



April 1, 1987  
Volume 31, Number 28

### Bad rumor

A rumor has circulated the campus recently that June 1 is a holiday. June 1 is **not** a holiday.

It is, however, a festive day: it's graduation for the Class of 1987.

### Good news

In observance of the Independence Day holiday, the Institute will be closed Friday, July 3.

### Daylight time

Daylight Saving Time will return early this spring, starting at 2am Sunday, April 5, rather than the last Sunday in April as has been customary. Set your clocks ahead one hour.

### Awards reminder

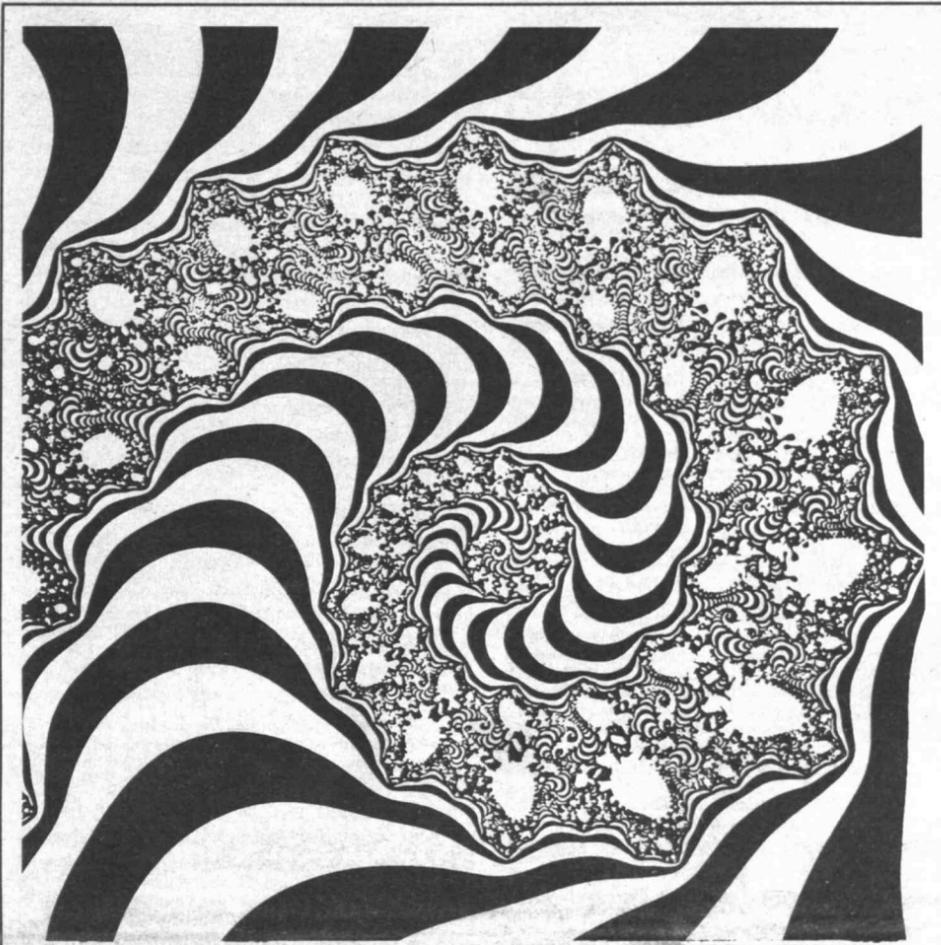
Friday, April 3, is the deadline for nominations for Institute-wide awards to be presented at the Awards Convocation in May. Nominations for all awards but the Goodwin Medal should be sent to Rm W20-345; Goodwin Medal nominations are due in Rm 3-136.

### Tear sheet

Pages 11 and 12 are tear sheets this week. A complete list of MIT summer programs appears on page 11, while the cultural richness of April is chronicled by China Altman on page 12.



An effort to dispose of some two-part epoxy resin led to an unexpected smoky reaction that caused the evacuation of three MIT buildings—12, 13 and 24—at about 3pm Monday afternoon, March 30. There were no injuries and no fire, Cambridge Fire Department Officials said. The reaction occurred when the resin was mixed. City fire crews left the area at about 4pm and said that students and employees could return to the buildings. However, Dr. Alan M. Ducatman, chief of MIT's Environmental Medical Service, said the odor in Building 24, where the reaction occurred, was too strong for work to resume. He ordered that the building remain closed overnight. It reopened about 7am Tuesday, March 31. The incident halted the sorting of mail from 2:30pm Monday until 6:30am Tuesday, causing a one-day delay in delivery.



An unidentified fractal reproduced from the program for the math symposium.

## Name that fractal

MIT's Department of Mathematics and the Goethe Institute Boston have joined forces to interject some chaos into the observance of National Mathematics Awareness Week, April 13-19.

The Goethe Institute Boston and the department will present a symposium on mathematical representations of chaotic and unpredictable natural phenomena. "The Beauty of Fractals: History, Dynamics, and the Modeling of Natural Phenomena," will be held Saturday, April 11, 10am-5pm, in Rm 10-250. It is free and open to the public.

National Mathematics Awareness Week is sponsored by the Joint Policy

Board for Mathematics, an arm of the American Mathematical Society, the Mathematical Association of America and the society for Industrial and Applied Mathematics. The theme of the observance is "The Beauty and Challenge of Mathematics." The intent of the awareness effort is to "help Americans regain an understanding of mathematics and its importance in our society," the organization said.

Dr. Kenneth M. Hoffman of the MIT Department of Mathematics is director of federal relations for the joint policy board and is the moving force behind (continued on page 4)

## New housing study is underway

The issue of affordable home ownership for low- and moderate-income people—including such individuals as teachers, retail clerks, police officers, firefighters and tradesmen who want to live in the community which they work—is the focus of a major study at MIT's Center for Real Estate Development.

"There is an expectation on the part of most Americans that at some point in their lives they will be able to buy a home," said James McKellar, director of the Center. "For many, the prospects of meeting this expectation have been greatly diminished in recent years."

The study has been undertaken in conjunc-

tion with the Massachusetts Housing Partnership, a state initiative to address housing needs by forging partnerships between local housing sponsors, the housing industry and the state's finance agency.

It will be led by Professor McKellar and other MIT faculty members, Professors Langley C. Keyes, Jr., Michael Wheeler and Denise DiPasquale in the Department of Urban Studies and Planning.

Professor Keyes said that the Reagan administration has discontinued much of the federal funding that since 1932 has helped provide housing subsidies and pro-

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## Faculty begins discussions on reforms in curricula

By CHARLES H. BALL  
Staff Writer

The MIT faculty is scheduled to vote this month on the first actual change arising from the ongoing reassessment of the undergraduate education program.

At the same time, the faculty has heard of several major changes being considered for freshmen. These include encouraging first-year students to consider taking required physics and chemistry later in the freshman year, a shift in the emphasis of residence and orientation week, and a freshman calendar different from that of upperclassmen.

A motion to adjust the humanities, arts and social science (HASS) component of the General Institute Requirements was discussed at the faculty meeting on March 18, and is due to be put to a vote at the April meeting after additional discussion.

The change focuses on the distribution element of the HASS requirement. At present, undergraduates must take three of the required eight subjects in the humanities area from a list that includes 156 subjects in 22 fields. The proposal reduces the number of subjects to about 50, more or less equally (continued on page 4)

## Panel to address black admissions

An informal discussion on the question "What Kind of Blacks Should Be Admitted to MIT?" will be held starting at 5:30pm Thursday, April 2, in the Marlar Faculty Lounge of the Ronald McNair Building, Rm 37-252.

The discussion is sponsored by the Black Graduate Student Association, the Office of the Dean of the Graduate School and the Graduate Student Council. It is open to the MIT community.

Dr. John B. Turner, associate dean of the Graduate School and assistant provost of MIT, will be the moderator.

The panel will be Dr. Joyce T. Gibson, director, Office of Minority Education; Frank S. Jones, Ford Professor of Urban Affairs, Department of Urban Studies and Planning; Dr. Kenneth R. Manning, professor of the history of science and head of the Writing Program, Department of Humanities; Dr. Shirley M. McBay, dean for student affairs, and Dr. James H. Williams Jr. of the Department of Mechanical Engineering.

The question posed in the title of the discussion takes note of the debate at MIT and elsewhere on what indicators—SAT scores, high school grades, extracurricular activities, etc., as well as race—should be the basis for offering admission to black students.

## You need an MIT degree to figure the score

The way the score kept building, it's a good thing the two hockey teams represented places called the Massachusetts Institute of Technology and the California Institute of Technology.

Otherwise, they might not have been able to keep track of things.

As it was, the final score, as reported by Caltech, was something of a mystery to the uninitiated.

It was MIT, 11; Caltech, the logarithm of 1,000.

In simpler terms, that's 11-3.

"You guys just killed us," reported Bob Finn of the Caltech news office. "At one time it was 10-0."

Still, he said, a good time was had by all at the first ice hockey game between MIT and Caltech, two schools better known for their pranks than their athletic victories.

The game was played Wednesday night (March 25) at the Pasadena Ice Skating Center in Pasadena, Calif., in front of what Finn said might have been "the biggest crowd ever" in the small arena.

Both squads are club varsity teams. At

MIT, that means that graduate students as well as undergraduates can play. At Caltech, it means that anyone at the university, including employees, can join the team. One of their players, for example, is a 38-year-old member of the professional staff.

"Your guys were just faster and better," said Finn.

Actually, the MIT club, at 15-6-1, is the winningest hockey squad in the school's history. This past season also was the

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# INSTITUTE NOTICES

\*—Open to public  
\*\*—Open to MIT Community only  
\*\*\*—Open to members only

## Announcements

**Examination Schedules**—All students should obtain schedules at Information Center, Rm 7-121. Examinations not listed or a conflict in examinations (two exams in the same period) must be reported to the Schedules Office, Rm E19-338, Fri, April 17, 1987.

**Career Planning and Placement Company Recruitment Presentations\*\***—Motorola—April 1, 4:30-6:30pm, Rm 2-146.

**Wellesley Life**—A limited number of MIT undergraduates will be able to live and study at Wellesley next year as part of the residence exchange. MIT students now living at Wellesley discuss their experiences at an informational meeting, Wed, April 1, 4pm, Rm 6-231. Applications available, Wellesley-MIT Exchange Office, Rm 7-108, x3-1668, and are due by Fri, April 3.

**Big Screw Contest**—Alpha Phi Omega contest, April 21-10. Vote for the MIT faculty or staff member most deserving of the Big Screw Award, \$501/vote. Proceeds go to a charity of the winner's choice.

**Talbot House Available**—Enjoy spring in Vermont. Talbot House Office, Rm 7-103, is accepting applications for May visits. Weekends that have not been assigned by the March 31 deadline will be open to MIT community groups on a first-come, first-served basis. Also, the months of June, July and August are now being assigned on an advance booking first-come, first-served basis. Info: Sharon, x3-4158.

**Wives' Group Needs Babysitters**—Weds, 3-5pm in the Student Ctr. Babysitters are paid \$10. Linda, x3-1614.

**Language Conversation Exchange\*\***—Wives' Group needs conversation partners for internationals at the Institute interested in practicing English. English speakers can practice or learn the language of which they are native speakers. An effort is made to match persons with similar interests and training. After participants are put in contact the arrangement is worked out by the partners. Contact Linda Roach, x3-1614.

**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. Upcoming events: *Robotics and Beyond*—through April 26.

**Advisory Committee on Shareholder Responsibility (ACSR) Meeting\*\***—Wed, April 1, 4pm, Rm 10-300. To consider a number of questions, if pending, relating to the proxies of firms in which the Institute is a shareholder. Info: Walter L. Milne, committee secretary, Rm 5-208, x3-5278.

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

**Nightline\*\***—a student-run 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. x3-7840.

## Club Notes

**MIT Student Cable Programming Group\*\***—Seeks people interested in programming the cable television network. Info: Jeff Cohen, x5-8178 dorm.

**Tool and Die Magazine\*\***—MIT's humor magazine meets every Thurs, 7pm, Rm 50-309.

**Freshman Class Council Meetings\*\***—1st & 3rd Mondays of every month, 5:15pm, Student Ctr 4th Floor. All members of the class of 1990 are invited to play an active role in their class and its activities. New members granted voting privileges after attending two consecutive meetings. See Class of '90 Bulletin Board in Lobby 7 for more info.

**MIT/DL Bridge Club\***—Duplicate bridge, Tues, 6:30pm, Student Ctr Rm 349. ACBL masterpoints awarded; come with or without partner, newcomers always welcome. Special tournaments monthly. Handicap game, 3rd Tues every month. Info call Gary Schwartz, x8-2459 Draper, or Mark Dulcey, 825-0471. Admission: \$1/students, \$2/non-students.

**MIT Go Club\***—Meets every M/Th, 5-7pm, Bldg NE43 7th floor lounge. Ring bell to get in if locked. Info: x3-4874.

**MIT Scrabble Club\***—Meets every 1st and 3rd Weds, 6:30pm, Rm 4-153. Snacks & fun; all levels. Bring your board.

**MIT Science Fiction Society\***—The world's largest open collection of science fiction books and magazines is located in Student Ctr Rm 473. Meetings, Fri, 5:30pm. Info: x5-9144 dorm.

**MIT Table Tennis Club\*\***—Meets Fri, 8-10pm; Sat, 6-9pm, DuPont T-Club Lounge. All levels welcome. Info: Hoang Do, x3-2843.

**Animal Rights Forum\***—Meets 2nd & 4th Weds each month, 5pm, Rm 8-105. Info: Peter Mead, x5-9616 dorm.

**MIT Nautical Association\*\***—Sailing Pavilion open every day, 9am-sunset. New sailing cards on sale at Cashier's Office, Lobby 10: \$10/students, \$30/faculty, staff; \$40/alumni. New members are requested to present proof of swimming ability such as small boat swim test at pool. Three levels of shore school (beginners) classes offered, Mon & Thurs, 5:15pm. Student dock staff needed. Info: x3-4884.

**MIT Outing Club\***—Camping, cycling, climbing, canoeing, cabins: meets M/Th, 5-6pm, Student Center Rm 461. Also, see our bulletin board in "Infinite Corridor" next to Athena.

**MIT Soaring Association\***—Learn the exciting sport of soaring from FAA certified instructors. We fly from the Mansfield airport every weekend and some holidays (weather permitting). Mansfield is 45 minutes south of Cambridge, off Rt 95. Student membership: \$125; typical flight: \$16. Contact: Bob De Saro, 890-8925 or 264-4426 eves.

**Scuba Club\*\***—The club sponsors dives throughout the term. Call scuba locker (x3-1551) for info and equipment rentals. For more info contact Michael Bernard, x3-8907 or 628-3018 eves.

**MIT Hobby Shop\*\***—Complete supervised facilities for woodworking and metalworking, Rm W31-031, M-F, 10am-6pm; Wed, 10am-9pm. Fees: \$15/term students; \$25/term community. Info, x3-4343.

**MIT Karatedo Doshinkan Club\***—A classical non-competitive style of karate, incorporating movements developed over centuries to produce the greatest level of health, meets Mon, 4:30-6pm; Wed & Fri, 5-6:30pm, Dance Studio, 3rd flr duPont. Info: Mark, x3-0988 or Dave, x3-0472.

**MIT Wonhwa-do Club\***—A synthesis of karate-do and judo-type martial arts, meets MWF, 7-8:15pm, DuPont Exercise Rm. Beginners welcome. Info: Victor Lin, x5-8227 dorm.

**MIT Aikido Club\*\***—Non-competitive martial discipline, meets M-F, 5:30pm, DuPont Exercise Rm. Beginners always welcome. Info: Mitch Hansberry, 247-7861 or 258-1272.

**MIT Yoga Club\***—Rejuvenate your spirit with Kundalini Yoga. Active, enjoyable classes; beginners always welcome. M/W, 5:30-6:30pm, Burton House Dining Hall. Info: Fred or Jeff, 623-7907 eves.

**MIT Wu Tang Club\***—teaches traditional Northern Chinese Kung Fu. Initial training is in the long fist style, with instruction in long sword available to advanced students. T/Th, 8-9pm, Burton Dining Hall; Sat, 9am-12noon. Info: Meilin Wong, x3-7788.

## Religious Activities

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

**Tech Catholic Community\***—Roman Catholic Masses: Suns, 9am, 12 & 5pm, MIT Chapel. Tues & Thurs: 5:05pm, MIT Chapel. Fri, 12:05pm, MIT Chapel. Chaplaincy Office: x3-2981.

**MIT Hillel\***—Fri, April 3: Conservative/Reform Services, 5:30pm; Hillel; Orthodox Services, Burton Conference Rm, 5:50pm; Community Shabbat Dinner, 6:45pm, Ashdown House Hulsizer Dining Rm—paid reservations due Thursday, \$6.50; "Sex, Race, and Violence in the Book of Esther"—Prof Jeremy Wolfe, 8:30pm, Ashdown House. Seder and Passover Meal Reservations—At Hillel booth, April 1-2, 10am-3pm, Lobby 10. Fri, April 10: No Shabbat Services. Mon, April 13: MIT Community Seder, led by Rabbi Dan Shevitz, 6:45pm, Walker Hall; \$15/students, \$25/non-students; \$12.50/children 6-12; paid reservations due by April 7. Tues, April 14: Satellite Seders at various campus locations; contact Hillel (x3-2982) for information. Any student desiring Home Hospitality for a seder should call Hillel as soon as possible. We will try to place you in a suitable home. If you can host a student (or students) in your home, please call Hillel, x3-2982. Passover lunches and dinners available at Kasher Kitchen, Rm 50-007; \$4.50/lunch, 12:30-1:30pm; \$6.50/dinner, 5:30-7pm (except Fri), cash/Validine; reservations made at Hillel, the Kasher Kitchen or at the Passover Booth, April 1-2, Lobby 10. Sell your chametz—Rabbi Shevitz available to help; come by Hillel. Project Mazon—Hillel's hunger action project: bring your non-perishable chametz to Hillel by Fri, April 10. Volunteers needed to help distribute the food, Sun, April 12.

**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.

**United Christian Fellowship\*\***—Large Group Meetings, every Fri, 7-8:30pm, Rm 6-321. Join us for worship, singing, prayer, Biblical teaching and fellowship. Small Group Bible Studies in dorms at various times. Info: Gail Sadlo, x5-8957 dorm.

**Graduate Christian Fellowship\***—Come join other grad students, faculty, and staff as we meet in small groups for fellowship, Bible study, prayer, and praise. Current groups meet Mon, 12-1pm, Rm W20-441 (info: Curt Bronkhorst, x3-4414); Tues, 6:30-8pm, Rm W20-441 (info: Tony Lee, x3-6185); Thurs, 4-5:30pm, Rm E51-136 (info: Lance Roulic, 391-0706). An outreach group also meets each Thurs, 9pm, Rm W24-441 (info: Burt Kaliski, 776-4507). Activities are open to both Christians and those interested in learning more about Christianity. General info: Roz Wright, x3-5959/4420.

**Baptist Student Fellowship\*—Vespers**—Sun, 7pm, MIT Chapel. **Boston-wide Fellowship**—Topical study, Tues, 5:45pm, Metropolitan Baptist Church; meet at Lobby 7, transportation provided. **Family Bible Study**—Wed, 8pm, C-1 Westgate. **Exegetical Bible Study for Graduate Students**—Thurs, 12noon, repeated 1pm, 312 Memorial Dr 2nd flr.

**Meditation and Discourse on the Bhagavad Gita\*—Swami Sarvagatananda, minister, Ramakrishna Vedanta Society of Boston**, Meets every Fri through May 15, 5:15pm, MIT Chapel.

**MIT Islamic Society\***—Daily prayers, Ashdown House (basement), 5 times a day. Call x5-9749 dorm, for schedule. Friday prayer, Ashdown House 1-1:30pm, Khutba starts at 1pm, congregation at 1:20pm.

**MIT Bahai Association\***—Informal discussions, Thurs, 8pm, Nancy, x3-3361 or Brian, 354-0117.

**Christian Science Organization at MIT\***—Weekly Testimony meetings, Thurs, 7:30pm, Rm 4-145.

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

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

**Noon Bible Study\***—Every Thurs, Rm 66-168, bring lunch. Ralph Burgess, x3-2422. (Since 1965.)

**Edgar Cayce Study Group\***—Tuesdays, 6:30-9pm, Edgar Cayce's Search for God material will be used as the basis for group discussion & meditation. For info: Douglas McCarroll, 497-0819 12-9pm or Scott Greenwald, x3-7423.

**MIT Campus Crusade for Christ\***—Fridays, 7:17pm, Marlar Lounge, Rm E37-252, TGIF weekly meeting of MIT Campus Crusade for Christ. We "thank God it's Friday" every week with singing, biblical input, discussion and fun. Info: x5-9153 dorm.

## Other Opportunities

**John Asinari Award for Undergraduate Research in the Life Sciences**. Undergraduates in Course VII, VII-A and VII-B are eligible. For details, see Tom Lynch, Rm 56-524, x3-4711. Deadline for submissions: April 24, 1987.

## International Opportunities

*The following is a list of opportunities available to foreign nationals or students desiring work abroad. For more information on these, please see the International Jobs notebook in the Office of Career Services, Rm 12-170.*

Harris Corporation is currently seeking students who would like to explore permanent career opportunities at their Japan facility. They particularly need individuals in the areas of technical sales engineering and application engineering. This opportunity can be for US citizens or Japanese nationals.

Petroleum de Venezuela (USA) Corporation will be interviewing students from Venezuela, Curacao, and Bonaire who will be graduating in 1987 in computer science, business administration, finance, accounting, personnel management, economics, geology, geophysics, international law, and all fields of engineering. The location of the interviews is at the Boston Marriot Copley Place from April 1-April 5. To schedule an interview, call Eduardo Santander, 236-5800 on the dates of the interviews. For more information before the interview dates, call Mr. Miguel Colmenares collect at 212-303-2216.

## Internships

*The following is the list of internships received this week. For more information please see the Internship Information notebook in the Office of Career Services, Rm 12-170.*

**Volunteer internship:** Ashoka, an organization which supports third world nationals who have ideas for significant change within their developing societies, is offering internships to students who would like training in development issues, development education, computer work, fundraising and writing.

### Internships Offering a Stipend:

The City of New York, Dept of Sanitation, has 20 internship positions for first or second year graduate students enrolled in public or business administration, computer science, finance, engineering, economics, law, policy or planning. Salary is \$200/wk.

Raychem Corporation in Menlo Park, CA is accepting applications for their Summer Intern Program. To be eligible you must have completed your junior year or be a graduate student in chemistry, materials science, applied physics, polymer science, chemical, electrical or mechanical engineering.

## Student Jobs

*There are more job listings available at the Student Employment Office, Rm 5-119.*

### On Campus: Technical

Training consultants needed for Project Athena to assist with live teaching of minicourses and aid in course development. Both summer and fall positions available with flexible hours. Familiarity with some Project Athena supported software required. Previous training, tutoring, or public speaking experience preferred. Applications and a more detailed job description available at Rm 11-115. Contact: Gitta Salamon, x3-0185, Rm E40-318. Athena ID: gitta.

### Off Campus: Technical

Summer Position: Engineering assistant, primarily doing construction and computer programming. Electronic or construction circuit experience or any physical science/math field. Job located in and around Ft. Walton Beach, FL. Work involved in the Strategic Defense Initiative Program. Hours flexible, summer; wage negotiable depending on experience. Contact: Dr. Miles Palmer, Science Applications International Corporation, 1 Clifford Drive, Shalimar, FL 32579, 904-651-1053.

Summer Position: Program and design using HP 3000. 35 hrs/wk, summer, at negotiable wage. Job convenient to Westchester County and Rockland, NJ. Contact: Alice Berlin, Automated Resources, 21 Phillips Parkway, Montvale, NJ 07645, 201-391-1500.

### Off Campus: Non-Technical

Summer Position: Childcare workers who would like to work with children 6-12 years old. These children are emotionally-disturbed, and/or have been abused. You must have patience and love to work with children. Work full-time, summer, at \$240/wk. Contact: Greg Howard, Italian Home (for children of all nationalities), 1125 Center St, Jamaica Plain, MA 02130, 524-3116. (Located near Faulkner Hospital on the Green Line.)

Research Position: Interviewing teenage boys and conducting survey at the Adolescent Center, about attitudes towards and use of birth control, as patients come in. (45 minutes/interview.) Work between 9am-4:30pm, afternoon hours available. Pay dependent on experience, \$5.50-\$7.50/hr (grads); \$5-\$5.50/hr (undergrads). Contact: Dr. Demetrios, Adolescent Center, Boston City Hospital, 424-4086 or 424-4092.

## Cable Television Schedule

*MIT Cable Television serves the MIT campus. For connection and programming information, call x3-7431.*

### Wednesday, April 1

**Channel 9:** 9-10am—12.56 Plate Tectonics Seminar, live coverage. 12-1pm—*Eyes on the Prize* Part 3: *Ain't Scared of Your Jails 1960-1961*.

**Channel 10:** 11am-12noon—Live coverage of the MIT Optics and Quantum Electronics Seminar.

**Channel 13:** 11am-12noon—"Granule Exocytosis in Lymphocyte Effector Functions" Pierre Henkart, National Cancer Institute. 12noon—"The Biochemistry of Antigen Presentation" Dr. Malcolm L. Gefter, MIT.

### Thursday, April 2

**Channel 8:** 6pm—Physics 8.02 Help Session 8. Program will repeat until 4pm, 4/7.

**Channel 9:** 7-8pm—*Eyes on the Prize* Part 3: *Ain't Scared of Your Jails 1960-1961*.

**Channel 11:** 10:30-12noon—12.733, Air/Sea Interaction, live from WHOI. 1-2:30pm—13.871, Wave Scattering, live from WHOI.

### Friday, April 3

**Channel 8:** Physics 8.02 Help Session 8. Program will repeat until 4pm, 4/7.

**Channel 13:** 12-1pm—"Regulation and Actin-Gelsolin by Ca<sup>2+</sup> and Phosphoinositides" Dr. Paul Janmey, Hematology/Oncology Unit, Mass. General Hospital. 1pm—"Common Carbohydrate Recognition Domain in Endocytic Receptors and Other Proteins" Durt Drickamer, Columbia University.

### Saturday, April 4

**Channel 8:** Physics 8.02 Help Session 8. Program will repeat until 4pm, 4/7.

### Sunday, April 5

**Channel 8:** Physics 8.02 Help Session 8. Program will repeat until 4pm, 4/7.

**Monday, April 6**  
**Channel 8:** Physics 8.02 Help Session 8. Program will repeat until 4pm, 4/7.

**Channel 9:** 9-10am—12.56 Plate Tectonics Seminar, live coverage.

### Channel 13:

12-1pm—*Exocytosis in Lymphocyte Effector Functions*" Pierre Henkart, National Cancer Institute. 1pm—"Regulation and Actin-Gelsolin by Ca<sup>2+</sup> and Phosphoinositides" Dr. Paul Janmey, Hematology/Oncology Unit, Mass. General Hospital.

### Tuesday, April 7

**Channel 8:** Physics 8.02 Help Session 8. Program will repeat until 4pm.

### Channel 10:

4-5:30pm—Live coverage of the MIT VLSI Seminar.

### Channel 11:

10:30-12noon—12.733, Air/Sea Interaction, live from WHOI. 1-2:30pm—13.871, Wave Scattering, live from WHOI.

### Wednesday, April 8

**Channel 9:** 9-10am—12.56 Plate Tectonics Seminar, live coverage. 12-1pm—*Eyes on the Prize* Part 4: *No Easy Walk 1961-1963*.

**Channel 10:** 11am-12noon—Live coverage of the MIT Optics and Quantum Electronics Seminar.

**Channel 13:** 11am-12noon—"Common Carbohydrate Recognition Domain in Endocytic Receptors and Other Proteins" Durt Drickamer, Columbia University. 12noon—"The Role of Interleukin 3 and Fibroblast-Derived Factors in Growth, Differentiation and Biochemical Properties of Mast Cells" Dr. Richard L. Stevens, Department of Rheumatology and Immunology, Brigham and Women's Hospital, Harvard Medical School. 5pm—"Normal and Neoplastic Lymphocyte Maturation" Dr. Irving L. Weissman, Stanford School of Medicine. Live from Harvard Medical School.

### Thursday, April 9

**Channel 8:** 6pm—Physics 8.02 Help Session 9. Program will repeat until 4pm, 4/14.

### Channel 9:

7-8pm—*Eyes on the Prize* Part 4: *No Easy Walk 1961-1963*.

### Channel 11:

10:30-12noon—12.733, Air/Sea Interaction, live from WHOI. 1-2:30pm—13.871, Wave Scattering, live from WHOI.

### Friday, April 10

**Channel 8:** Physics 8.02 Help Session 9. Program will repeat until 4pm, 4/14.

### Channel 13:

12-1pm—"Cotranslational Insertion and Sorting of Membrane Proteins in the Endoplasmic Reticulum" Dr. David Sabatini, NYU Medical School. 1pm—"Normal and Neoplastic Lymphocyte Maturation" Dr. Irving L. Weissman, Stanford Medical School.

### Saturday, April 11

**Channel 8:** Physics 8.02 Help Session 9. Program will repeat until 4pm, 4/14.

### Sunday, April 12

**Channel 8:** Physics 8.02 Help Session 9. Program will repeat until 4pm, 4/14.

## UROP

*MIT and Wellesley undergraduates are invited to join with faculty members in pursuit of research projects of mutual fascination. Faculty supervisors wishing to have projects listed should send project descriptions to the UROP Office. Questions? Contact us, x3-5049, Rm 20B-141. Wei Undergraduate Research Award. Faculty are urged to nominate undergraduates who have made outstanding contributions in undergraduate research at the interface of the life sciences and engineering. Nominations for this award should be sent by April 15, 1987 to N. McGovern, UROP Office, 20B-141, x3-5049.*

**Geologic Mapping in Iceland.** Field assistant needed for summer mapping project on the SE coast of Iceland. Must be willing to live in a tent for two months. Knowledge of geology useful but not essential; can be acquired in the field. Project involves mapping of a small gabbroic intrusion with a graduate student. For credit or PAY if UROP funds are available. Faculty supervisor: Dr. Peter Meyer, x3-2829. Contact: Jon Snow, x3-5465.

**Programming.** Experienced C and Unix programmers for development of advanced writing tools for spring term, with strong possibility of full time during summer and/or research for future thesis topic. 6.170 or equivalent in software engineering experience required. Faculty supervisor and contact: Prof James Paradis, Rm 14N-311, x3-7392.

**Clinical Research Center.** Unique opportunities to participate in projects in clinical and clinically-related areas of laboratory investigation. Broad areas include: 1) nutritional biochemistry and metabolism; and 2) neurosciences and behavior. UROPers will have close contact with physician preceptors and faculty supervisors active in clinical research, as well as have exposure to patient care, clinical rounds, and seminars and conferences directed at integrating recent research findings from laboratory and clinical investigation with clinical knowledge. Upperclass students are preferred for these positions. Credit. For more information, contact: UROP coordinators Jerrold Bernstein and Naomi Fukagawa, Rm E17-445, x3-3091, or Director Prof Richard Wartman, Rm E25-604, x3-6732.

**Making Computer-Generated Holograms.** UROP needed to develop a system for generating holograms with an HP-Laserjet printer. Project has two phases: 1) learning the mathematical formalism for making computer-generated holograms and determining the feasibility and limitations of using the HP-Laserjet as the output device, and 2) writing the software to control the printer given an arbitrary hologram description. Good thesis project. Student should have an interest in optics and holography, knowledge of UNIX and C necessary. Credit initially; pay available after satisfactory progress demonstrated. Faculty supervisor: Prof Cardinal Warde, Rm 13-3065, x3-6858. Contact: Jim Kottas, Rm 10-370, x3-3624.

## TECH TALK



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# Mazlish named to Meloy Chair

Professor Bruce Mazlish, an historian known particularly for his pioneering theories exploring the uses of psychology in understanding history and public policy, has been named as the third holder of the Thomas Meloy Professorship in Rhetoric.

The announcement was made by MIT Provost John M. Deutch. He praised Dr. Mazlish, who has been a member of the MIT faculty for more than 30 years, for his "wide-ranging contributions to historical scholarship."

Professor Mazlish, appointed to a five-year term that began January 1, succeeds Professor Elzbieta Chodakowska, a novelist, essayist and literary critic, in the chair.

The Meloy Professorship, intended to encourage students to gain a mastery of words in every field of their education, was established in 1978 by the Thomas Meloy Foundation. The late Mr. Meloy, who received engineering administration from MIT in 1917, was the founder and president of Meloy Laboratories, now a division of Revlon.

Dr. Pauline Maier, professor of history and head of the history faculty in the Department of Humanities, described Professor Mazlish as "one of a very small group of contemporary professional historians who have resisted the tendency toward narrow specialization and allowed their minds to range freely over the course of human history."

At the same time, she said, they "have so framed their writings that they might reach, in the best tradition of rhetoricians, a large and varied audience that includes the general public as well as academicians."



Professor Maier termed Dr. Mazlish "a prolific scholar whose publications are distinguished by the range of scholarly vocabularies on which they have depended—from that of western intellectual history... to the language of psychoanalysis... to the language of social theory."

Dr. Mazlish, who won a major international award, The Toynbee Prize, in 1986, has explored the relationship between psychology and history, and the importance of personality in determining policy.

He applied this research in biographies he has written of former Presidents Richard Nixon and Jimmy Carter and former Secretary of State Henry Kissinger.

Professor Mazlish's major research interests have been European intellectual history, the philosophy of history, psycho-history and comparative development history.

He has authored more than 250 major papers and articles and a number of books. Among them are *The Western Intellectual Tradition* (with Jacob Bronowski), *The Riddle of History*, *James and John Stuart Mill*, *The Revolutionary Ascetic*, and *The Meaning of Karl Marx*.

Born in 1923, Professor Mazlish received a BA degree from Columbia University in 1944, an MA in 1947 and PhD in 1955. He was an instructor in history at MIT from 1950 to 1953, when he became director of the American School in Madrid, Spain. He was appointed to the MIT faculty in 1955. He was chairman of the history section in the Department of Humanities from 1965 to 1970 and head of the department from 1974 to 1979.

He has been a fellow or visiting professor at several other major institutions of higher learning, including Harvard University and the Institute of Advanced Study at Princeton University.

His professional associations include a fellowship in the American Academy of Arts and Sciences.

# Khoury named to new post

Dean Ann F. Friedlaender of the School of Humanities and Social Science has announced the appointment of Professor Philip S. Khoury as associate dean. In this capacity, he will concentrate on the school's participation in the ongoing reassessment of the undergraduate curriculum.

Dean Friedlaender, commenting on the creation of the new post, said, "Professor Khoury is a historian of international stature who is widely known and respected within the School of Humanities and Social Science and the rest of the Institute for his interest in and concern for undergraduate education."

"One of the founders of the Burchard Scholars Program and now its current codirector, Professor Khoury has demonstrated both imagination and effectiveness in creating new initiatives to enhance and integrate the role of the humanities and

social sciences in MIT's technical and scientific education. I am delighted that he has agreed to undertake this important task."

Dr. Khoury, associate professor of history, is a political and social historian of the Middle East, with a strong background in comparative urban history and politics and in comparative nationalist movements. He teaches a wide range of subjects and, from 1984 to 1986, he held the Class of 1922 Career Development Chair, which recognizes excellence as a teacher.

Professor Khoury received the BA from Trinity College in 1971, and the PhD from Harvard University in 1980. He spent 1974-75 and 1976-77 at St. Anthony's College, Oxford University, where he was an associate fellow and tutor.

He also has received postdoctoral fellowships from Harvard's Center for Middle Eastern Studies, the Mellon Foundation's Aspen Institute for Humanistic Studies and the Social Science Research Council.

He is the author of *Urban Notables and Arab Nationalism: The Politics of Damascus 1860-1920* and *Syria and the French Mandate: The Politics of Nationalism*.

# Two companies join transit group

By SCOTT CAMPBELL  
Center for Transportation Studies  
Union Pacific and DuPont have joined the Affiliates Program of the MIT Center for Transportation Studies, bringing total program membership to 17 corporations.

The Affiliates Program, established in 1981 to develop research relationships between MIT and the transportation industry, sponsors technical seminars and offers executive education programs in transportation.

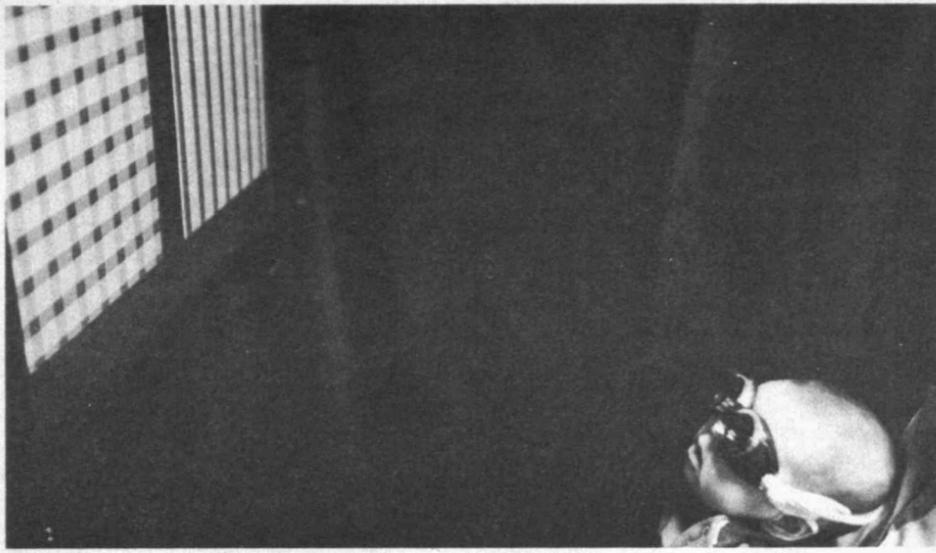
The addition of the third largest railroad carrier in the United States, along with one of the biggest shippers in the global market, maintains the balance intended between transportation buyers and sellers in the Affiliates Program. With these additions, membership includes seven major shippers, five railroads, four trucking firms and a motor vehicle manufacturer.

Union Pacific, which includes Missouri Pacific and the Western Pacific railroads, operates more than 200 trains in any given hour over more than 21,000 route miles. It is the leading hauler of finished autos and chemicals, and a leader in auto parts, forest products, coal, grain, and trailer and container traffic. It operates a fleet of 2,500 road locomotives and 95,000 freight cars, and serves 16 metropolitan areas with more

than one million population and 10 of the country's 20 largest ports. The railroad's innovative computerized Transportation Control System, the most comprehensive in the industry, dispatches, monitors and performs the billing and accounting for every item shipped.

