd flrs, bike stor, \$590 incl. Call 742-0924.

Cambridge: summer sublet, M/F, poss fall, 1BR in beau sunny furn 3BR condo, gar & off-st prkg, walk to MIT, Hvd, Central, BU, 5/15-9/1, \$350/mo. Lisa 354-6942.

Cambridge: spacious 3BR, 2b, lrg, v sunny ktchn, laundry, 10 min walk to Kendall, \$1275/mo. Call 864-7725.

Cambridge: Kendall, walk to T (Red & Green), 3-fl townhse, 3BR, centair, 2b, gar, yd, fully equipped ktchn, microwave, d/w, disp, w/d, no pets, avail 6/1, no fee, \$1500. Call 617-491-0992.

Cambridge: summer sublet 7/1 - 9/1, exc resid nbrhd nr T, 2BR, lrg LR, grand piano, 1 1/2b, patio, deck, w/d, d/w, disp, exc for visiting fac. Call 354-4551.

Cambridge, E: sunny studio w/lrg eat-in-ktchn in quiet, safe nbrhd, 10-min walk to MIT, also close to bus & Green Line, \$475+. Annie x3-7036.

Cambridge, E: spacious, sunny 3-decker for sale, nr Courthouse & MIT, 5 rms per apt, skylights, high ceilings, arch detail, \$270,000. Call 577-8905.

Cambridgeport: summer sublet in lrg, sunny hse w/ yd, friendly, independent 5-person furn hse, nr

river, MIT, BU, all amens, 2LR, 2 1/2 bath, prkg, 5/15-9/1, \$350 neg. Mary 547-1591.

Cambridgeport: sublet for July/Aug, 2BR apt, nr Green & Red lines, Hvd, MIT, BU, Stop & Shop, on st prkg, \$656/mo + util. Call 864-5975.

Cape Cod: vacation, Bass Rvr, 4BR mod home, 3 blocks to ocean beach on Nantucket Sound, avail May 1 - Oct 1, \$700/wk. Stanley x3-4288 or 617-643-0771.

Cape Cod: N. Eastham, 2BR cape, 1/2 mi to Bay, deck, outside shower, w/d, d/w, 1 wk \$575, 2 or more \$550/wk. Call x3-3492 or 899-4253 lv mssg.

Charlestown: 1BR + den, eat-in-ktchn, w/w, gd closet space, quiet nbrhd, no dep or sec, \$650/mo+. Margy or Frank, Draper x8-2828 or 242-4626.

Eastman/Grantham, NH: Yankee barn home, 2 1/2 baths, 6 rms, 2-car gar, sun deck, screen porch, close to sailing, golfing, skiing, hiking, \$210,000. Bill, Linc x7187 or 603-863-9170.

Everett: summer sublet avail, mid-May till 8/31, spacious 2BR, fully furn, close to everything, delightful family nbrhd, \$625 incl cable TV & util. Rob x3-2690 or 394-0618.

Maine: island hse, ocean vw, equipped, mod bath, quarry swimming, cycling, walk to shops, grt restaurant, nature preserves, 3.5 hr N of Boston, \$360/wk. Call x3-3490 or 547-1311.

Medford: 6 1/2 rm, 3 lrg BR, nw hgt sys, nr T, avail 6/1, no fee or pets, \$975 unhtd. Call 395-2543.

Nantucket, Mandaket: deluxe 3BR townhse, deck, ocean vw, tennis, avail 6/1 - 6/15, \$600/wk. Call Linc x7048 or 861-7487.

Newton: single family 3BR, encl porch, lrg LR, refrig, disp, w/d, nr Rt 1 & 9, bus stop to T & Watertown, avail 5/8, \$1050/mo. Call 527-8577.

Newton Ctr: single fam hse, 3BR, dead-end st, playground, avail 3 mo starting 6/1, 10 min to T, bus to Watertown, Camb, conv shopping, no pets, \$1500/mo. Call Linc x4280 or 527-7133.

Newton Highlands: 2BR w/finished attic studio in 2-fam, w/d, refrig, fpic, nr Green Line, quiet, avail 5/1, \$1100/mo or sublet through 8/31 for \$1000/mo. Call Stu, Linc x3912 or 964-7794.