Dupont, whose sales for 1985 were \$29.5 billion, produces biomedical products for the health care industry, industrial and consumer products, fibers, polymer products, agricultural and industrial chemicals. Dupont is also involved in petroleum exploration and production, petroleum refining, marketing and transportation, and the mining and marketing of coal. The company is one of the largest shippers in the world. It is also about the 40th largest electronics company in the United States, providing cleaning solvents, connectors and photopolymer products to the electronics industry. Excluding energy operations, Dupont contracts \$500 million in domestic shipping services and \$100 million in international transportation yearly. It has the largest private rail fleet in the country—nearly 10,000 rail cars.

For information about the program, contact Gerard McCullough, deputy director, MIT Center for Transportation Studies, Rm 1-123, x3-5378.



Three-month-old Ivan Khoo seems to find the patterns on the screens intriguing. The images are designed to test the development of his binocular vision.

—Photo by Donna Coveney

# Study finds boys lag behind girls in vision development

By PAULETTE BOUDREAUX  
Staff Writer

Some MIT researchers have discovered that infant boys lag behind infant girls in one key area of vision development during their early months. They suspect that a temporary increase in the male sex hormone testosterone in the boys may be partly responsible.

Said Professor Richard Held of the Department of Brain and Cognitive Sciences, this discovery raises some important questions about the differing paths of brain development in males and females and about the influence of hormones on the development of the brain's cortex.

Professor Held is working on the project with Research Scientist Dr. Jane Gwiazda and Principal Research Scientist Joseph A. Bauer, both of Brain and Cognitive Sciences. They are now looking for more infant subjects so they can begin to answer these questions.

Scientists have already linked each sensory and motor process to a specific region of the cortex, according to Professor Held. As a step toward understanding how the brain develops and the cortex functions Professor Held and his colleagues have focused their attention, for more than a decade, on the region that controls vision. This discovery came out of that research.

Some testing by Professor Held and his colleagues has centered around growth in grating acuity, which depends on retinal development, and growth in vernier acuity, which requires brain processes and is therefore dependent on development in certain areas of the cortex. In measuring grating acuity Professor Held and his colleagues found no difference between the sexes. But in measuring vernier acuity they found that around four months the girls were significantly higher than the boys and this remained so for a time. But by about seven months of age the boys have caught up and their development seems to continue from there at about the same rate as the girls.

Professor Held said that the period between the third and seventh months of life is the period of the most rapid synaptic development in females and males. This type of development allows nervous impulses to travel quickly from one neuron to another. "This is a period of enormous activity and it is during this period that testosterone levels rise in males only—we have wondered why."

"We already know that testosterone has something to do with the development of the male reproductive system," said Professor Held. "Testosterone begins to be present in male infants during their first month of life and we don't know why so early." However, "There is increasing evidence that its presence in infants has something to do with the development of the nervous system that is unrelated to reproduction," he added.

Professor Held said that in addition to learning more about the influence of the male hormone on the rate of visual development in baby boys, their study could also yield significant knowledge about exactly what it is that infants see and it could also have some application to pathology.

However, Professor Held said that before drawing any definitive conclusions the team needs to test more subjects. "We have noted considerable range in the variability of levels of testosterone in different infants and considerable range in the development rate and onset of certain kinds of visual functions," he said. "We need more evidence."

For the testosterone study the team is

seeking male infants that are four to eight weeks old at the start of the study. The infants will be tested biweekly for a total of about four to ten visits. The parents of the subjects will be paid \$10 for each visit and will receive a bonus of \$50 on the last visit.

Dr. Gwiazda said that during the vision tests, the infant will sit on his parent's lap in a darkened room while patterns are projected onto small screens. One of the researchers will record the infant looking behavior as the patterns are changed. Over time as the baby's different visual functions develop the patterns that he prefers will also change. "We will test the infant until he shows a shift in preference, which is an indication that his binocular vision has developed," said Dr. Gwiazda. Binocular vision refers to the development of perceptual coordination of the two eyes and is related to a person's depth perception. It is during the period of development leading to complete binocular vision that the boys lag behind the girls.

During the testing the babies will be required to wear infant size swim goggles fitted with polarized lenses like the ones used to view 3-D movies. The test will take about five minutes.

At each visit blood samples will also be drawn from the baby's heel at the Clinical Research Center at MIT for analysis. "We hope to be able to correlate testosterone levels and vision development," said Dr. Gwiazda.

The infants participating in the study will also receive free monthly eye examinations by a pediatric optometrist.

# Course I to offer environment major

The Department of Civil Engineering has a new undergraduate degree program in Environmental Science and Engineering.

The Course I announcement said the new program is the first at the undergraduate level at MIT focused on environmental studies.

It's designed for students who want deep knowledge of physical, chemical and biological processes as well as the analytical and computational skills needed to address the crucial problems of human impact on the environment.

Those aiming for careers in environmental engineering, management and planning—whether in manufacturing, government or consulting—will find the new program useful, the department believes.

Required courses include fundamental subjects in fluid mechanics, hydrology, chemical thermodynamics, environmental chemistry, waste water treatment, and ecology. Students will also take subjects emphasizing analytical and computational tools, such as computer programming, differential equations, probability, statistics and economics.

The curriculum draws heavily on subjects offered by the Water Resources and Environmental Engineering Division of civil engineering. It also includes subjects from the School of Science and the School of Humanities and Social Sciences.

Additional information can be obtained from Professor Rafael Bras, head of the Water Resources and Environmental Engineering Division, Rm 48-311, x3-2117, or the department's academic programs office, Rm 1-281, x3-7106.

# Faculty begins discussions on reforms in curricula

(continued from page 1)

divided among five broadly-defined fields.

The Maier Committee, which studied the matter, found that there were "several problems and disadvantages in the current HASS distribution system" and especially noted these: "1) It does not effectively build breadth into students' HASS programs. . . 2) It has failed to sustain demanding workloads in many distribution subjects, undermining the rigor and reputation of the HASS program. . . 3) The current HASS distribution system offers no common experience for undergraduates to balance or complement that from the Science Core."

The faculty discussion focused on whether the five proposed fields—cultures and societies; historical studies; literary and textual studies; mind, thought, and value; and the arts—might still be too vague to ensure that the goals of the distribution requirement are met.

Among those supporting the motion were the provost, Professor John M. Deutch, and Dean Ann F. Friedlaender of the School of Humanities and Social Science. While acknowledging that the proposed solution was not perfect, they said it adequately addressed the problem.

The faculty also was told it would receive a proposal next month for the establishment of a minor in HASS. This will be an optional program for undergraduates who want to add a measure "of greater rigor and depth to their HASS experience" by augmenting the concentration element of their HASS requirement in an approved way.

President Paul E. Gray told the faculty that it could expect to discuss various aspects of the curriculum review for a year or more as additional proposals emerge from the reassessment, which he described as the most extensive examination of the undergraduate program in 25 years.

Professor Margaret L. A. MacVicar, dean for undergraduate education and a principal architect of the academic review, said that the period since October, when reports of the humanities, engineering and science commissions studying the curriculum were first presented to the faculty, has been marked by advice with "a proper amount of encouragement and caution."

A major development arising from discussions by the Committee on the Undergraduate Program, she said, has been sharpened attention to "the crucial role of the freshman year, starting with admissions and carrying on as the class navigates its first year."

"It is clear," she continued, "that insufficient linkages and feedback have existed between the admissions staff and the freshman year instructors, especially in the core science subjects."

"The diversity of backgrounds and aspirations which increasingly characterize applicants has significance for the planning and design of the educational experience and of the subjects the students will take," she said. "Conversely, the observations and insights of the freshman year instructors must inform the admissions process, as well as point the way with regard to directions of needed personal support networks for students."

One result of this, she said, is that CUP will "actively encourage better linkages."

"A second imperative," Professor MacVicar said, "is that legitimate, unstigmatized alternative pathways through the freshman year be explored."

Such pathways, she explained, "must permit students who by preparation or preference wish to defer physics or chemistry to do so and not to be bulldozed by the typically monolithic freshman first term program."

"Tackling this issue," she stated, "means rethinking the structure of the freshman year and its relation to subsequent years."

On the subject of residence and orientation, or R/O week, Professor MacVicar noted that the week now is "almost wholly dominated" by housing decisions, adding: "Recognition of MIT as a world-class institution of learning and as an assembly of inspiring fellow students and faculty is crushed beneath the frenetics of 'getting settled.'"

She said a faculty group headed by Professor Thomas Allen is examining R/O "with an eye to making recommendations. . . for fundamental changes in the way in which freshmen first are engaged by MIT."

She said a new seminar-advising system initiated by UASO—where advisors lead a freshman seminar group in a topic chosen by the students—also is gaining ground. Eight pilot seminars this year will be expanded to 32 next year, engaging between one-third and one-fourth of the entire class.

Other possibilities, she said, include changing the freshman calendar to incorporate a more structured Independent Activities Period, and restoring final examinations to subjects normally taken the first year. "Finals are arguably most useful as educational experiences for freshmen," Professor MacVicar said. She emphasized the need to review the effectiveness of pass/fail and suggested that the freshman academic load be capped at 4 1/2 subjects.

Professor MacVicar also commented on a range of other initiatives related to the academic review, among them a "contexts" format that would facilitate the integration of science and technology with the humanities, arts and social sciences.

It takes its name, she said, from its goal of having students "grapple with the human contexts within which scientific and technological endeavors are pursued."

Another idea, Professor MacVicar said, is "the establishment of a dual major—a new concept—not a dual degree, but a program in the spirit of dual competency."

Summarizing, she said: ". . . the most difficult enterprise of all. . . is giving form and substance to what is meant by saying that MIT wants to mount a 'more integrated' education. Not a fragmented one whose components are in tension, but rather, a cross-woven education, with elements of seamlessness."

"The relationship of the humanities, arts and social sciences to science and technology must not be discontinuous at the boundaries, nor mysterious to the student."

## Name that fractal

(continued from page 1)

Mathematics Awareness Week. The board has called for increased federal support for mathematics as critical to a healthy economy and a secure national defense. Last year Professor Hoffman arranged for a presidential proclamation on the week. The focus this year is on activities at the state and local levels, such as the symposium on fractals.

Governor Dukakis is scheduled to issue a Massachusetts proclamation establishing Mathematics Awareness Week.

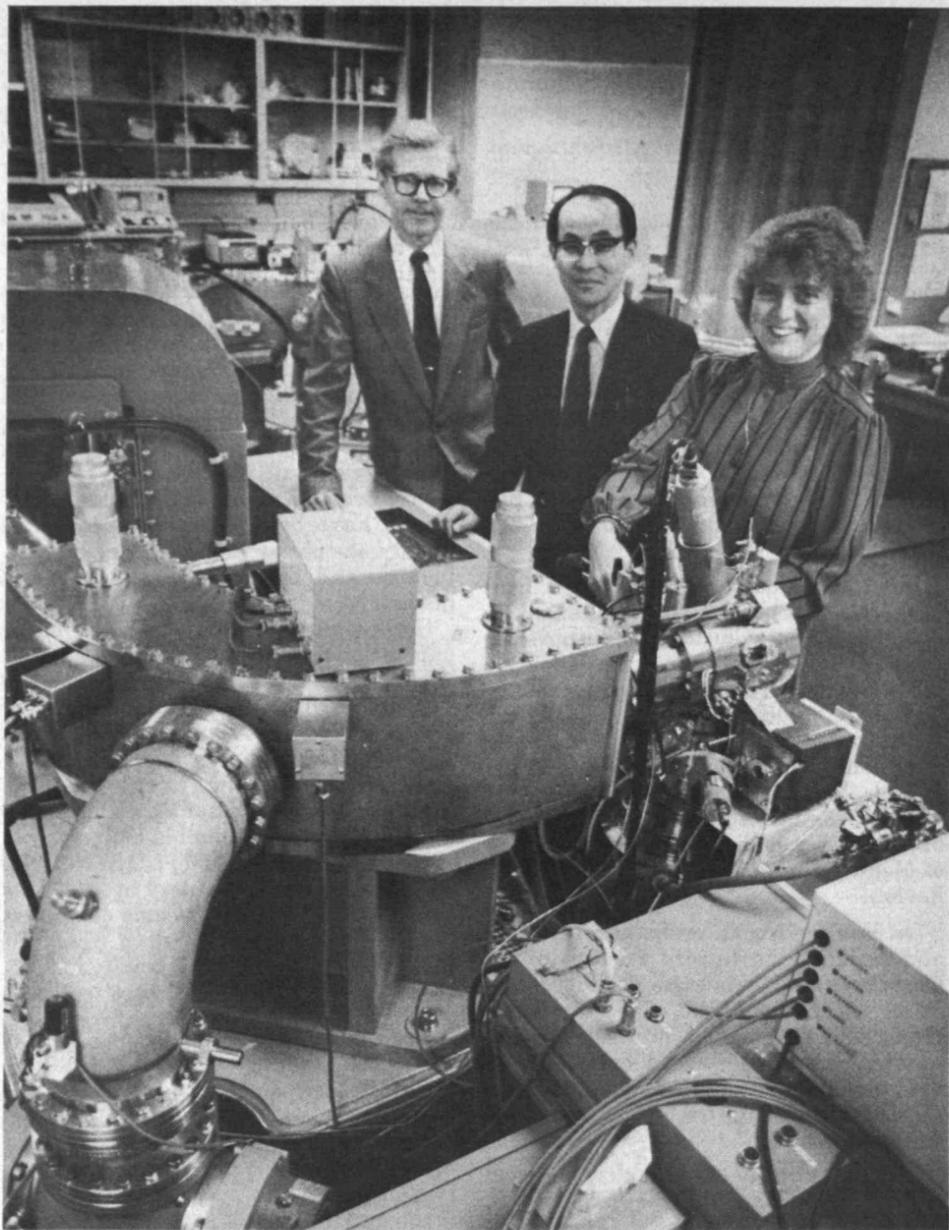
Fractal geometry seeks to describe the unpredictable and chaotic in nature—the crags of mountaintops, the swirl pattern produced when cream is added to coffee, the flux of world weather patterns. Those events and many others evade the formal analysis that mathematicians can produce of nature's more elegantly symmetrical patterns and predictable phenomena.

The symposium will seek to explain some of the elementary concepts of the new field of fractal geometry and outline

some of its applications. The use of computer graphics as a tool to explore the intricacies of fractals will be emphasized.

The event at MIT is scheduled in conjunction with a Museum of Science exhibit, "Frontiers of Chaos—Computer Graphics and the Fractal Geometry of Nature." The museum event also involves the Goethe Institute Boston, the German cultural center for New England. The exhibition consists of 90 color computer graphics of new mathematical formulations that describe chaotic natural behavior. The graphics are the work of a mathematics and physics research team at the University of Bremen, Germany, headed by Professors Heinz-Otto Peitgen and Peter H. Richter.

Professor Peitgen will speak at the MIT symposium. Other speakers will be Professors Michael Barnsley of Georgia Institute of Technology, Robert L. Devaney of Boston University, Benoit B. Mandelbrot of IBM's Thomas J. Watson Research Laboratory and Harvard University, and Michael Voss of IBM.



Professor Klaus Biemann and Dr. Catherine E. Costello, director and associate director, respectively, of the MIT-NIH Mass Spectrometry Facility, flank Professor Takekiyo Matsuo of Osaka University at the side of the first high-mass/tandem-mass spectrometer capable of measuring spectra up to mass 14,500. The new device was acquired with \$1 million in NIH funding. The facility observed its 20th anniversary March 26 with a symposium.

—Photo by Donna Coveney

## Symposium marks anniversary of Mass Spectrometry Facility

Emergency room physicians, when treating an unconscious patient suffering from an overdose of an unidentified drug, routinely send body fluids to commercial laboratories that specialize in computerized drug analysis.

That now common analysis was pioneered in the 1970s by researchers led by Professor Klaus Biemann using the MIT's Mass Spectrometry Facility.

The facility, supported by the National Institutes of Health, celebrated its 20th year with a symposium last week focused on present day perspectives in state-of-the-art spectral data for the biomedical community across the country. Each year, an average of 150 researchers from 80 different institutions make use of the facility at MIT, contributing more than 100 publications to the literature.

The facility is critically important in the development of new techniques in this field, Professor Biemann said. "No commercial company, for example, could have devoted the time and resources that were required to bring computer drug analysis techniques on line," he said. "A facility such as the one at MIT is a requisite."

The Mass Spectrometry Facility at MIT was the first of its kind to be supported by the NIH. In 1966, a high-resolution mass spectrometer cost about \$100,000 and could be made available only at very few laboratories. A key goal of the MIT facility was to train experts who could direct similar facilities elsewhere. That goal has been achieved. Of the five other facilities the NIH now supports, three are directed by former students of Professor Biemann. Among the speakers at the March 26 symposium were three PhD students of Professor Biemann—Throck Watson, director of the Mass Spectrometry Facility at Michigan State University, Ronald A. Hites of Indiana University, and Stephen A. Martin of the Medical University of South Carolina.

Professor Biemann came to MIT in 1955 from the University of Innsbruck in his native Austria, where he had received his PhD in 1951. At MIT, he began the work that led the development of a quick and reliable instrument for determining the structure of organic compounds—the gas chromatograph-mass spectrometer.

The instrument determines the structure

of compounds—and hence, their identity—by giving the range, or spectrum, of masses of the pieces that make up the compound. Such instruments had been used in the petroleum industry. In 1959, Professor Biemann became the first to apply them to complex organic compounds.

Professor Biemann also sent scaled-down gas chromatograph-mass spectrometers into space during the mid-1970s aboard two Viking spacecraft which landed on Mars and sampled Martian soil.

The NIH-supported facility at MIT has remained in the forefront of the field of bioorganic mass spectrometry. With \$1 million in new NIH funding, the facility has recently acquired the first high mass-tandem mass spectrometer capable of measuring spectra up to mass 14,500.

## 8 win traineeships

Seven freshmen and one junior have received \$750 spring-term traineeships from the Department of Civil Engineering. The stipends encourage research with departmental faculty members under the auspices of the Undergraduate Research Opportunities Program. Recipients, topics and faculty advisors are:

Tracy Vail of McKinleyville, Calif., "Debonding in Sandwich Panels," Professor Lorna Gibson.

Laura Marmorstein of Miami, Fla., "Anisotropy in Cellular Materials," also Professor Gibson.

Elena Koutras of Dallas, Texas, "Sediment Dating," Professor Harold Hemond.

Christopher Liro of Austin, Texas, "Measurement of Strain NonUniformity," Professor Charles Ladd.

Joanne Spetz of Bakersfield, Calif., "Centrifuge Testing for Models of Braced Excavations in Dry Sand," Professor Robert V. Whitman.

Dharanija Vasudevan of Shantinagar, India, "Radon as a Natural Tracer in Determining Hydrologic Flowpaths," also with Professor Hemond.

Quannah Pratt of Dayton, Ohio, "Anisotropy of Sedimented Clay," Professor John Germaine.

Dianne Tobey of Wilmington, Mass., a junior in Earth, Atmospheric and Planetary Sciences, "Development of Techniques for Measuring Iron Reduction by Phytoplankton," Professor Francoil Morel.

# Concert to feature world premiere

By JUDY WHIPPLE  
Experimental Music Studio

New Music in Town at Kresge Auditorium will feature the world premiere of a devilish new work by Alejandro Vaino (vin-YOW), a rising star in European new music, whose work was described as "pungent, original, and imaginative" by the Financial Times of London.

The concert on Friday, April 10, explores the "bionic sound world" created when live instruments are combined with computer-generated sound. It will be the first live performance of Vaino's music in this country.

Also on the program are the first Boston performances of works by Peter Otto, Denis Smalley, and Denis Lorrain. Tickets are \$7 general, \$4 students, elders, and are available through the MIT Experimental Music Studio, x3-7418, or from Strawberries, Out-of-Town Tickets, and Concertcharge.

Born in Argentina, the 35-year old Vaino now lives in London and is known for being at home in many musical worlds. He has been involved in a spectrum ranging from classical to rock and has composed music for some 20 films.

Composer Robert Kyr calls Vaino's music "the work of an original. It is brimming with rhythmic vitality, kaleidoscopic in the diversity of its sound-color, and full of surprise and adventure."

In his new Toccata del Mago (Magician's Toccata), scored for computer and strings, Vaino says, "I have taken great risks." It is a pulsating work whose driving, complex rhythms will challenge eight of Boston's best string players, under the direction of conductor Ronald Feldman. His earlier Triple Concerto will be performed in late April as part of the San Francisco Symphony's "New and Unusual Music" series. Taken as a pair, these two works present some of the most remarkable effects—and the most difficult challenges for performers—in the entire computer music literature.

The composer created the Toccata's

computer part at the MIT Experimental Music Studio, which commissioned the work. Computer and strings are closely interwoven, with the computer part often "diving into the instruments, coming out, taking over, burying them in sound, and then diving again," Vaino says. "At times, ideally, you should not be able to tell when an instrument stops playing and the computer takes over, and vice versa." Kyr adds, "Somehow, as if by magic, he has managed to balance the musical and the technological in a single expression."

The eerie "Recent Hurling" (1983), by Californian Peter Otto, was called "a smash" in performance by the L.A. Weekly. It was created for—and with—the extraordinary voice of soprano Susan Judy, who will give its first Boston performance in the April 10 concert. This work combines tape, Buchla synthesizer, and live processing of Judy's performance into a real-time interactive exchange between voice and computer, where aspects of each are often blurred and exchanged.

In New Zealander Denis Smalley's sinuous Clarinet Threads (1985), Bruce Creditor's amplified clarinet threads its way through a computer-generated sound world in surprising and subtle ways. Also on the program is Canadian Denis Lorrain's dramatic and percussive "...black it stood as night" (1985), a work for tape solo which extracts the essences of instrumental percussion: explosive impact, resonance, rhythm, and raw energy.

In a related event on Tuesday, April 14, Alejandro Vaino will talk about his ideas and music in a free public lecture (4:30pm, Bartos Theatre, Wiesner Building). These events are sponsored by the MIT Experimental Music Studio, and supported in part by funding from the Council for the Arts at MIT, the MIT School of Humanities and Social Science, the Massachusetts Council on the Arts and Humanities, the National Endowment for the Arts, and the System Development Foundation.

## Success is conference focus

"How Do You Spell Success?" is the title of a career development conference for women in technical careers which will be held April 3-4 at MIT.

The event is being sponsored by the Association of MIT Alumnae (AMITA) and the Society of Women Engineers' Boston Section.

It is designed for women in all technical professions, interpreted as including everything from accounting to astronautics to zoology.

It will begin Friday at 5:45pm with registration, followed by a reception. On Saturday, April 4, activities will begin at 8:15am with late registration in Rm 10-105. Registration will be followed by welcoming remarks at 9am in Rm 10-250.

The activities on Saturday morning will include women from different technical fields sharing their experiences during their talks.

Different definitions of success and different ways of achieving that success is a theme that runs through many of the work-

shops Saturday afternoon. They will be grouped under the headings Career Choices, Personal Issues and Survival skills and will address issues such as: Success is Making Your Career Fit You; Recognizing Opportunities and Dealing with Involuntary Change; How do Creative People Define Success?; Careers and Families, Perceptions, Reflections and Reality; The Imposter Syndrome, Why Doesn't Your Success Feel Real?; Creating, Believing and Selling your Image; Time Management, How to Set Priorities; How to Choose Your Battles When Playing for Real; Speaking Power and Nonverbal Communication; Conflict Management; The Professional with a Handicap, and Money: How to Manage Your Finances to Achieve Your Goals.

Laura Clausen, associate chancellor, Massachusetts Board of Regents for Higher Education and an MIT graduate, will give the keynote speech.

Advanced registration is encouraged. Forms are available from the MIT Alumni Office, Rm 10-110, x3-8230.

## Techology, culture seminar planned

"Promise or Threat? Releasing Genetically Engineered Organisms into the Environment," is the title of a forum being sponsored by the Technology and Culture Seminar at MIT on Monday, April 6 at 4pm in Rm 9-150.

The forum will explore the questions surrounding the issue of genetically engineered organisms and their effect on the environment.

David Glass, director, Patents and Regulatory Affairs, Biotechnica International, Inc. will describe something of the promise and possibilities of such organisms.

David Pimentel, professor of Entomology, Cornell University will talk about some of the problems and dangers associated with the releasing of genetically engineered organisms.

Sheldon Krinsky, professor of Urban and Environmental Policy at Tufts University will speak on the social, economic and political implications of the proposed use of this technology.

Professor Sallie Chisholm, an ecologist in MIT's Civil Engineering Department will chair the forum.

For more information call x3-2983.



Teacher Linda Moriarty shows two James Hennigan School students how to use the turtle on their classroom computer.  
—Photo by L. Barry Hetherington

## Computers tested as teaching aid

Can computers improve the teaching process and help children to learn? Or do they merely distract attention from deep-seated problems affecting many public school systems?

Those questions are at the heart of a pilot program—called "Project Headlight"—that has incorporated computers into the regular curriculum at the Hennigan School in Boston in an attempt to improve the educational climate there.

"We chose Hennigan because it is central to the problem of education in the United States," says Seymour Papert, professor of mathematics and education. "It's an inner-city school with a range of problems: single parents who are just trying to survive, not much education at home. It is a culture on the margin of literate society."

The story of "Project Headlight" and the work of Professor Papert and his MIT team is told in the April issue of Technology Review.

The article, by senior editor Alison B. Bass, reports that the Hennigan project has 252 personal computers donated by IBM and a programming language known as LOGO, originally designed by Professor Papert in the 1960s.

Two of LOGO's more promising spinoffs are included in the Hennigan experiment: LOGOwriter, a package that combines programming with word processing, and LEGO/LOGO, software that allows children to use the computer to manipulate toys built with parts from LEGO sets.

Based on plain English, LOGO allows children to draw all kinds of geometric shapes, symbols, and complex pictures with the computer. Their "pencil" is the Turtle, a gray apparatus that can be directed to move in any direction on the screen.

The Turtle, according to Professor Papert, allows children to visualize and grasp mathematical concepts in a way they can't with textbook problems.

"In directing the Turtle," Dr. Papert told the magazine, "children have to make judgments about the size of numbers as well as spatial judgments. For instance, I've seen many small kids who don't know the difference between 10 and 10,000. But they pick up that difference very quickly with the Turtle; if they command it to go 10,000 steps, the computer will say, 'I don't like 10,000 as an input.'"

He added: "The reason why children don't learn math is not because it's hard, but because it's not related to their experience. They can't do anything with it that seems worth doing and so it feels dead to them."

"In the real world, people always learn by experience. A lot of theorists and thinkers about education agree it would be a powerful way to learn in the classroom. But up until now nobody knew how to provide experiences that embody the kind of math knowledge that we think children need to have..."

"Now we have a technology that children can use to make something they're interested in... The computer provides children with a way of appropriating mathematical knowledge—and using it in a very personal way."

The concept goes far beyond the way computers are often used in public schools—as tools for drill and practice in the basic skills, something that can often be done just as effectively with paper and pencil.

Some critics, however, doubt the value of even this "creative" approach.

One of the most outspoken is Dr. Papert's colleague at MIT, Joseph Weizenbaum, professor of computer science, who agrees that a more open, less rigid approach to

education is a fine idea and acknowledges that Dr. Papert may have found a better form of teaching.

But what, he asks, does that have to do with computers? If anything, he says, an overemphasis on computers obscures the real issue, which he believes is the need to fundamentally restructure the educational system and deal with the social problems that hinder children's natural urge to learn.

"Children may not be motivated in school because they're hungry or they've been abused at home or for any number of reasons," Professor Weizenbaum said. "Simply introducing computers avoids the question of why children may not be motivated in school. It converts a social problem into a technological problem and then tries to solve it by technical means. In that sense, the computer serves to inhibit the asking of important questions about the way our society raises and teaches its young."

As to the argument that programming teaches children valuable cognitive skills, in effect teaching them how to think, Professor Weizenbaum argues that the kind of thinking learned through programming—logical step-by-step analysis—is only one, limited variation of human thought.

"Programming applies to a very narrow domain of problem solving," Weizenbaum maintains. "But most human problems—whether to get married, whether to have children—are not solved that way."

While the debate remains unresolved, most of the teachers at the Hennigan told the author of the Technology Review article that Project Headlight has had a beneficial effect not only for children but for teachers reaching "burnout."

Linda Moriarty, who said her interest in teaching was rekindled by the advent of the computer experiment, said that LOGO "has a magic that nothing else has." She adds, "Personally, I feel my instructional program is pretty exciting. But LOGO seems to add a dimension I wouldn't want to lose."

Wouldn't it be more important to bring in new and more talented teachers, reduce the student/teacher ratio, pay teachers more?

That isn't about to happen, Ms. Moriarty replies, and given that reality, she thinks it's important to put something into the schools that will appeal to the teachers who are already there. And she believes that computers—used as Professor Papert intends—could be that something.

Has Project Headlight achieved results? Hennigan's overall reading scores are still below the national average, but most of the school's math scores have climbed since the program began in 1985.

In reality, however, no efforts are being made to test the Hennigan students on what they learn from LEGO/LOGO.

Why? The MIT researchers say it is extremely difficult to measure in any systematic way what concepts the children are picking up. They view Project Headlight as an experiment to study how children learn with computers, not as a benchmark test from which to develop standards.

Says Mitch Resnick, an MIT graduate student in computer science: "Tests tell how well kids learn by rote... But what's really important for kids to learn, the actual process of learning—that's a hard thing to test. And how do you test whether you've gotten kids excited and curious about learning?"

# THE INSTITUTE CALENDAR

April 1-12

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.

## MISS THE TECH TALK DEADLINE?

Put your announcement on the MIT Cable System. "Today at the Institute" runs 24 hours a day and can be viewed in Lobby 7, Lobby 10 and anywhere the cable is connected.

Simply submit announcement in writing to Rm 9-050. We prefer a day's warning, but faster action may be possible.

Useful also for correcting errors, notifying about cancellations, and dealing with emergencies.

Note: If you have met the Tech Talk deadline, your announcement is automatically put on cable (except for exhibits and some multimeetings programs).

## Events of Special Interest

**Public-Private Partnership in Building Equity in Low Income Housing\*\***—Shann Turnbull, principal, Management and Investment Services, Australia, Dept of Architecture/Dept of Urban Studies SIGUS (Special Interest Group in Urban Settlements) Workshop, April 6-10, 2-6pm, N52 4th floor seminar rm.

## Seminars and Lectures Wednesday, April 1

**Generation of Amplitude-Squeezed Light\*\***—M. Teich, Columbia University, EECS/RLE Seminar on Optics and Quantum Electronics, 11-12pm, Rm 36-428.

**The Nodal Expansion Method and Parity Simulation\*\***—Peter Laughton, Dept of Nuclear Engineering Seminar, 2:30-3:30pm, Rm 24-213.

**Robotics at JPL: The MARS Rover Project\***—Dr. R. Doshi, technical staff member, JPL, Calif, Dept of Civil Engineering Intelligent Engineering Systems Labs Artificial Intelligence: Hardware and Software Seminar, 3-4pm, Rm 1-350.

**Fracture Analysis of 2-D and 3-D Fiber/Matrix Composite Models by Local and Global Energy Release Rate Methods\***—Dr. F.G. Bucholz, Dept of Mechanical Engineering, Institute of Mechanics, University of Paderborn, Composite Materials Seminar, 3:30-4:30pm, Rm 33-206.

**The NOSC Systolic Linear Algebra Parallel Processor\*\***—Franklin Luk, Cornell University and Thinking Machines Corp, Dept of Mathematics Numerical Analysis Seminar, 4pm, Rm 4-159. Refreshments served, 3:30pm, Rm 2-349.

**A Quantitative Basis for Interpreting Igneous Rock Abundances\*\***—Dr. William Bryan, Woods Hole Oceanographic Institution, Dept of Earth, Atmospheric and Planetary Sciences Conoco Lecture, 4-5pm, Rm 54-915.

**Ship Financing\***—Richard Hawkins, vice president, Transportation Division, Bank of Boston, International Shipping Club Seminar, 4:15pm, Rm E51-302.

**New Materials through Science and New Science through Materials: Adventures in Carbon Research\***—Prof Mildred S. Dresselhaus, Institute Professor and Abby Rockefeller Mauze Professor of Electrical Engineering, Killian Award Lecture, 4:30pm, Rm 10-250.

**Managing Hazardous Waste When Communities Don't Trust Government\***—Joan N. Gardner, director MA Site Safety Council, Dept of Environmental Quality Engineering, Dept of Urban Studies & Planning Seminar, 5-6pm, Rm 7-335.

**Hidden Miracle: World Class Japanese Subcontractors\*\***—Nishi Guchi, research fellow, International Motor Vehicle Program, MIT Ctr for Technology, Policy and Industrial Development, MIT-Japan Science and Technology Forum Lecture, 5:30pm, Student Ctr Mezzanine Lounge.

**Making Connections\*\***—Writing Center ESL Workshop on transitions for clearer, smoother writing, 6:15-7:15pm, Rm 14N-317.

## Thursday, April 2

**The Response of Line-Stiffened Fluid-Loaded Infinite Elastic Plates to Convecting Pressure Fields\*\***—Steven Petri, doctoral candidate, Dept of Mechanical Engineering Doctoral Thesis Presentation, 2pm, Rm 5-314.

**Macromolecular Engineering in Silicon-Mediated Polymerizations\***—Dr. D. Sogah, E.I. DuPont de Nemours and Co, Program in Polymer Science and Technology Seminar, 3-4pm, Rm 4-145.

**Application of Vision to the Assembly of Micro Devices\*\***—Dr. Arkady Makhlin, senior manager, Vision, Sensory and Adaptive Systems, Digital Equipment Corp, Laboratory for Manufacturing and Productivity Seminar, 3-4:30pm, Rm 35-520. Refreshments follow.

**Chaos in Atomic Nuclei\*\***—Hans Weidenmüller, MPI, Heidelberg, Physics Colloquium, 4pm, Rm 10-250. Refreshments served, 3:30pm, Lobby 10-250.

**The Limits of Maritime Strategy: Changing Prospects for United States Naval Power Since 1945\*\***—David Alan Rosenberg, Strategy Dept, US Naval War College, Defense and Arms Control Studies Program Seminar, 4-5:30pm, Rm E51-140.

**Competition and Cooperation in Telecommunications Between Japan and the United States\*\***—Nozomu Takasaki, Mitsubishi; Clyde Prestowitz, Woodrow Wilson Ctr for Scholars, Smithsonian Institution, Communications Forum Seminar, 4-6pm, Wiesner Bldg Bartos Theatre Rm E15-070.

**Adiabatic Diesel Research Programs at the Ford Motor Company\*\***—Mr. W. Wade, Ford Motor Company, Sloan Automotive Lab Seminar, 4pm, Rm 31-161.

**A Genetic Engineering Approach to the Production of Phenylalanine\*\***—Dr. Keith Bachman, Bio Technica International, Inc, Applied Biological Sciences Seminar, 4:30pm, Rm E25-111. Refreshments served, 4pm.

## Friday, April 3

**EXPROC: An Expert/PROCedural System for Complex Numerical Calculations\*\***—Mr. J. Dannenhoffer, Informal CFD Seminar, 12-1pm, Rm 33-206. Coffee and refreshments served.

**Distant Cooling Flows\*\***—Carolyn Crawford, Inst of Astrophysics, Cambridge, Ctr for Space Research Astrophysics Lunch Seminar, 12:10pm, Rm 37-252. Sandwich lunch available, 12noon.

**Neural Control Over Acetylcholine Receptor Properties\*\***—Leslie Henderson, Tufts MS, Physiology, MIT Cell Biology Seminar, 12:15pm, Whitehead Institute Auditorium.

**Surface Adsorbate Photochemistry and Applications to Patterned Aluminum Growth for Microelectronics\***—Dr. G.S. Higashi, AT&T Bell Laboratories, Ctr for Materials Science and Engineering Colloquium, 12:15pm, Rm 9-150. Lunch served, 12noon.

**Man-Machine Interface for Computer-Assisted Surgery\*\***—G. Chang, graduate student, Dept of Mechanical Engineering, Newman Laboratory for Biomechanics and Human Rehabilitation Seminar, 1-2pm, Rm 1-114. Bring your lunch.

**Computer Simulation of Polymeric Glasses\*\***—Peter Ludovice, Chemical Engineering Seminar, 2pm, Rm 66-110.

**Pyrolysis Behavior of Different Coal Types\*\***—Glen Ko, Chemical Engineering Seminar, 3pm, Rm 66-110.

**Water Wave Mechanics\***—Triantaphyllos R. Akylas, associate professor of mechanical engineering, MIT, Dept of Mechanical Engineering Seminar, 3pm, Rm 3-270. Refreshments follow in Rm 1-114.

**The Daedalus Project: Using Technology to Bring a Myth to Reality\***—Steven Bussolari, assistant professor, MIT Dept of Aeronautics and Astronautics, Integrated Studies Program Intersection of High Technology with Humanistic Endeavor Program, 3:15pm, Rm 20C-117. Refreshments follow.

**Sex, Race, and Violence in the Book of Esther\***—Dr. Jeremy Wolfe, MIT Dept of Brain and Cognitive Sciences, Hillel Seminar, 8:30pm, Ashdown House Hulsizer Dining Rm. Optional dinner available, 6:45pm; dinner reservations due by April 2 at Hillel (W2a).

## Monday, April 6

**Entrainment and the Evolution of Cloud Droplet Spectra in Cumuli\*\***—Dr. Jorgen B. Jensen, National Center for Atmospheric Research, Boulder, Colorado, Ctr for Meteorology and Physical Oceanography Seminar, 11am, Rm 54-915.

**Analysis of Stepwise Linear Non-Linear Euler Beam Structures\***—George Sarver, Dept of Aeronautics and Astronautics Division of Structures, Materials and Aeroelasticity Research Conference, 3pm, Rm 33-206. Refreshments served.

**Chaos and Atmospheric Predictability\***—Prof Edward N. Lorenz, MIT Dept of Earth, Atmospheric and Planetary Sciences, Dept of Mechanical Engineering Fluid Mechanics Seminar, 4-5pm, Rm 5-234.

**The Release of Genetically Engineered Organisms\*\***—Dr. David Glass, Biotechnica International; Dr. David Pimentel, Dept of Entomology, Cornell University; Dr. Sheldon Krinsky, Ctr for Public Service, Tufts University, Technology and Culture Seminar, 4pm, Rm 9-150.

**Promise or Threat? Releasing Genetically Engineered Organisms into the Environment\***—David Glass, director, Patents and Regulatory Affairs, Biotechnica International, Inc; Prof Sheldon Krinsky, Urban and Environmental Policy, Tufts University; Prof David Pimentel, Dept of Entomology, Cornell University, Technology and Culture Seminar Forum, 4pm, Rm 9-150. Informal supper and discussion follows.