NH: Squam Lake, rustic ample log cabin, modern comforts on quiet priv cove, dock, canoe, slps 4-7. Avail Aug, 2-wk min, \$2000. Call 671-646-8618.

Quincy: 4 lrg rm apt, walk to T, stores, schools & churches, lrg closets, full mod ktchn & bath, laundry, off-st prkg, \$650/mo. Call x3-0403 or 773-7010.

Salem: 2+BR townhse condo, 5 yrs old, cath ceiling, mod lrg e-i-k, 1 1/2 b, fpic, gar, laundry rm, central air & vac, club hse & tennis, abuts conserv land, ask \$123K. Call 508-741-3060.

Sweden, Maine: lakefront cottage avail for weekly summer rental, 2BR, slps 5, dock, \$600/wk July, Aug: \$400/wk June, Sept. Mark x3-4488.

Wakefield: lrg 4-rm apt, 1st flr of 2-fam, conv loc, w/w, w/d hookup, 2-car prkg, no pets, perf for adults, close to bus & T, \$600+, sec. Allison x3-7327.

West Roxbury: condo, 1BR, top flr, deeded prkg, balcony, air cond, on T line, laundry rm & elevator, \$73,000 or bst. Niki, Linc x7485.

1BR, charming, safe, walking dist to all nds, 20 mins by T to MIT, fully furn for MIT visitor, grt view, sunny top flr, sh term OK, 1-mo to acad yr, nonsmkr, \$600 + utils. Lois, x3-3121 or 569-2045.

■ WANTED

Wanted: used flute. Cindy x3-0564.

Academic couple wishes to rent hse in Camb for July & Aug, prefer Brattle/Linnaean St. areas, exc references avail. Molly x3-5526 or 868-1436.

MIT professor, spouse, & baby nd hse 6/1/91-8/31/91 (flex), nd 2BR & study, laundry, access to public transp, pref Cambridge but will consider others. Call 415-941-9572.

Wanted: bicycle touring equip: panniers, tools, etc; two VT 100 terminals, free/bst offer. Roland x3-5483.

Wanted: kids' downhill ski packages, szs 9 & 2. Call 665-7916 aft 5:30pm.

Older professional couple from Winchester, in between houses, available for housesitting in Boston or suburbs for July. Will look after your house & garden. Call 729-5837.

■ ROOMMATES

Arlington Hts: non-smkg woman to shr quiet, sunny 2BR apt, fpic, porches, hdwd flrs, off-st prkg, on Mass Ave bus line, \$362.50+. Sandy x3-0411 or 641-4753.

Belmont: 3M sk M/F non-smkg hsmts to fill duplex 4 mi from MIT, 1 block from #73 bus

John F. Elliott Dies at 70

Professor John F. Elliott of Winchester, who was respected internationally for his contributions to metallurgical science and engineering, died Monday, April 15, at the MIT infirmary from complications resulting from a brain tumor. He was 70. A memorial service was held April 22, at the Church of the Epiphany in Winchester.

Professor Elliott was a member of the Department of Materials Science and Engineering at MIT. For more than four decades, his name was associated with outstanding leadership in chemical-process metallurgy and in the specific field of steelmaking. The fruits of his research have been used by industries in many countries and his influence in his chosen field has been multiplied by the work of his many students, by his extensive publications, and by his lectures at universities in Japan, South America and Europe.

In 1974 he was a visiting professor at Tohoku University in Sendai, Japan, and in 1976 he held a similar post at Simon Bolivar University in Caracas, Venezuela.

In 1978 and again in 1981 he visited the People's Republic of China. In 1978 he was a member of a delegation organized by the Minerals, Metals and Materials Society and the American Institute of Mining, Metallurgical, and Petroleum Engineers. In 1981 he was vice chairman of the First Bilateral US-China Metallurgical Conference held in Beijing.

Professor Elliott made a major contribution to the literature in his field with the two-volume series, *Thermochemistry for Steelmaking*, published in 1960 and 1963. Later he was co-editor of *Metallurgical Treatises*, published in 1981. In addition he authored more than 210 journal articles.

In 1982, he was one of two North American faculty members named AISI Distinguished Professors by the American Iron and Steel Institute.

Since 1978, Professor Elliott had been director of the Mining and Mineral Resources Research Institute created by the US Bureau of Mines at MIT. The institute coordinates teaching and research activities related to mineral resources for a consortium of New England universities.

Professor Elliott was born in St. Paul, Minn., July 31, 1920 and received the bachelor's degree in metallurgical engineering with high distinction from the University of Minnesota in 1942. Later that year he began a four-year tour of World War II duty with the Navy in Washington and the South

Pacific Theater, rising to the rank of lieutenant commander.

In 1946 he became a pre-doctoral fellow at MIT in what then was called the Department of Metallurgy. He received his doctoral degree in 1949.

From 1949 to 1951 he was a physical chemist with US Steel Corp. in Kearny, N.J. From 1951 to 1955 he was with Inland Steel Co. in Chicago as a research metallurgist and as assistant superintendent for quality control.

In 1955 he returned to MIT as associate professor of metallurgy. He was promoted to professor in 1960.

Professor Elliott, a member of the National Academy of Engineering since 1975, has received many awards and honors, among them: the John Simon Guggenheim Memorial Fellowship, Imperial College, England; election as a fellow of the American Academy of Arts and Sciences; election as a fellow of The Metallurgical Society; Albert Easton White Distinguished Teacher Award, American Society of Metals; election to honorary membership, Iron and Steel Institute of Japan; election as a fellow of the American Institute of Chemical Engineers; election as a fellow of the American Association for the Advancement of Science; honorary membership, Japan Institute of Metals; the Tawara Gold Medal, Iron and Steel Institute of Japan.

He is survived by his wife, Frances (Pendleton) Elliott; a son, William Stowe Elliott of Princeton Junction, N.J.; a daughter, Dorothy Elliott Sempolinski of Corning, N.Y.; two sisters, Dorothea Collins of Gibsonia, Pa., and Lois Thompson of Roseville, Minn.; and four grandsons.

Memorial donations may be made to the John F. Elliott Graduate Fellowship in Chemical Process Metallurgy, c/o MIT Treasurer's Office, 238 Main St., Suite 200, Cambridge, Mass. 02142, or to the Parish of the Epiphany Education Fund, 70 Church St., Winchester, Mass. 01890.

PUTNAM REMEMBRANCE

The Medical Department will hold a reception in remembrance of Dr. Willard S. Putnam Jr. on Monday, April 29, at 5pm in Rm E25-401. Dr. Putnam was a personal physician in the Medical Department from 1964 until his retirement in 1987. He died in February. Friends and colleagues of Dr. Putnam are invited to attend.

DE NATALE SERVICE

A memorial service will be held Saturday, April 27, at 1pm in the MIT Chapel for Victor De Natale, a 1982 graduate from the School of Architecture and Planning. He also received the MArch degree in 1984. He was an architect with Linnea 5 in Cambridge. He died March 29 following a long illness. A reception will follow the ceremony.

Memorial contributions may be made to the AIDS Action Committee or in Mr. De Natale's name to the Rotch Library Fund at MIT.

JOHN R. LOBLUNDO

A funeral Mass was held April 11 for John R. Loblundo, 68, of Somerville, a retired head custodian in Physical Plant. Mr. Loblundo worked at MIT from 1967 until his retirement in 1985.

He leaves his wife, Josephine (LaPusata); three daughters, Catherine Ray and Debra Loblundo of Somerville and Joanne Polley of Brockton; two sons, John R. Jr. of Natick and Joseph R. Loblundo of Concord, and four grandchildren.

JOHN W. NOBLE

John W. Noble, 92, of Ipswich, a retired service staff member at Lincoln Laboratory, died on March 31. He worked at Lincoln from 1953 until his retirement in 1961.

Mr. Noble is survived by a son, John W. Noble of Winchester, and a daughter, Gertrude Mabel Smyth of Ipswich.