## Tuesday, April 7

**Atherectomy: Preliminary Experience with a New Percutaneous Endarterectomy Device\*\***—David Faxon, University Hospital, Boston, MIT Laser Biomedical Research Ctr/MGH Wellman Laboratories/Harvard-MIT Division of Health, Science and Technology Lasers in Biomedical Research Seminar, 11am, Rm 37-252. Coffee served, 10:30am.

**Brain-Like Processing with Optics\*\***—Dana Z. Anderson, University of Colorado-Boulder, Laser Research Ctr/George R. Harrison Spectroscopy Laboratory/Research Laboratory of Electronics/School of Engineering/Plasma Fusion Ctr Modern Optics and Spectroscopy Seminar, 11-12pm, Rm 37-252. Refreshments follow.

**What Can Demented and Amnesic People Learn\*\***—Dr. John D.E. Gabrieli, postdoctoral fellow, Harvard Dept of Psychology and Social Relations/MIT Dept of Brain and Cognitive Sciences, Clinical Research Ctr Age-Related Neurological Diseases Lecture, 12-1pm, Rm E25-117.

**Introduction to MIT Information Services\*\***—Tricia Kellison, Information Services overview of the four groups within IS: the Microcomputer Center, Consulting Services, Training Services and Publications, and a walking tour to the new Microcomputer Training Lab in Bldg 11, 12-1pm, Rm 10-340.

**The Determinants of American Foreign Economic Policy: The Case of Telecommunications\***—Prof Peter Cowhey, University of California-San Diego, Political Science Seminar, 1:15-3pm, Rm E53-482.

**The ADAM Advanced Design Automation System\*\***—Alice Parker, University of Southern California-Los Angeles, VLSI Seminar, 4pm, Rm 34-101. Refreshments served, 3:30pm.

**Viscous Fluid Motion in a Spinning and Nutating Cylinder\***—Prof Thorwald Herbert, Virginia Polytechnic Institute and State University, Dept of Mechanical Engineering Applied Mechanics Seminar, 4pm, Rm 3-343.

**Structure and Recognition Mechanism of Eco Ri Endonuclease\*\***—Dr. John Rosenberg, University of Pittsburgh, Biology Colloquium, 4:15pm, Rm 10-250. Coffee served, 3:45pm.

**The Cosmic Far Ultraviolet Background\***—Dr. Stuart Bowyer, Dept of Astronomy, University of California, Ctr for Space Research Seminar, 4:15pm, Rm 37-252. Refreshments served, 3:45pm.

**Fluid Mechanic Design of Marine Propellers\*\***—Prof J. Kerwin, MIT Dept of Ocean Engineering, Dept of Aeronautics and Astronautics Gas Turbine Laboratory Seminar, 4:15pm, Rm 33-206. Refreshments served, 4pm.

**High-Rises in the Fields\***—John Herbers, national correspondent, The New York Times, MIT Ctr for Real Estate Development Neshier Lecture on The American City: Future Prospects, 6pm, Rm 9-150.

**Light Performances\*\***—Achim Lipp, Ctr for Advanced Visual Studies "The Artists Speak On Aspects of Performance" Presentation, 7-10pm, W11.

**Running with Symmetry\*\***—Marc Raibert, MIT, Cognitive Science Seminar, 7:30pm, Rm 34-401. Commentary: Thomas McMahon, Division of Applied Sciences, Harvard University.

## Wednesday, April 8

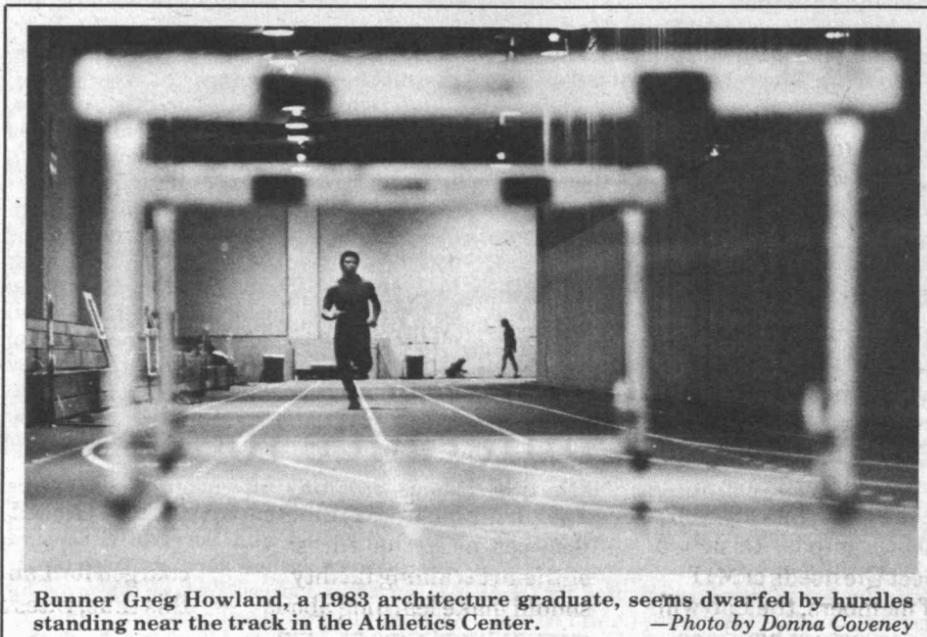
**Femtosecond Spectroscopy in GaAs MOW Structures\*\***—A. Mysyrowicz, Ecole Polytechnique, Palaiseau, France, EECS/RLE Seminar on Optics and Quantum Electronics, 11-12pm, Rm 36-428.

**Microsoft Excel for the Macintosh\*\***—Elaine Smith, Apple Computer, Information Services Seminar demonstrating this powerful spreadsheet, charting, and filing tool including hints for the power user, 12-1pm, Student Ctr Mezzanine Lounge.

**Transient Second-Order Force on a Vertical Cylinder\*\***—P.F. Wang, Dept of Ocean and Civil Engineering Informal Hydrodynamics Seminar, 3:30-5pm, Rm 5-314.

**Numerical Treatment of a Partial Integro-Differential Equation\*\***—J.M. Sanz-Serna, Universidad de Valladolid, Spain, Dept of Mathematics Numerical Analysis Seminar, 4pm, Rm 4-159. Refreshments served, 3:30pm, Rm 2-349.

**Complexities of MORB Petrogenesis: Evidence from the Bay of Islands Ophiolite\*\***—Prof Donald Elthon, Dept of Geosciences, University of Houston, Dept of Earth, Atmospheric and Planetary Sciences Conoco Lecture, 4-5pm, Rm 54-915.



Runner Greg Howland, a 1983 architecture graduate, seems dwarfed by hurdles standing near the track in the Athletics Center. —Photo by Donna Coveney

**Complementary Aspects of Kodaly's and Bartok's Folk Music Research\***—Prof Stephen Erdely, MIT, Music Office Ethnomusicology Lecture, 4pm, Rm 4-160.

**New Materials through Science and New Science through Materials: New Materials and New Science by Intercalation\***—Prof Mildred S. Dresselhaus, Institute Professor and Abby Rockefeller Mauze Professor of Electrical Engineering, Killian Award Lecture, 4:30pm, Rm 10-250.

**Pronunciation Problems\*\***—Writing Center ESL Workshop on the pronunciation of CH and SH, 6:15-7:15pm, Rm 14N-317.

## Thursday, April 9

**Tips and Techniques for IBM PC Users\*\***—Kip Warren, IS Consulting Services, Information Services discussion of how users can get the most out of their PC's by building Batch files for both novice and expert users, 12-1pm, Student Ctr Mezzanine Lounge.

**Thermal Analysis of Printed Wiring Boards\*\***—Prof David Roynance, MIT Dept of Materials Science and Engineering, Laboratory for Manufacturing and Productivity Seminar, 3-4:30pm, Rm 35-520. Refreshments follow.

**Spontaneous Formation of Mach Stems in Reacting Shock Fronts: A Computational Study\***—Dr. P. Collella, Livermore Laboratories, Special Applied Mathematics Colloquium, 4pm, Rm 2-338. Refreshments served, 3:30pm, Rm 2-349.

**The History of Quantum Field Theory\*\***—Silvan Schweber, Brandeis University, Physics Colloquium, 4pm, Rm 10-250. Refreshments served, 3:30pm, Lobby 10-250.

**Statistics and Dynamics of Sheet Polymers\***—Dr. Yacov Kantor, Dept of Physics, Harvard University, Program in Polymer Science and Technology Seminar, 4-5pm, Rm 4-163.

**Soviet Views on Emerging Technology\*\***—Robert Nurick, associate director, RAND/UCLA Ctr for the Study of Soviet International Behavior, Defense and Arms Control Studies Program Seminar, 4-5:30pm, Rm E51-140.

## Friday, April 10

**Solar Oscillations\*\***—Eugene Ldavey, MIT, Ctr for Space Research Astrophysics Lunch Seminar, 12:10pm, Rm 37-252. Sandwich lunch available, 12noon.

**Dispersion of Brownian Spheres in Cylindrical Pores\*\***—Gretchen Mavrouniotis, Chemical Engineering Seminar, 2pm, Rm 66-110.

**The Transport of Particulate Material in Vertical Standpipes\*\***—Prof Roy Jackson, Princeton University, Chemical Engineering Seminar, 3pm, Rm 66-110.

**Hypersonic Flow in High Altitude Plumes\***—Dr. John A. Lordi, head, Physical Gas Dynamics Group, CALSPAN Advanced Technology Ctr, Buffalo, NY, Dept of Aeronautics and Astronautics Seminar, 3pm, Rm 33-419.

**The Shapes of Planetary Atmospheres\*\***—Dr. Conway Leovy, University of Washington-Seattle; visitor, MIT Ctr for Meteorology and Physical Oceanography, Ctr for Meteorology and Physical Oceanography Seminar, 4pm, Rm 54-915.

## Saturday, April 11

**The Beauty of Fractals: History, Dynamics and the Modeling of Natural Phenomena\***—Michael Barnsley, Robert L. Devaney, Benoit B. Mandelbrot, Heinz-Otto Peitgen, Richard Voss, Dept of Mathematics/Goethe Institute of Boston Lectures, 10am-5pm, Rm 10-250.

## Readings

**Sue Miller\***—author of *The Good Mother and Inventing the Abbotts*, MIT Writing Program reading, Thurs, April 9, 8pm, Rm 10-250. Free.

## Films

**Kesho\***—MIT-Japan Science and Technology Program/MIT Wellesley Exchange/Japan Society of Boston film directed by Kazuo Ikehairo, based on the novel by Junichi Watanabe, April 1, 7:30pm, Rm 10-250. Story of a widow and her three daughters as they struggle for survival and love in modern Japan. Admission: \$2.

**Screening of Work in Progress by Ross McElwee: Working Title: Checkpoint Charley\***—MIT Film/Video Section screening of film by filmmaker of *Sherman's March*, and discussion, Mon, April 6, 7pm, Wiesner Bldg Bartos Theatre. McElwee will be present.

## Community Meetings

**Alcoholics Anonymous (AA)\*\***—Meetings every Tues, 12-1pm, Rm E23-364. For info call Gene, x3-4911. Also, Thurs, 12noon, Rm 24-110. Info: Joan, x3-1973.

**Al-Anon\*\***—Meetings every Fri, noon-1pm, Health Education Conference Rm E23-297. The only requirement for membership is that there be a problem of alcoholism in a relative or friend. Call Gene, x3-4911.

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

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

**Overeaters Anonymous\***—Meetings every Mon, 12-1pm, Rm E23-297. This is not a lunch time meeting, so please do not bring any food.

**MIT Faculty Club\*\***—The Club is open Mon-Fri. Luncheon hours: noon-2pm; dinner hours: 5:30-8pm. For dinner and private party reservations, call x3-4896, 9am-5pm daily.

**Feminist Reading Group\*\***—Meets every Wed, 12-1pm, Rm E51-310. Info: Sharon, x3-3622.

**Spring Workshop in Advanced 35mm Photography\*\***—MIT Student Art Association classes, Mon, April 6-May 18 (including Patriot's Day), 5-7pm, Rm W20-429.

**Communicating with Your Teenager\*\***—Medical Dept's Social Work Service/Health Education Service Workshops, Mondays, April 6-June 8 (8 weekly meetings except Patriot's and Memorial Days), 1pm, E23-501. No charge, but pre-registration required. Call x3-1316 to register.

**Working Mothers' Support Group\*\***—Meets every other Wed, 12:30-1:30pm, Rm 18-583. Ongoing discussion/support group for coping with job, children, daycare, illnesses, spouses, etc. New members and prospective mothers welcome. Next meetings: April 1, 15. Contact: Janette Hyde, x3-2490 or Bette Livesey, x3-6320.

**Are SATs Prejudiced Against Women?\*\*\***—Women's Forum Meeting sponsored by Admissions, April 6, 12-1pm, Rm 10-105. Bring your lunch.

**MIT Wives' Group\*\***—Morning Group—April 1: Museum of Fine Arts: "The Art That is Life: The Arts & Crafts Movement in America 1875-1920"—Info: Nabuko Ariura, 577-8955 or Nadia Burini, 734-6368. April 18: Museum of Science—Info: Isabelle Porto, 494-0113 or Chihiro Mirjake, 646-4868. Afternoon Group—April 1: Yugoslavia—Dragica Mijailovic. April 8: How Children Learn Through Play: A Participation Workshop—Elaine Reisman. Afternoon group meets 3-5pm, Student Ctr Rm 491; Babysitting provided during meeting in Student Ctr Rm 407.

**MIT Women's League Informal Embroidery Group\*\***—Wednesday luncheon gatherings, 10:30am-1:30pm, Rm 10-340. Meeting dates: April 8 & 22, May 13 & 27, June 10. Come during your lunch hour. Coffee & tea served.

## MIT Activities Committee

MITAC, the MIT Activities Committee offers discount movie tickets for General Cinema, Showcase and Sack (USA Cinemas) Theaters (\$3 ea). Tickets are good 7 days a week, any performance.

Tickets may be purchased at MITAC Office, Rm 20A-023 (x3-7990), 10am-3pm. Mon through Fri. Ticket sales in the Lobbies 10 and E18 on Fri, 12-1pm. Lincoln Lab employees may purchase tickets in Rm A-270 from 1-2pm, Tues through Fri only. Check out our table of discounts for camping, dining, musical and cultural events available to you through MITAC.

**New York City Day Trip**, Sat, April 11. Take a stroll around Fifth Avenue; pick up some Easter chocolates at Godiva; explore the Village; take in a museum; enjoy an old-fashioned horse 'n buggy ride; tour the NBC building—and more—during a day of gallivanting and discovering. Bus leaves West Garage, Sat, April 11, 7am; leaves for Boston, 8pm, Cost: \$18/pp. Reservations made in Rm 20A-023.

# i/s

News about information systems throughout MIT

## Micro Training Lab to Open

Tricia Kellison  
Information Services

Your office has a new computer, assembled and ready to go. You find the power switch, but after a few strange beeps and whirs, an error message appears on the screen. None of the keys on the keyboard seem to do anything. You're afraid to turn the computer off—what if you ruin something? Maybe you should check one of the manuals—but which one? The person who set up the computer left behind about six different shrink-wrapped manuals. . .

Does this scene sound familiar? If so, you'll be happy to know that help is around the corner. In early May Information Systems will open a Microcomputer Training Lab, the first of its kind on the MIT campus. Designed to meet the needs of MIT staff members, the Lab will host a variety of hands-on microcomputer classes.

The new Lab is in a prime campus location, Room 11-206. It's directly across the hall from the MIT Microcomputer Center and close to several other Information Systems resources.

During the past year, members of the MIT community were offered a selection of IS microcomputer courses at off-campus locations. Such classes included *Introduction to the IBM PC*, *Introduction to DOS*, *Beginning WordPerfect*, and both introductory and advanced courses in *Lotus 1-2-3* and *Symphony*.

However, an off-campus site is costly and inconvenient for MIT users. The new Lab will not only make the classes more accessible, but will allow the range of offerings to be expanded and strengthened.

The Lab will be equipped with six Macintoshes, six IBM XTs, and a ceiling-mounted Sony color projec-

tor connected to both a Mac and an XT. With this arrangement, the instructor can demonstrate software while class members follow along at their individual workstations. Jeanne Cavanaugh, Manager of Training Services, notes that this state-of-the-art training facility should make learning about micros stimulating and fun.

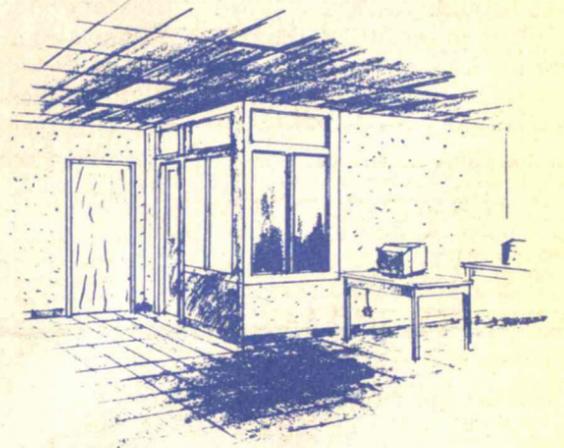
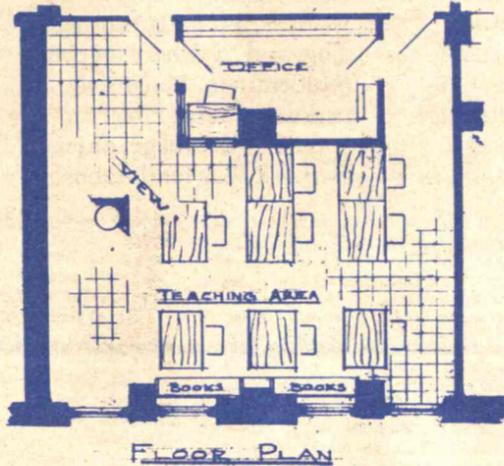
The presence of Macintoshes in the Training Lab is another innovation. Until recently, the IBM PC family dominated the administrative computing scene at MIT. In the last 12 months, however, Macintosh purchases made up approximately 50% of all system units purchased with requisitions from the MIT Microcomputer Center. Starting in July, the Lab will begin to offer Macintosh counterparts to the IBM PC courses now given.

When not in use for classes, the Lab will be open for practice and troubleshooting, with an attendant present to help with questions and problems. To use the Lab for practice, you will need a referral from a Lab instructor, or an IS or Micro Center consultant.

The Laboratory will also be available by reservation to other MIT departments for training-related activities. Call x3-7685 to receive a copy of the Training Lab policies regarding such use.

The Microcomputer Training Lab is being funded by MIT as part of the Institute's commitment to the Information Systems Strategic Plan for Administrative Computing. One full-time staff person will coordinate Lab activities, with a manager and an assistant also devoting time to its operation (see *Meet the Training Services Trio* in this issue).

The instructors for upcoming spring classes are independent microcomputer



consultants. In the future, more instructors will be drawn from MIT Information Services' full-time consulting staff.

Although a fee will be charged for Lab classes (at this time, rates are approxi-

mately \$150 for a full day of training), the price is much less expensive than most comparable courses offered outside MIT. Further, these classes are specifically tailored to meet the needs of the MIT community.

A catalog describing all classes available through Information Systems is mailed to MIT staff quarterly; the spring catalog went out recently. Copies of the catalog are also available in Rooms 11-209 and 11-314. ●

## The INSITE Story

Lee Ridgway  
Information Services

MIT's campus can be viewed in many different ways, and the virtual view from the Office of Facilities Management Systems is a panoramic 9,000,000 square feet. That's the amount of floor space encompassed in all of MIT's buildings, as seen through OFMS's computerized database, INSITE.

The story of INSITE began in the mid-60s, when then-provost Jerome Wiesner became concerned that space allocation decisions at the Institute were not backed up by hard data. Wiesner and O. Robert Simha, Director of the Planning Office, concluded that an accurate inventory of building space was needed, and that a computerized database was the way to keep track of it.

They envisioned a managerial tool that tallies not only square footage, but also how it's used, what's in it, and who controls it—vital information when it comes to divvying up MIT's precious floor space.

Kreon Cyros, now Director of the Office of Facilities Management Systems, was hired in 1966 to develop such a system. Over the next four years, using the Integrated Civil Engineering System,

Cyros created INSITE (Institutional Space and Inventory Techniques). Subsequent improvements, and a development effort in the late '70s headed by Tim Dempsey, now Manager of Facilities Systems at Information Systems, led to the current version.

Inside INSITE, data is organized into hierarchies and relations. The hierarchy is a record of space within a building, based on MIT's room numbering scheme: building/floor/room/subdivision, or E19-451A, for example. Now you can see why even the closets have numbers—to account for every little cubbyhole, a number is needed that can go into INSITE. Related to each space record is a highly detailed file of attributes associated with that room, ranging from equipment, to people, to activity, to maintenance information.

From the beginning, INSITE was designed to be flexible, on the premise that managers and planners might think of new ways to use it. INSITE's data structure and problem-oriented language, plus its report generator, make it possible to call up and sort data in just about any way desired

—by space name or by attribute within a space.

MIT's labs and physical plant, for example, use thousands of filters which need service regularly. These filters, accounting for over 35,000 changes a year, have been made an attribute of the rooms that contain them. A query to INSITE about filters tells those in charge where, when, what, and from whom such service is needed.

The INSITE database operates through an IBM mainframe batch system, and yields printed output. Two recently developed modules use IBM PC/ATs to give the system added graphics and analysis capabilities.

INSITE-CAD, a computer-aided drafting system, digitizes and displays scaled floor plans in response to database queries. Changes made to a drawing on the CAD system can also be sent directly to INSITE to update the database. The other micro connection to INSITE is INSITE-ANALYST, a powerful spreadsheet program that managers can use to analyze facilities data using a unique hierarchical display.

Telecommunications Systems is exploring the use of  
(continued on page 2)

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## Strategic Plan: Administrative Workstations

Cecilia d'Oliveira  
Information Systems

The Administrative Workstation Pilot has spent approximately three months selecting, using, and evaluating a number of microcomputer hardware and software products to determine those most appropriate for use in administrative offices on campus. The pilot also focused on what related support services Information Systems should provide to workstation users.

The team evaluated the IBM PC/XT-089 and the Apple Macintosh Plus and associated software. They chose these machines for a

number of reasons: many people are already using them in administrative settings; purchasing trends on campus over the last year indicate a continued interest in these products; appropriate software is available; and the product lines are viable and compatible with MIT's computing and communications environment.

Five XT's and six Macs were distributed to pilot offices for evaluation. Each XT had a 20-MB hard disk, 360-KB diskette drive, 640-KB RAM, monochrome monitor, WireTree Plus surge protector, Preview graphics

adaptor, Multitech modem, and either an IBM Proprinter or Panasonic KXP1092 printer. Each Macintosh Plus included a 20-MB SCSI hard disk, 800-KB diskette drive, 1-MB RAM, WireTree Plus surge protector, and Imagewriter printer.

Software evaluated on the IBM systems included *SuperCalc 4* for financial analysis and graphics, *Dataease* for database management, *WordPerfect* for text processing, and *Linkware* for communications. Macintosh users evaluated *Excel* for spreadsheet and graphics, *Omnis 3 Plus* for database

management, Microsoft *Word 1.05* for text processing, *MacDraw* for structured graphics, *Versaterm* for terminal emulation and *Linkware* for file transfer.

Because most pilot members are very familiar with Lotus 1-2-3, it was not included in the evaluation. But it is included in the product recommendations in the team's final report.

The report includes evaluations of the hardware, software, and support services (such as training, consulting, hotline, and documentation) used in the pilot, as well as recommendations

for the use and support of these or other products. The report also addresses policy and procedure issues relating to back-up and security of personal computer data files, and modification of product support recommendations as new products are introduced by computer industry vendors.

The report was submitted to the Strategic Plan Working Group in late March. The Working Group will review the recommendations with the Strategic Plan Advisory Council and other representatives of the community. ●

## It's All Relative

Daniel R. Schechter '88

Imagine traveling near the speed of light. It's not easy. A jet airliner travels only about a millionth as fast. But now with the aid of several computer programs developed in the Physics department, you can travel as fast as you like, at least on screen.

Under Prof. Edwin F. Taylor's direction, several students have developed a trio of programs that help students visualize experiments impossible to duplicate in the real world.

One program, *Visual Appearance*, displays a view from a spaceship moving near the speed of light. The computer landscape holds a large cube, a small cube, a pyramid, and a skyscraper.

The user controls the speed and altitude of the spaceship as the shapes in the display

warp and change colors according to the theory of special relativity. Thomas LeCompte '85 developed the program; Kenney Ng '89 added the Doppler color shift.

The other two programs, *Observer* and *Collision*, are more practical. Introduction to Special Relativity, Physics 8.20, has featured them for the past several years.

*Observer*, developed by Eric Berman '88, Glen Myers '88, and Prof. Taylor, lets students place objects on a "cosmic highway." Objects in the center horizontal lane stand still. Objects above the center move to the right; below, to the left. The farther the objects are from the center, the faster they

move, until at the outermost lanes they move at the speed of light.

Items such as rulers and clocks placed in the various lanes demonstrate the effects of time-stretching, where fast-moving clocks run slower; and Lorentz contraction, where objects moving very fast get shorter along their direction of motion. By observing these effects students study the consequences and paradoxes that arise.

*Collision*, developed by Shawn Gaither '86, Kenney Ng, and Prof. Taylor, helps students solve equations describing the interactions of subatomic particles. Students enter data about the particles into a table. The



computer then completes the table entries, labeling each step in the process. *Collision*'s diagram option charts the interactions on a 3-D momentum-energy graph. Or, using the computer-movie option, students can watch simulated collisions of particles a million times smaller than a speck of dust.

These programs, written in C, Pascal, and FORTRAN, use a variety of graphics packages. *Observer* and *Collision* are available for both the IBM PC series and the Mac. Funding for the project comes from Project Athena. With support from Apple Computer, Eric Berman '88 converted the programs for the Macintosh.

For more information or copies of these programs, contact Prof. Taylor at x3-7433, Room 26-147. ●

## Analog or Digital — That is the Question

On March 6, Jeff Schiller, MIT's network manager, conducted a special orientation session on the 5ESS digital switch telephone system. The system will be installed at MIT in June 1988. The session focused on factors to consider in deciding on digital or analog service. Here we present a synopsis of the questions and answers covered in the session.

**Q:** What is the difference between an analog line and what we have today?

**A:** None. There is no difference.

**Q:** What is the difference between what we have today and a digital line?

**A:** Digital lines are completely different from analog lines. They allow for

access to new computer-like features within the 5ESS switch. However they are not compatible with analog phones — you cannot have both a digital and analog telephone connected to the same wires.

In fact, you must not connect two digital telephones to the same wires. Each digital phone must have its own dedicated connection to the 5ESS.

**Q:** Can two digital phones share the same directory number?

**A:** Yes. Although each digital phone must have its own dedicated line, two phones can be programmed at the 5ESS switch to share the same directory number(s).

**Q:** Some off-campus locations have 253 or 258 line

service. Will digital service also be provided off-campus?

**A:** No. Telecommunications Systems will be able to offer analog service off-campus by providing a leased phone line between the off-campus location and MIT. However, there are severe limitations on the distance between the central 5ESS switch and connected digital phones.

**Q:** What is the fastest speed that you will be able to provide for data access?

**A:** With a digital telephone, you will be able to communicate with any other digital phone on campus at speeds up to 19.2 KB asynchronous or 64 KB synchronous.

**Q:** With a digital telephone, how are calls dialed?

**A:** Voice calls are dialed much as they are today, with the keypad (Touch-Tone®) on the telephone. Data calls may also be dialed in this way, or by entering commands on a connected terminal or computer.

**Q:** Are answering machines supported by digital phone lines?

**A:** The information available today indicates that answering machines CAN NOT be used with digital telephones. However, Telecommunications Systems understands the need to provide this support. We are working with AT&T to develop a mechanism for using answering machines with digital phones, or to provide a reasonable alternative. ●

## INSITE

(continued from page 1)

INSITE-CAD in the mammoth job of rewiring MIT for the 5ESS phone system. With INSITE-CAD layouts pinpointing phone jacks, Telecommunications will be able to prepare overlays showing where the new wiring can be run, and new jacks installed. These overlays can then be inserted in a layer discrete from the rest of the graphic database.

Although only OFMS personnel can access INSITE, anyone at MIT can make a request to OFMS for information in the database, or make use of their services.

Some time ago, MIT began to spread the word about INSITE to other large institutions that could benefit from this approach to facilities management. In 1973, the INSITE Consortium was formed for the exchange of ideas, data, and experiences on facilities management.

The Consortium's growing membership now includes over 30 academic, health care, corporate, and government institutions. OFMS Director Cyros recently made presentations on INSITE in Dublin and Tokyo. In his continuing effort to increase the number of institutions sharing in MIT's commitment to this technology transfer. ●



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# Massachusetts Institute of Technology



April 1, 1987

MIT Personnel Office, E19-239  
400 Main Street  
Cambridge, Massachusetts

# MIT POSITIONS AVAILABLE

### SMOKING PROHIBITED BY LAW

IN CONJUNCTION WITH THE CITY OF CAMBRIDGE ORDINANCE #1046, EFFECTIVE MARCH 7, 1987, SMOKING IS PROHIBITED IN ALL MIT ACADEMIC AND SERVICE BUILDINGS LOCATED IN CAMBRIDGE.

It is Institute policy not to discriminate against individuals on the basis of race, color, sex, sexual orientation, religion, handicap, age or national or ethnic origin in the administration of its programs and activities.

This list includes all nonacademic jobs currently available on the MIT campus. Duplicate lists are posted outside (10-215) and in the Personnel Office (E19-239).

Information on openings at Lincoln Laboratory (Lexington, MA) is available in the Personnel Office (E19-239).

Persons who are NOT MIT employees should call the Personnel Office at 253-4251.

Employees at the Institute should continue to contact their Personnel Officers to apply for positions for which they feel they qualify.

Carl Belforti	253-4278
Virginia Bishop	253-1591
Ken Hewitt	253-4267
Appointments:	
Rose Rizzo	253-4274
Sally Hansen	253-4275
James McCarthy	253-4269
Oveta Perry	253-1594
Appointments:	
Maureen Howard	253-4268
Kim Bonfiglioli	253-4076
Appointments:	
Marlisha McDaniels	253-4263

### ADMINISTRATIVE AND ACADEMIC STAFF

**BENEFITS ANALYST**, Personnel-Compensation, to assist in developing proposals for new benefits programs and modifications of existing programs. Will develop written materials including ERISA summary plan descriptions, summaries of legislative impact on MIT benefits and materials for the implementation and administration of benefits plans; collaborate with other Compensation staff on benefits projects and issues; maintain detailed, up-to-date knowledge of current laws and regulations that affect benefits and benefits administration; and develop cost estimates reflecting Institute activity. Duties may include contact with outside benefit carriers, lawyers, consultants and other MIT staff. Requirements: bachelor's degree or equivalent experience, preferably with formal courses in benefits design and/or administration; and three to five years of professional work experience in benefits administration. Must have strong writing and mathematical skills. **A87-889**

**SYSTEMS PROGRAMMER II**, Operations and Systems, to work in the VAX systems support group performing systems programming and maintenance for three systems running VAX/VMS. Primary responsibilities include file system integrity and maintenance; maintenance of systems software and utilities; system performance analysis and tuning; software installations and updates; network configuration and management; and overall maintenance of the systems. Requirements: bachelor's degree in computer science or equivalent combination of education and experience; at least three years of systems programming and maintenance experience with VAX/VMS; and command of systems programming using a high level language. Experience in data communications, general networking and writing device drivers and familiarity with DEC's software problem report mechanism and software information network are desired. **A87-898**

**ASSISTANT MANAGER - MICROCOMPUTER CENTER**, to assist in all aspects of managing the Microcomputer Center and concentrate in the area of hardware sales. Will direct and manage center in absence of the manager; hire, train and supervise student staff; schedule all staff; manage inventory and inventory system; publicize center's goods and services to the MIT community; interact with PC repair facility and purchasing and warehousing functions; act as sales consultant; design and prepare sales reports; and perform other duties as assigned. Requirements: bachelor's degree or an equivalent combination of education and experience and at least four years of directly related experience, including experience using computers, preferably PC's or workstations. Supervisory and retail computer sales experience desirable. Excellent interpersonal and communicational skills essential. **A87-897**

**SENIOR MANAGER FOR OPERATIONS**, Medical Department, to manage the day-to-day operations of the Medical Department. Responsibilities will include management of medical records, pharmacy, diagnostic testing, housekeeping, dietary services, facilities maintenance and purchasing; and administration of support staff payroll and personnel functions. Requirements: bachelor's degree and at least five years of direct/related experience, including education or experience in health care management. Advanced degree in health care or management preferred. Superior communicational and interpersonal skills are essential. Proven strengths in planning, organizational development, analytical skills and administrative management are also necessary. **A87-896**

**PROPERTY MANAGER**, Treasurer's Office, to assist in the management of the MIT's real estate holdings in Eastern Massachusetts. Will manage information database for investment properties; design and execute reports for use in property management decisions; review and prepare commercial leases; maintain mortgage, tax and gift accounts; perform research related to deed, title and assessment issues for new acquisitions; and assist in the management of various construction projects related to existing commercial and industrial properties. Requirements: bachelor's degree; at least two years of experience in a field related to property management, construction or commercial leasing; and knowledge of spreadsheet and database software via personal computers necessary. Must have use of an automobile. **A87-895**

**LIBRARIAN III**, MIT Libraries, to act as the associate head for monograph cataloging and authority control and participate in the administration of the catalogue department. Will have responsibility for monograph cataloging; coordinate authority control function and oversee name and subject authority control units; have an active role in planning and implementing an automated authority control system; manage a staff of six librarians and the equivalent of ten full-time support staff; direct orientation and training program; and serve as liaison with public service and processing staff of the divisional and branch libraries. Requirements: M.L.S. from an ALA-accredited library school; relevant professional experience, including original monograph cataloging and authority work experience; and expert knowledge of LC classification and theory, LCSH, AACR2 and MARC formats. Knowledge of automated authority control systems and OCLC cataloging subsystem preferred. **C87-202**

**MANAGER OF SYSTEMS**, Physical Plant, to manage the planning, implementation and operation of a new on-line management information system. Will act as liaison between Physical Plant managers and the Information Systems development team; and coordinate the interface between the new system and other MIT computer systems. Requirements: bachelor's degree in computer science, engineering or business, or an equivalent combination of education and experience; and at least three years of experience in computer applications and the design, development and implementation of on-line automated systems. Strong oral and written communicational skills necessary. **A87-894**

**ADMINISTRATIVE OFFICER**, Office of the Dean of Engineering, to manage accounts including direct expenditures and transfers to departmental accounts. Will prepare annual budget for Dean's Office and assist in the preparation of the School's annual long-range plan and budget; supervise staff and act as office manager; oversee student, support staff, staff and faculty payrolls; review research proposals and staff and faculty appointments; assist in the preparation of semi-annual affirmative action report; and participate in the review of space change requests and space utilization studies. Requirements: at least three years of administrative experience. Excellent organizational and communicational skills essential. Familiarity with computer applications such as spreadsheets and database management very important. **A87-893**

**INDUSTRIAL HYGIENE TECHNOLOGIST**, Environmental Medical Service. Will conduct field evaluations to assess potential exposures to toxic substances, particularly asbestos; perform required laboratory analyses and conduct special hazard control programs; advise departments and contractors regarding MIT and governmental regulations relative to environmental controls required; and assist in all industrial hygiene programs,

including rotation in emergency on-call program. Requirements: associate's degree in a physical science, ability to climb ladders to secure samples for asbestos analyses and normal eyesight (corrected) to perform required microscopic analyses. **C87-201**

**MANAGER, SUSTAINING FELLOWS PROGRAM**, Resource Development. The Sustaining Fellows Program recognizes, informs and cultivates the involvement of key donors. Will market program to alumni and friends of the Institute; plan annual dinner involving entire membership; communicate with fellows on a regular basis; maintain records for membership and services; act as liaison in responding to informational requests; coordinate membership activity with district directors; review and update communications and literature; and participate in development and implementation of other donor recognition activities. Requirements: bachelor's degree, highly developed human relations skills, excellent writing skills and willingness to travel. Three or more years of experience in university fundraising, public relations or professional sales preferred. **A87-892**

**ASSISTANT DEAN FOR RESEARCH**, Office of the Dean for Student Affairs, to provide research support to the dean for student affairs and section/office heads within the ODSA on a variety of academic and quality of life issues, with a special focus on underrepresented minority student groups. Will contribute to the development of policies and assist in carrying out the goals of the ODSA. Requirements: Ph.D. or equivalent analytical and research experience; familiarity with educational research issues and methodology; and experience with electronic data processing and statistical analysis. Excellent written and verbal communicational skills and attention to detail essential. **A87-890**

**PERSONNEL AND STUDENT AFFAIRS ADMINISTRATOR**, Earth, Atmospheric, and Planetary Sciences, to manage, on behalf of department head, all departmental personnel and academic matters. Responsibilities include hiring and termination of all clerical and research staff; wage and salary administration for all non-faculty personnel; insuring upholding of affirmative action policies and procedures; creating a personnel and student affairs database system; arbitration; visa procurement procedures for international visitors; monitoring student financial aid; and serving on various academic committees. Requirements: bachelor's degree or equivalent work experience; and 3-5 years of related experience in personnel, academic or general administration in a university setting. Excellent communicational, organization and interpersonal skills essential. Familiarity with computer systems is necessary. **A87-889**

**ASSISTANT ARCHIVIST**, MIT Libraries, to share the responsibility for the operation of the Institute Archives by assisting with daily routines. Will retrieve, arrange, preserve, box, and describe a wide variety of archival and manuscript materials; perform historical research when necessary to appraise, organize and describe collections; prepare finding aids for collections; serve on the reference desk; help researchers with the use of the book, archives and manuscript collections; and answer reference letters. Requirements: bachelor's degree (preferably in a technical field) with archival training and substantive pre-professional experience, including experience with bibliographic and research techniques. Must be able to communicate clearly in writing, to work systematically and carefully and to respect confidentiality of records. **C87-200**

**TECHNICAL INSTRUCTOR**, Center for Materials Research in Archaeology and Ethnology, to supervise graduate laboratory. Supervisory responsibilities include one-to-one laboratory supervision and instruction in materials analysis; assisting faculty in the design and teaching of year-long graduate subjects; preparation of laboratory instruction manuals; design, construction and maintenance of laboratory equipment for special research and/or teaching programs; responsibility for small library; working with faculty and staff on research projects, including opportunity to conduct independent research; development, maintenance and documentation of reference collections; and computer-aided documentation of all laboratory procedures. Requirements: skill in microscopy, including considerable experience in metallography and with the polarizing microscope; and expert darkroom skills. Teaching experience and ability to operate personal computers or mini-computers are highly desirable. **C87-199**