■ LOST AND FOUND

Lost: 1 clip earring w/2 strings of rhinestones, between bldg 16 & 56. Anna x3-3545.

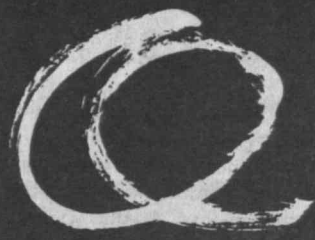
Lost: gold bracelet, grt sentimental value! Please call Janine x3-3096.

Found: 1 pair of silver metal-rimmed glasses in News Office, 5-111. Call x3-8608.

■ MISCELLANEOUS

Russian language svcs: interpreting, translating, word processing, editing, language instruction. Call 662-3153.

Roto-tilling service. Also, Cape Cod, Dennisport, 1BR efficiency w/sm picnic area, 3/4 mi from beach, \$200/wk or \$70/wknd, June only (2 adults capacity limit). Bruce x3-3993.



THE ARTS

The Arts Page is produced by the Office of the Arts in collaboration with ARTSNET--253-4003

TALENT SEARCH

“Musicians. Behind-the-Desk” Applications

Proposals are now being accepted for the **MIT Musicians Behind-the-Desk Concert Series** planned for the Fall of 1991 and made possible by Music and Theater Arts and the Office of the Arts.

Participation is open to all vocalists and instrumentalists among MIT's academic, support, technical, and administrative staff. Concerts will be held at noon on Fridays in Killian Hall on Oct 4-25, Nov 1-22, and December 6-13.

Proposals for recitals should be accompanied by a demo tape and must include name, address, phone, and department of staff member; name of supervisor; three possible concert dates in order of preference; names, instruments, and background information for all performers; and a proposed program.

The selected performers will receive one three-hour rehearsal in the hall; up to 100 flyers for distribution by the artist; 75 copies of a one-page program; use of the piano/harpsichord; use of the tape recording booth (performer provides the cassette tape); \$75 honorarium per concert payable to the performing staff member.

The deadline for application is May 31. To obtain an application form or more information, call 253-2906 or stop by 14N-207.

OPENING TODAY

Exhibition at Harvard by MIT's Taho

Geo-Luminescence, a sculptural installation by Assistant Professor Ritsuko Taho of MIT's Visual Arts Program opens with a reception today (April 24) from 5-7:30pm at the Carpenter Center for the Visual Arts at Harvard University, 24 Quincy Street, Cambridge.

Composed of salt, copper, plaster and wood, the work represents light and dark, myth and alchemy, and cycles of the earth and life, enlivening an unused site beneath the Carpenter Center.

Ann Wilson Lloyd of the Carpenter Center states that *Geo-Luminescence* “clings to the building's *pilotis* like a giant chrysalis, turning the cold cement into a glowing incubator or a monumental crypt. Its enormous copper-coated bowl...is tilted to display its bed of rock salt and cache of fragile plaster eggs scaled to the size of human newborns. There are nearly 500 of them, a poignant reference to the ova a woman produces in her lifetime.”

Geo-Luminescence will be on view through October. Information: 495-3251

RECEPTION FRIDAY

Swiss Poster Art Exhibition Opens

The work of many of Switzerland's most prominent 20th-century graphic designers will be showcased in *Posters! Affiches! Affissi! Plakate! Swiss Poster Art 1906-1990/From the CIBA-GEIGY* Collection opening at the MIT Museum on April 27.

Posters! Affiches! Affissi! Plakate! will exhibit 90 posters originally designed to advertise consumer products, tourism, art exhibitions, and public services. Created by noted Swiss designers including Max Bill, Armin Hofmann, Otto Baumberger, Hans Falk, and Josef Mueller-Brockmann, the posters reflect the three dominant cultures of Switzerland (Swiss-German, Italian, and French), and are stylistically representative of major European art movements since 1900.

The public is invited to the opening reception Friday, April 26 from 5-7pm. Swiss refreshments will be served.

A symposium on Saturday, April 27 at 2pm will feature “Six Posters I Wish I Had Designed and Why” by Chris Pullman, vice president of design at WGBH and “A Contextual View of Graphic Style and the Poster” by R. Roger Remington, professor and director of Graphic Design Archives at the Rochester Institute of Technology.