**LIBRARIAN I**, Dewey Library, to provide reference service and respond to in-depth needs in economics or related subjects. Will assess user education needs and provide instruction in both one-on-one and classroom sessions; manage and develop research-level collections in subject area; review existing collections and make recommendations for additions, weeding and storage; serve as liaison to the MIT community in subject area; manage circulation, reserve and stacking activities; and handle full range of personnel management and supervision for the equivalent of eight full-time staff members. Requirements: M.L.S. from an ALA-accredited library school and a degree in one of the social sciences, preferably economics; and supervisory experience. Prior pre-professional experience in a research library is desirable. Must demonstrate well developed interpersonal skills and the ability to communicate well in groups with faculty, students and staff. **C87-198**

**MANAGER, MICROCOMPUTER CENTER**, Information Services, to manage and supervise activities involved in the recommendation, sale and support of computer workstations and associated peripheral devices, software, documentation and supplies. Will manage Center operation, including sales, inventory control and consulting; supervise the work of administrative, support and student staff; participate in the preparation and monitoring of budgets; participate in interviewing, hiring and evaluating staff; work with other Information Systems managers to publicize related services; and establish rapport and participate in outside professional activities with other university computer stores and centers. Requirements: bachelor's degree, preferably in a scientific or technical field, or an equivalent combination of education and experience; and experience using computers, preferably workstations or personal computers. Must have excellent interpersonal and communicational skills and a demonstrated ability to build and manage successful teams. Experience in retail personal computer sales is desirable. **A87-888**

**ASSISTANT TO THE BURSAR - LOAN COLLECTIONS**, Bursar's Office, to be responsible for the collection of student loan accounts and student accounts receivable delinquent accounts. Will conduct exit interviews with students; communicate with delinquent alumni borrowers to develop an acceptable means of repayment; interpret credit information; skip-trace lost borrowers; communicate with agencies and law firms; and work closely with Institute offices and faculty. Must become knowledgeable in truth-in-lending, privacy of information and consumer protection regulations and become expert in MIT, federal and state student loan programs. Requirements: bachelor's degree or equivalent combination of education and experience; and experience in debt collection, financial management and office procedures. Must have good interpersonal and analytical skills and communicate well. Must also be able to work independently. **A87-887**

**SOFTWARE/HARDWARE ANALYST**, Electrical Engineering and Computer Science, to maintain and improve a diverse network of hardware and computing resources. Requirements: a minimum of two years of programming experience, including extensive UNIX experience (preferably 4.3bsd), proficiency in C, experience installing and maintaining complex subsystems and familiarity with or willingness to learn digital circuit troubleshooting and repair. Must have good documentation skills and the ability to communicate and work effectively with students, departmental staff and outside vendors. TOPS-20, HP/UX, VAX/VMS and/or LISP experience helpful. **A87-885**

**ASSISTANT MANAGER-OPERATIONS**, Telecommunications Systems, to provide operational management support to the manager for operations and administration. Will plan, schedule, assign and monitor the work of the switchboard console and message center operators and the customer service representatives; consult with departments regarding telecommunications equipment and services; participate in negotiations and dealings with vendors; assist in the selection and hiring of support staff personnel; train personnel in the operations section and assist in the training of personnel from other sections; and train MIT users on the features, types of equipment and operation of telecommunications systems. Requirements: bachelor's degree and two to three years of work experience in telecommunications, preferably in operations with particular emphasis on customer service related activities. **A87-884**

**RESEARCH DEVELOPMENT OFFICER**, Harvard-MIT Division of Health Sciences and Technology. Will assist principal and project investigators in the preparation of proposals for funding; develop symposia and seminars on relevant medical problems; identify new funding possibilities from government, foundations and industry; and assist in formulating longer term research program plan. Requirements: Ph.D. (or equivalent degree) in the physical sciences, biological sciences or engineering, or M.D. Should have familiarity with process of formulation and conduct of interdisciplinary research; experience with research and development; broad exposure to medical specialties; and organizational and interpersonal skills. **A87-883**

**APPLICATIONS DEVELOPMENT PROGRAMMER II**, Project Athena (temporary, 12 months), to assist MIT faculty members working on educational software design and implementation. Will write device drivers and other system software in support of video course development; implement applications programs, standards and libraries; maintain contact between faculty and other Athena staff; investigate appropriate software and hardware choices; provide information to users and communicate user needs to developers; and install, document, maintain and modify applications packages obtained from vendors or other computing facilities. Requirements: bachelor's degree or equivalent combination of education and experience and at least one year of experience with at least two of the following: UNIX, C, FORTRAN, Pascal, Lisp, and interactive computer graphics in a scientific environment. Excellent communicational skills essential. **A87-880**

**POSTDOCTORAL ASSOCIATE**, Biology (temporary, six to twelve months), to investigate the causes of Alzheimer's disease and Down's syndrome. Involves computer-assisted, three-dimensional reconstruction of brain structures; sectioning human post-mortem brain specimens; and performing immunohistochemistry and conventional histochemistry to localize neurotransmitters and neuropeptides. New techniques for combining monoclonal antibody methods with computer assisted reconstruction will be developed. Requirements: Ph.D., at least one year of experience in cutting and staining tissue sections for histology and histochemistry and knowledge of laboratory biochemistry. Experience with mono/polyclonal antibody reagents and PC experience desirable. This position is currently full-time for six months or half-time for twelve months. **C87-197**

**CONTRACT ADMINISTRATOR**, Office of Sponsored Programs, to administer sponsored projects, including proposal review, grant and contract negotiations and post-award administration. Requirements: a bachelor's degree in business administration or a related field or an equivalent combination of education and experience. At least three years of experience in one or more aspects of sponsored program administration in a university preferred. **A87-879**

**SUPERVISOR OF MECHANICAL SERVICES HVAC**, Physical Plant, to supervise up to fifteen skilled mechanics. Will provide technical expertise for the third shift operations group; evaluate and troubleshoot HVAC problems; and handle the day-to-day implementation of Institute policies. Requirements: a minimum of five years of experience in the operation and maintenance of building and mechanical equipment; two to three years experience in direct supervision of trades personnel desirable. Advanced technical school training in HVAC and associate's degree in engineering science or business administration also desirable. **A87-878**

**TECHNICAL WRITER II**, Project Athena, to design, research, edit, write and update Project Athena's user documentation set. Will work with faculty, programmers and consulting staff to determine user documentation needs; edit material written by other staff; participate in the design of Athena's system and services; test pre-release software; and consult on one or more Athena applications systems. Will also hire and supervise student technical writers and supervise other technical writers on special projects. Requirements: bachelor's degree or equivalent combination of education and experience; two years of technical writing experience; knowledge of at least one programming language; experience in an applications area such as graphics or statistics; and computer science coursework. Knowledge of UNIX strongly desired. Applications for this position must include a writing sample. **A87-877**

**SYSTEMS PROGRAMMER II**, Project Athena, to join a systems development group in building network-based services for a multi-thousand workstation environment. Existing projects include name, authorization, authentication, file and notification servers and the X window system. Will work with multi-vendors and provide developmental support for an educational applications group. Hardware includes both public and private access workstations. Requirements: bachelor's degree or equivalent combination of education and experience and three to five years of experience in UNIX systems programming. Familiarity with BSD network facilities and with FORTRAN and Lisp preferred. **A87-876**

**ASSOCIATE DIRECTOR**, Division of Comparative Medicine. Will interact with principal investigators regarding animal research activities; oversee the administration of the protocol review process; serve on the Committee on Animal Care; monitor the operation of animal facilities; coordinate clinical services; participate in independent and collaborative research; coordinate the activities, education and training of postdoctoral associates and summer fellows in laboratory animal medicine; participate in the development of training seminars for MIT personnel who work with animals; and organize weekend clinical care. Requirements: D.V.M. or equivalent and board certification or eligibility in the American College of Laboratory Animal Medicine. **C87-196**

**LIBRARIAN IV**, Libraries, to administer the acquisitions department. Will participate in planning and implementing automated acquisitions and serials control systems; manage monographic and serial acquisition processes; and manage a staff of four professional and twelve support staff plus student assistants. Other responsibilities include organizational and personnel planning, budget management, allocation and assignment of staff and development and implementation of new policies and procedures. Will serve on library council, which discusses major program and administrative policy issues; and participate in long range planning and budget formulation. Requirements: M.L.S. from an ALA-accredited library school and a minimum of five years professional experience, including two years in an acquisitions department of a research library. Experience with serials programs, gifts and exchange programs and government document depositary programs preferred. Thorough knowledge of the book trade, bibliographic control principles and practices and automated technical processing in a research laboratory important. **C87-195**

**INDUSTRIAL LIAISON OFFICER**, Industrial Liaison Program, to interact with an assigned number of ILP member firms. Will plan and carry out activities to service companies, including visits to company locations, group presentations and meetings with company officials; assist company representatives with technical questions by arranging faculty contact or providing references and information; and solicit new company members. Requirements: bachelor's and master's degrees, at least one of which must be in engineering or science (preferably in electrical engineering and computer science, materials science and engineering or mechanical engineering); and a minimum of two years of industrial experience. A management perspective and an ability to communicate with technical staff, corporate executives and MIT faculty and staff are essential. One MIT degree preferred. **A87-872**

**NURSE PRACTITIONER**, Inpatient Unit, Medical Department (part-time, 20 hours/week, 11:00 p.m. to 7:00 a.m.), to manage care for ambulatory patients in collaboration with the on-call physician. Will handle all telephone calls from patients; give advice, medical information etc.; maintain documentation; and assist inpatient unit registered nurse with inpatient care on request. Requirements: graduation from approved NLN accredited Nursing School; Massachusetts R.N. license; graduation from nurse practitioner program with ANA certification; and at least one year of experience in nurse practitioner practice. **C87-193**

**POSTDOCTORAL ASSOCIATE**, Applied Biological Sciences, to work on developing an enzymatic system for removing low density lipoprotein (LDL) for potential treatment of hypercholesterolemia. Requirements: Ph.D. or M.D. and experience in biochemistry or enzymology. **C86-173**

**ASSISTANT DIRECTOR**, Resource Development, to support the resource development activities of the Office of the Provost during coming capital campaign. This position reports to the director of development services and to the provost and is an excellent opportunity for a career professional capable of superior performance under intensive deadlines. At least three years of fundraising experience in a university or major non-profit organization preferred. Background should include proposal writing for the private sector, including corporations and foundations; prospect research and strategizing; and research management and planning of fundraising activities. **A86-861**

**POSTDOCTORAL RESEARCH ASSOCIATE**, Brain and Cognitive Sciences, to study optic-tract plasticity and regeneration in mammals. Will study single-axon morphology in developing and mature animals. Parallel studies include analysis of protein synthesis and use of molecular markers. Ph.D. required. Applications for this position should include the names of three references. **C86-192**

**AUDITOR I**, Audit Division, to review and appraise the soundness, adequacy and application of accounting, financial and operating controls of the Institute. Will review the extent to which assets are accounted for and safeguarded against losses of all kinds; prepare reports as directed; participate in review of systems and procedures; and make recommendations on improvements in systems design and computer applications. Requirements: bachelor's degree in business administration with major in accounting or equivalent combination of education and experience; and one to three years of experience with a certified public accounting firm or internal auditing. Knowledge of systems analysis and computer capabilities desirable. **A86-854**

**POSTDOCTORAL ASSOCIATE**, Division of Comparative Medicine, to conduct research on intragastric nitrosation and predictive modeling of gastric carcinogenesis in laboratory animals. Responsibilities include assisting in surgery and preparation and analysis of biological specimens for biochemical analysis. Requirements: D.V.M. or equivalent, experience in laboratory animal surgery and manipulation, training in physiology and knowledge of techniques for biochemical evaluation. **C86-191**

**SYSTEMS PROGRAMMER III**, Sloan School of Management, Sloan Computer Facility, to provide primary systems support (including software installation, documentation and consultation) for small computer systems: 25 Xerox workstations running Star office automation system, Xerox Development Environment and Interlisp-D, as well as 6 Xerox network file, print, etc. servers; 2 IBM RT PC's and 3 AT&T 3B2's running UNIX; and 36 IBM PC XT's running PC-DOS. Will interact with faculty and staff to see that effective use is made of these machines; and serve as a small system resource to the Sloan School on software questions. Requirements: bachelor's degree or equivalent; one year of experience using at least one of the above operating systems; and programming experience in one or more high level languages (e.g., REXX, C, FORTRAN, Pascal or LISP). Must be able to work effectively with novices and experts, learn new things quickly, and adapt to a rapidly changing technical environment. **A86-847**

**POSTDOCTORAL ASSOCIATE**, Applied Biological Sciences. Research areas include the novel use of enzymes for treating hypercholesterolemia and oral delivery systems for polypeptide drugs. Ph.D. required. Background in biochemistry, chemistry, chemical engineering, biomedical engineering or related area desirable. **C86-190**

**POSTDOCTORAL ASSOCIATE**, Applied Biological Sciences, to study lipoprotein structure and metabolism, particularly in arterial wall, with an overall goal to develop new methods for diagnosis and treatment of heart disease. Ph.D. required. **C86-189**

**ASSISTANT TRANSMISSION MANAGER II**, Telecommunications Systems, to provide engineering, design and operational management support to the Transmission Manager. Will assist in the planning, development and implementation of telecommunications networks; participate in negotiations with common carriers, vendors and contractors; study applications of new technology and submit recommendations; and assist in the design of special circuits and equipment. Requirements: B.S. in electrical engineering or computer science or equivalent combination of education and experience; 2 - 3 years experience in data communication and networking; and familiarity with LANs, packet switching, telecommunications protocols, and network architectures. **A86-824**

**ROUTE SUPERVISOR - GROUND SERVICES**, Physical Plant, to coordinate the grounds, moving and trucking operation and supervise hourly personnel. Will provide horticultural expertise for Institute grounds and with outside vendors; handle inventory and purchasing for grounds; implement Institute policies on attendance, discipline, safety, etc.; make recommendations with regard to hiring hourly personnel; and perform other duties as assigned. Bachelor's degree in horticulture or equivalent combination of education and experience and three to five years supervisory experience required. **A86-807**

**ROUTE SUPERVISOR**, Building Services, Physical Plant, to supervise the cleaning and support operations for Institute academic buildings. Will assist the shift supervisor; perform periodic inspections of facilities and equipment; coordinate and respond to requests, including emergencies, from the MIT community; monitor cleaning supplies and equipment; and provide support to other shifts, including the West Campus and Physical Plant shop operations. Three years of supervisory experience required. Knowledge of the Building Services equipment, supplies and areas of responsibilities necessary. Must be able to communicate and cooperate with subordinates, superiors and the MIT community. **A86-794**

**TECHNICAL INSTRUCTOR - SPEECH AND DEBATE COACH**, Office of the Dean for Student Affairs (9 month, part-time position), to train and coach all levels of forensics and oversee the activities of the MIT Debate Society. Debaters range from novices to nationally ranked. Will work with the student chairman of the club to secure funding; travel with the team; and judge events as required. Bachelor's degree and previous debating and/or coaching experience required. Excellent communication skills and knowledge of the field of forensics required. **C86-184**

**SYSTEMS PROGRAMMER III**, Operations and Systems, to provide programming expertise to maintain systems and operational procedures, assure the quality of developed software, and distribute releases in a large complex network of systems. Bachelor's degree in computer science (or equivalent) and 3 to 5 years systems experience required, as are experience in systems programming and program maintenance and quality assurance, or combined experience in systems programming with related programming activities. Must be an accomplished UNIX programmer with understanding of operating systems, networks and advanced utilities. Strong knowledge of C and of UNIX commands and utilities necessary. **A86-787**

**CONSULTANT II**, Project Athena, to support students and faculty using standard end-user software, assist the Manager of Consulting in providing consulting to users and participate in the design of Athena's systems and services for end-users. Will learn and use standard end-user software and on-line consulting tools; provide about 20 hours/week consulting to users; provide feedback about operations in the field; provide technical leadership and training for the consulting team; prepare technical information for other members of the consulting team and interested users; hire, train and supervise student consultants; supervise the administration of on-line consulting tools; design and implement utility programs and modify existing programs; evaluate pre-release software and monitor changes to the released system; and help provide documentation and training for end-users. Bachelor's degree or equivalent combination of education and experience and three or more years experience in computer programming or system administration required. Experience with UNIX (especially 4.2BSD), computing experience in a university setting and in a networked environment, experience with a variety of end-user software and ability to train other technical staff preferred. Supervisory skills, technical writing skills and extensive UNIX utilities experience desirable. **A86-769**

**MECHANICAL ENGINEER**, Physical Plant, to work on renovation and new construction projects. Will develop, guide and work with academic community on renovation design from inception through cost estimate and construction for projects ranging from one room to entire buildings. Bachelor's degree in mechanical engineering and minimum five to ten years engineering experience required; experience should include design of all phases of institutional building mechanical systems including HVAC, plumbing, utilities, laboratory facilities and utility distribution systems. Must be able to monitor architect/engineer designs for MIT interests. Professional registration desirable. **A86-745**

**POSTDOCTORAL ASSOCIATE**, Applied Biological Sciences, to study biochemical and genetic regulation of growth factor receptors. Ph.D. required. Strong background in recombinant DNA technology and/or protein chemistry preferred. **C86-181**

**ASSISTANT RADIATION PROTECTION OFFICER**, Medical Department - Environmental Medical Service, to review applications for permission to use radioactive material; review available facilities and equipment for such work, recommending changes as necessary; train personnel in appropriate radiation protection and radionuclide handling techniques; survey approved authorizations to assure continuing compliance with regulations; and supervise RPO technicians involved in surveys and waste collection. Bachelor's degree, preferably in chemistry, biochemistry or physics, and a master's degree in radiological health or health physics required. Some experience in health physics applications in academic programs desired. Must be eligible for certification by the American Board of Health Physics within 5 years of start of employment. **C86-180**

**POSTDOCTORAL ASSOCIATE**, Applied Biological Sciences, to be part of an ongoing research group investigating the effects of chemical carcinogens on gene expression, amplification and protooncogene activation using animal models. Candidates should have Ph.D. and experience in biochemistry and/or molecular biology. **C86-179**

**SUPERINTENDENT FOR NEW FACILITIES**, Physical Plant, to plan, direct and supervise all campus renovation and new construction projects and provide engineering and construction management support for plant operating divisions. Will direct an engineering and architectural staff responsible for all facilities design and construction at MIT utilizing in-house personnel or outside design professionals. Will also be responsible for establishing and maintaining Institute standards, specifications and budgets for design and construction of new facilities and renovations. Extensive experience in project management and budgeting, design of buildings and construction practice is necessary. A bachelor's degree in engineering or a related field is required with advanced study in engineering or business desirable. Registration as a professional engineer is required. **A86-724**

**CLINICAL VETERINARIAN**, Division of Comparative Medicine, to be responsible for coordination of animal health care activities within the MIT animal facilities. Develop animal quarantine and surveillance protocols; implement diagnostic tests and therapeutic regimens; and interact frequently with MIT faculty and staff. Will monitor experimental procedures to ensure that accurate information is provided in the Animal Research Committee protocol review forms. Will train postdoctoral scholars and inexperienced investigators in experimental animal manipulations. May conduct independent or collaborative research. Will supervise a veterinary technician involved in the administration of primary health care. Candidate must have Veterinary License in at least one state and eligibility to obtain Massachusetts license. Must have board eligibility in the American College of Laboratory Animal Medicine. **C85-139**

#### SPONSORED RESEARCH STAFF

**EDUCATION COORDINATOR**, MIT-Wellesley Upward Bound Program, to work with youth from various economic, ethnic and racial backgrounds in a year-round college preparatory educational program. Will supervise all educational staff; develop and implement evaluation measures to assess and monitor student progress; develop and implement courses to provide remedial and/or college preparatory instruction; and maintain support services through both the target high school and community organizations. Requirements: bachelor's or master's degree in education (secondary concentration). Two years of related experience desired. Experience with diagnostic prescriptive educational approaches in both remedial and enrichment applications helpful. Understanding of issues confronting disadvantaged populations preferred. Must have valid Massachusetts driver's license. **R87-232**

**TECHNICAL ASSISTANT**, Center for Cancer Research, to perform research in the molecular biology of growth factor action. Will organize and maintain laboratory and conduct experiments involving recombinant DNA technology and mammalian cell culture. Requirements: bachelor's degree in biology and previous laboratory experience. Must be able to work independently. Experience in molecular genetics preferred. **R87-231**

**TECHNICAL ASSISTANT**, Physics, to assist two principal investigators studying the biophysical and biochemical basis of cataract formation in the eye lens. Will separate, purify and characterize lens proteins by standard biochemical methods, including size-exclusion and ion-exchange chromatography, electrophoresis and isoelectric focusing, high performance liquid chromatography and absorption spectroscopy. Additional responsibilities include coordinating operations within laboratory; purchasing and preparing materials; testing experimental procedures; and independent research. Requirements: bachelor's degree in biochemistry, chemistry, biology or a related field; and laboratory experience. Excellent organizational skills and the ability to work with precision essential. Experience in biochemistry and/or eye research preferred. R87-230

**TECHNICAL ASSISTANT**, Whitaker College of Health Sciences, Technology and Management, to assist in research directed toward understanding the mechanisms by which animal cells process extracellular macromolecules, including hormones such as insulin, transport proteins such as transferrin and lipoproteins such as the major cholesterol carrier, LDL. Will isolate lipoproteins and lipoprotein-deficient sera from plasma and prepare media for the growth of cells in culture. Other duties may include general laboratory maintenance and assisting with biochemical experiments. Requirements: bachelor's degree in biology. Exposure to biochemistry, cell biology and animal physiology preferred, as is laboratory experience using basic techniques of pipets, balances, pH meter and preparation of buffer solutions. R87-229

**RESEARCH ASSOCIATE**, Materials Science and Engineering, to work on electronic basis of intergranular embrittlement phenomena in metals as part of an interdisciplinary research team effort directed at principles of hydrogen resistance in ultrahigh-strength steels. Will perform supercell total energy and band structure calculations on model segregated grain boundary core structures and intergranular fracture surfaces in close collaboration with researchers in metallurgy, mechanics, physics and chemistry. Requirements: Ph.D. or equivalent in solid state physics or materials science; expertise in the physics and physical metallurgy of intergranular embrittlement and surface phenomena; and experience in state-of-the-art electronic band structure and total energy calculations, including supercomputer supercell calculations (preferably involving magnetic transition metal systems). Pertinent publications and proposal record are also required. R87-228

**TECHNICAL ASSISTANT**, Center for Cancer Research, to carry out procedures in molecular cloning and studies of gene expression and structure in an immunology laboratory. Will also oversee ordering and reagent preparation. Requirements: bachelor's degree in biology and significant experience with molecular biological techniques and with cell culture. R87-225

**SR. ANALYST/PROGRAMMER**, Applied Biological Sciences (sixteen month, half-time position), to work on research project involving classification, data transfer and interchange, and related issues with human foods. Specific tasks will include database administration; participation in design and programming of human interfaces to systems; training and upgrading of staff skills; participation in the design of coding, naming and classification models; assisting with project conversion from Multics to other machines; assisting in facility management for the project's VAX/VMS system; and providing programmer and user level documentation. Requirements: experience with a variety of computer systems, including Multics, IBM VM/CMS, DEC VMS and MSDOS; and experience with two or more major microcomputer-based word processing systems and database management systems. R87-224

**TECHNICAL ASSISTANT**, Applied Biological Sciences, to improve and analyze an immobilized enzyme system for clinical use. Will perform studies of chemistries and support materials ranging from enzymatic activity analyses to mechanical and biocompatibility testing of solid supports. The goal of the project is to analyze the kinetic parameters of the immobilized enzyme device and to scale up the device for animal studies to be done by another group. Independent projects are encouraged. Requirements: bachelor's degree with "wet chemistry" laboratory experience; concentration in chemistry, biochemistry, material science or applied biology preferred. R87-222

**TECHNICAL ASSISTANT**, Chemistry, to carry out procedures in molecular biological research, including growth and harvesting of microorganisms, isolation of plasmid DNA, restriction map characterization of plasmids, plasmid engineering techniques and construction of genetically altered strains of bacteria. Will also maintain strains and DNA stocks; prepare microbiological media and other reagents; prepare all types of electrophoretic gels; perform routine protein isolation and enzyme assays; and perform general housekeeping duties associated with lab upkeep. Requirements: bachelor's degree in biology, microbiology or molecular biology; familiarity with genetic engineering theory and practice; and one to two years of undergraduate research experience, including experience with plasmid construction and analysis. R87-217

**TECHNICAL ASSISTANT**, Chemistry, to carry out growth of methanogenic and nitrogen fixing anaerobic microorganisms. Will produce methanogenic and diazotrophic cells and harvest these cells under conditions preserving activity; perform cell disruption and anaerobic protein purification procedures; prepare media; maintain fermentors and associated equipment; do some training of other laboratory personnel; and perform some laboratory upkeep. Must sometimes work flexible hours. Requirements: bachelor's degree in biology or chemistry. Must be familiar with basic microbiological techniques, including strain purification, aseptic propagation and principles of microbial cultivation. Must also understand basic chemistry relevant to medium preparation. Willingness to learn the operation of fermentors, cell harvesting and disruption equipment and protein isolation apparatus necessary. R87-216

**RESEARCH ASSOCIATE**, Center for Information Systems Research, to participate in all phases of research projects, including design, data gathering, analysis and report writing, with major responsibilities in project management. CISR's core faculty is the MIS faculty of the Sloan School. Will interact daily with other CISR staff, faculty, and students, and with managers from industry and government; and participate in planning seminars. Requirements: M.B.A. and two to three years of professional experience in MIS or the computer industry, including project management experience; consulting experience highly desirable. Must have interest in and knowledge of current MIS issues spanning technical, managerial and organizational concerns. Excellent analytic abilities and writing skills necessary, as are good interpersonal skills. R87-215

**SYSTEMS PROGRAMMER**, Haystack Observatory, to develop and install computer system enhancements and operating system upgrades for multiple computer systems. Will upgrade communications software, graphic software and database software; develop and implement procedures to maximize overall reliability; and interact with computer system users and operators and vendor software support personnel. Requirements: bachelor's degree in computer science or equivalent combination of education and experience; and working knowledge of FORTRAN, structured program design and documentation and FORTRAN accessible system facilities. Familiarity with VAX, Harris and/or IBM PC systems desirable. Must be able to work as a member of a project team. This position is located in Westford, MA. R87-212

**TECHNICAL ASSISTANT**, Energy Laboratory (temporary, one year position), to assist in research involving physical, chemical and biological characterization of inorganic dusts produced in mining and quarrying operations. Will correlate red blood cell hemolysis with dust parameters, such as particle shape, size and crystallinity. Will also assist in design of experiments and calibration, use and maintenance of a variety of analytical instruments. Requirements: bachelor's or master's degree; and evidence of independent research capability. Background in biology or chemistry preferred. R87-211

**RESEARCH SPECIALIST/PROGRAMMER**, Research Laboratory of Electronics, to work closely with a team of researchers to develop a phonetically based speech recognition system. Will help senior researchers implement specific algorithms on computers; participate in system design and implementation; conduct research in acoustic phonetics; identify acoustic cues for phonetic contrasts; develop specific recognition algorithms; and evaluate system performance. Will also interact with other government contractors for information exchange and system integration. Requirements: bachelor's degree in electrical engineering, linguistics or computer science and at least two years of experience in research and problem solving using computers. Familiarity with Symbolics Lisp Machines desirable. Excellent interpersonal and communicational skills important. R87-210

**RESEARCH ASSOCIATE**, Earth, Atmospheric, and Planetary Sciences, to work on the chemistry of oceanic hydrothermal fluids and the particulates that precipitate from them in the water column. Requirements: ability to initiate and lead projects to sample the oceanic water column for dissolved and particulate trace elements; and strong knowledge of conventional trace analysis and SEM and electron probe techniques. Ph.D. in oceanography preferred. Prior experience with research submarines, especially ALVIN, highly desirable. R87-209

**DC POWER ENGINEER**, Laboratory for Nuclear Science, to work on design and operation of high precision, high power DC supplies used at 800 MeV electron linear accelerator. Will specify, install, upgrade and maintain several dozen high and ultra-high precision DC power systems, ranging in power from 5 KW to 1 MW, with adjustable current ranges up to 4000 Amps and stabilities down to 3 ppm. Requirements: a minimum of a bachelor's degree in electrical engineering, oriented toward power applications; three years of applicable experience, including design experience with high power, precision, transistorized and SCR power supplies and associated DC connections; and familiarity with control and instrumentation systems. Industrial or accelerator experience in similar or larger size power systems valuable, as is knowledge of the legal regulations on power systems. R87-208

**TECHNICAL ASSISTANT**, Biology (temporary), to assist with research into the molecular biology of competitiveness in soil bacteria. Will prepare and analyze DNA constructs by standard molecular genetic methodology; test modulation of leguminous plants by bacteria (rhizobia); grow bacteria; prepare DNA; and do restriction analysis, gel electrophoresis, cloning, etc. This position is currently full-time for six months with an excellent chance of renewal for six additional months and possibility of further continuation. Requirements: bachelor's degree and at least one year of experience in molecular genetic techniques. R87-206

**STAFF PHYSICIST**, Laboratory for Nuclear Science, to join the spectrometer systems group at the Bates Linear Accelerator Center. Will maintain and upgrade the large magnetic spectrometers used in single-arm and coincidence studies of electro- and photo-induced reactions on nuclei at intermediate energy; advise and assist experimenters; prepare documentation; participate in target development; and help to develop new detector systems, particularly those suitable for experiments with 1 GeV CW and polarized electron beams. Requirements: Ph.D. in physics and several years of applicable experience. Must be able to develop a solid knowledge of electronic instrumentation and microcomputers. These positions are located in Middleton, MA. R87-202, R87-193

**DATA ACQUISITION SYSTEMS PHYSICIST**, Laboratory for Nuclear Science, to maintain and extend data acquisition systems hardware and software using CAMAC interfacing on micro-VAX computers. Will test and maintain currently supported systems, consult with and assist experimenters and isolate and repair faults. Requirements: master's degree or equivalent combination of education and experience; three years of experience with real-time computer systems; and a background in experimental physics. Must be able to communicate and work well with users. Experience with VAX/VMS operating systems, diverse networks and PC hardware and software desirable. This position is located at the Bates Linear Accelerator Center in Middleton, MA. R87-194

**TECHNICAL ASSISTANT**, Chemistry, to operate and maintain advanced high performance mass spectrometer. Will carry out sample preparation, interpret data obtained and use computer as necessary to process data. May write programs for new mass spectrometry applications. Requirements: at least a bachelor's degree in physics. Experience in design and construction of experimental equipment and some experience with magnetic mass spectrometers and computer programming desirable. R87-199

**RESEARCH STAFF**, Haystack Observatory (one or two year appointment). Applicants should have a background and interest in observational spectral-line astronomy applied to studies of interstellar matter, star formation and extragalactic molecules. Will also be involved in the development and expansion of the capabilities of the Haystack radio telescope. Requirements: recent Ph.D. in radio astronomy. This position is located in Westford, MA; appointment will be effective July 1987. R87-196

**MECHANICAL DESIGN ENGINEER**, Plasma Fusion Center, to work on design of nuclear fusion apparatus and cryogenics and vacuum enclosures for high field magnets. Requirements: advanced degree in mechanical engineering, experience in fusion device design and registered professional engineering license. R87-192

**RESEARCH STAFF**, Laboratory for Computer Science, to work in distributed database system architecture and implementation in connection with an ongoing distributed database system project and the MIT common system. Will design and implement extensions to an operational distributed database system; design and implement a remote procedure call interface for access to database servers from the MIT common system; participate in writing technical papers for publication; maintain database servers and a personal computer database system; and administer a database experiment presently under way. Requirements: master's degree in computer science or bachelor's degree with two years of experience in the design and implementation of computer systems or an equivalent combination of education and experience. Experience with C and UNIX helpful. R87-191

**TECHNICAL ASSISTANT**, Biology (temporary, six to twelve months), to assist with research into the causes of Alzheimer's disease and Down's syndrome. Research involves computer-assisted, three-dimensional reconstruction of brain structures. Will section human postmortem brain specimens and perform immunohistochemistry and conventional histochemistry to localize neurotransmitters and neuropeptides. Requirements: bachelor's degree, at least one year of experience in cutting and staining tissue sections for histology and histochemistry and some knowledge of laboratory biochemistry. PC experience desirable. This position is currently full-time for six months or half-time for twelve months. R87-189

**TECHNICAL ASSISTANT**, Center for Cancer Research, to join a group working on a recombinant DNA project. Duties include preparation and analyses of RNA and DNA; propagation of bacteria, plasmids and bacteriophage; cloning and subcloning of cDNA; and DNA sequencing. Requirements: bachelor's degree in biochemistry, chemistry or biology and laboratory experience. Experience in molecular biological research desirable but not essential. Ability to take responsibility and use initiative essential. R87-188

**RESEARCH SPECIALIST**, Research Laboratory of Electronics, to provide ongoing support for and to continue development of a large speech processing software system (SPIRE) and associated tools and systems. Will fix bugs, design and implement extensions, port code to new versions of the operating system, write and update documentation, oversee distribution to other sites, act as liaison to those sites and the MIT Technology Licensing Office, supervise undergraduates and work closely with researchers to design speech tools. Will also assess hardware needs; maintain hardware and software for a collection of Lisp Machine workstations; write and maintain device drivers; allocate database and file space; and participate in other long range planning. Requirements: bachelor's degree in computer science and/or electrical engineering or equivalent combination of education and experience and a minimum of two years of experience programming Symbolics Lisp Machines. Excellent interpersonal and communicational skills important. R87-174

**COMMUNICATIONS OFFICER**, Research Laboratory of Electronics, to oversee the production of all headquarters documents and publications including the technical report series, annual progress report, newsletter, on-line calendar, specialized reports for new consortium and administrative documents. Will supervise five support staff members in providing services in the following areas: contract reporting and reprints, computer graphics and technical illustration, photography, copying and reproduction, and mail. Will also supervise document room library and library services. Requirements: bachelor's degree and at least five years of related experience including supervisory experience and editorial skills. Should have very strong computer and communicational skills. Knowledge of IBM hardware and software desirable. R87-171

**RESEARCH SCIENTIST**, Spectroscopy Laboratory (one-year position), to conduct theoretical research and perform administrative duties. Will develop mathematical models to describe the interaction of laser radiation with living tissue, for applications to surgery and medicine; and participate in the day-to-day administration of the Laboratory. Requirements: Ph.D. in theoretical physics and at least five years of subsequent research experience with a strong record of publications, including experience and publications in applications of lasers to surgery. Should also be experienced in numerical methods and in scientific and administrative applications of computers, as well as in academic administration. Applications for this position should include three letters of reference. R86-169

**TECHNICAL ASSISTANT**, Biology (temporary, approximately eight months), to work on an ongoing project involving recombinant DNA skills (e.g., cloning and sequencing). Requirements: experience in recombinant DNA techniques. Will consider applicants at advanced undergraduate, graduate student or post-doctorate level. R86-165

**TECHNICAL ASSISTANT**, Biology, to work in microbial genetics laboratory. Duties include protein purification (column chromatography and gel electrophoresis); gene cloning (use of restriction enzymes, transformation, colony screening and purification); and use of spectrophotometry, thin layer chromatography, HPLC and NMR. Requirements: bachelor's degree in biology and experience in recombinant DNA techniques and microbial genetics. R86-157

**APPLIED PHYSICIST/ENGINEER**, Plasma Fusion Center, to develop design concepts for high performance, high field copper magnet tokamaks. Will work on special studies for CIT project; investigate high field magnet concepts for ETR; and develop designs for other applications of high and super high field magnets, including super high field solenoids for laser produced plasmas. M.S. or Ph.D. in engineering physics, electrical engineering or mechanical engineering required. Experience in fusion systems and/or engineering physics desired. R86-152

**POSTDOCTORAL SPONSORED RESEARCH STAFF**, Plasma Fusion Center (one to two year position), to participate in the area of coherent electromagnetic wave generation in ongoing programs which include research on gyrotrons, free electron lasers, relativistic magnetrons, free electron lasers for biomedical applications and electromagnetic wave wigglers for the free electron laser. Will also help identify new concepts for electromagnetic wave generation. Ph.D. in a relevant area of physics required. Experience in the field of electromagnetics desirable. R86-150

**SYSTEMS PROGRAMMER**, Harvard-MIT Division of Health Sciences and Technology, to support educational and research computer resources. Will maintain systems software; supervise hardware maintenance; handle daily system backup and crash recovery; oversee service contracts, inventory and user accounts; and evaluate, install and maintain new software and hardware and develop and disseminate appropriate documentation. Will be the Biomedical Engineering Center's primary computer consultant and will interact with a broad user community. Bachelor's degree in computer science or an equivalent combination of education and experience required. Experience in UNIX and C highly desirable. Experience in writing interactive programs and user-oriented documentation preferred. Familiarity with real-time laboratory use of computers and

computer networking helpful. Must have good writing skills and be able to deal effectively with users. R86-149

**RESEARCH SCIENTIST**, Laboratory for Electromagnetic and Electronic Systems, to perform and supervise theoretical and experimental studies to determine changes in cell membrane structure and composition induced by physical stresses. Will also supervise graduate and undergraduate students and collaborate with a research team of faculty, research staff and students. Ph.D. in biological chemistry or biophysics required. One to two years of post-doctoral experience preferred. Ability to work with faculty, staff and students essential. R86-146

**TECHNICAL ASSISTANT**, Center for Cancer Research, to be involved in the operation and management of a DNA synthesis facility. Will handle chemicals; operate a computer-controlled DNA synthesizer (Autogen 6500); process synthesized oligonucleotides; and interact with customers regarding paper work and costs involved in the synthesis. Will also assist principal investigators studying the mechanism of T-lymphocyte antigen recognition; this study includes experiments in molecular biology, cellular biology and protein chemistry. Requirements: bachelor's degree in chemistry, biochemistry, biology or related field; and two to three years of laboratory experience in some of the areas described above. Capacity to work with precision and stability essential. Should be willing to learn various aspects of modern biology. R86-136

**RESEARCH ASSOCIATE**, Physics, to participate in fundamental research on prevention and reversal of cataract by protein modification both *in vitro* and *in vivo*. Experiments involve characterization, separation and ligand binding to lens proteins; and physico-chemical studies of the phase diagram of protein water solution. Experimental techniques will include chromatography, electrophoresis, centrifugation, high performance liquid chromatography and spectroscopy. Will interact with other postdoctoral fellows and graduate and undergraduate students and supervise one technician. Ph.D. in biochemistry or chemistry required. Experience in lens research desirable. R86-114