Looking ahead, on Saturday, May 4 at 2pm, Dr. Anneliese Harding of the Goethe Institute in Boston will present a gallery talk, “Swiss Poster Art: A Mirror of 20th-Century Painting.”

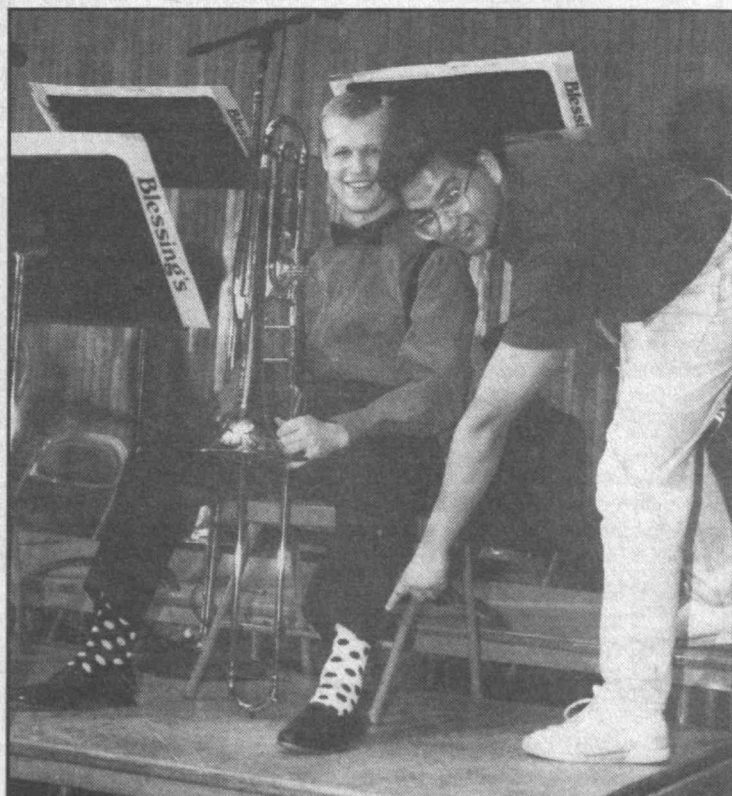
The exhibition is sponsored by the CIBA-GEIGY Corporation to celebrate the 700th anniversary of the founding of the confederation of Switzerland. CIBA-GEIGY is a leading developer and manufacturer of pharmaceuticals, agricultural and specialty chemicals, and vision care products in the United States. It is a wholly-owned subsidiary of CIBA-GEIGY Limited in Basel, Switzerland.

The MIT Museum is located at 265 Mass. Ave. Hours are Tues-Fri 9-5, Weekends 1-5. Information: 253-4444.



NATIONAL CHAMPS

MIT Festival Jazz Ensemble Wins Top Honors



Members of the MIT Festival Jazz Ensemble put their best foot forward.

The MIT Festival Jazz Ensemble took top honors at the 33rd annual Notre Dame Collegiate Jazz Festival, the oldest collegiate jazz festival in the United States.

MIT shared outstanding band awards with Oberlin Conservatory and the Western Michigan University School of Music.

Susan Ward '92, who missed last year's competition due to illness, earned recognition for outstanding individual performance on the alto saxophone.

MIT was the unanimous choice of the judges who included jazz pianist Harold Mabern Jr., drummer Roy Hanes, bassist Eddie Gomez, trumpeter Randy Brecker, saxophonist Dick Oatts, and jazz writer and historian Dan Morgenstern. The band rated high scores for originality, choice of music, and effect.

Judge Dick Oatts commented that the Ensemble “kept his interest throughout...a great original approach to music.”

and Morgenstern added that “it's refreshing to encounter imagination and humor, neither one an abundant commodity.”

This marks the first time the Ensemble has won the award for outstanding band at the NDCJF under the direction of Jamshied Sharifi '83. They last achieved top honors in 1985 under the direction of Festival Jazz Ensemble founder Herb Pomeroy.