**RESEARCH SCIENTIST**, Applied Biological Sciences, to carry out a several year project aimed at identifying the genetically active components of chewing tobacco. Requirements: Ph.D. or Sc.D. in a research field, experience in genetic toxicology of complex mixtures and evidence of ability to obtain independent research support in a related area. R86-111

**RESEARCH SPECIALIST**, Plasma Fusion Center, to conduct experimental research on free electron lasers. Research will include designing experimental systems, conducting experiments and analyzing and presenting data. Requirements: Ph.D. in physics, at least two years of postdoctoral experience in the field of free electron laser research and a working knowledge of computer codes for electron beam transport and free electron laser gain. R86-104

**POSTDOCTORAL GEOPLASMA PHYSICIST**, Center for Space Research, three positions to conduct basic research in wave-particle interactions and plasma turbulence in Earth's ionosphere and magnetosphere. Will also interact with fellow experimentalists engaged in satellite and rocket research. Requirements: Ph.D. in physics or applied mathematics with strong background in theoretical plasma physics. Knowledge of space physics desirable but not required. R86-089, R86-088, R86-087

**THEORETICAL GEOPLASMA PHYSICIST**, Center for Space Research, to conduct independent theoretical research in wave-particle interactions and plasma turbulence in Earth's ionosphere and magnetosphere. This position also involves interaction with fellow experimentalists engaged in satellite and rocket research. Requirements: Ph.D. in physics or applied mathematics with strong background and several years of research and postdoctoral experience in theoretical plasma physics, particularly in the area of kinetic theory of plasmas, and space physics. R86-086, R86-085

**RESEARCH ENGINEER**, Energy Laboratory, to join the Aerosol Characterization Group, a multidisciplinary team involving chemical engineers, materials scientists and inhalation toxicologists in research on the physical and chemical characterization of inorganic combustion-generated aerosols. Requirements: master's degree in physical sciences or mechanical or chemical engineering and at least 2 years experience in high temperature catalysis studies or chemical characterization. Must have a strong background in coal combustion technology, aerosol science and instrumentation. Effective written, oral and interpersonal skills essential. R86-084

**RESEARCH ENGINEER/SCIENTIST**, Center for Transportation Studies, to develop decision support systems. Emphasis will be on network optimization algorithms, decomposition methods and statistical analyses. Will work with both faculty and students on the development of planning and operations control systems for railroads, trucklines, airlines and logistics networks. Requirements: master's degree in operations research, good programming skills and programming work experience. R86-083

**POSTDOCTORAL SPONSORED RESEARCH STAFF**, Spectroscopy Laboratory. Three positions to pursue selected applications of lasers and laser spectroscopic techniques. Research opportunities exist in applications of lasers to chemistry, nuclear physics, collision physics, picosecond spectroscopy and medicine and surgery. Ph.D. in physics, chemistry or a related engineering field; extensive hands-on experience in designing and building laser-optical systems; and an interest in both theory and experiment required. Candidates interested in laser surgery and medical applications of lasers should have experience in biomedical engineering. Must be capable of leadership and providing guidance to students; will be expected to spend some time in service to the Laser Research Center. Applications should include c.v. and names of three references. R86-075, R86-074, R86-073

**RESEARCH SPECIALIST**, Plasma Fusion Center, to operate, maintain and fabricate RF heating equipment on TARA. Will provide a technical resource to the technicians in the RF group; assure the operational readiness of all RF heating equipment; improve operation procedures, documentation and equipment as needed or as directed by senior staff; assist with the fabrication of new equipment; contact vendors; write and update documentation; and test prototypes. Will also be responsible for maintenance of the RF equipment, reporting to engineers and scientists with the status and recommendations for maintenance problems; and perform high level troubleshooting. Associate's degree and 15 years of R & D experience required, including electronics experience through engineering assistant level. Demonstrated understanding and skill in fabrication, documentation, troubleshooting and maintenance of high power radio frequency and/or microwave transmitters is also necessary. R86-061

**RESEARCH ASSOCIATE**, Materials Processing Center, to work on processing, structure and mechanical properties of metal and ceramic matrix composites. Will work on composite fatigue, fracture, damping, statistical characterization of strength, stereology of fiber distribution defects; acoustic emission, residual stresses, stress concentrations, single fiber testing, application of fracture mechanics to coated fibers and interfaces in the composite, *in-situ* SEM testing of coated fibers, shock wave and double cantilever and blister enlargement experiments to measure interfacial strengths and toughnesses and relate these to processing parameters to tailor microstructures to improve overall composite behavior. Ph.D. or equivalent in materials science required. Should have familiarity with finite element analysis, scanning and transmission electron microscopy, non-destructive testing, ultrasonic measurement of elastic constants and internal friction measurements. Research experience in metal matrix composites and a pertinent publication and proposal record essential. R86-060

**RESEARCH SCIENTIST**, Laboratory for Nuclear Science, to participate in a research program involving the application of spin-polarized hydrogen techniques to the development of polarized proton sources and jets for use with high energy accelerator-based experiments. Ph.D. in physics and experience with dilution refrigerators required. This research is being conducted at the Brookhaven National Laboratory, Upton, Long Island, New York. R86-055

**RESEARCH ENGINEER**, Ocean Engineering, to conduct research on marine propellers. Will take on a leadership role in carrying out research projects and generating new concepts. Doctorate in naval architecture with an emphasis on the hydrodynamics of marine propellers required. Must be able to combine analytical and computational skills as applied to the design of marine propellers. R86-048

**ACCELERATOR SYSTEMS DIVISION HEAD**, Laboratory for Nuclear Science, to assume overall responsibility for operations and participate actively in planning and development. Will take part in development of the accelerator system and the establishment of operational protocols. A Ph.D. in physics or engineering and a command of beam optics, rf systems and control instrumentation is desirable. This position is located in Middleton, MA. R86-019

**ACCELERATOR PHYSICIST**, Laboratory for Nuclear Science, to take part in development of the accelerator and in the establishment of operational protocols. Ph.D. in physics or engineering and a command of beam optics, rf systems and control instrumentation desirable. This position is located in Middleton, MA. R86-018

**TECHNICAL ASSISTANT**, Whitaker College of Health Sciences, Technology and Management, to do genetic and behavioral work with *Drosophila*. Will carry out mutagenesis and crosses; conduct behavioral testing; maintain fly stocks; and prepare media. Other duties will include general laboratory maintenance and monitoring the ordering of supplies. Bachelor's degree in science and some experience in basic laboratory techniques required. Experience working with *Drosophila* genetics preferred. R86-998

**RESEARCH ASSOCIATE**, Statistics Center, to develop software for statistical graphics, data analysis and computationally intensive methods on SUN workstations and concurrent computing environments. M.A. or Ph.D. in statistics with experience in FORTRAN, C, UNIX and graphics interface languages required. R86-992

**RESEARCH ASSOCIATE**, Laboratory for Computer Science, to work on a distributed computer system supporting heterogeneous program invocation. Will contribute to the overall system design, with responsibility for major components of the system. Specific duties include system design, specification and documentation; publication of papers; implementation and debugging of code; and working with students and staff. Possible areas of effort include remote invocation semantics, management of abstract data types, display semantics or data storage services. Requirements: Ph.D. in computer science or equivalent combination of education and experience; successful research experience; and experience with one or more of the following: programming language design, distributed systems, network protocols, network-based services, operating system design, LISP or CLU. R86-969

**POSTDOCTORAL SPONSORED RESEARCH STAFF**, Plasma Fusion Center (temporary), to participate in design studies of commercial, engineering test and ignition reactors based on the tokamak configuration. Will conduct parametric surveys and will participate in an interdisciplinary group effort performing detailed engineering analysis. Ph.D. in nuclear engineering or physics required, as is experience in system studies, mechanical/thermal hydraulics design and neutronics calculations on the CRAY's. Familiarity with demountable resistive magnet design essential. This position is for 1 to 2 years, determined by mutual agreement. R86-965

**SHIFT SUPERVISOR**, Nuclear Reactor Laboratory, to be in direct charge of reactor operation on one shift (rotating shift). Will oversee startup, shutdown, utilization, experiment approvals, installation, maintenance, refueling and other activities. A master's or bachelor's degree in nuclear engineering or equivalent, a working knowledge of reactor physics and engineering, and the ability to handle or learn reactor computer codes are required. Experience in reactor operation or a directly related field is desirable. Applicant must qualify for a USNRC senior operator license and successfully requalify every two years and must adhere to and follow radiation protection guidelines and safety procedures associated with the handling of radioactive materials. R86-960

**POSTDOCTORAL SPONSORED RESEARCH STAFF**, Plasma Fusion Center (temporary), to work on coherent radiation generation by free electrons including such mechanisms as free electron lasers, relativistic magnetrons and Cerenkov emitters. Ph.D. required, as is laboratory experience in one or more of the following areas: electromagnetism, microwaves, accelerators, high voltage electronics. R86-956

**SPONSORED RESEARCH STAFF**, Laboratory for Nuclear Science (Temporary, one year appointment). The Center for Theoretical Physics is seeking highly qualified applicants in the areas of nuclear or particle theory. Ph.D. in nuclear or particle theoretical physics, superior graduate record, and demonstrated ability to do effective research in areas of interest to members of the Center are required. Selection is based on letters of recommendation, published research, and perhaps a visit or seminar. There is a possibility of renewal for a second year. R86-942, R86-943

**RESEARCH ASSOCIATE**, Earth, Atmospheric and Planetary Sciences, to conduct vigorous research programs on the general problem of three-dimensional earth structure and its relationship to mantle convection, specifically on the structure and dynamics of descending lithospheric slabs. PhD and some previous experience in structural seismology and large-scale numerical computation required. R85-854

**MANAGER OF COMPUTER SERVICES (RESEARCH ENGINEER)**, Aeronautics and Astronautics, to be responsible for all software and operations of a facility presently consisting of a PE 3242 with array processor, DEC PDP 11/70, 3 DEC 11/23s, and a net of 12 IBM and Corvus microcomputers. Responsibilities will include all aspects of computer operations, system and applications software, management of student programming staff, assistance to users, and acquisition of new hardware and software. All computers are used in the Gas Turbine Laboratory computer facility dedicated to large scale fluid dynamic calculations, high speed data acquisition and analysis, and the real time control of experiments. Requires a strong background in both systems and applications programming, graphics, and applied mathematics. Experience with multi-user computer facilities, 3-5 years as a computer professional, and a degree in applied science or engineering are required. R85-846

**ASSISTANT GROUP LEADER-DIAGNOSTICS**, Plasma Fusion Center, to work in the TARA group. Will be responsible for overseeing the base core diagnostics, coordination of the upgrade and installation of new diagnostics. Will organize requirements for diagnostic specification, CAMAC, cabling, space allocation, and control interface, along with developing required software for CAMAC Data Acquisition. Responsibilities include making magnetic measurements of plasma equilibrium. Ph.D. in Physics or Nuclear Engineering with specialization in Plasma Physics preferred. Good organizational skills and the ability to work on a wide variety of diagnostics necessary. Experience with a magnetic field reconnection and associated anomalous resistivity, CAMAC based data acquisition and writing programs for control CAMAC modules desirable. R85-743

**RESEARCH STAFF AND PRINCIPAL RESEARCH STAFF**, Department of Electrical Engineering and Computer Science. Primary responsibilities are development and maintenance of advanced IC processes, including all phases of design from substrates to multi-level interconnects. Active participation in research on advanced technology concepts also expected. Electrical Engineering, Materials Science, or Physics PhD and 5-10 years industrial experience, including demonstrated successful LSI process development, required for Principal Research Staff. For Research Staff, similar PhD required and 1-2 years similar industrial experience desirable. R84-331, R84-332, R84-333

#### LIBRARY SUPPORT STAFF

**LIBRARY ASSISTANT III**, Catalogue Department (part-time, 20 hours/week), to process monograph records to be converted from manual- to machine-readable form. Will maintain files of records to be converted; photocopy union shelflist cards; organize photocopies in preparation for conversion; maintain files of printouts of converted records; mail barcode labels with appropriate bibliographic information to divisional and branch libraries; and compile conversion backlog statistics. Will also perform pre-cataloguing searching, both on- and off-line. Requirements: graduation from high school and a minimum of one year of direct/related experience. Attention to detail and good organizational skills necessary. L87-951

**LIBRARY ASSISTANT IV**, Acquisitions Department, to be responsible for receipt of an assigned portion of current periodicals and serials. Will process and record materials on visible record cards; process invoices; type forms to note format, title or agency name changes; keep statistics; claim outstanding materials; answer telephone inquiries; sort incoming periodicals and serials; solve problems involving bibliographic searching; correspond with public service units, publishers and vendors to solve problems; and undertake special projects as assigned. Requirements: accurate typing skills (40 wpm) and a minimum of 2.5 years of direct/related experience; post high school education may count toward experience. Previous library experience and reading knowledge of one or more foreign languages desirable. Capacity for detail and excellent organizational and communication skills essential. L86-850

#### SECRETARY/STAFF ASSISTANT

**ADMINISTRATIVE SECRETARY**, Brain and Cognitive Sciences, to support research neuroanatomy laboratory office for one professor and several postdoctoral associates, graduate students and technical staff. Will type reports and manuscripts using Word Perfect on IBM word processor; prepare correspondence from dictaphone tapes; maintain and review files and records; coordinate and schedule meetings and appointments; provide information on departmental and Institute procedures; prepare requisitions, travel vouchers and other Institute forms; and order and maintain inventory of supplies. Requirements: excellent typing and proofreading skills and a minimum of 4.5 years of direct/related experience; post high school education may count toward experience. Excellent organizational interpersonal and communication skills essential. Some knowledge of neuroscience helpful. B87-977

**ADMINISTRATIVE STAFF ASSISTANT**, Summer Session Office. Will process applications, letters of admission and class rosters using IBM PC; respond to inquiries via telex, telephone or letter; assist in the preparation of and participate in 7:00 am Monday registration during the summer; monitor office accounts; maintain files and inventory; and interact with faculty and design service in the preparation of folders. Requirements: excellent typing skills, word processing experience or willingness to learn and a minimum of 4.5 years of direct/related experience. Must be able to handle detail, work under pressure to meet deadlines and deal tactfully with people. B87-968

**ADMINISTRATIVE SECRETARY**, News Office, to support director and to direct the work flow of receptionist and senior secretary. Will handle schedule and mail for director; maintain budgetary, personnel and purchasing records, supplies, petty cash and travel arrangements; receive work from administrative staff and distribute it fairly; word process and proofread news releases and letters; independently reply to correspondence; and handle complex telephone contact. Requirements: excellent typing and proofreading skills and a minimum of 4.5 years of direct/related experience, including experience with word and list processing; post high school education preferred and may count toward experience. Must be willing to learn spreadsheet function on computer. Excellent organizational skills and tact essential. B87-865

**ADMINISTRATIVE SECRETARY**, Center for Technology, Policy and Industrial Development, to support an associate professor. Will coordinate and schedule appointments and travel; type, proofread and produce manuscripts and teaching materials; and maintain and review files and records. This position involves considerable telephone and in-person contact with people within and outside the Institute.

Requirements: excellent typing and dictation skills, knowledge of word processing and a minimum of 4.5 years of direct/related experience. Must have excellent organizational skills and be able to work with minimal guidance. B86-831

**ADMINISTRATIVE SECRETARY**, Office of the Dean for Student Affairs, to support the undergraduate seminar program, residence/orientation, freshman initiatives and other programs. Will develop and maintain budgeting, filing and record systems; gather information and type and proofread reports and correspondence; coordinate mailings; respond to telephone and in-person inquiries regarding programs and procedures; monitor budgets and review purchasing transactions; supervise student workers; serve as primary resource on computer/word processing system and assist in training others; and coordinate and schedule appointments, meetings and special events. Requirements: 65 wpm typing skills, conceptual knowledge of DECmate or IBM Wordperfect, and a minimum of 4.5 years of direct/related experience. Excellent organizational and interpersonal skills and ability to work under pressure in a fast-paced environment essential. B86-818

**ADMINISTRATIVE SECRETARY**, Laboratory for Manufacturing and Productivity, to support the Director, Administrative Officer and the Assistant to the Director. Will maintain and review files and records, including records on personnel, budgetary and purchasing transactions; read, sort, distribute and review mail; handle considerable telephone contact and provide information; type and proofread reports, manuscripts, examinations and correspondence; reproduce reports and manuscripts; coordinate and schedule appointments, meetings and special events including large groups; and arrange travel. High school diploma or equivalent, excellent typing skills and minimum 4.5 years direct/related experience required; post high school education may count toward experience. Experience with word processing essential. Must be able to exercise discretion in obtaining and providing sensitive information. B86-585

**SENIOR SECRETARY**, Resource Development, to act as word processing specialist and provide backup for word processing coordinator. Will key in and format documents generated by the offices of campaign systems, major gifts, development services and others; archive documents; and provide other general clerical support as time allows. In absence of word processing coordinator, will control and maintain word processing system; coordinate typing; assist users with problems; act as liaison between vendor and users; and maintain supply inventory. Requirements: graduation from high school or equivalent, excellent typing skills and a minimum of 2.5 years of direct/related experience; post high school education may count toward experience. Word processing skills or ability to learn essential. Must be able to meet tight deadlines and work under pressure. B87-989

**SR. SECRETARY - TECHNICAL**, Chemistry, to perform varied duties for one professor who is also associate editor of a journal. Will type correspondence, technical papers, course work and grant proposals; answer telephones; arrange appointments and travel; monitor research accounts; and file. Requirements: good typing skills, including technical typing, experience with dictaphone equipment and a minimum of 2.5 years of direct/related experience. Word processing experience or willingness to learn necessary. Should be effective at setting priorities and organizing work without detailed supervision. B87-984

**SR. STAFF ASSISTANT**, Campus Information Services, to perform clerical and secretarial duties under direction of manager and assistant coordinator in the conference services office. Will support career services presentation; type and proofread documents; compile information for registration mailings; process incoming registration materials; answer and screen calls; provide information to visitors; investigate costs and availability of items and services from outside vendors; maintain files; assist in scheduling rooms and services; prepare invoices and monitor internal account; schedule appointments; prepare Institute forms; order supplies; operate office equipment; and arrange travel. Requirements: graduation from high school or equivalent, accurate 50 wpm typing, familiarity with DECmate word processing and a minimum of 2.5 years of direct/related experience. Excellent organizational skills and ability to work with minimal supervision essential. B87-983

**SR. STAFF ASSISTANT**, Operations and Systems, to assist deployment manager with the management of grant equipment. Will purchase and track equipment; monitor and maintain equipment inventories; reconcile grant accounts; and serve as liaison to the Treasurer's Office and to vendors. Will also reconcile other deployment accounts and allocate equipment; and work with the planning group to coordinate Physical Plant work, including determining what work needs to be done and ordering, monitoring and tracking the work. Requirements: a minimum of 2.5 years of direct/related experience, including some accounting and purchasing experience. Strong organizational skills and attention to detail essential. Ability to interact with a wide variety of people important. Some knowledge of computing desirable. B87-972

**SR. STAFF ASSISTANT**, Research Laboratory of Electronics, to support three faculty members. Will type correspondence; prepare and reproduce course materials, including high quality computer graphics; prepare research manuscripts and publications; order equipment and supplies; arrange travel; answer phones and greet visitors; file; and perform occasional library research. Requirements: excellent typing skills, including technical typing or willingness to learn, and a minimum of 2.5 years of direct/related experience. Must be willing to learn new computer technologies for file management, word processing and graphics. Flexibility and excellent organizational skills essential. B87-961

**SR. STAFF ASSISTANT**, Research Laboratory of Electronics (part-time, 25 - 30 hours/week), to support one professor in the radio astronomy group. Will take and transcribe dictation involving specialized terminology; type technical manuscripts and statistical tables and charts involving specialized terminology and assume responsibility for accuracy and format of this material; schedule appointments; arrange travel; and distribute and respond to office mail. Requirements: excellent typing skills, including technical typing and knowledge of word processing or willingness to learn, knowledge of some method of dictation and a minimum of 2.5 years of direct/related experience. Must be able to work independently. B87-960

**SR. SECRETARY**, Plasma Fusion Center, to support a group of research scientists. Will type and proofread reports and correspondence from rough draft and typed copy; answer phones; receive and screen visitors; maintain files and records; distribute mail; photocopy; maintain reading room; and perform other related duties as assigned. Requirements: graduation from high school or equivalent, good typing skills (50 wpm) and a minimum of 2.5 years of direct/related experience. Willingness to learn word processing essential. Must be able to handle a variety of responsibilities in a busy environment. B87-958

**SR. SECRETARY**, Brain and Cognitive Sciences (part-time, 17.5 to 20 hours/week), to support two associate professors of neurobiology and their research groups. Will use typewriter and word processor to prepare correspondence, manuscripts and grants; prepare Institute forms; maintain correspondence and account files; order supplies; photocopy; answer phones; and perform other related support functions as assigned. Requirements: good typing and proofreading skills and a minimum of 2.5 years of direct/related experience. Familiarity with medical and biological terminology helpful. Good interpersonal and organizational skills essential. Flexibility and initiative important. Experience with DECmate II preferred; willingness to learn mandatory. B87-954

**SR. SECRETARY**, Materials Processing Center, to support the academic and research responsibilities of the Metal Matrix Composites Laboratory. Will type manuscripts, proposals, correspondence and other materials; organize and maintain large filing system; handle telephone inquiries; work closely with faculty, staff, students and personnel from industry and government; and perform other related duties as assigned. Requirements: excellent typing skills and a minimum of 2.5 years of direct/related experience. Knowledge of word processing (MacIntosh) and/or willingness to learn necessary. Must have excellent organizational and interpersonal skills, as well as the ability to work independently. B87-949

**SR. STAFF ASSISTANT**, Nuclear Engineering, to support three professors. Will prepare class notes, research reports, technical papers and general correspondence from handwritten materials; handle telephone calls, appointments and travel arrangements; share photocopier duties with other support staff; prepare transparencies for class and research work; prepare MIT accounting forms; and perform other related duties as assigned. Will interact with graduate and undergraduate students as well as other support staff and faculty members. Requirements: excellent typing skills and a minimum of 2.5 years of direct/related experience. Experience typing Greek equations and using a personal computer and knowledge of T3 preferred. Strong communicational skills helpful. B87-947

**EDITORIAL ASSISTANT**, History Section, to perform secretarial, administrative and some editorial functions connected with a major academic journal (The Journal of Interdisciplinary History) and the teaching, professional and scholarly activities of one professor. Requirements: excellent typing and word processing skills and a minimum of 2.5 years of direct/related experience, including editing experience. Ease in dealing with students, colleagues, professors and government and corporate officials necessary. B87-946

**SR. SECRETARY**, Center for Information Systems Research (part-time, 20 hours/week), to support CISR seminars, special projects, accounting activities; will also support associate director. CISR's faculty is the MIS group at the Sloan School; their research studies significant managerial issues in the utilization of computer-based information systems. Will prepare correspondence and reports, often using word processor; answer phones and screen calls; arrange travel; help arrange seminars and meetings; and assist in accounting-related tasks, such as preparing requisitions and reconciling monthly statements. Requirements: good typing skills and a minimum of 2.5 years of direct/related experience, including some

word processing experience. Excellent interpersonal skills essential. Book-keeping experience helpful. B87-945

**SR. SECRETARY**, Fiscal Planning and Budget Office, to support nine staff members. Will answer phone and greet visitors; type all correspondence and statistical tables using either personal computer or typewriter; maintain and order office supplies; act as key operator for photocopier; assist in arranging meetings and office functions; photocopy, log budget changes, file, mail budget authorizations; and perform other related duties as required. Requirements: good typing skills, including statistical typing, and a minimum of 2.5 years of direct/related experience. Ability to use dictaphone necessary. Must have strong organizational skills and a pleasant phone manner. B87-943

**SR. SECRETARY**, Laboratory for Computer Science, to support two faculty members. Will prepare class notes, reports, research proposals and technical memos; maintain files and databases of the research group; use computer-based support including text editor, formatters and file systems as appropriate; handle correspondence, telephones and travel arrangements; and perform other related duties as assigned. Requirements: good typing skills, including technical typing and a minimum of 2.5 years of direct/related experience; post high school education may count toward experience. Must be willing to learn computer-based text editing and other computer aids. Ability to work independently and exercise judgment in prioritizing tasks important. B87-935

**SR. SECRETARY**, Office of Donor Relations and Campus Visits, to produce presidential letters and other official correspondence. Will also arrange meetings; produce and organize campus visits material; maintain files; photocopy and distribute copies; type office correspondence; maintain and reconcile office accounts; answer telephones; sort and distribute mail; and oversee inventory of office supplies. Requirements: excellent typing and proofreading skills and a minimum of 2.5 years of direct/related experience. Should be well organized, attentive to detail and accurate; should also have a pleasant and professional telephone manner. Must be willing to learn to use IBM PC for word and data processing. Familiarity with MIT desirable. B87-926

**SR. SECRETARY**, Alumni Association, to support the director of alumni information management. Will arrange meetings and travel; answer phone inquiries and correspondence; organize and maintain files; prepare and maintain documents on DEC word processing equipment; and assist in special projects and other records and administrative procedures as required. Requirements: good typing skills and a minimum of 2.5 years of direct/related experience. Organizational ability, flexibility and capacity to handle several projects simultaneously essential. Ability to work independently necessary. Knowledge of DECmate II helpful; training will be provided. B87-925

**SR. STAFF ASSISTANT**, Sloan School of Management, to support the executive education programs office. Will answer and place calls and take messages; respond to routine inquiries independently; receive visitors; type correspondence and other materials; maintain files; process applications for the program and respond to routine requests for information; prepare requisitions and order supplies; and perform other related duties as assigned. Requirements: accurate typing and proofreading skills and a minimum of 2.5 years of direct/related experience; post high school education may count toward experience. Word processing experience or willingness to learn necessary. Strong interpersonal skills essential. Familiarity with MIT procedures preferred. B87-917

**SR. STAFF ASSISTANT**, Project Athena, to assist deployment manager with grant equipment. Will purchase and track equipment; monitor and maintain equipment inventories; reconcile grant accounts; and serve as liaison to the Treasurer's Office and vendors. Will also reconcile other deployment accounts and allocate equipment; and work with the planning group to coordinate Physical Plant work: determine what work needs to be done and order and monitor that work. Requirements: a minimum of 2.5 years of direct/related experience, including some accounting and purchasing experience. Strong organizational skills and attention to detail essential. Must be able to interact with a wide variety of people. Some knowledge of computing desirable. B87-915

**SR. SECRETARY**, Civil Engineering (part-time, 17.5 hours/week), to support the undergraduate officer. Will type class notes, technical papers, proposals and reports and handle heavy interaction with students. Requirements: strong typing skills and a minimum of 2.5 years of direct/related experience. Knowledge of and experience with word processing helpful. Strong interpersonal skills important. Must be able to function effectively while handling several projects. B87-894

**SR. SECRETARY**, Industrial Liaison Program, to support two liaison officers. Will process mail; type, edit, proofread and reproduce correspondence and reports; answer telephones and provide information or referral as appropriate; input and retrieve data and reports on computer system; maintain and establish files and filing system; schedule appointments, seminars and travel; and perform other related duties as required. Will work as part of a team to provide support for ILP as a whole. Requirements: excellent typing skills, experience with and/or willingness to learn DEC VAX 11/780 computer system and a minimum of 2.5 years of direct/related experience. Excellent organizational skills and ability to work effectively as part of a team essential. Familiarity with MIT helpful. (One of these positions is in a non-smoking office.) B87-869, B87-870

**SR. SECRETARY**, Sloan School of Management, to become a part of the Sloan School by working for three professors in the Applied Economics, Finance and Accounting Area. The Sloan School combines a stimulating academic atmosphere and a business orientation. Support these busy professors in both their teaching and research, some of which is technical in nature. Become actively involved in office automation by becoming proficient on IBM PC's using Wordperfect and other software, and by learning to use electronic mail system. Daily interaction with faculty, students and visitors is part of this interesting and varied position. Requirements: excellent typing and proofreading skills and a minimum of 2.5 years of direct/related experience; post high school education may count toward experience. Technical typing skills (50 wpm) highly desirable. Willingness to learn Wang word processing and IBM PC essential. Excellent organizational skills and ability to work with minimal supervision important. Knowledge of MIT helpful. B87-860

**SR. SECRETARY**, Aeronautics and Astronautics, to share the support of six faculty members in the Division of Instrumentation, Guidance and Control. Will type and word process technical reports, class notes and correspondence from rough draft; arrange travel and travel advances and prepare travel vouchers; answer phones, take messages and schedule meetings; photocopy notes and reports; and order office supplies. Requirements: excellent typing and proofreading skills and a minimum of 2.5 years of direct/related experience; post high school education may count toward experience. Good telephone manner, attention to detail and excellent organizational skills are mandatory. Word processing experience preferred. B87-858

**SR. MEDICAL SECRETARY**, Medical Department, to support an internal medicine cluster consisting of physicians and nurse practitioners. Will answer telephone, schedule appointments, perform patient triage, handle medical transcription and typing of correspondence and reports, order and coordinate patient medical records and test results, maintain office files and perform other related duties. This person works with another secretary to provide relief coverage for lunch, illness and vacation. Requirements: excellent typing and transcription skills, working knowledge of medical terminology, and a minimum of 2.5 years of direct/related experience. Some college or secretarial school training preferred. Must have good judgment and organizational skills and be able to work effectively under pressure. B86-856

**SR. SECRETARY**, Property Office, to support the staff of the office. Will handle all correspondence and chronological files; organize and maintain general filing systems; answer telephones; process all mail; handle reproduction services; and type government reports, Tech Talk ads and property procedures manual. Requirements: excellent typing skills, knowledge of word processing (preferably DEC) and a minimum of 2.5 years of direct/related experience. Secretarial or business school training preferred. Must be able to work independently and establish priorities in a service-oriented environment with occasional pressure. B86-848

**SR. STAFF ASSISTANT**, Artificial Intelligence Laboratory, to support faculty members. Will type or typeset, edit and proofread reports, manuscripts, correspondence and similar materials; initiate and compose correspondence; maintain and originate files and records, including records of graduate student admission and records for a journal; schedule appointments, meetings, exams and seminars; compile materials for prospective graduate students; act as course secretary; arrange travel; answer telephones and receive visitors; and perform other related duties as necessary. Requirements: excellent typing skills and a minimum of 2.5 years of direct/related experience. B86-833

**SR. SECRETARY**, Harvard-MIT Division of Health Sciences and Technology, to support the director of the Hyperthermia Center. Will answer and place phone calls; receive patients; take messages from doctors and patients; respond to routine inquiries; receive visitors and schedule appointments; type correspondence, manuscripts, grant proposals and other documents; maintain director's publication library; and perform other related duties as necessary. This position involves considerable interaction with students, staff, patients, doctors and other visitors. Requirements:

excellent typing and proofreading skills and a minimum of 2.5 years of direct/related experience. Knowledge of word processing helpful. Familiarity with medical terminology preferred. Discretion, tact and good interpersonal and organizational skills essential. **B86-807**

**SR. SECRETARY**, Sloan School of Management, to support the director and other staff members of the Management in the 1990's research program. Will type correspondence and reports from rough drafts using Wang word processor and electric typewriter; answer phones and screen calls; photocopy; prepare high quality presentation materials; arrange travel; and perform library searches. Will be part of a team which supports seminars and conferences by assisting with logistics. Some overtime may be necessary. Requirements: high school graduation or equivalent, 50 wpm typing skills and a minimum of 2.5 years of direct/related experience; post high school education may count toward experience. Word processing skills preferred. Should have excellent interpersonal skills to handle frequent contact with faculty, students and corporate sponsors. Dictaphone experience helpful. **B86-759**

**SR. SECRETARY**, Chemical Engineering, to support faculty members and research staff. Will type class materials, manuscripts, proposals, etc.; compose letters and other correspondence; organize and maintain files and professional library of faculty members; handle telephone inquiries; monitor financial accounts and expenditures and maintain financial records; arrange meetings and travel; carry out occasional library research; and interact with students, advisees and colleagues of the faculty members. Requirements: excellent typing skills, word processing experience (preferably with IBM PC) and a minimum of 2.5 years of direct/related experience. Should be outgoing, with good organizational and interpersonal skills and the ability to work with a variety of individuals. Technical typing skills desirable. Good command of English and good telephone presence essential. **B86-741**

**SR. SECRETARY**, Sloan School of Management (part-time, 14 - 17.5 hours/week, Tuesdays and Thursdays), to support three professors in the Applied Economics, Finance and Accounting area. Will coordinate course preparation (assemble readings packets, type handouts and exams and create visual aids); type and edit manuscripts and reports, often of a technical nature; coordinate meetings, schedule calendars and arrange travel; and handle daily interaction with faculty, students and outside visitors as well as busy telephones. Requirements: excellent typing and proofreading skills and a minimum of 2.5 years of direct/related experience. Must be willing to learn to operate Wang word processor and IBM PC. Technical typing skills and dictaphone experience desirable. Must have good organizational skills, attention to detail and ability to work with minimal supervision. Knowledge of MIT helpful. **B86-701**

**SR. SECRETARY**, Office of Leadership Gifts, to support two staff members. Will prepare forms, correspondence, reports and other documents; answer telephones; organize calendar, travel plans, files and correspondence; prepare information on donors and prospects; and enter and retrieve information on the prospect donor database. Will also make arrangements for special alumni events. Occasional overtime will be necessary during peak periods. Requirements: 65 wpm typing skills, solid competence in word processing and database entry and retrieval and a minimum of 2.5 years of direct/related experience. Strong organizational skills, close attention to detail and absolute discretion in handling confidential material are essential. **B86-697**

**SR. SECRETARY**, Harvard-MIT Division of Health Sciences and Technology, to work in the administrative office. Will type, edit and sometimes prepare correspondence; formulate, type and proofread technical and non-technical proposals and reports; organize meetings; answer phone; assist in preparation of course budgets and statistics; maintain files; conduct library research; keep calendar; transcribe machine dictation; and handle incoming mail. Will also assist with the development of new consortium, multi-project proposals and assist with other projects as directed. Requirements: excellent typing skills and minimum 2.5 years direct/related experience. Must be able to synthesize information from a variety of sources and be able to perform duties at different levels. Good command of English grammar and syntax necessary. College experience preferred. **B86-661**

**SR. SECRETARY**, Chemical Engineering, to support Department Headquarters. Will answer busy telephones, provide general information and refer callers to other offices when appropriate; arrange for visitors to meet with professors and students; type correspondence, including technical proposals and reports, for Department Head; sort and distribute a large volume of mail; maintain inventory of office supplies; prepare requisitions and vouchers for signature; and order coffee and supplies for seminars and luncheons. This position will occasionally require additional irregular hours. Excellent typing skills and minimum 2.5 years direct/related experience required, as is ability to use word processing equipment, preferably DECmate II. Good organizational skills and ability to handle heavy visitor contact essential. Knowledge of MIT helpful. **B86-618**

**SR. STAFF ASSISTANT**, Materials Science and Engineering, to report directly to the department head. Will provide administrative support for the entire faculty search process; assist in departmental fundraising activities; prepare faculty mailings; assist in arranging faculty meetings; and type reports to M.I.T. officials, text and figures for technical papers, proposals and talks. This individual will also be responsible for handling the department head's mail and telephone and maintaining office supplies and some office machinery. Requirements: excellent typing skills and a minimum of 2.5 years of direct/related experience, including experience with IBM AT and dictaphone. This is an exciting and very demanding position which requires excellent organizational and interpersonal skills to work effectively in a busy, team-oriented setting. **B86-586**

**SR. SECRETARY**, Laboratory for Information and Decision Systems, to support one senior faculty member and two senior research staff members. Will prepare and type course materials, articles for publication, proposals, correspondence and technical reports; keep and maintain student records; arrange international and domestic travel; make extensive conference arrangements; and act as liaison with all levels of faculty and staff. Good typing skills, including some technical typing, and minimum 2.5 years direct/related experience required. Experience with or willingness to learn technical word processing on an IBM PC necessary. Must have good attention to detail and work well independently. Good knowledge of Institute procedures very helpful. **B86-583**

**SR. SECRETARY**, Brain and Cognitive Sciences, to support neuropsychology laboratory. Will type grant proposals, patient reports, correspondence and tables; transcribe taped patient interviews on word processor and typewriter; assemble syllabi, class schedules and reprints for graduate courses; order books, reprints, equipment and office supplies; arrange travel; prepare travel vouchers; arrange research meetings; answer phones and screen and route messages; photocopy; maintain files; coordinate incoming manuscripts for journal review; and receive visitors. Excellent typing skills and minimum 2.5 years direct/related experience required; post high school education may count toward experience. Familiarity with medical terminology and technical typing preferred. Must be able to work well under deadlines and with frequent interruptions. Will be asked to work overtime. **B86-554**

**SR. SECRETARY**, Treasurer's Office, to support the assistant treasurer, associate director and administrative assistant in interrelationships with individual donors, attorneys, trust officers and members of the Institute community in the area of planned giving. Will type and proofread correspondence and reports; schedule meetings and keep calendar; answer telephones and receive visitors; photocopy and distribute mail; review wills, trusts and other legal documents; arrange travel and itineraries; order and maintain office supplies; review monthly accounting statements; operate IBM PC to obtain financial information; and perform other related duties as required. Requirements: excellent typing skills, knowledge of and/or willingness to learn word processing and a minimum of 2.5 years of direct/related experience. Shorthand desired. Excellent organizational and interpersonal skills and the ability to work independently essential. Familiarity with legal terminology desirable. **B86-543**

**SR. SECRETARY**, Undergraduate Academic Support, Office of the Dean for Student Affairs, to support section head in exercising overall management of the office, and to support the freshman advising program, the research efforts of the office and the new special freshmen initiatives. Position involves interaction with the MIT community, both in person and by telephone. Requirements: excellent typing skills, familiarity with or willingness to learn word processing and a minimum of 2.5 years of direct/related experience. Familiarity with MIT helpful. Excellent interpersonal and organizational skills essential. **B86-450**

**SR. SECRETARY**, Materials Science and Engineering, to perform secretarial duties including typing general correspondence, preparation of technical reports and journal papers from handwritten manuscripts, distribution of reports, administration of project budgets, review of monthly statements, coordination of departmental seminars (scheduling speakers, rooms, AV equipment), RA/TA appointments for graduate students, planning both domestic and international travel for projects in Spain, Egypt, and Switzerland. Ordering goods and services from outside vendors, arranging appointments; phone messages, filing, maintaining office supplies; general office tasks. Dictaphone or shorthand skills desirable. Ability to interact effectively with many people in a busy office necessary. Accuracy in recording messages, expenditures, reviewing monthly budget summaries, monitoring paper flow, and the ability to organize and control work from multiple sources and set up and maintain effective information systems-storage and retrieval capacity essential. Fluency in Spanish highly desirable. Minimum 2.5 years direct/related experience required. **B86-180**