On Friday, May 3, the Festival Jazz Ensemble and the MIT Concert Jazz Band, directed by Everett Longstreth, present their annual Spring Jazz Concert at 8pm in Kresge Auditorium. Admission is \$1.

The Festival Jazz Ensemble will also perform at the May 9 Inauguration Concert at 8pm in Kresge Auditorium.

What to Do to Prevent Future Oil Spills

■ By Henry Marcus
Ocean Engineering

The Persian Gulf conflict has once again focused our attention on oil spills. The terrible spills off Saudi Arabia are vastly different in origin and size from those that have occurred near our own coastlines. Yet they should spur us to renew our efforts to prevent oil spills here at home. One of the best ways to do this is by improving the design and operation of the tankers that carry oil to our shores.

Their numbers are growing. Energy experts expect imports of crude oil and petroleum products to increase by up to 50 percent within a decade. Most of this additional oil will arrive by sea. Less than one in every 50,000 gallons of the oil

moving through US waters is spilled, but that adds up to an average of 9,000 tons annually—more than enough to cause serious environmental damage.

Last year, in the wake of the Exxon Valdez disaster, Congress mandated that all new tankers traveling in US waters be built with double hulls. Yet double-hulled ships alone cannot protect our coastline from disaster.

I served as the chairman of a committee of the National Research Council that has just released a study of 17 possible tanker designs. We found that the double-hull approach has many advantages over traditional single-hull designs, especially in a low-speed collision or grounding. A severe accident such as occurred with the Exxon Valdez, however, probably would puncture both hulls and spill oil. The double-hull design also poses some

potential safety problems of its own, such as difficulty in inspecting the large void space between the hulls.

These concerns are manageable; overall, we found no design superior to double hulls in all accident scenarios. But double hulls are not a panacea; all designs perform better in some situations and worse in others.

One design that deserves more consideration, for example, has double sides and an oil-tight deck across its middle to divide cargo tanks into upper and lower chambers. In theory, such a vessel would spill less oil in a severe accident—although it, too, has drawbacks.

This and other alternatives look good on paper, but implementing them raises other concerns. When automobile manufacturers consider the feasibility of safety options, they crash vehicles into a wall and do other tests to

see which works best. Yet the maritime industry has done relatively few safety experiments, largely because it has not been expected to design craft to withstand accidents. As a result, it lacks the data base or even the criteria to evaluate how well a vessel will survive an accident. No one really knows how double hulls and other designs will perform. This is unacceptable.

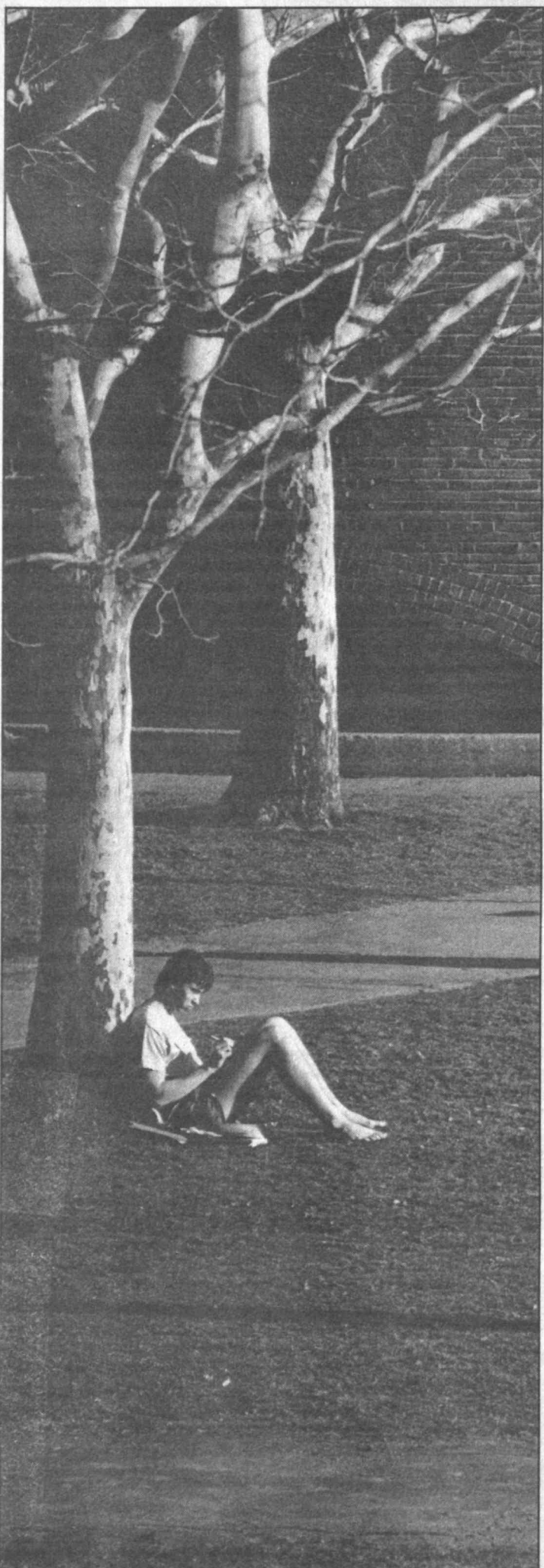
It also is difficult to assess the costs and benefits of different options. Our committee's best estimate was that double hulls could cut by half the oil now spilled in US waters as a result of collisions and groundings. They would add one or two cents to the cost of each gallon shipped, or \$700 million per year when the Oil Pollution Act of 1990 is fully implemented.