**SECRETARY**, Materials Processing Center, to support MPC headquarters. Will maintain files of research accounts, maintain mailing lists and perform periodic mailings, answer telephones, photocopy, file, run errands, type some letters and reports, order supplies and maintain mailing machine and photocopier charges. Will also perform other related duties as assigned. Requirements: graduation from high school or equivalent, basic typing skills and a minimum of one year of direct/related experience. Must be willing to learn Xerox word processing system. **B87-987**

**STAFF ASSISTANT**, Personnel - Benefits Systems and Records. Will process benefit forms; monitor compliance with eligibility rules and other benefit plan provisions; maintain benefits records in computer database; handle follow-up correspondence regarding employees' benefit choices; and interact with other Institute offices and benefit providers. This position involves the opportunity to learn a wide variety of employee benefit programs and to assist in writing and streamlining office procedures and developing applications for personal and mainframe computers. Requirements: a minimum of one year of direct/related experience. Should be comfortable working on computer terminals and willing to learn DECmate II word processor. Good problem solving and organizational skills, accuracy and attention to detail are very important. **B87-971**

**SECRETARY**, Environmental Medical Service. Will type various documents, file, maintain records, deliver materials within the Institute and perform other related duties as assigned. Requirements: good typing skills and a minimum of one year of direct/related experience. Knowledge of DECmate II preferred. Good communication skills and poise in dealing with people and emergency situations essential. **B87-963**

**SECRETARY**, Anthropology/Archaeology Program (part-time, 20 hours/week), to support program coordinator and a small group of faculty members. Will answer telephones, arrange travel, sort and deliver mail, handle mailing, photocopy, and order office supplies. Will also type, edit, format and print correspondence and reports using word processing and perform other related duties as assigned. Requirements: excellent typing skills and at least one year of direct/related experience. Must be familiar with or willing to learn word processing on AT&T and IBM personal computers. Good organizational and interpersonal skills and the ability to work well under pressure essential. **B87-950**

**SECRETARY**, Laboratory for Electromagnetic and Electronic Systems (part-time, 20 hours/week), to support administrative secretary, one faculty member and two research staff members. Will type research proposals and reports, manuscripts, correspondence and other materials on both word processor and typewriter; answer telephones; handle petty cash; assist with handling accounts and problems that appear on statements; request laboratory equipment and supplies; monitor purchase orders; process invoices; open mail; assist in arranging travel; and perform other related duties as assigned. Requirements: strong typing skills and a minimum of one year of direct/related experience. Must have some word processing experience and be willing to learn TechWriter editor. Ability to work under pressure and meet deadlines in a busy environment essential. **B87-948**

**SECRETARY**, Mechanical Engineering, to support one faculty member. Will type technical manuscripts and reports, update mailing lists and distribute materials, answer phones, photocopy, prepare teaching materials and handle heavy interaction with students and faculty. Requirements: excellent typing skills, including technical typing, and a minimum of one year of direct/related experience. Must be able to work independently and under pressure. Good interpersonal skills important. **B86-702**

**SECRETARY**, Energy Laboratory (part-time, 20 hours/week), to support one faculty member in the Sloan Automotive Laboratory. Will type class material, correspondence, memoranda, forms, reports and proposals; maintain files; arrange travel; order course materials; and perform other related duties as required. Requirements: high school diploma or equivalent, good typing skills and a minimum of one year of direct/related experience. Must be willing to learn word processing. **B86-699**

#### TECHNICAL SUPPORT STAFF

**DENTAL ASSISTANT**, Medical Department, to work in the MIT Dental Service and report to the head dental assistant. Will assist dentists and dental hygienists with dental procedures; prepare required dental solutions; sterilize instruments; maintain examining rooms; assist with record keeping; and take and process dental x-rays. Requirements: graduation from high school and from approved dental assistant program. Previous work experience desirable. Must be able to work effectively as a team member in a busy setting. **T87-940**

**TECHNICAL ASSISTANT**, Haystack Observatory, to operate Haystack and the Westford radio telescopes and associated equipment. Will set up and operate microwave receiving equipment, tape recorders, chart recorders, autocor peripheral equipment and the HP1000 pointing computer and its peripheral equipment; and assist scientists in planning and carrying out their observing

programs. This position requires night and weekend work as well as tower climbing. Requirements: associate's degree in astronomy, physics or engineering or the equivalent in directly related experience. Ability to work independently essential. Must have or be able to obtain security clearance. This position is located in Westford, MA. **T87-909**

**HVAC DESIGNER/DRAFTSPERSON**, Physical Plant, to work in the utilities engineering section. Will make load calculations, design HVAC systems and carry design through the drafting stage. Requirements: graduation from technical school and a minimum of five years of experience in the mechanical designer drafting field. Must be able to work with minimal supervision. **T86-837**

#### OFFICE ASSISTANT/ADMINISTRATIVE ASSISTANT

**ADMINISTRATIVE ASSISTANT**, Office of the Dean for Student Affairs, to support the dean for student affairs. Will coordinate meetings and appointments; handle incoming mail and telephone inquiries; respond to questions and a variety of sensitive problems; interact with other personnel throughout the Institute and provide information to the general public; draft and edit letters; type reports and correspondence; maintain files; arrange travel; and coordinate other projects as requested. May direct the work of support staff and students. Requirements: excellent typing and word processing skills and a minimum of 4.5 years of direct/related experience, preferably in a university setting. Excellent organizational and interpersonal skills and ability to work under pressure essential. Post high school education and knowledge of MIT preferred. **S87-990**

**ADMINISTRATIVE ASSISTANT**, Alumni Association, to coordinate Cambridge-based projects and other administrative functions of the national MIT Enterprise Forum and the MIT Enterprise Forum of Cambridge. Will process all program materials; serve as editorial and production coordinator for monthly newsletter; interact with alumni leaders, Forum executive committee, corporate sponsors and the general community; and oversee the daily operations of the national office, including directing the work of part-time clerical assistance. Requirements: a minimum of 4.5 years of direct/related experience; post high school education may count toward experience. **S87-988**

**ADMINISTRATIVE ASSISTANT**, Office of Career Services, to assist associate director in administering the Fall and Spring on-campus recruiting programs. Will interact with company representatives regarding recruitment information; make up detailed schedules for companies; help greet recruiters and explain schedules and office services; oversee sign-up desk; help prepare careers handbook including full responsibility for insert; assist students in writing resumes and cover letters and finding reference materials; assist in training new support staff; compile annual statistical analysis of placement of students; and help with other projects as necessary. Requirements: good typing ability and a minimum of 4.5 years of direct/related experience. Good communication and organizational skills, ability to work with computers and ability to work well and accurately under pressure essential. Must be able to work during recruitment periods even when the Institute is closed. **S87-985**

**ADMINISTRATIVE ASSISTANT**, Resource Development, to assist the director of major gifts in managing flow of work. Will type, edit and proofread correspondence, memoranda, reports and other documents; maintain calendar; arrange travel and complete reimbursement vouchers; assist in planning meetings; maintain tracking systems reflecting status of campaign prospects; provide information on activities within major gifts; maintain files; provide telephone coverage; assist in monitoring budgets and monthly statements; and prepare management reports reflecting campaign process. Requirements: a minimum of 4.5 years of direct/related experience. Excellent organizational and interpersonal skills necessary. Knowledge of word processing, personal computer and dictating equipment desired; willingness to learn necessary. **S87-979**

**ADMINISTRATIVE ASSISTANT**, Resource Development, to identify, research and prepare profile reports on prospective individual, corporate and foundation donors to the Institute. Will review lists of major prospects and donors to determine those with greatest potential; compile background material on prospects using files, references and electronic databases; and provide administrative support to the daily operations of the Campaign Systems group. Requirements: graduation from high school or its equivalent and a minimum of 4.5 years of direct/related experience; post high school education preferred and will count toward experience. Strong research and writing skills and ability to analyze and synthesize information essential. Must have strong organizational and interpersonal skills and familiarity with or willingness to learn to use computers and databases. **S87-967**

**ADMINISTRATIVE ASSISTANT**, Sloan School of Management, to be responsible for monitoring and reconciling over 200 Sloan School accounts. Will review accuracy of detailed financial information; prepare reports on account status; resolve problems and discrepancies; and organize backup information of monthly statements. Additional duties include review and approval of temporary help invoices; responding to inquiries about accounting procedures; assisting in year-end closing and other financial duties as assigned; participating in converting manual tracking procedures to computer databases; and other general office duties as assigned. Requirements: typing skills and a minimum of 4.5 years of direct/related experience; post high school education may count toward experience. Ability to review and organize detailed financial information with a high degree of accuracy essential. Knowledge of MIT accounting procedures helpful. S87-964

**ADMINISTRATIVE ASSISTANT**, Office of Campaign Systems, to identify, research and prepare profile reports on prospective individual, corporate and foundation donors to the Institute. Will review lists of major prospects and donors to determine those with greatest potential; compile background material on prospects using files, references and electronic databases; and provide administrative support to the daily operations of the Campaign Systems group. Requirements: graduation from high school or its equivalent and a minimum of 4.5 years of direct/related experience; post high school education preferred and will count toward experience. Strong research and writing skills and ability to analyze and synthesize information essential. Must have strong organizational and interpersonal skills and familiarity with or willingness to learn to use computers and databases. S87-957, S87-956, S87-955

**ADMINISTRATIVE ASSISTANT**, Mathematics, to coordinate department's service courses. Will schedule exams; oversee proctoring assignments; track student flow and maintain related records; and type some correspondence, syllabi, notes and announcements. This position involves a large volume of work and interaction with many students. Requirements: good typing skills and a minimum of 4.5 years of direct/related experience. Strong organizational skills and ability to work effectively with frequent interruptions and high pressure essential. Experience in a student-oriented setting preferred. S87-953

**ADMINISTRATIVE ASSISTANT**, Bursar's Office, to support bursar, senior managers and director of the Office of Registration and Student Financial Services. Will generate and proofread reports; schedule appointments; arrange travel; screen calls; purchase and monitor supply requisitions; monitor and order office supplies; provide general accounting support and information; prepare weekly payroll report for support staff, consultants and students; answer inquiries regarding status of student accounts; perform independent projects; and provide backup support to all areas of the office. Requirements: graduation from high school or its equivalent, excellent typing skills and a minimum of 4.5 years of direct/related experience; post high school education will count toward experience. Strong organizational skills essential. Bookkeeping and accounting experience helpful. S87-952

**ADMINISTRATIVE ASSISTANT**, Sloan School of Management, to support the associate dean for master's and bachelor's programs in design and execution of an effective alumni/ae fundraising program for graduates of the master's program. Will work closely with the associate dean, the coordinator of the master's program, the master's program advisor and the editor of SLOAN; maintain frequent contact with alumni as well as with other areas at Sloan and MIT; handle large mailings and detailed arrangements; and type letters and reports. Requirements: excellent typing skills and a minimum of 4.5 years of direct/related experience. Ability to work independently and excellent sense of detail essential. S87-934

**ADMINISTRATIVE ASSISTANT**, Property Office, to be responsible for the inventory of all newly acquired equipment funded by MIT or its sponsors. Will initiate property records from purchasing and accounts payable information; locate and tag equipment in the field; and complete property records for entry into the property database. May occasionally input information into the database and perform other related duties as deemed necessary by the property manager. This position involves direct contact with principal investigators, fiscal and administrative officers, faculty, staff and students. Requirements: a minimum of 4.5 years of direct/related experience; post high school education may count toward experience. Associate's degree preferred. Some experience in equipment inventory and property management desirable. Must have ability to handle large amounts of detailed information and solve problems. Excellent communicational skills necessary. S87-903

**ADMINISTRATIVE ASSISTANT**, Energy Laboratory, to provide administrative and secretarial support to Advanced Technology Group. Will type and proofread reports, manuscripts, correspondence, etc. from rough draft or verbal instruction; collect and prepare information for reports; and coordinate and schedule appointments, meetings, seminars and special events.

Will be responsible for distribution of workload and supervision of other support staff. Minimum 4.5 years direct/related experience and good typing and word processing skills required. Must have strong organizational and managerial skills. Good command of English essential. S86-406

**SR. OFFICE ASSISTANT**, Credit Union. Will input transactions such as withdrawals, deposits and loan payments via a VT220 Digital terminal; impart Credit Union rules and regulations and answer inquiries regarding loan and share balances; and act as backup to the senior computer operator. This position requires some overtime during peak periods. Requirements: a minimum of 2.5 years of direct/related experience, including experience with a computer mainframe, preferably a Digital PDP11-84 system or equivalent. Familiarity with the use of a CRT and personal computer also necessary. Must be able to work flexible shifts. S87-976

**SR. OFFICE ASSISTANT**, Credit Union. Will assist the senior loan processor in the preparation and typing of minutes; assist in the preparation of loan applications, notes, disclosures, security agreements, extensions and co-maker responsibilities; assist with the control of vehicle titles, insurance verifications and notices of insurance cancellations; maintain and control pledges to the account used to secure officers and committee loans; balance daily work generated; help with file maintenance for loan information; and act as backup to customer service representatives during lunch and peak business periods. Requirements: 50 wpm typing skills and a minimum of 2.5 years of direct/related experience. Familiarity with CRT preferred. Facility for working with figures important. Good interpersonal skills and pleasant telephone manner essential. S87-975

**SR. OFFICE ASSISTANT**, Media Laboratory, to support the assistant director for administration and finance. Will use Wang word processor to prepare correspondence, memoranda and reports and to send and receive electronic mail; file and maintain records; answer telephones, screen calls and greet visitors; schedule meetings; distribute and retrieve keys and maintain accurate key records; assist in solving minor building problems and refer other problems to appropriate person or office; and assist with organizing and entering data for building and personnel database. Requirements: good typing and proofreading skills and a minimum of 2.5 years of direct/related experience; MIT experience preferred. Word processing experience or willingness to learn necessary. Ability to work with minimal supervision and good interpersonal skills essential. S87-969

**SR. OFFICE ASSISTANT**, Architecture, to assist executive officer and student activities coordinator with orientation, registration and end-of-term procedures. Will respond to departmental telephone inquiries and direct questions to appropriate resources; handle office mail; maintain student files and records; authorize issuance of key cards and keys and assign lockers; and process student payroll. Will also support administrative officer in processing requisitions and handling petty cash. This position involves occasional overtime. Requirements: 50 wpm typing skills, familiarity with or willingness to learn word processing, and a minimum of 2.5 years of direct/related experience. Ability to work under pressure and deal with deadlines, excellent proofreading and organizational skills, accuracy and tact essential. S87-965

**SR. OFFICE ASSISTANT**, Information Services, to sell, distribute and mail documentation, software and computer supplies in the Microcomputer Center's publications sales section. Will handle over-the-counter selling; distribute documents internally; mail computer documentation and software internally and externally; update reference documentation; and perform on-line text editing and database maintenance, filing and other related duties as necessary. Requirements: 50 wpm typing skills and a minimum of 2.5 years of direct/related experience. Must be able to deal with many kinds of people and to field questions about a large stock of complex computer supplies. Ability to work with minimal supervision essential. S87-944

**SR. DATA ENTRY OPERATOR**, Alumni Association, to process gifts and pledge data for interactive update of alumni records on database management information system. Will also provide information on gift data from the database to alumni association and MIT staff in response to telephone, written or personal inquiries; maintain records of gifts processed through the system, submit weekly and monthly gift status reports and acknowledgments; and assist in special projects and other records procedures as required. Requirements: good typing skills and a minimum of 2.5 years of direct/related experience. Data entry experience preferred. Ability to handle detailed work with high degree of accuracy and follow through on all aspects of assignment essential. Flexibility and ability to work closely with others important. S87-937

**SR. OFFICE ASSISTANT**, Chemistry, to support department headquarters. Will assist financial administrator in accounting work; type correspondence and forms; file; maintain records; reconcile statements; process travel vouchers, invoices and requests for payment; route proposals and other financial documents; and perform some receptionist duties. Requirements: good typing skills and a minimum of 2.5

years of direct/related experience. Experience with word processing or willingness to learn necessary. S87-921

**SR. OFFICE ASSISTANT**, Nuclear Engineering. Will verify expenditures on monthly detail transaction account reports; match packing slips with purchase orders; prepare invoices for signature or request vendor to invoice; review account files and follow up on outstanding requisitions, purchase orders and invoices; prepare and submit billings; maintain record of purchase orders; order supplies; maintain schedule of conference room; maintain telephone log; issue key cards and maintain key inventory; type; and file. Requirements: good typing skills and a minimum of 2.5 years of direct/related experience. Experience with Symphony preferred; bookkeeping and accounting experience helpful. Must be able to deal with constant interruption and a multitude of details. Good communicational and interpersonal skills essential. S87-918

**SR. OFFICE ASSISTANT**, Center for Materials Science and Engineering (part-time). Will process standardized forms and correspondence; verify and correct summaries, reports and calculations; maintain and review files and records including requisitions, purchase orders, invoices and status of departmental accounts; schedule colloquia and set up lunches; issue keys; handle office mail and telephones; and enter and maintain information on an IBM PC AT. Requirements: graduation from high school or equivalent and a minimum of 2.5 years of direct/related experience. Experience with UNIX operating system helpful. S87-900

**COMPUTER OPERATOR**, Sloan School of Management, to monitor and maintain a PRIME 850 and an IBM 4341 minicomputer, their terminals and peripherals, 25 Xerox 8010 workstations and 150 IBM microcomputers. Will start the minicomputers and back them up to tape; run first level diagnostics when a system fails and contact service representatives when necessary; maintain communications between the systems and with other computers on campus; stock paper, ribbons and other supplies for use on peripherals, 35 public micros and one Xerox print server; supervise and instruct student night operators; maintain the appearance of the printer room, terminal room and two PC laboratories; and help to develop strategies to improve system operations. Requirements: basic understanding of computer operating systems and a minimum of 2.5 years of relevant education and/or experience. Must be able and willing to answer users' questions and to direct them to appropriate sources of information. S86-847

**SR. OFFICE ASSISTANT**, Telecommunications Systems, to handle office mail and telephones, provide message answering service and filter electronic mail. Will also maintain files and inventory of equipment; process standardized forms or correspondence; provide information on procedures within area of responsibility; schedule meetings, events and programs; compose and type routine correspondence; and perform other related clerical, financial and secretarial duties. Requirements: graduation from high school or equivalent, 40 wpm typing skills, and minimum 2.5 years direct/related experience; post high school education may count toward experience. Ability to handle detail important. Proficiency with adding machines, calculators and computer terminals helpful, as is some bookkeeping and accounting experience. S86-674

**SR. OFFICE ASSISTANT**, Telecommunications Systems, to prepare purchase orders, process invoices and keep appropriate records. Will maintain and update the master file of telecommunications charges to appropriate departments; field questions and resolve billing problems; maintain inventory and sales records, including monitoring inventory and generating orders to maintain stock at proper levels; receive and stock shipments; interact with customers when making sales and concerning questions of price and capabilities of items. Other duties include typing, answering phones and general clerical tasks. Requirements: graduation from high school and a minimum of 2.5 years of direct/related experience. Telecommunications experience preferred. S86-633

**RECEPTIONIST**, Technology Licensing Office. Will receive and assist visitors, answer all incoming telephone calls, maintain copying and postage machines, order office supplies, file, photocopy, type some correspondence, provide secretarial backup and handle special assignments as they arise. Requirements: graduation from high school or equivalent, accurate typing skills and a minimum of one year of direct/related experience. Excellent interpersonal skills and flexibility essential. Must be willing to learn word processing on personal computer. S87-986

**OFFICE ASSISTANT**, MIT Libraries (part-time, 20 hours/week), to process incoming and outgoing mail and packages. Will use van and booktruck to deliver to and pick up mail and books from libraries at on- and off-campus locations; fill mailbags and boxes daily and take them to shipping platform; answer inquiries on current mail and shipping procedures; maintain inventory of supplies; maintain files; compile statistics; maintain adequate postage supplies; train new staff when necessary; and perform other related duties and

special assignments. Requirements: graduation from high school or equivalent and a minimum of one year of direct/related experience; post high school education may count toward experience. Willingness and capacity for physical exertion necessary. Massachusetts driver's license, excellent driving record and three years of driving experience also required. S87-982

**OFFICE ASSISTANT**, Energy Laboratory (part-time, 20 hours/week), to support business office. Will file, type, photocopy, distribute report, answer phones for routing or message taking and provide other general assistance to office staff. Requirements: graduation from high school, accurate typing (speed not essential) and a minimum of one year of direct/related experience. S87-980

**RECEPTIONIST/OFFICE ASSISTANT**, Personnel - Employment, to act as departmental receptionist. Will provide services related to the employment process, including information on job status, specifications and applications procedures. Will assist people in completing applications and refer inquiries to appropriate Institute Offices. Additional duties will include administering typing tests, scheduling interviews, maintaining database of applicant information, assisting with resume acknowledgment system, and word processing. Will work on special projects as assigned. Requirements: a minimum of one year of direct/related experience. Must be able to grasp routine procedures quickly and to recognize unusual situations and respond to them appropriately. Good interpersonal skills and ability to work well under pressure essential. Accurate typing and familiarity with computer terminals helpful. S87-978

**RECEPTIONIST**, Laboratory for Nuclear Science, to join the administrative support group at the Bates Linear Accelerator Center. Will attend switchboard, receive visitors and do light typing. Requirements: graduation from high school or equivalent; accurate typing skills and one year of direct/related experience preferred. Good interpersonal skills and a pleasant telephone manner essential. This position is located in Middleton, MA. S87-974

**OFFICE ASSISTANT**, Credit Union. Will answer telephones and take messages; handle inquiries relating to balances and current policies; take and prepare share withdrawals; use personal computer to type correspondence; provide clerical assistance in the delinquent loan area; complete verification forms requested by members for other lending institutions; and act as a backup for customer service representative during lunch hours. Requirements: good typing skills (50 wpm) and a minimum of one year of direct/related experience. Familiarity with personal computer and/or terminal preferred. Facility for working with figures, good interpersonal skills and a pleasant telephone manner essential. S87-973

**OFFICE ASSISTANT**, Registrar's Office, to assist the supervisor of the registration section in the registration of students, verification of student status, preparation of registration data for entry into the CRT visual input terminals and registration day activities. Requirements: accurate typing skills, familiarity with word processing and a minimum of one year of direct/related experience. Must be able to handle detail and willing to work with students and faculty. College experience desirable. S87-962

**BENEFITS SPECIALIST**, Personnel - Compensation, to communicate benefits information to all segments of the MIT community. Will answer benefits questions by telephone, in person and in writing; and provide special support for one or more benefits programs. Will also assist in developing and conducting orientation programs for new employees; and provide support as required on projects involving the development of communication materials and other projects as assigned. Requirements: a minimum of one year of direct/related experience. Excellent communicational and organizational skills and ability to interact with a wide variety of people essential. Must be able to work under pressure and with minimal supervision. Experience with or willingness to learn DEC word processing necessary. Knowledge of MIT helpful. S87-941, S87-942

**OFFICE ASSISTANT**, Medical Department (part-time, 17.5 hours/week), to work in medical record services. Will pull and file medical records from telephone and written requests; file medical material into records; dispatch records and record boxes to proper stations; maintain patient index file; and perform minor repairs on Telelift system. May be assigned special record projects and may be required to work morning and evening shifts. This position involves lifting boxes and pushing heavy carts. Requirements: a minimum of one year of direct/related experience. Good communicational skills and ability to work in a team setting important. Accuracy with details and ability to work under pressure essential. S87-932

**OFFICE ASSISTANT**, Libraries - Microreproduction Laboratory (part-time, 20 hours/week, afternoons), to receive and process requests on the telephone and in person. Will answer inquiries and discuss available services; compute the costs of requests; prepare invoices for submission to the Accounting Department; respond to routine written inquiries; tabulate various statistics; and enter and proofread data in a computerized microfiche titling

system. Requirements: graduation from high school, accurate 50+ wpm typing skills, and a minimum of one year of direct/related experience; post high school education may count toward experience. Knowledge of basic accounting procedures desirable. Punctuality and regular attendance important. Must have good command of English. S87-923

**RECEPTIONIST/OFFICE ASSISTANT**, Purchasing and Stores, to support the general purchasing office. Will receive and direct visitors and answer telephone inquiries; process incoming and outgoing departmental and US mail; screen incoming requisitions and maintain authorized signature file via terminal; and replenish supplies and materials. Will also perform other related duties as directed. Requirements: a minimum of one year of direct/related experience. Must have excellent interpersonal skills. Typing skills, experience using a terminal and willingness to learn office automation desirable. S87-891

**OFFICE ASSISTANT**, MIT Libraries, to process incoming and outgoing mail and packages. Will deliver and pick up mail and books; fill and deliver mail bags and boxes daily; answer inquiries about mail and shipping procedures; maintain inventory of supplies; maintain orderliness of mail room and adhere to safety and security procedures; maintain files and records; compile statistics; train new staff when necessary; and perform other related duties as required. Requirements: graduation from high school or equivalent; a minimum of one year of direct/related experience; valid Massachusetts driver's license and excellent driving record; three years of driving experience; and some knowledge of automobile and van maintenance. Should be willing to lift heavy mail bags and boxes. Must be dependable, punctual and able to work independently and accurately in a fast paced, high volume environment. S87-889

**RECEPTIONIST**, News Office, to receive telephone calls and visitors to MIT's chief public relations office. Will file; photocopy; label, fold, stuff and mail news releases; and do some typing. Requirements: graduation from high school or equivalent, accurate typing skills and a minimum of one year of direct/related experience; post high school education may count toward experience. Willingness to learn word processing essential. Must be courteous, cooperative and punctual. S87-867

**OFFICE ASSISTANT**, Electrical Engineering and Computer Science, to support department headquarters. Will type memos and letters; photocopy reports and memos; process large mailings; monitor use and condition of conference room; sort and distribute daily mail; act as key operator for photocopy area; verify and initiate action for key requests and maintain key records; type and process research assistant appointments; process student payroll; check and verify monthly charges; and serve as a courier when necessary and perform special projects as needed. Requirements: good typing skills and a minimum of one year of direct/related experience. Good interpersonal and communicational skills important. S86-849

**OFFICE ASSISTANT**, Plasma Fusion Center, to assist in the preparation of various payrolls. Will also perform verification and record keeping tasks associated with those payrolls; handle petty cash and billings for supplies and services; order and maintain office supplies; assign keys and process certain travel documents; and maintain and implement records on DECmate II word processing system. Good typing skills and minimum one year direct/related experience required. Should have the ability to handle detail accurately. Facility with figures and excellent interpersonal skills essential. Good organizational skills and willingness to learn record keeping on a word processor necessary. S86-646

**SERVICE ASSISTANT**, Earth, Atmospheric and Planetary Sciences (part-time, 12 - 15 hours/week; September through May), to prepare and clean up for daily tea hour. Will order tea supplies, maintain kitchen facility and help set up faculty luncheon. Will occasionally do errands for headquarters. Requirements: valid driver's license. Must be reliable. S87-901

#### SERVICE STAFF

**SR. TECHNICIAN (ELECTRO-MECHANICAL)**, Chemistry, to assist in laboratory research or analytical work. Will operate highly technical experimental apparatus and maintain, repair and build electronic equipment. May direct and train technicians of a lower grade. Requirements: graduation from a two year day technical school or its equivalent and a minimum of five years of applicable experience; some familiarity with sophisticated chemical analytical instruments (nuclear magnetic resonance spectrometers, mass spectrometers and ultraviolet and infrared spectrophotometers); and familiarity with most of the following: power amplifiers, radio frequency amplifiers, low noise radio frequency preamplifiers, phase detectors, radio frequency generators, records and x/y plotters, mechanical and turbine pumps, optical equipment and computer and magnet systems. H87-568

**LABORATORY AIDE**, Brain and Cognitive Sciences, to perform routine assignments related to the teaching and research laboratories. Will collect, wash, rinse and sterilize various types of laboratory glassware for use in microbiological, tissue culture, bacteriological, biochemical and other experiments. After demonstrated experience may work independently setting work priorities, maintain supplies, prepare media and give direction to others. Will perform related laboratory duties as assigned. Requirements: graduation from high school or equivalent. Some experience in scientific glass washing desirable. Must be conscientious and follow directions well. Ability to work without direct supervision for extended periods important. H87-567

**SHOP HELPER B**, Energy Laboratory, to assist in maintenance of a large combustion research facility (under supervision), including operation of equipment and mechanical repairs. H87-566

**HANDYWORKER**, Haystack Observatory, to perform duties normally those of a handyworker, including but not limited to minor activities of the other trades, such as painting, masonry, carpentry, rigging, snow removal, and equipment and furniture moving. Will also drive a fork lift and light vehicles; make pickups and deliveries; maintain lawns and grounds; and make minor road repairs. Requirements: Massachusetts driver's license. Must be physically able to perform described duties and be willing and able to climb towers. H87-562

**MAINTENANCE MECHANIC**, Chemistry, to perform a variety of duties primarily related to the servicing, maintenance, repair and renovation of buildings and associated plant equipment. Will assist tradespeople when needed; construct, repair and install bookcases, shelves, cabinets, partitions, special crates and boxes; repair and install furniture, floor tiles, pumps, blowers, door closers, fans, etc. May install locks, air lines, vacuum lines, bench tops, lamps, etc.; may be required to paint, shovel snow, move items, drive or perform other related duties as needed. Requirements: a minimum of three years of applicable experience, including experience in the use of all common hand and power tools. Must be able to work from oral and written instructions. H87-561

**GENERAL HELPER**, Graphic Arts Service, to perform a variety of routine jobs, such as running copy machines, stapling, collating, binding, cleaning, oiling and supplying raw materials to the bindery, press room, ozalid rooms, etc. Will work in various groups doing repetitious work as assigned. Requirements: graduation from high school or its equivalent. H87-550

**PROJECT MACHINIST**, Brain and Cognitive Sciences. Will fabricate medical and/or biological equipment; perform some design work, brazing and silver soldering; work closely with and advise faculty on appropriate machining matters; advise and direct students in the use of the facility; direct overall operation of the machine shop, including maintaining inventory and equipment; schedule use of the facilities; and organize and prioritize incoming requests for jobs. May supervise and train other machinists and helpers. Requirements: formal apprenticeship (three years) and ten years of additional experience working close tolerances. Should demonstrate mechanical ingenuity and have experience and familiarity with the construction and repair of pieces of complicated apparatus. H87-548

**TECHNICIAN A (E-M)**, to assist in laboratory research or analytical work under direction or supervision of scientific personnel. Will operate highly technical experimental apparatus; operate accelerator to provide electron beams for experimental purposes and systems testing; maintain and repair accelerator systems during operation; keep records, logs and documents of system performance; participate in vacuum system maintenance and vacuum leak testing as well as operation of bridge cranes and some rigging; during shutdown periods provide technical support consisting of repair, preventive maintenance and installation of equipment. Rotating shift work is involved. Requirements: two years of day technical school or its equivalent and a minimum of two years of experience. Experience in operating and maintaining ion implanting facilities, nuclear power or fusion facilities, radar installations, high power laser facilities or other accelerators preferred. These positions are located in Middleton, MA. H87-545, H87-544

**PRESS OPERATOR REPRODUCTION WORKER B**, Graphic Arts Service, to set up and operate a Multilith or Davidson press to accomplish high quality custom offset printing. Will determine and obtain paper stock required; mix necessary inks; adjust air-operated feeding mechanism; place metal, paper or plastic plate on press; adjust plate cylinder, ink roller and water flow; start run, inspect first copies and make necessary adjustments; complete run; and perform operational maintenance on press (cleaning, oiling, etc.) and make minor repairs. May expose and develop own plates for line copy of half-tone from negatives or positives; guide and train others in press operation; or assist in the operation of larger presses. Will be required to operate other equipment in the offset department. Requirements: graduation from high school or equivalent and three to four years of applicable experience. H86-509

**SHADEWORKER**, Physical Plant. Minimum of 5 years experience in the trade required, as are knowledge of current trade practices in measuring, cutting and installing shades and complete knowledge of venetian blind repair and cleaning. Some knowledge of repair and installation of drapes and projection screens desirable. Ability to use hand tools, power tools and sewing machine essential. Must be able to work effectively from ladders and scaffolding. May be required to work irregular shift and assist other trades in Metal Shop. H86-423

**INSTRUMENT SYSTEMS WORKER**, Automatic Temperature Controls, Physical Plant, to maintain, diagnose and repair microprocessors and associated instrumentation. Must have ability to perform tests and adjustments of input and output devices, also to set-up and maintain history and documentation files. Associate degree and/or two years formal training in electronics plus a minimum of 3 to 5 years experience in temperature or process control required. Must be capable of trouble shooting electronic circuitry. Will work any and all shifts as required by operations. H86-336

#### OTHER POSITIONS

##### TECHNOLOGY CHILDREN'S CENTER

**DAY CARE TEAM TEACHERS** (35 hours/week, year round position), to work with a mixed age group in campus-based center. Will share responsibility for curriculum, classroom management, child guidance and staff/parent communication. Should be able to relate well to culturally diverse families and be committed to team teaching. Requirements: degree in early childhood education or related field and at least one year of teaching experience. Please contact Luise Flavin, Technology Children's Center, 60 Wadsworth Street, Cambridge, MA 02142, (E55-Plaza) 253-5907. Note: this is not an MIT position.

#### MIT POSITIONS AVAILABLE

MIT Positions Available is a publication of the Personnel Office, Massachusetts Institute of Technology. It appears as a supplement to TECH TALK 35 times a year and as an independent entity other weeks. Address inquiries or resumes to the MIT Personnel Office, Room E19-239, MIT, Cambridge, MA 02139. General telephone inquiries are received at (617) 253-4251. Please include the job number(s) when making inquiries.

#### DEADLINE INFORMATION

To post MIT openings in Positions Available, "Request for Personnel" forms should be submitted to the appropriate Personnel Officer in the Personnel Office. Deadlines for submission are as follow:

**12:00 noon on Wednesday** (except when the following Monday is an Institute holiday)

**12:00 noon on Tuesday** (when the following Monday is an Institute holiday).

## Meet the Training Lab Trio

Robyn L. Fizz



Achieving new heights: Tawney Wray, Jeanne Cavanaugh, Tricia Kellison

If you've ever taken an IS noontime seminar or all-day training session, you've probably met Jeanne Cavanaugh, Tricia Kellison, or Tawney Wray. This dynamic team coordinates the computer training program offered by IS.

Jeanne became Training Services Manager a year ago. Her background in education, as a junior high and high school math teacher, then as an instructor at the BC Math Institute, and finally as an MIT computer consultant, prepared her well for her present position. She understands the fear that computers instill in the inexperienced, and she feels a real sense of accomplishment knowing that her group provides MIT staff with a chance to learn about computers in a supportive atmosphere.

Tricia, who received her B.S. degree in Cognitive Sciences from MIT in 1984, has found her way back to the Institute. After completing a Masters in Education at Harvard, she returned to MIT as an Information Services staff member. She's combined her interest in computers and education, first as a Microcomputer

Center consultant, and now as the Microcomputer Training Laboratory Coordinator.

You may have run into Tricia in the last six months as a teaching assistant in an IS course, or as a word processing consultant. In her new position, she will oversee the day-to-day running of the new microcomputer training lab — scheduling classes and practice times, selecting hardware and software, and assisting instructors who use the laboratory for hands-on courses.

Tawney, new to MIT and microcomputers, has jumped on board with the kind of contagious excitement that makes everyone around her feel inspired about their work. Tawney has quickly become a Macintosh expert, and claims she'll never return to the typewriter. She designs the IS course catalog, coordinates course registration, and answers client questions about Training Services.

If you need instructions on how to find Building 11 and the IS offices, ask Tawney. Having almost missed her job interview last summer, while winding her way through the MIT maze, she has a detailed set of directions for the uninitiated.

## Mainframe Tip

UNIX's output redirection feature lets you "redirect" output from your screen to a file. For instance, the `ls -l` command displays an annotated list of the files in your directory on your terminal screen:

```
%ls -l mydir
-rw-r--r-- 1 nessus 665 Nov 17 05:16 letter
-rw-r--r-- 1 nessus 6706 Mar 11 11:56 paper
```

To create a file `foo` containing a list of the `mydir` directory, use the UNIX output redirection symbol, `>`:

```
%ls -l mydir > foo
```

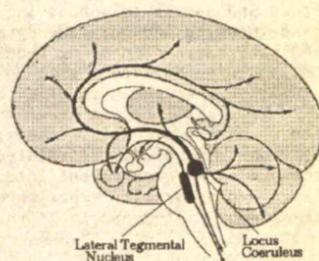
Instead of listing your file on the screen, UNIX redirects the output to file `foo`, which now contains a listing of the directory `mydir`:

```
%cat foo
-rw-r--r-- 1 nessus 665 Nov 17 05:16 letter
-rw-r--r-- 1 nessus 6706 Mar 11 11:56 paper
```

To add redirected output to the end of an existing file, use `>>` instead of `>`:

```
%date >> foo
%cat foo
-rw-r--r-- 1 nessus 665 Nov 17 05:16 letter
-rw-r--r-- 1 nessus 6706 Mar 11 11:56 paper
Wed Apr 1 10:52:07 EST 1987
```

## Am I Blue? No, Blushing.



Last month in the article *Am I Blue?* we made a mistake. We colored the lateral tegmental nucleus blue, instead of the locus coeruleus. The locus coeruleus is the black disk directly behind the lozenge-shaped lateral tegmental nucleus.

Apologies to our readers and Professor Ingram.

## Athena Spring Minicourse Schedule

The Athena minicourses for the rest of Spring Semester will meet in Room 35-225, at the times listed below. For a complete description of all the minicourses, see the Athena Minicourse Index available in all Athena clusters.

Date	At Noon	At 7 pm	At 8 pm
4/6 (Mon)	Word Processing	Scribe	Thesis
4/8 (Wed)	Scribe	Thesis	Scribe (Math)
4/14 (Tue)	---	Scribe (Reports)	Thesis
4/15 (Wed)	Resumes	Scribe	Scribe (Reports)
4/16 (Thu)	---	Scribe	Resumes
4/22 (Wed)	Thesis	Resumes	Thesis
4/23 (Thu)	---	Scribe (Math)	Scribe Questions

*Word Processing* is an introduction to Emacs, Scribe and the Athena printers. The course, which assumes relatively little knowledge of the Athena system, covers the elements essential to producing a document on Athena.

*Scribe* demonstrates how to use this formatter to produce letters and simple reports. The course treats Scribe commands and special features in substantially greater depth than *Word Processing*. This class, or

some previous knowledge of Scribe, is a prerequisite for the following classes.