More information is badly needed. But in the meantime, it also is essential

to consider ways of controlling pollution more effectively on existing vessels. The phase-out of single-hull vessels in US waters will begin in 1995, then take 20 years to complete.

Serious consideration should be given to requiring that all existing crude oil tankers in US waters promptly meet the latest International Maritime Organization provisions for pollution prevention for new tankers. Structural or operational changes also might be required of existing tankers, although the cost and effectiveness of these need to be weighed against other possible safety measures.

(Dr. Marcus is associate professor of marine systems in the Department of Ocean Engineering. This article appeared in the *Bangor Daily News* and is reprinted here with the author's permission.)



The still-bare branches of one of the Chapel sycamore trees let sunlight fall on Joost Bonsen, a senior in electrical engineering and computer science, as he enjoys spring warmth.
Photo by Donna Coveney

Here & There

■ In a major speech at the annual meeting of the American Association for the Advancement of Science, MIT Professor **Kenneth R. Manning** made the point that women, Jews and African-Americans had relatively little representation in the scientific community through the 19th and at least half of the 20th century.

He also noted how historians and other observers of society can affect the complexion of the scientific community by choosing to honor or isolate groups—and he used as an example the main campus complex at Killian Court.

"When walking in front of MIT with the Charles River at your back," he told his audience, "one looks up to see names in large letters topping the crowns of the buildings.

"In largest letters are Aristotle, Newton, Franklin, Pasteur, Lavoisier, Faraday, Archimedes, Da Vinci, Darwin and Copernicus. A host of other names appear, between nine and twelve surrounding each of the large-size names. Considerable thought went into the selection of names around 1916, when the Institute moved from Boston to its new campus in Cambridge. . . There was special concern to include an American, which is one reason Benjamin Franklin is so prominently placed.

"A community was being created, a community of so-called greats. There were no women, no Jews, no blacks."

Dr. Manning, professor of the history of science and head of The Writing Program, said Madame Curie was omitted because she was living at the time, and Einstein would have been left out on the same grounds, although his real fame did not come until later. No one had heard of Benjamin Banneker, a free black who became a leading 18th century American scientist, Dr. Manning said, "and the mood of the country would not have permitted his inclusion anyway."

Dr. Manning said he has received about 50 calls requesting copies of his Sarton Memorial Lecture, titled "The Complexion of Scientific Communities." In it, he also surprised many of his listeners by telling them that the approximately 1,200-member National Academy of Sciences includes just one black—the mathematician, David Blackwell.

And is it time to carve some new names on an MIT facade, Dr. Manning was asked.