*Scribe (Reports)* presents the basics of the Scribe report document type, including creating chapters and sections.

*Thesis* explains how to use Scribe with the MIT Thesis document type and thesis template files. The course covers creating a title page, abstract page, table of contents, chapters and bibliography that conform to MIT Thesis standards. It is

advisable to take *Scribe (Reports)* before trying this.

*Scribe (Math)* explains how to use the Scribe math environment to produce equations, symbols and formulae within documents.

*Resumes* presents the Scribe resume document type, and how to use it to create an attractive resume.

*Scribe Questions* is not a formal course, but rather a "question and answer" session. So bring your Scribe problems.

## IS Spring Collection

All Information Services Seminars Meet at Noon

M	T	W	Th	F
6 APRIL	7 Introduction to Information Services Rm 10-340	8 Excel for the Novice to the Power User W20 Mezz. Lounge	9 Tips and Techniques for Using Your PC W20 Mezz. Lounge	10
13	14 PASSOVER	15 MacWrite & Microsoft Word 3.0 W20 Mezz. Lounge	16 BCS IBM PC User Group Resources Rm 10-105	17
20	21 Overview of Desktop Publishing for the IBM PC Rm 10-105	22 MacDraw, MacDraft and accessories W20 Mezz. Lounge	23 Ventura Publisher Demo Rm 10-105	24
27	28 Overview of Desktop Publishing for the Mac Rm 10-105	29 PageMaker Demo W20 Mezz. Lounge	30 Ready-Set-Go Demo Rm E40-298	

April brings another series of informal noontime seminars on various aspects of computing. Check the calendar at left for dates and places.

IS spring courses begin with a two-day class, *Introduction to Lotus 1-2-3*, on April 15 and 16, and conclude with a two-day *Advanced Lotus* class that meets on May 20 and 21. In between, we've planned two sections each of our three most popular training sessions: *Introduction to the IBM PC* on April 22 and May 1; *Introductory DOS* on April 24 and May 6; and *Introduction to WordPerfect* on May 8 and 18.

Three DECmate II classes will also be offered: *Intro-*

*duction to Word Processing*, *Advanced Word Processing* and *Multiplan*. All IBM PC and DECmate sessions are hands-on classes, in which students work extensively with the machines.

The five-day *Ergonomic Skills Training* course is back. A similar course, offered last fall, was very well received. This particular course qualifies for the Personnel Department's Tuition Assistance program.

For complete descriptions of IS courses, including dates, times, places, and how to enroll, see the Spring '87 catalog with the yellow cover. Pick up a copy in Room 11-314 or in the Microcomputer Center, Room 11-209.

# MICROCOMPUTER CORNER

## Thunderscan for the Mac

Joanne Larrabee  
Information Services

The graphic shown with this article is a scanned image of — you guessed it — a scanning device. The artwork was electronically transferred from paper to a Macintosh computer using a product called Thunderscan. Made by Thunderware, Inc., this scanner digitizes an image by translating it into a series of small, closely spaced black dots.

Thunderscan works by passing a small lens back and forth from the top to the bottom of the original page. The scanning hardware determines whether the lens is passing over a light or dark area of the page, and creates a file that uses densely spaced dots to recreate the darkest portions, and less close spacing for lighter regions.

What makes Thunderscan a comparatively

inexpensive scanner at \$229 is its reliance on an Imagewriter printer — the standard dot-matrix printer used with the Macintosh — to perform the mechanical aspects of the scan.

To scan a page, the original is fed into the Imagewriter behind the platen and paper bail. (That means the artwork must be of a reasonable size and thickness to fit in the printer.) The scanner cartridge replaces the ribbon cartridge, snapping easily into place. The software that comes with the device makes the scanner traverse the page, as would the print head and ribbon during normal printing.

Scanning an image is a relatively slow process: a single page can take 30 to 40 minutes. Once the image is



entered, it may be edited with simple drawing tools that are part of the software and resemble those found with most Macintosh painting programs. For more precise work, the file may also be refined with graphics programs such as *MacPaint*, *MacDraw*, *FullPaint*, and *SuperPaint*.

Thunderscan is a clever mechanism for capturing artwork for flyers, newsletters and similar publications. Text, however, does not read well after scanning; you can add clean text to a scanned image using one of the programs men-

tioned above. For much quicker and more precise scanning, several products are available in the \$1,500-\$10,000 price range. But the results from these devices are still inadequate for most professional publications.

Thunderscan will work with a Macintosh or Macintosh Plus, and an Imagewriter I or Imagewriter II printer, but particular combinations of these computers and printers may require a special cable or power adapter to accommodate differences in design between models. At this writing, Thunderscan is not compatible with the new Macintosh SE computer, and it may be several months before such a version becomes available.

Thunderscan is sold by Thunderware, Inc., 21 Orinda Way, Orinda, CA 94563 [(415) 254-6581]. ●

## Consultant's Hotline



Consultant's Hotline features some of the questions heard most often by Micro Center consultants. If you have micro questions, call x3-7686; or visit or write to the Micro Center, Room 11-209.

**Q:** I'm confused about the various versions of the Intel 8087 and 80287 math co-processor chips and their different speeds. Which chips work with which IBM PC, or its compatibles?

**A:** The 8087 math co-processor works with the IBM PC/XT (or like machines) using the 8088 microprocessor, while the 80287 works with the PC/AT or other 80286 microprocessor machines. The table below matches each machine and its speed (in megahertz) with the proper chip model.

Chip	Machine
8087	IBM PCs and XT's @ 4.77 MHz
8087-2	"Turbo" XT clones @ 8.00 MHz
8087-3	"Turbo" XT clones @ 10.00 MHz
80287-6	Runs up to 6 MHz on 6-8 MHz AT's
80287-8	Runs up to 8 MHz on 6-10 MHz AT clones
80287-10	Runs up to 10 MHz on 6-12 MHz AT clones

The 80287 math co-processor operates at about 2/3 the speed of the 80286 processor on the PC/AT, so a main processor speed of 8 MHz implies an 80287 speed of 5.3 MHz.

## Caring for Your Microcomputer

Prevention is better than cure. —Erasmus

Now you have your microcomputer set up and ready to go. You've signed up for classes at the Training Lab. And you are starting to fall in love with your new toy. Here are some tips to help you keep your micro healthy and out of the repair shop.



turn it upside down and let it dry for 24 hours. If the keyboard still doesn't work or if the liquid is sweet or sticky, take the keyboard in for repair or replacement.

- Use a power surge suppressor to protect against drastic changes in the electrical current that can result in damage to your computer.
- Provide maximum air circulation on all sides of your monitor. Nothing should be on top of the monitor while it's in use.
- Protect your screen from burned-in images by turning down the brightness when you leave your micro unattended for long periods.

### For IBM PC Users

- Protect the read/write heads in your diskette drive. Push the "open/close door" lever to the "up" or "open" position to disengage them when the drive is not in use.

- Run the "system check-out" on the diagnostics diskette every three months or so. This diskette can be found in the back of your PC *Guide to Operations* binder. To use the diskette, put it in the a: drive and turn on the computer.

- Be careful to discharge yourself of static electricity before changing boards or touching the back of the computer for any other reason. Touch a metal surface to discharge the electricity.

- Run the "prepare system for moving" routine on the diagnostics diskette before packing your hard disk drive for a move.

### For Mac Users

- Never remove the main unit cover, even when the unit is turned off. Removing the cover not only exposes dangerous high-voltage components, but voids your warranty.

- Clean the mouse from time to time by rotating and removing the dial from the bottom, swabbing the rollers inside the casing with alcohol, and wiping the ball with a soft, clean, dry cloth.

- Never switch off the hard disk while the light is blinking or you may lose information. However, if you're not going to use your Mac for a week or more, switch off the hard disk.

Sources for this article: *IBM Guide to Operations*; *IBM PC and XT Owner's Manual* by Chertok et al.; *Macintosh Plus manual*; *Macintosh Hard Disk 20 manual*. ●

### For All Micro Users

- Keep your computer away from radiators, out of direct sunlight, and in an adequately ventilated location. A clean, smoke-free environment is best.

- Keep your micro and disks away from magnets and magnetic fields, such as printers, telephones, color TVs, stereo speakers — anything containing transformers or coils. Magnetic fields can erase or scramble data.

- Keep your computer and keyboard dry. If you do spill thin, clear liquid such as coffee on your keyboard,



### The MIT Microcomputer Center

Room 11-209, 253-7686

Hours: Monday-Friday, 10am-4pm

**IBM Special:** IBM PC-XT 278 with 256K includes serial port, DOS 3.2, Hercules Plus graphics card and either an IBM monochrome monitor or a Princeton MAX-12 amber monitor. Limited offer while supply lasts. Price: \$1415.

**Apple Macintosh SE:** Apple's newly announced Macintosh SE includes two floppy disk drives and one expansion slot for adding special features. Price: \$1805. Macintosh SE with 20MB hard disk is \$2305.

**New Accessories:** *Mouse Pads*, \$11.50; *Dust Covers* for Mac Plus/keyboard, \$10.40, for Imagewriter II, \$5.40; *Glare Screens* for IBM monochrome and Princeton monitors, \$44.90.

### Toner Recycling

Do you have an Apple LaserWriter, a Hewlett Packard LaserJet, or other Canon-compatible laser printer? Information Services would like to investigate local toner recycling services, which refill empty toner cartridges and sell them for \$20-\$30 less than the cost of a new one. If you would be willing to donate your empty cartridge to us, call Joanne Larrabee at x3-8422.

**Q:** When I open the Font/DA Mover on the Mac, it always goes to font mode. Can I get it to go directly to desk accessory mode?

**A:** Yes. To open directly into desk accessory mode, hold down the OPTION key while double-clicking on the Font/DA Mover. Keep the OPTION key depressed until the Font/DA screen appears. ●

**Doubledecker Tour of Boston.** Sat, April 25. For those new to the Boston area, and for those Bostonians who never seen it from a doubledecker bus—this is the tour for you. Sights include: Beacon Hill, the North End, the Waterfront, Charlestown, the Freedom Trail and more. Bus leaves West Garage, 9am; returns approx. 1pm. Last stop will be Quincy Market. Those who wish may leave the tour at that time for lunch or shopping. Cost: \$7/pp.

**The Norman Conquests; Table Manners.** Thurs, April 30, 8pm, Lyric Stage. Join Norman and his entourage as he frolics through a comical charade of real-life roulette. Poor Norman loves his wife but he's also fallen in love with his sister-in-law and his brother-in-law's wife. A rollicking play by Alan Ayckbourn. Tickets: \$8/pp (reg \$9), available in Rm 20A-023.

**Pennsylvania Dutch Weekend.** Fri-Mon, May 22-25. At last, 4 days and 3 nights in the land of the "Plain People," with lots of great things to see and do. Trip includes transportation, hotel, Farmer's Market, The Amish Farm, The Amish Homestead, smorgasbord lunch at the Good and Plenty, the Electric Map at Gettysburg, the Gettysburg Battlefield Tour, etc. We will also visit Hersheyland, Chocolate-land, Founders Hall, and whatever else we see along the road that looks exciting (which are not included in the price). Bus leaves West Garage, Fri, May 22, 7am; returns Mon, May 25, approx 8pm. Cost: only \$150/pp/dbl occupancy.

**Council for the Arts Museum Passes.** On campus, there are 10 passes employees may borrow for free admission to the Museum of Fine Arts. To check on availability, call x3-5651. At Lincoln Lab, passes are available in the Lincoln Lab Library, Rm A-150.

**Museum of Science Tickets.** Available for only \$1. Pay another \$1 at the door, for a total savings of \$3/pp/adult; \$1/pp/child (reg \$5/pp/adult; \$3/pp/child).

**The City Books are here.** Only \$.75 ea (reg \$7.50).

**Important!** To avoid disappointment, purchase tickets and make reservations early as we are limited by ticket availability and transportation. All MITAC events and ticket purchases are non-refundable due to the non-profit nature of our organization.

## Social Activities

**Graduate Student Wine and Cheese Reception\*\*—Hillel Party.** Tues, April 7, 5-7pm, Ashdown House West Dining Rm. Cover: \$1.

**Japanese Table\*\*—MIT-Japan Science and Technology Program/Wellesley-MIT Exchange Program lunch table.** every Tues, 1-2pm, new Japanese Lounge and Meeting Rm, Walker 220. Bring bag lunch; all levels of Japanese welcome. Hosted by Japanese wives.

## Movies

**The Hustler\*\*—Lecture Series Committee Classic Film.** April 3, 7:30pm & 9:30pm, Rm 10-250. Admission: \$1/MIT & Wellesley ID.

**Octopussy\*\*—Lecture Series Committee Movie.** April 3, 7pm & 10pm, Rm 26-100. Admission: \$1/MIT & Wellesley ID.

**Raiders of the Lost Ark\*\*—Lecture Series Committee Movie.** April 4, 7pm & 10pm, Rm 26-100. Admission: \$1/MIT & Wellesley ID.

**Annie Hall\*\*—Lecture Series Committee Movie.** April 5, 6:30pm & 9pm, Rm 26-100. Admission: \$1/MIT & Wellesley ID.

**The Blue Angel\*\*—Lecture Series Committee Classic Film.** April 10, 7:30pm, Rm 10-250. Admission: \$1/MIT & Wellesley ID.

**The Tall Blonde Man with One Black Shoe\*\*—Lecture Series Committee Movie.** April 10, 7pm & 9:30pm, Rm 26-100. Admission: \$1/MIT & Wellesley ID.

**The Fly\*\*—Lecture Series Committee Movie.** April 11, 7pm & 9:30pm, Kresge Auditorium. 26-100. Admission: \$1/MIT & Wellesley ID.

**The World According to Garp\*\*—Lecture Series Committee Movie.** April 12, 6:30pm & 9:30pm, Rm 26-100. Admission: \$1/MIT & Wellesley ID.

## Music

**Thursday Noon Hour Chapel Concert\*\*—Swiss organist Juerg Neuenschwander performs works of Du Mage, Kotter, Vogt, Scherrer, Bach and Bruhns.** Thurs, April 2, 12noon, MIT Chapel. Free.

**Affiliated Artist Series\*—Paul Orgel, piano performs Beethoven's Sonatas Op. 78 & 53; Janacek's four pieces from *On an Overgrown Path*; Chopin's Ballade No. 3, Op. 47, & Scherzo No. 4, Op. 54.** Fri, April 3, 8pm, Kresge Auditorium. Free.

**MIT-Brown Concert Band Joint Concert\*—John Corley, conductor.** Sat, April 4, 3pm, Kresge Auditorium.

**Walking in the Spirit\*—MIT Gospel Choir Spring Concert.** Jeryl Payne, musical director, with guest choirs from other colleges. Sat, April 4, 7:30pm, Kresge Auditorium. Admission: \$3 general; \$1 students/seniors.

**The Dove and The Magic Cloak\*—Sephardic music traditions in an original fable for spring performed by Voice of the Turtle, narrated by Robert J. Lurtsema.** Hillel-sponsored concert, Sun, April 5, 4pm, Kresge Auditorium. Tickets: \$12, \$10, \$8 (\$2 off for students/seniors) available at MIT Hillel, W2a, x3-2982.

**Thursday Noon Hour Chapel Concert\*\*—Boston Renaissance Ensemble: David Hahn, lute; Margaret Pash, gamba; John Tyson, recorder.** Thurs, April 9, 12noon, MIT Chapel. Free.

**New Sound Works\*—George Numrich, SMVisS, creates sound sculptures on new musical instruments.** April 9-10, 7:30pm, CAVS Exhibition Rm (W11).

## Theater

**Working\*—MIT Musical Theatre Guild production.** April 2-3, 8pm, April 4, 6:30pm & 9pm, April 5, 7pm, Student Ctr Sala de Puerto Rico. Tickets: \$3/MIT students, \$4/students, senior citizens, \$5/faculty & staff, \$6/general. Info/reservations, x3-6294.

## Dance

**Existence\*\*—A multi-media dance which, in addition to being fun, ruminates on the peculiarity of our biological existence, featuring films, slides, massive diagrams of human anatomy, periodic performances and a very plucky DJ.** produced by Ebon Fisher and The CORD. Sat, April 4, 9pm-1am, DuPont Gym. Admission: \$2 at the door.

**MIT Ballroom Dance Club Workshops\*—Sun, April 5:** Beginning Swing, 1-1:30pm; Intermediate Rumba, 2-3pm; Professional Viennese Waltz, 4:30-5:30pm, Burton Dining Hall. Admission: Beginning—\$.25/members, \$.50/non-members; Intermediate—\$.50/members, \$1/non-members; Advanced—\$.25/members, \$.30/non-members. Info: x5-9171 dorm.

**MIT Dance Workshop\*\*—Regular Meetings:** Beginning Modern Technique, M/W, 3-5pm, Dupont T-Club Lounge. Composition/Improv, Tues, 3-5pm, Dupont T-Club Lounge; Intermediate Modern Dance, T/Th, 5:30pm, Walker 201.

**MIT Folk Dance Club\*—weekly dancing—Sun, International Dancing, 7:30pm, Student Center Sala de Puerto Rico; Tues, Balkan and Western European Dancing, 7:30pm, Rm 407 Student Center; Wed, Israeli Dancing, 7:30pm Sala de Puerto Rico.**

**Yoga\*—ongoing classes in traditional Hatha and Iyengar style.** Beginners: Mon, 5:15pm; Intermediates: Mon, 6:15pm. For information call Ei Turchinetz, 862-2613.

**Rhythmic Gymnastics Classes for Women\*\*—MIT Women's League classes.** Fri, 12-1pm, Rm 10-340. Info: Helena 596-2396 eves.

## Exhibits

**COMMITTEE ON THE VISUAL ARTS**  
Albert and Vera List Visual Arts Center  
Jerome & Laya Wiesner Building  
20 Ames Street

**Hayden Gallery—Krzysztof Wodiczko: Counter-Monuments.** Large photographic documentation of projected slides onto buildings. Also, a large special indoor projection project designed especially for this Gallery by this Polish artist. Through April 12.

**David and Sandra Bakalar Sculpture Gallery—Tony Smith: The Shape of Space.** Celebrating the monumental painted steel sculpture *For Marjorie*, 1961, installed on the campus as part of the MIT Permanent Collection. Two major works in welded bronze offer insight into the sculpture. Illustrated brochure accompanies the exhibition. Through April 5.

**The Reference Gallery—Out of Eastern Europe: Private Photography.** "Semi-official" contemporary photography by independent artists working outside the artists' unions, from East Germany, Czechoslovakia, Hungary and Poland. Includes landscape, portraiture, documentary, conceptual, narrative and abstract. Illustrated catalogue accompanies the exhibition. Through April 12.

### THE MIT MUSEUM

**MIT Museum Bldg—Black on Black.** An environmental light installation by Beth Galston evoking architectural and natural forms. Through June 27. **Ben Thompson and Associates Inc: 20th Anniversary Exhibit.** Models, photos and plans chronicle the history of the architecture firm that has designed the country's most successful and influential waterfront marketplaces—including Boston's Faneuil Hall and Baltimore's Harbour Place. BTA is the recipient of The American Institute of Architects 1987 Architectural Firm Award. Through April 25. **80 Years Later.** Anniversary exhibit of the Guild of Book Workers. Through June 27. **Artists in the Computer Age.** Eclectic selection of works showing the versatility and new possibilities of expression opened by use of the computer, April 6 through July 31. **Light Sculptures by Bill Parker, MIT '74.** Changeable, touchable plasma sculptures by the artist who developed this medium. Hours: Weekdays 9am-5pm, Saturdays 10am-4pm.

**Compton Gallery—Telegenic Charismas.** Portraiture by Jeremy Gardner combines the accuracy and immediacy of the photograph with the subjective interpretation of the painter and sculptor. Gardner's work with digital photography and electronic paint systems molds these new tools into a powerful medium and bridges the gap between painting and photography. April 10 through June 27. **Opening Reception—April 9, 5-7pm.** Gallery hours: Weekdays 9am-5pm, Saturdays 10am-4pm.

### Hart Nautical Gallery

**Ongoing exhibits: George Owen '94: Yacht Designer—**Line drawings and half-models designed by one of the early professors of naval architecture at MIT. **MIT Seagrant—A** review of MIT ocean research; **Collection of Ship Models—**Half-models and drawings. Historical view of the design and construction of ships.

**Edgerton's Strobe Alley—Exhibits of high speed photography.** Main corridor, 4th floor.

### Corridor Exhibits

**Corridor Exhibits:** Building 1 & 5, 2nd floor: **John Ripley Freeman Lobby, Building 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. Building 6: **Laboratory for Physical Chemistry.**

### OTHER EXHIBITS

**Institute Archives and Special Collections—The Women's Laboratory, 1876-83—**The MIT Woman's Laboratory was founded by Ellen Swallow Richards to provide chemical laboratory facilities for Boston area women. In exhibit documents, Richards discusses the value of science education for women and the uses they are likely to make of it. Hall exhibit case across from 14N-118.

**Architectural Work of Gottfried Bohm—**Dept of Architecture Exhibition Space, Bldg 7 4th floor.

**Jerome B. Wiesner Student Art Gallery—**for 1986 scheduling, any MIT student or student group interested in showing or performing art in the Gallery, call Andy Eisenmann, x3-7019 in Rm W20-429, M-F, 9-5.

## Wellesley Events

**Jewett Arts Center\*—Selections from the Wellesley College Museum Permanent Collection.** April 11 through June 7; **Recent Acquisitions and Alumnae Gifts.** April 11 through June 7. **Contemporary Prints from the Permanent Collection.** continuing.

**Feminists in the Bureaucracy\*—Jacquelyn H. Gentry, PhD and Joyce B. Lazar, MA, National Institute of Mental Health, Stone Ctr Colloquium.** Wed, April 1, 8pm, Science Ctr Rm 377.

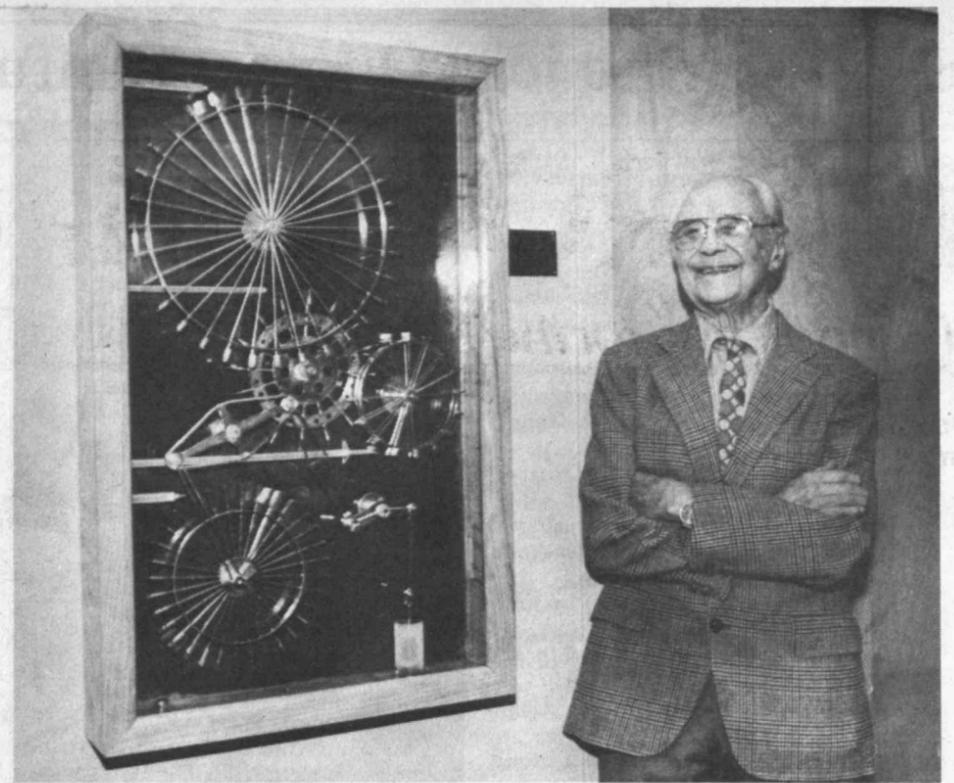
**Public Policy in the Arts\*—Prof Judith Balfe, College of Staten Island, Lecture.** April 1, 4:30pm, Library Lecture Rm.

**Stress in the Lives of Women in the Health Professions: First Findings\*—Rosalind Barnett and Grace Baruch, co-directors, Women's Lives Project, Wellesley College Ctr for Research on Women, Luncheon Seminar.** Tues, April 2, 12:30-1:30pm, Cheever House. Bring brown bag lunch.

**Our Hatred is Too Old: Mothers and Daughters in Greek Drama\*—Gail Reimer, Wellesley College, Lecture and performance.** April 2, 4:15pm, Tower Court Great Hall. Following discussion, feminist revisions of *Medea* and *Electra* presented by students.

**1200 Years of Silence: Greek Women in the Byzantine Era\*—Prof Margaret Alexiou, Harvard University and Prof Emily Abu Hannawalt, Boston University, Lecture.** April 2, 8pm, Slater International Ctr.

**The Social and Legal Development of Women in Greece in the Recent Years\*—Simoni Zafiropoulou, Greek Cultural attaché, Lecture.** Fri, April 3, 4:15pm, Slater International Ctr.



## Taylor sculpture is unveiled

It was, said Professor John B. Heywood, director of MIT's Sloan Automotive Laboratory, a small celebration of continuity.

Returning to the laboratory for a seminar, and the formal presentation of one of his sculptures, was C. Fayette Taylor, professor of automotive engineering, emeritus; founder and director of the laboratory from 1929 until his retirement in 1960, and a pioneer in the development of the internal combustion engine.

Professor Taylor, who is 92 and lives in Brookline, was joined at the presentation by his brother, Edward S. Taylor, 74, of Lincoln, who also was a professor at MIT working out of the Sloan laboratory. Edward, who received the SB in mechanical engineering from MIT in 1924, was on the MIT faculty from 1927 to his retirement in 1968.

C. F. Taylor, since his retirement, has become well known for his sculptures in metal. His gift to the laboratory is a moving sculpture—a series of wheels that are geared together and driven by jets of compressed air.

The Taylors, along with a middle brother, the late Philip B. Taylor, who eventually became chief executive of the Curtiss Wright Aeronautical Corporation of Paterson, N.J., originally concentrated their talents on aircraft engines.

C. F. Taylor began his career as a World War I naval officer in charge of the Navy's aeronautical engine laboratories. He directed the first official tests of the Liberty

**Growing Up in Greece and the Immigrant Experience\*—**Informal Discussion, April 3, 5:30pm, Continuing Education House.

**Celebrations and Rituals of Women in Greece and Cypress\*—Mary Vouras and alumna Alexandra Anthony, filmmakers.** Discussion, April 3, 7:15pm, Slater International Ctr.

**Music Everywhere Concert\*—Wendy Gillespie (Wellesley '72), viola da gamba; Paul Elliott, tenor; James Tyler, lute** present Renaissance lute songs, April 3, 8pm, Houghton Memorial Chapel.

**The Concerto Company Concert\*—**Wellesley Performing Music Faculty presents concertos of Beethoven, Handel and Mozart, Sun, April 5, 8pm, Jewett Auditorium.

**Morocco, Old and New\*—**Film by Wellesley student Anissa Bouziane '87, Wellesley College International Week luncheon and film, Mon, April 6. Admission: \$4/non-Wellesley students; reserve by April 2. Reservation/info: 235-0320 x2082.

**Eurasian Music Ensemble\*—**Lecture and concert of Ottoman music and instruments from 14th century to the present, April 6, 7pm, Pendleton East Salon.

**Motherist Movements in Europe and South America\*—**Temma Kaplan, director, Women's Ctr, Barnard College, Lecture, April 6, 8pm, Schneide Student Ctr Davis Lounge.

**Women and the Afro-American Struggle; Fundji, the movie\*—**Prof Vivian Gordon, Wellesley College visiting associate professor, Discourses in Colonialism Discussion, Tues, April 7, 7:30pm, Margaret Clapp Library Lecture Rm.

**Beyond the African Food Crisis\*—**Katema Yisru, special advisor on Africa, World Food Program, UN, Lecture, April 7, 8pm, Slater International Ctr.

**A Contemporary Print from Jewett Art Museum Permanent Collection\*—**Susan Taylor, Wellesley College Museum Director, Art Break discussion, April 7. Call 235-0320 x2051 for info.

**What Women Should Contribute to World Peace\*—**Margaret Papandreou, first lady, Greece, Wellesley College International Week Lecture, Wed, April 8, 8pm, Jewett Auditorium.

**Human Rights: Amazing Strides\*—**John F. Gibson, consultant, Commission on Human Rights Geneva; Professor of International Relations, Tufts University, Wellesley College International Week Human Rights Forum, April 8, 4:15pm, Slater International Ctr.

**Histories Denied, Histories Revealed: Original Picture Research as a Tool to Document and Illuminate Women's Pasts\*—**Sally Fox, author, *The Medieval Woman* and the forthcoming *The Victorian Woman*, Women's History Lecture, April 8, 7:30pm, Pendleton West Rm 105.

engine, as well as many other engines of that early period.

After the war, he received an ME degree from Yale University's Sheffield Scientific School and also became engineer-in-charge of the Army's aircraft power plant laboratories at McCook Field in Dayton, Ohio.

It was here that the first high-output air-cooled cylinders were developed, and tetraethyl-lead was first tested in a multi-cylinder engine.

In 1923 he became chief design engineer at the Wright company, playing a key role in the development of large air-cooled radial engines.

He came to MIT in 1926, and over the years, as a guest lecturer, carried his expertise in the field of internal combustion engines and all types of reciprocating machinery to campuses throughout the United States and the world.

His two-volume textbook, *The Internal Combustion Engine in Theory and Practice*, published by the MIT Press, is still widely used and was recently revised and updated.

## Quasiquicentennial Fact

Dr. Sheila Evans Widnall, MIT '60, was the first woman appointed to MIT's engineering faculty in 1964. She was also the first woman to serve as chairman of the MIT faculty and is now president-elect of the American Association for the Advancement of Science.

**Poetry Reading\*—**Alan Shapiro, author, *The Courtesies and Happy Hour*, Reading, April 8, 8:15pm, Margaret Clapp Library Lecture Rm.

**Jupiter Strator and the First Catilinarian Oration of Cicero\*—**Ann Vasaly, Professor of Classics, Boston University, Greek and Latin Dept Lecture, April 8, 4:15pm, Margaret Clapp Library Lecture Rm.

**Life Stories of Greek Women: Discovering Internal Obstacles to Self-Realization\*—**Chryssi Inglessi, visiting research scholar, Ctr for Research on Women Seminar, Thurs, April 9, 12noon, Cheever House. Bring brown bag lunch.

**The Needs of Nicaragua: First Hand Impressions\*—**Dr. Leonard Friedman, practicing psychiatrist, Lecture and slide presentation, April 9, 7pm, Slater International Ctr.

**Oral Tradition in East Africa\*—**Deborah Foster, research associate, African Studies Ctr, Boston University, International Week Lecture, April 9, 7pm, Slater International Ctr.

**Women and AIDS\*—**Mary Evert, deputy assistant secretary of communications, US Dept of Health and Human Services, Phi Sigma Forum Lecture, April 9, 8pm, Science Ctr Rm 377.

**Recognizing Our Differences, Celebrating Our Strengths\*—**Wellesley College Ctr for Research on Women Full-Day Colloquium on Daughters and Mothers, Sat, April 11. Registration fee includes lunch at Wellesley College Club. Space limited; registrations first-come, first-served. Info: 431-1453.

**International Food and Craft Festival\*—**April 11, 12-4pm, Schneider Student Ctr.

**Concert\*—**The Wellesley Widows, the Tupelos, and Blue Notes a capella singing performance, Sat, April 11, 1:30-4pm, Hay Amphitheatre.

**Wellesley College Dancers\*—**April 11, 8pm; April 12, 7pm, Alumnae Hall.

**Concert\*—**Wellesley College Choir presents music of Brahms, Bartok and Fine, Sun, April 12, 4pm, Houghton Memorial Chapel.

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

Send notices for Wednesday, April 8 through Sunday, April 19, to Calendar Editor Rm 5-111, before noon, Friday, April 13.

# 110 join Quarter Century Club

Nearly 600 members of the community gathered last week to welcome 110 new people to membership in the Quarter Century Club. Membership in the Club now tops 2,000. New members are:



One of the first to be called at the installation of new members of the Quarter Century Club was Raymond Ausrotas of aeronautics and astronautics.

—Photo by L. Barry Hetherington

Mario W. Aloisi of North Reading, Laboratory for Nuclear Science.  
 Professor Ali S. Argon of Belmont, Department of Mechanical Engineering.  
 Raymond A. Ausrotas of Cambridge, Department of Aeronautics and Astronautics.  
 Professor Alan H. Barrett of Center Harbor, N.H., Department of Physics.  
 Paul F. Barrett of Westwood, Physical Plant.  
 Gladys Barron of Waltham, Educational Video Projects.  
 Rose C. Bella of Winchester, Research Laboratory of Electronics.  
 Martin W. Berg of Burlington, Lincoln Group 12.  
 Professor Aron M. Bernstein of Cambridge, Department of Physics.  
 Sidney L. Borison of Newtonville, Lincoln Group 34.  
 George W. Boylen Jr. of Wilmington, Medical Department.  
 Gordon L. Brown of Malden, Earth, Atmospheric and Planetary Sciences.  
 Kathryn D. Brownell of Cambridge, Department of Chemical Engineering.  
 Richard P. Burnes of Bedford, Lincoln Group 17.  
 Thomas S. Caiazza of Wilmington, Lincoln Group 12.  
 Marie Cammarotta of East Boston, Dining Service.  
 John L. Cataldo of Meredith, N.H., Lincoln Group 42.  
 Edward A. Chateaufort of Swampscott, Lincoln Group 71.  
 Professor Stephan L. Chorover of Brookline, Department of Brain and Cognitive Sciences.  
 Michael F. Collins of Milton, Physical Plant Superintendent's Office.  
 Jerome Connor of Arlington, Department of Civil Engineering.  
 Antonio A. Dasilva of Arlington, Physical Plant.  
 Alfred F. DeParolesa of Lexington, Lincoln Group 12.  
 Professor Michael L. Dertouzos of Waban, Department of Electrical Engineering and Computer Science.  
 Kenneth V. Donaghey of Winchester, Physical Plant.  
 Dennis W. Duffy of Medford, Graphic Arts.  
 Donald F. Duffy of Waltham, Research Laboratory of Electronics.  
 Robert G. Duggan of Burlington, Lincoln Group 18.  
 Thomas H. Dupree of Cambridge, Department of Nuclear Engineering.  
 Evelyn M. Elston of Belmont, Lincoln Group 18.  
 William R. Fanning of Beverly, Lincoln Group 71.  
 William D. Fitzgerald of Lexington, Lincoln Group 33.  
 William J. Fitzgerald of Billerica, Administrative Systems.  
 Patrick J. Flaherty of Dorchester, Physical Plant.  
 Charles Freed of Lincoln, Lincoln Group 52.  
 Professor Anthony P. French of Arlington, Department of Physics.  
 Mario J. Fresina of Rockland, Medical Department.  
 Arthur J. Giordani of Quincy, Laboratory for Information and Decision Systems.  
 John N. Goddard of Woburn, Office of Laboratory Supplies.  
 John K. Gostanian of Malden, Bates Linear Accelerator.

Dominic W. Grasso of Somerville, Physical Plant.  
 Albert R. Gregory of Littleton, Lincoln Group 44.  
 Professor William E. Griffith of Lexington, Department of Political Science.  
 Frank C. Herne of Still River, Lincoln Group 54.  
 Albert H. Horst of Westford, Lincoln Group 44.  
 Andrew J. Howitt of Westwood, Lincoln Group 71.  
 Elizabeth C. Hurlbert of Nashua, N.H., Office of Sponsored Programs.  
 Philip A. Ingwersen Jr. of Wellesley, Lincoln Group 33.  
 Josef F. Jacquart of Walpole, Administrative Systems.  
 Professor Ali Javan of Cambridge, Department of Physics.  
 Barbara A. Johnson of Boston, Energy Laboratory.  
 Ralph F. Julian of North Chelmsford, Haystack Observatory.  
 Professor Louis Kampf of Cambridge, Literature Section.  
 Thomas J. Kane of Walpole, Housing, McCormick Hall.  
 Professor Henry W. Kendall of Sharon, Department of Physics.  
 Wade M. Kornegay of Sudbury, Lincoln Group 35.  
 Professor Bertram Kostant of Newton Centre, Department of Mathematics.  
 Margaret E. Lania of Belmont, Center for Space Research.  
 Vito N. Leone of East Wareham, Lincoln Group 53.  
 Kenneth F. Levie of West Roxbury, Credit Union.  
 Antonio R. Leyenaar of Lexington, Lincoln Group 71.  
 Professor Lawrence M. Lidsky of Newtonville, Department of Nuclear Engineering.  
 William T. Lindley of Lexington, Lincoln Group 87.  
 Professor J. David Litster of Wellesley, Department of Physics.  
 Perry R. Longaker of Boxboro, Lincoln Group 95.  
 Norma A. Lord of Cambridge, Office of Laboratory Supplies.