Perhaps so, he said.

■ On the MIT campus, he's Army Major **Herbert W. Waters III**, an ROTC training officer for the past 2 and 1/2 years.

At his home in Dartmouth, Mass., near New Bedford, he can give vent to another identity—Ray Waters, rap musician.

With his two younger brothers, also military men, Maj. Waters has formed a rap group called "Hit Squad." It has distributed one record produced in a sound studio in the basement of Ray's home and hopes soon to put out a video.

Plans have been on hold, however, precisely because of the brothers' military duty. Chris, 26, and Mark, 24, both Marine lieutenants, have been serving in the Persian Gulf.

Maj. Waters, 33, said he and Chris are instrumentalists who play the guitar, bass, keyboard and program drums. Mark is a writer. They have long been involved with music as a hobby and saw rap as a way of getting into the music business. They turned to rap as their medium, Maj. Waters said, "because my brother and I can't sing—we play instruments and we're pretty good writers.

"We're trying to go national," he added, and might be getting a review soon in *Billboard*, the entertainment publication.

Their first release takes a shot at talk show host Geraldo Rivera, whose hometown is nearby Marion. It has been played on radio stations in New Bedford and Boston, and Maj. Waters hopes Rivera might invite them onto his show.

In the meantime, there's always the military—a family tradition. Maj. Walter's father, now principal of the Carney Academy elementary school in New Bedford, was the first black colonel in the Marine Corps reserves.

■ A new book on United States and Japanese competitiveness by a member of the Sloan School faculty is attracting attention from the national and international media.

Japan's Software Factories: A Challenge to U.S. Management (Oxford University Press) by **Michael A. Cusumano** raises the specter that Japan's computer giants are mass-producing software with the same principles of quality control and project management that has enabled Japan to dominate manufacturing businesses.

"The kinds of things they're doing present a real challenge," Dr. Cusumano, Mitsubishi Career Development Assistant Professor of Management, told *The Washington Post*. "If we don't pay attention in managing software as a production-like activity, we could find ourselves in trouble," he said.

Business Week, reporting on the book, said Professor Cusumano "found that Japanese software writers produce about 70 percent more lines of source code than their American counterparts with fewer than half as many defects."

The *Wall Street Journal*, comment-

ing that Professor Cusumano's book was "turning heads in the US," quoted him as saying, "Toyota had 50 percent more efficiency than the US in 1965, but the cars were terrible, but Toyota caught up with Detroit in performance and design and that is what I predict will begin in software."

And a book reviewer for the *Far Eastern Economic Review* wrote, "The challenge now facing US firms is whether they can learn from the Japanese success in managing software development, especially since, as Cusumano warns, it seems likely that Japanese producers will further refine their software skills and compete even more effectively in a wider range of products and markets, within and outside Japan. [The book] is likely to remain the last word on the subject of managing software development for the foreseeable future."

Professor Cusumano also is the author of a major book on Japan's industrial development, *The Japanese Automobile Industry: Technology and Management at Nissan and Toyota* (Harvard University Press, 1985).

Professor Cusumano has lived and worked in Japan for more than five years. He joined the management school faculty in 1986.

■ Also on the publishing front, a faculty member and instructor in the Department of Electrical Engineering and Computer Science are authors of an inclusive work on superconductivity, *Foundations of Applied Superconductivity* (Addison-Wesley Publishing Company). They are **Terry P. Orlando**, an associate professor of electrical engineering, and **Kevin A. Delin**.

CLIPS AND QUOTES:

—In a story on breaks in underground utility mains, *The Christian Science Monitor* quotes Dr. **David H. Marks**, head of the Department of Civil Engineering, on the increasing ability to predict where and when pipes and lines will rupture with such devices as small television cameras: "I think we're going to get better at it because the risks are getting bigger."

—Ad Week/*New England* reports that the Space Engineering Research Center is getting a new logo that will likely get exposure well beyond Massachusetts: "MIT is sending a zero-gravity experiment on the space shuttle in late 1991, and the logo will be used in signage for the experiment and be reproduced as an embroidered patch that astronauts will wear while on the mission."

Charlie Ball