Alden P. Marshall of Hudson, N.H., Lincoln Group 54.  
 William L. McGilvary of Woburn, Lincoln Group 83.  
 Charles D. McGinley of Tewksbury, Lincoln Group 15.  
 Bernard J. McGovern of Lynn, Lincoln Group 54.  
 Jean C. Mead of Lexington, Lincoln Group 33.  
 Evelyn M. Monahan of Cambridge, Comptroller's Accounting Office.  
 Guy J. Morac of Watertown, Food Services.  
 Lawrence F. Mullaney of Hudson, Lincoln Group 47.  
 Maria S. Murphy of Ipswich, Summer Session.  
 Professor Irwin Oppenheim of Cambridge, Department of Chemistry.  
 Frank T. Ordway Jr. of Marlboro, Lincoln Group 18.  
 Leslie Pardy Jr. of Reading, Campus Police.  
 Professor Igor Paul of Andover, Department of Mechanical Engineering.  
 C. Ross Peatfield of APO San Francisco, Lincoln Division II.  
 Muriel A. Petranic of Reading, Office of Dean of the School of Engineering.  
 Laurence W. Pickard of Milton, Physical Plant.  
 Professor William F. Pounds of West Newton, Sloan School of Management.  
 Vernon A. Raine of Westford, Graphic Arts.  
 J. Bruce Rankin of Lexington, Lincoln Group 33.  
 Barbara A. Robbins of Bedford, Lincoln Director's Office.  
 Grace Rowe of Stoneham, Laboratory for Nuclear Science.  
 Professor Jerome H. Saltzer of Waban, Department of Electrical Engineering and Computer Science.  
 Institute Professor Nevin S. Scrimshaw of Boston.  
 George M. Shannon Jr. of Needham, Lincoln Group 38.  
 Professor Irwin I. Shapiro of Lexington, Department of Earth, Atmospheric and Planetary Sciences.  
 Donald Silva of Arlington, Physical Plant.  
 Paul K. Simmons of Cambridge, Plasma Fusion Center.  
 Professor Kenneth A. Smith of Manchester, Associate Provost.  
 Professor David H. Staelin of Wellesley, Department of Electrical Engineering and Computer Science.  
 Gerard W. Stevens of Littleton, Lincoln Group 18.  
 Lyman A. Stinson of Saugus, Laboratory for Nuclear Science.  
 William H. Stotz of Hudson, Lincoln Group 66.  
 Robert M. Sullivan of Dorchester, Comptroller's Accounting Office.  
 Kenneth Titilah of Gloucester, Lincoln Group 11.  
 James F. Tolpa of Chelmsford, Lincoln Group 33.  
 Bernard F. Wadsworth of Arlington, Laboratory for Nuclear Science.  
 John E. Wasik of Dorchester, Nuclear Reactor Laboratory.  
 James M. Watson of Brockton, Draper.  
 Leo J. Webb of Gloucester, Physical Plant Superintendent's Office.  
 Robert Weber of Northboro, Lincoln Group 94.  
 Professor Myron Weiner of Brookline, Department of Political Science.  
 Professor Sheila E. Widnall of Lexington, Department of Aeronautics and Astronautics.  
 Professor Gerald N. Wogan of Belmont, Department of Applied Biological Sciences.  
 Anna E. Zaitz of Carlisle, Lincoln Group 82.

# Psychology program to begin this spring

A new interdisciplinary Program in Psychology will begin this spring under the auspices of the School of Humanities and Social Science.

The program will draw faculty participation from the Department of Brain and Cognitive Sciences, the Department of Architecture, the History Section of Humanities, the Sloan School of Management and the Program in Science, Technology and Society. It will be administered by an interdepartmental steering committee appointed by Dean Ann Friedlaender of the School of Humanities and Social Science and chaired by Professor Jeremy Wolfe of Brain and Cognitive Sciences.

"The interests of the faculty in the new program span the great range of topics in the study of human behavior and mental life, from visual perception to psychohistory, from the development of language to the social psychology of management," Professor Wolfe said.

Professor Wolfe noted that until last year the name Psychology was assigned to Course IX. "It was something of a misnomer because Course IX emphasized only certain areas of psychology and included topics outside the field," he said. "The reality was reflected in the change in the name of Course IX to Brain and Cognitive Sciences."

"There are psychologists in many departments at MIT, but no mechanism to bring them together," Professor Wolfe said. "The new program will provide an umbrella for teaching and intellectual interaction."

The program also will administer a revised HASS concentration in psychology and hopes to sponsor a series of colloquia on psychology for the MIT community.

In addition to Professor Wolfe, members of the steering committee are Professors Susan Carey (Brain and Cognitive Sciences), John Carroll (Management), Sandra Howell (Architecture) and Kenneth Keniston (Science, Technology and Society).

Faculty interested in participating in the Program in Psychology are invited to contact Professor Wolfe, Rm 10-137, x3-4875.

# New wing opens at Science Museum

MIT students have free access to one of the wonders of Boston, the Museum of Science's new wing and OMNIMAX theater.

The free admission to the museum—a student ID is required—is sponsored by Tau Beta Pi, the Massachusetts Beta Chapter of the Engineering Honor Society.

For others, admission to the museum or the theater is \$5 for adults, and \$3 for children 4 to 14 and senior citizens 65 and older. Combination tickets are \$7.50 for adults, and \$5 for children and senior citizens.

A principal mission of the new wing, which opened in March, is to improve the scientific literacy of adults—a theme often articulated by MIT President Paul E. Gray, who is a museum trustee.

Roger L. Nichols, museum president and director, said in a letter to Dr. Gray: "While the programming in the current exhibit halls is geared toward family groups, the programming in the new wing (especially at night) will be geared to increasing the awareness of science among adults, who have as much need to know about science as kids do."

The centerpiece of the \$24 million, 115,000 square-foot new wing is the state-of-the-art Mugar Omni Theater, the only theater of its kind in New England and one of only 12 in the country. It houses the world's largest movie projection system, a dome screen 76 feet in diameter and a 27,000-watt, 84-speaker sound system.

The 334-seat theater is designed to highlight advancements in science and high technology through a variety of state-of-the-art resources, formats and media.

The Charles Hayden Planetarium, also a part of the new wing, holds daily shows recreating the beauty and wonder of the universe.

The wing also houses a cafe; an innovative gift shop; high-tech exhibits showcasing new technology; The Polage, a polarized collage sculpture; a three-story atrium where actors will depict science through theater, and an interactive computer arcade.

# You need an MIT degree to figure the score

(continued from page 1)

10th winning season in a row for the team, coached by Joe Quinn for the past seven years. And not to rub it in, Caltech, but with the MIT spring sports schedule getting into high gear, several members of the MIT squad, including its two leading scorers, didn't make the spring-break trip to the West Coast.

Alex Jessiman, a defenseman who scored six goals in each of two games this season, was working out with the crew squad. And Rich Zermani, the second highest scorer, is also the number one

pitcher on the baseball team and was off playing in Florida. Others, including Tom Dorf, Mike Foley and Brian Luschwitz, were with the lacrosse and golf squads.

Players who did go, and emerge victorious, as they say, included the team tri-captains, Brian Balut, Dale Archer and Marshall Jackson.

The game was billed by Caltech as being a battle for The Beaver Cup, since both schools call themselves the Beavers.

As far as anyone knows, there is no such cup.

But something tangible was won—by none other than MIT President Paul E. Gray.

He had made a friendly wager with his

Caltech counterpart, Marvin Goldberger, betting a case of New England lobsters against two cases of Pasadena Lager Beer.

"We haven't figured out how to get the bottled beer out to you," said Finn.

A suggestion that the team bring it home created some doubt as to whether the beer would make it intact.

In the meantime, said Finn, the mayor of Pasadena, at a barbecue reception for the two teams, brought up the idea of a football game between the two schools in—where else?—the Rose Bowl, which happens to be in Pasadena.

"It's something to think about," said Finn.

—Charles H. Ball

# Quasiquicentennial Fact

US Secretary of State George Shultz received the PhD in economics from MIT in 1949 and was a faculty member teaching industrial economics from 1949-57.

## ←Here & There→



An MIT senior majoring in biology, **Carol D. Morris** of Washington, D.C., graced the cover of the Boston Herald's Sunday Magazine. She was one of five Greater Boston college students interviewed for an article on "tomorrow's world leaders."

In addition to her studies, Ms. Morris works part-time as a lab technician, chairs the Black Students' Union, and serves on three undergraduate committees.

She told the magazine of her strong belief in the importance of service to society. "I think we should go to college to learn and develop and to better serve those who don't have access to the system, not just to make a lot of money when you get out," she said.

Ms. Morris intends to do graduate work in biology and perhaps go to medical school. She hopes eventually to be in a policy-making position in the health-care field. "With something as basic as health care, everyone should have equal access," which is not the case now, she told the magazine.

While expressing concern about her own generation as "a very individualistic one," she said she remained optimistic about the future. "I really believe that people in general are giving. I hope my generation won't listen to the materialistic messages they get. . . We've got to realize. . . that some of our present values are misguided. We need more people. . . concerned with people."

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MIT—or more precisely, the School of Architecture and Planning—played a key role in formulating and guiding the Governor's Design Awards Program.

The program is the first in the country to encourage residents to nominate projects that represent outstanding design

in their communities in the areas of architecture, landscape architecture, urban design and public improvements. The first 14 awards were made in December.

MIT's Laboratory of Architecture and Planning was selected in a competitive process by the Massachusetts Council on the Arts and Humanities, the sponsoring agency, to administer the program.

**Mary Jane Daly**, a research associate in the laboratory, served as project director, and **Lois A. Craig**, associate dean of the School of Architecture and Planning, was senior advisor to the project. Dean **John de Monchaux** served on the final design jury with four other nationally known design professionals.

Ms. Daly said the laboratory's participation in the project reflected "a tradition in the School of Architecture and Planning of examining and developing models for promoting citizen participation, creating incentives for change and establishing networks of communication among public officials and citizens."

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Actor-producer-director **Sylvester Stallone** on what he claims is the broad appeal of arm wrestling, which happens to be the subject of his latest movie:

"You've got guys from MIT [arm wrestling] and guys who can't spell MIT."

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Among MIT students on the fast track is **Joanne R. Hetzler**, a graduate student in chemistry. She finished second among women runners in the March 15 St. Patrick's Day 10-kilometer race in South Boston.

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Five junior faculty members at MIT are among 90 young scientists of extraordinary promise selected to receive \$25,000 Sloan Research Fellowships awarded by the Alfred P. Sloan Foundation. The fellowships offer the recipients an opportunity to pursue research interests "without reference to the priorities and timetables of other research grant programs," the foundation said.

The MIT award winners, all assistant professors, are **Keith A. Nelson**, chemistry; **Garth Saloner**, economics; and **Mehran Kardar**, **Aneesh V. Manohar** and **Janos Polonyi**, physics.

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MIT people were in the middle of professional dance performances presented last weekend at the Cambridge Multicultural Arts Center. **Diana Kenney** who works in the Biotechnology Center and **Marian Chang**, a Harvard exchange student in

the Experimental Music Studio, were choreographers for the show, "A Way of Saying It." **Dan Leary**, a graduate student in philosophy was sound engineer.

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Lotus Development Corporation has awarded a \$30,000 research grant to Dr. **Robert C. Berwick**, associate professor of computer science and engineering and head of the Artificial Intelligence Laboratory's Natural Language Processing Group.

The group studies the connection between computation and natural language. It seeks to build programs that can communicate with people in a variety of languages and that also can automatically learn new language rules.

"The work being done is exploring the fertile ground where we think software is headed in the next 10 years," said **Edward J. Belove**, Lotus vice president of corporate research and development.

The first grant of its kind by Lotus, it matches funds awarded to Professor Berwick as recipient of a Presidential Young Investigator Award from the National Science Foundation. A graduate of Harvard University, Professor Berwick received the PhD from MIT in 1982.

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Two MIT faculty members played key roles in a recent conference at the National Academy of Sciences Building in Washington, D.C., on new medical devices, and the factors influencing their invention, development and use.

Dr. **Robert W. Mann**, Whitaker Professor of Biomedical Engineering, served as co-chairman and Dr. **Edward B. Roberts**, David Sarnoff Professor of Management of Technology, gave one of the major addresses, on "Technological Innovation and Medical Devices."

In addition, **Edwin Whitehead**, founder of the MIT-affiliated Whitehead Institute, reminisced about his experiences in medical device invention.

The conference was part of the National Academy of Engineering Symposium Series on Technology and Social Priorities.

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### CLIPPINGS AND QUOTES:

—The Maine Sunday Telegram in Portland, Me., credits an MIT alumnus, **H. King Cummings** (SB in 1939, business and engineering administration), with bringing the Sugarloaf ski area out of bankruptcy into solid financial health in a year's time.

In an article headlined "King of the Mountain," the newspaper said Mr. Cummings, chairman and chief executive officer of the Sugarloaf Mountain

Corporation, did the trick by emphasizing skiing (as opposed to condominium building) and recruiting a new management team. Mr. Cummings, 70, who is also the long-time leader of Guilford Industries, a textile company, is described as an expert skier who makes a half dozen runs down the mountain almost every day.

—New York Times economics columnist **Leonard Silk** writes that **Charles P. Kindleberger**, Ford International Professor of Economics Emeritus, and a leading economics historian, finds some parallels between the world's financial condition today and what it was prior to the stock market crash and subsequent depression in 1929.

The most alarming analogy between the Great Depression and the present, Professor Kindleberger told the Times, "is in the organization and leadership of the world economy." Adds Silk: "His [Professor Kindleberger's] explanation of why past depressions were so wide and deep and long-lasting was that no country took charge as the economic and financial leader."

—In a Williams College talk that preceded the Vatican's document on reproductive techniques, Dr. **Caroline Whitbeck** of MIT said that mainstream medical ethics had not adequately dealt with the situation in terms of human relationships and society.

Dr. Whitbeck, a philosopher at the School of Engineering's Center for Technology, Policy and Industrial Development, noted that medical techniques such as in vitro fertilization make it possible for as many as five people to have a "parental" relationship with a single child. She cited the woman who furnishes the ovum, the man who contributes the sperm, the woman who carries the fetus to term, and the two people who take on the role of what she called the "social parents."

—In an article on competition among physicists to be first with a discovery, Discover magazine quotes MIT's Nobel laureate physicist **Samuel Ting** as having provided what the magazine calls "Ting's Law," to wit: "To be wrong is very bad. To be second is completely meaningless."

—The same magazine carried an article by **Kosta Tsipis**, director of MIT's Program in Science and Technology for International Security, on ways of verifying arms contract agreements. As summarized by the magazine: "A dazzling collection of high tech devices—from spy satellites to radars that look over the horizon—makes it all but impossible for cheating to go undetected."

—Charlie Ball

## April's cultural potpourri

(continued from page 12)

Davidson about artists and computers.

At 1pm you can have the experience of a guided tour through "Black on Black," an installation by light artist **Beth Galston**. MIT Museum Building, 265 Mass Ave. x3-4444.

—**April 26, Sunday.** A Brass Festival. MIT's Brass Ensemble, Richard Given, director, will host a concert with brass ensembles from Berklee College of Music, Worcester Polytechnic Institute and Lowell State. Among the MIT pieces will be an arrangement for brass ensemble by Gregory Hopkins, former director of the MIT Brass. This will be the first performance of Hopkins arrangement of Gustav Holst's *Mars from The Planets*. From 2:30-4pm, with a reception following the program. Kresge Auditorium. Free. x3-2906.

—**April 27, Monday.** *Measure For Measure*, Shakespeare Ensemble. 7:30pm. Sala De Puerto Rico, MIT Student Center. Free. x3-2903.

—Sculptor/Artist **Betye Saar** holds "open studio," meaning you are invited to come for informal conversations as she is working. Wiesner Building, List Visual Arts Center. 2-4pm. x3-4400.

—**April 28, Tuesday.** *Measure For Measure*, Shakespeare Ensemble. 8pm. Sala De Puerto Rico, MIT Student Center. Free. x3-2903.

—**April 29, Wednesday.** "Spirit Catcher Meets Big Science." A free public lecture by **Betye Saar**, 7pm, Bartos Theatre, Wiesner Building, E15. x3-4400.

—**April 30, Thursday.** Noon Chapel Series. Here's that all-Bach program by

Concertino Boston: **Suzanne Stumpf**, Baroque flute; **Katherine Kyme**, Baroque violin; **Shannon Snapp**, Baroque cello; **Tesair Lauve**, harpsichord. Free. 12:05pm, MIT Chapel Building. x3-2906.

—**April 30, May 1, 2, Thursday-Saturday.** Spring major of the MIT Dramashop. *Groping For Words* with a curtain-raiser, *Womberang*, both by contemporary London playwright **Sue Townsend**. Director **Graham Watkins**, known for recently directing *The Hobbit* in London's West End, is in residence at MIT to direct these fully staged productions in Kresge Little Theater. 8pm. Admission: \$5 general, \$4 students/seniors. Box Office: x3-4720.

Sunday matinee at 2pm, May 3. These plays continue through the second weekend in May.

—**Tuesday nights in April.** Fellows of the Center for Advanced Visual Studies present special programs in "The Artists Speak" series. Call x3-4415 for details.

—**Throughout April.** At the MIT Museum Building, 265 Mass Ave: "Black on Black." An environmental installation by light artist **Beth Galston**. Through June 27.

—"80 Years Later." Fine press printers and binders, illustrators, calligraphers and decorated paper makers contribute to this exceptional anniversary exhibit of the Guild of Bookworkers. Through June 27.

—"Images for Survival." Poster exhibition commemorating the 40th anniversary of the dropping of the atomic bomb on Hiroshima, formerly at the Compton

## New housing study is underway

(continued from page 1)

grams to benefit people in need of assistance.

As a result, he said, "all responsibility for housing Americans fell to the individual states, many of which were unprepared to deal with the issue."

During the past six years, added Professor **Keyes**, state organizations have been established or expanded, with varying success, to carry this extra burden. Massachusetts is regarded as a leader in finding solutions to the housing dilemma.

Professor **McKellar** said the research program will have national implications, but will initially focus on Massachusetts on both the state and local levels.

"The Massachusetts environment has provided an excellent laboratory to examine these issues in a cooperative effort among industry, government and academia," he said.

The Center's research team will focus its efforts on three broad areas critical to the needs of low- and moderate-income home purchasers, he said, in particular those who are working through the Homeownership Opportunity Program to buy single-family detached homes.

He identified the three areas as: —Mortgage Assistance Programs (assessing the effectiveness of state-sponsored programs);

—Housing Design and Production (examining the effectiveness of state-sponsored programs);

—Housing Design and Production (examining the effectiveness of state-sponsored programs). All: Weekdays 9-5, Saturdays 10-4. x3-4444.

—Call x3-ARTS. The Council for the Arts at MIT runs a hotline, updated weekly, with recorded information on all MIT arts/music events. Dial x3-ARTS, 24 hours a day.

ing alternate housing forms and their suitability to household needs), and

—Consensus Building at the Local Level (examining the problem of overcoming local resistance to neighborhood housing development).

## Urban affairs expert to open lecture series

**John Herbers**, national correspondent for the New York Times and an authority on urban affairs, will be the first speaker, Tuesday, April 7, in the 1987-88 Nasher Lecturer Series offered by the MIT Center for Real Estate Development.

He will give his talk, "High Rises in the Fields," at 6pm in Rm 9-150. The lecture is free and open to the MIT community.

The lecture is part of a series that has the overall theme, "The American City: Future Prospects." The series is sponsored by **Raymond D. Nasher**, a developer and founding member of the center.

Mr. Herbers, author of four books, has reported on politics and urban affairs for 30 years. He was a Nieman Fellow in journalism at Harvard University and will be Ferris Professor at Princeton University in the fall, conducting a seminar on politics and the press.



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**INSTRUCTIONS:** Ads are limited to one (of approximately 30 words) per person 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 telephones, 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.

Deadline is noon Friday before publication.

## For Sale

Br nw L's Salomon SX81 ski boots, sz 305, usd only 1X, got for \$250, will sell for \$210. Call x5-8865 dorm or lv mssg x3-8761.

Fridge, sep frzr, 1-1/2 yrs old, perf for lab, apt or hm, for cpl/sgl, \$225. Call 469-9558.

Uni Vega Super 10 10-spd bike, blk frm, red lettrng, alum rims, quik release frnt tr, like nw, mst be seen. Bob, x292 Bates or 625-4889 aftr 5pm.

Snow King blower, old mdl but wrks, 4 horse. Arthur, x4341 Linc.

Sansui PC-V300 CD playr, \$150; Pioneer SX-6 cmprtr cntrlld rcvr, 45 w/ch, \$75. Gerry, x3-3963 or 494-8665.

Mini car racr, 3hp eng, chain drv, fibrglss bdy, frnt & rear air foils, ADAP constt winnr, br nw, \$550. Al Cangeme, x3-1500, lv mssg.

Eureka cannistr vac clnr w/pwr nozzl for carpts, gd cond, \$50 or bst; Radio Shack outdr tv ant, nw, \$5; old vac tube tv, wrks, \$10. Dave, x3389 Linc.

Atari 1200 XL, prg recd tv conn, \$200; dsk & bkcase, \$150/Emerson colr tv, \$180; 10-spd bike, \$50; 2 chrs, \$50. Call 576-1997.

Smith-Corona elctrc typwrtr, \$40 nego; Citrus fruit juicer, \$8; hairdryr, \$8; qrtz space htr, \$15; misc pots, pans, dishes. Barbara, x3-6925 or David, 876-9310.

Bikes: Eng classic Dawes "Realmrider" 3-spd hub gears, \$40; Austrian Puch "Pursuit" ltwt 10-spd, \$70; bth M's, upr handl, bars, nw trs, perf wrkng odr. George Wolf, x3-6781.

Pine dsk, Colnl styl, 48"Wx20"Dx30"H, 3 drwr acrss top, 2 lgr drwr on ea side, 1 drwr frnt has cosmetic damage, othrws gd cond, \$50 or bst. Derek/Susan, x3-6533 or 354-3329.

12-spd bike, 25" frm, Sountour Cyclone derailleur, alum whls, Avocet seat, see it to believe, \$125. Bruce, x3-5570 or 277-1470.

Luggage, strdy lthr-like vinyl, 26" brwn, ltld usd, \$20; 24" brwn, nw, nvr usd, \$15, have photo for viewing. Charlie, x3-7809.

Fiberglass boat, 13' w/18hp mtr, trailr & accessories, \$1,000. Chris McNeil, x812-224 Linc or 586-7182.

'86 Galaxy, 16-1/2" bowrider, 120hp mercruiser I/O, deep V hull, 7' beam, full inst fresh wtr use only, load rite galv TR&R, less thn 20 hrs, inc accessrs, \$7,500. Ron, x4026 Linc.

Free crib, all wd Kroll crib, ca 1940, slats nd regluing, but no brokn parts. Harry, x3-1637.

18' Lincoln fibrglass canoe, paddles. Call 599-9151 aftr 3pm.

1 tckt (orch K1) for *Les Miserables*, Sat, 4/18, 8pm, Broadway Theatre, NYC, \$30. Call x3-5548.

Whl w/mtd poor tr, 13"x175 tr, 4-hole mt for Chevette, \$10; nw w/w rad tr, sz P155R13 for Chevette, \$20; get the Mickey Mouse spare out of your trnk. Mr. Prince, x816-4958 Linc.

Bikes, M & F, 3-spd, \$50 ea. Jake, x8-1578 Draper.

San Francisco: American Airlines tckt, lv Logan Thurs 4/16 eve; rtrn Sat 4/26 eve, askg \$175 or bst. Paul MacMillan, x3374 Linc.

Pentax 50mm F2 SMC "A" lens, list \$59.95, bst rsnbl offr. Bob Saliga, x2557 Linc.

Elctrc range, 30", avocado, slf-cln ovr, exc cond, \$200. Call x3-4978 or 749-4668 aftr 6pm.

1926 enameld cst irn bathtub w/legs, xtra deep basin, \$150. Brian, x3-5367.

Scand Design furn: lmp tbl, \$110; 2-pc cffee tbl, \$150; stereo cbnt, \$140; tv std, \$75; all teak w/smokd glss, less thn 2 yrs old. Heather, x3-0801 or 475-1226 aftr 6pm.

## Vehicles

'58 Mercedes 190 sdn, orig ownr, no rst, chasis & eng in v gd rning cond, snw trs on xtra whls, parts car avlbl, \$3,000. Call x3-4201 or 749-4055.

'69 Volvo, 4-dr auto, Mich rads, stereo/cass, exc cond, see it to believe, \$500. Bruce, x3-5570 or 277-1470.

'70 Mercedes 220D, v gd cond, 4-dr sdn, rebtl eng, 30mpg, 4-spd, rcnt brks, trs, exh, rns grt, \$1,800. Call 776-7454.

'71 BMW 2002, sunrf, 4-spd, exc mech, nds no wrk, perf int, some rst, 96K, a classic, 1 ownr, \$2,500. Allen, 965-3028.

'71 VW Bug, gd eng, nw trs, brk, crackd frm, \$200. Call 647-0231 eves.

'71 Chevy Nova, 350 V8 eng, auto, rns/strts well, some rst, 100K, ribl trnsprtn, lving cntry, mst sell, bst offr. Pat, x3-5806.

'74 Volvo 164E sdn, factry sunrf, rns reliably but nds some mech wrk, \$750 or bst. Tom, x4212 Linc or 245-9187.

'76 Jeep Wagoneer, 68K, off rd & towing opts, Michelin's & Ziebart, exc cond, \$2,000. Call x3-2214 or 489-2112.

'76 Comet, sgl ownr, alpine stereo-cass, nw trs, batt & tune-up, v cln, no rst, lo mi, \$625. Call x3-6244.

'77 VW Rabbit, gd bdy, rns but eng nds wrk, \$300. Liz, x3-3461 or 262-1590.

'78 Buick Century sta wgn, AM/FM, nw trs, lots of nw prts (have all recpts), hi mi, \$900. Bill, x3-1416 or 484-1459 eves.

'78 Toyota Corolla, 2 dr sdn, 1 sm dnt, no bdy rst, gd 2nd car, gd mech cond, askg \$1,200. Call 745-7059.

'78 Subaru 4-whl drv wgn, not prtty but rns v well, br nw exh sys, gd trs & spare, nds brk wrk, tune up, someone to love it as I have, \$200 firm. Louise, x3-3272 or 545-4625.

'78 Suzuki GS 750, Vetter fairing w/lowers, nw trs, brks, shcks, muff, drv sprockts & chain, grt summr trnsprtn, \$850 firm. Christine, x3-8230 or 284-1859 eves.

'79 Toyota Corona, 4-dr lftbck, 5-spd, 91K, sunrf, AM/FM/tape deck, gd cond, \$2,500 or bst. Call x3-7700 or 969-9146 eves.

'79 Mercury Bobcat, dk brwn, lt int, v gd cond, 31K orig, askg \$2,000. Janine, x3-3087 or 1-887-9942 eves.

'80 Datsun 200SX, v reliabl, trbl-free trnsprtn, ovr 30mpg, some mnr rst, mst sell, \$1,375 or bst. Call x4598 Linc or 1-369-2886 aftr 6pm.

'80 Datsun 310GX, 5-spd, AM/FM/cass, xtras, \$1,600 or bst. Call x3-6267.

'80 Olds Omega, 4-spd std, V6, 4-dr, a/c, ps, pb, AM/FM, nw batt, gd cond, 117K, orig ownr, \$750 or bst. Call x816-3167 Linc or pref 734-1927 eves.

'81 Audi 4000, auto, a/c, AM/FM/cass, 77K, \$3,000 or bst. Dr. Lo, x3-4659 or 273-5100 x2834.

'81 Yamaha 650 maxim, shaft drv, 25K, gargd, v gd cond, \$950. Shahin, x3-5519 or 524-3466.

'82 Toyota Tercel, 2-dr, dlx int, 58K, \$2,950. Call x5902 Linc or 263-5568.

'82 Buick Skylark, V6, FWD, auto, ps, pb, AM/FM/cass, 62K, v well maint, a/c nds rpr, will split cost if you want, \$2,750. Mike, x3-5460.

'82 Mazda RX-7, silvr, 5-spd, a/c, 4-spkr stereo, alm, exc cond, \$5,500 or bst. Ann, x8-5165 Whitehead M-W or 1-834-7593 eves.

'82 Chevette, 4-dr htchbck, silvr w/bl stripe, nw trs, radio & tape dck, lugg rck, exc cond, 50K, std, \$2,100. Kathy, x3-4574 or 868-9804 7-10pm.

'82 Chevy Camaro, auto, 6 cyl, a/c, AM/FM, 57K, always gargd, exc cond, \$4,500 or bst. Call x2933 Linc.

'83 Toyota Corolla, 4-dr, 5-spd, a/c, 60K, \$4,100 or bst. Call x3-5611 11am-3pm or 864-4818.

'83 Mazda sta wgn GLC, 4-dr, std, 65K, \$1,200 or bst. Deborah Sullivan, 899-7662.

'84 Chevy Cavalier, 4-dr sdn, 2L-4 cyl, orig ownr, 21K, gd cond, well-maint. Call x5606 Linc or 272-1923 aftr 8pm.

'84 Kawasaki GPz550, silvr/red, Pirellis, caseguards, rack, alm, prtty & quik. Paul, x3-6908 or 321-4654.

'85 Pontiac Firebird, grt cond, nw trs & batt, AM/FM, a/c, cruise, alm, \$8,700. Lisa, x3-4611.

## Housing

Arlington Hts, 2BR, lrg LR, ktchn, cer bath, fridge, disposr, 1 car prkg, \$720+ utils. Dana, x4580 Linc.

ME seacoast summr rntl, July, fully eqppd, 2BR pine cabn on Mt. Desert Island overlooking Frenchman's Bay, \$450/wk or \$1,600/mo. Call x3-5757.

Medford, 5rm apt in 2-fmly hse, 2BR, 1 v lrg, mod ktchn & bath, nr T, 1st flr, storage, no pets, \$700/mo+ utils. Ownr, x3-5244 or 396-2086.

Island cottage, sleeps 5+, quiet ME fishing village, quarry swimming, band conrts, nature presrvs, grt lobster, \$300/wk during summr, low off-seasn rates. Marie, x3-7070 or 547-1311 eves.

2BR log cabin on quiet lake in Sweden, ME, avlbl by wk, May thru Oct, \$250-450/wk depndng on mo. Info: 443-4246.

Summr rntl: Oxford, ME, Lake Thompson cottage, \$350/wk. Call 646-8700 aftr 6pm.

Spring skiing, last chance: Jay Peak, VT, btfl 3BR mt-side retrt, all amenities, avlbl 4/16 on, reevee now for skiing/summr vac, \$400/wk+ utils. Call x3-7758.

## Wanted

CPU for wrd prcssng, w/prntr. China, x3-2705.

DECmate I w/prntr if possbl. Anne, x3-2705.

Furn: usd cmprtr dsk & stereo/tv cabnt. Garry, 497-1523.

2BR apt, July-Aug for visting cpl frm Stanford (math), non-smkrs, in/nr Camb &/or nr public transprt pref. Call x3-4380 or 415-857-9287 collect.

Baby sittr for 2-mo-old boy, flxb hrs, aftnoon/AM. Meir, x3-7814 or Meir/Yael, 494-5122.

Furn restorer-refnshr, reupholstrer to renew rckr. Pat, x3-3351 or 494-8761.

10" bnch saw & drill press, oldr Sears cast irn mdls pref. Bob, x8-2965 Draper.

Visiting prof frm Norway nds 1/2BR furn apt/hse nr MIT, Aug 87-June 88. Prof Newman, x3-6809.

Sublet wntd for 1 mo (approx 5/16-1) for visting composr, pref studio/1BR apt nr MIT or trnsprtn. Info: Experimental Music Studio, x3-7441.

Hse wntd, Aug/Sept in Camb for visting prof & fmlly, min 3BR. Call Mrs. Huggins, x3-3368 or 646-0343 eves.

Hackr w/Apple IIE or IIC w/modm for simpl file uploads, ez job. Michael, 494-0467.

3-4BR hse/ apt nr Hrvd Sq, June-Aug, refs avlbl. Call collect, 512-450-1929.

## Roommates

Dorchester, Melville Pk, prof non-smkng M to shr 9rm hse w/same, nr red line, prkg avlbl, 2 baths, jacuzzi, skylts, 2,000 s.f., \$380/mo+ shr utils. Call 288-7088.



Sloan School Dean Abraham J. Siegel stands between award-winning students at a recent ceremony honoring the group. From the left are James F. Dondero, Alexander Proudfoot-Howard J. Samuels Memorial Fellow; Thomas A. Bowers, Henry B. du Pont III Scholar; Jennifer J. Bailey, Miriam Sherburne Scholar; Dean Siegel; Gustavo A. Pierini, Henry Ford II Scholar; and Hoyt L. Davidson, Henry B. Du Pont III Scholar. The sponsored awards are presented annually to second-year master's students who have demonstrated unusual academic achievement and professional promise. The Sherburne Scholarship, given for the first time, was established by alumni/ae in recognition of Miriam Sherburne, who has given 50 years of dedicated service to the school, currently as master's program advisor. Two additional awards, the Louis E. Seley Scholarships, will be presented at a later date. The 1986-87 recipients are Thomas P. Cronin and Allen R. Frechter.

## Obituaries

### Mary E. Burke

A funeral was held March 8 for Mary E. Burke of Arlington, who died March 5. Mrs. Burke had been a senior secretary in chemistry since 1986. She was 54.

She leaves two sisters, Virginia R. Heaton of Winchester, and Dorothy J. Hews of Scarborough, Maine. Memorial contributions may be made to the Jimmy Fund.

### Antonio Finocchio

Antonio Finocchio, 80, of Everett, a former machinist at the Draper Laboratory, died March 13. Mr. Finocchio worked at MIT from 1960 until his retirement in 1972.

He is survived by his widow, Helen Bologna Finocchio; two sons, Vincent of Lynn and Anthony Finocchio of Lincoln, R.I.; a daughter, Janet DeNorcia of Framingham, 13 grandchildren and 13 great grandchildren.

### Guy L. Guidone

Guy L. Guidone, 70, of Medford, an administrator in Housing and Food Services from 1946 until his retirement in 1979, died March 17. A World War II veteran, Mr. Guidone was widely known to patrons of Walker Memorial.

He is survived by his widow, Adeline Musto Guidone; his mother and stepfather, Mary and Frank Contestible of Worcester; a sister, Edith Ruggiero of Nashua, N.H.; two stepbrothers, John and Robert Contestible of Worcester, and many nieces and nephews. Memorial contributions may be made to St. Joseph's Church, Medford, or to the University Hospital Cancer Research Fund.

### Laura M. Gutelius

A funeral Mass was held in St. Columbkil's Church, Brighton, for Laura M. Gutelius, 89, who died March 7. Mrs. Gutelius had been a stock clerk in Chemistry from 1949 until her retirement in 1965.

She is survived by a son, William, of New York City, a daughter, Elizabeth McKenna of Marshfield, and three grandchildren.

Hse to shr, non-smkng, Medford, nr bus, avlbl now, mostly furn, short-trm ok, \$270+ utils. Oded/Arthur, 395-8895.

F to shr furn 1BR Cambridge apt, nr Hrvd Sq, ideal for commutrs who nd a place 3-4 nts/wk, avlbl immed, \$150-200 inc utils. Abeer, x3-3593 or 868-1057.

## Carpool

Rdrs wntd for vanpool frm Hampstead NH area via Salem to Kendall Sq-Camb area, 7am (for 8:15am arvl)-5pm (for 6:15 rtrn). Patty, x3-5806/3428.

Rdrs wntd, Plymouth-Camb w/stops in Kingston & Boston: lv Plymouth, 6:45am, arrive Camb, 8am; lv Camb, 4:34pm, arrive Plymouth, 6:15pm, lo rates. Walter, x3-2458.

## Lost and Found

Found: 3/16, 11 keys on ring in Windsor St prkg lot. Ida, x3-4765.

Lost: silvr hnd-crftd piercd earring w/lt bl stone in ctr, on Tues, 3/17 around 5pm, sm rewrd offr, sentimentl valu. Anne, x3-1916.

### Lawrence Howarth

Lawrence Howarth, 63, of Lowell, a custodian at Lincoln Laboratory from 1972 until he became disabled in 1983, died February 18. He is survived by his wife, Mary.

### Euclide LaCombe

Word has been received of the February 2 death of Euclide LaCombe, 80, a retired carpenter at Lincoln Laboratory. Mr. LaCombe worked at Lincoln from 1953 until his retirement in 1970. He leaves his wife, Elva, of Chelmsford.

### Willard A. Mosher

Willard A. Mosher, a supervisor at the National Magnet Laboratory from 1950 until his retirement in 1980, died February 15 at 72. He had been living with his wife, Elizabeth, in Clearwater, Fla.

### John O'Connor

John O'Connor, 64, of Cambridge, a dormitory patrolman in Housing, died suddenly February 5. He leaves five sisters and three brothers.

### Virginia Safford

Virginia Safford, administrative assistant to Dr. Irving M. London, first director of the Harvard-MIT Division of Health Sciences and Technology, died March 22. Ms. Safford was a primary resource for students in the program before her retirement in 1985. She leaves no survivors.

### Astrid E. Shaw

Astrid E. Shaw, 72, of West Dennis, a former cashier at MIT, died March 5. Mrs. Shaw had worked at MIT from 1947 until her retirement in 1973.

She is survived by her husband, Robert E. Shaw; a step-mother, Anna Gustafson of Hartford, Ct., a sister and brother and several nieces and nephews.

Found: in Bldg 36, gld rim glasses w/bi-focals. Donna, x3-8529.

Lost: My fav windbreakr, a Northface Extreme, silvr-grey w/blk shldr, reward. Pat, x3-7466 or 547-0444.

## Miscellaneous

Will the drivr of the red car that accidentally hit my Silver Tercel (w/ski rck), the AM of Mon, 3/16, in the Main Lot please call L.R. Young, x3-7759.

Wrd pressing on Macintosh cmprtr, tech & non-tech, grphcs, eqtions, mny type styls & szes avlbl, fst dpndbl servc, guarntd rslts frm legible orig. Scotti, x3-4657.

Entr, edit, proofread & format docs thru IBM cmprtr & prnt txt on IBM ltrr qlty prntr. Cheryl, x3-0263 or 776-6004.

Bird ownrs: swp bird-sittng services w/caring bird ownrs, will care for your bird whn you're on vac, you care for ours on same basis, wk-for-wk trade, we have xtremely spoild cockatiel. Dave Forrest, x3-3222.

Antq shw, Sat, 4/4, 10am-4pm, 1st Parish Church, 630 Mass Ave, Arlington Ctr, sponsrd by Arlington Historical Society.

# M.I.T. SUMMER PROGRAMS

For detailed descriptions of the individual programs, please write or call the Office of the Summer Session, M.I.T., Room E19-356, Cambridge, Massachusetts 02139, Telephone (617) 253-2101.

## Aeronautics and Astronautics

**16.18s**  
Multi-Body Dynamics: An Algorithmic Approach Based on Kane's Equations  
Andreas H. Von Flotow  
Dan Rosenthal  
July 6-July 10  
\$1,200

**16.36s**  
Fundamentals of Flight Simulation  
Laurence R. Young  
Antonio L. Elias  
Robert V. Kenyon  
July 6-July 10  
\$1,125

## Applied Biological Sciences

**20.02s**  
Advances in Controlled Release Technology: Polymeric Delivery Systems for Drugs, Pesticides and Foods  
Robert S. Langer  
July 27-July 31  
\$1,150

## Biomechanics

**2.75s**  
Biomechanics of Human Movement in Orthopaedics, Rehabilitation, Neuroscience, and Sports  
Robert W. Mann  
June 15-June 19  
\$1,100

## Biotechnology Process Engineering Center

**20.40s**  
Biotechnology: Microbial Principles and Processes for Fuels, Chemicals and Biologicals  
Anthony J. Sinskey  
August 17-August 21  
\$1,150\*

**20.45s**  
Downstream Processing  
Charles L. Cooney  
August 10-August 14  
\$1,100\*

\* Combined tuition for:  
20.40s and 20.45s: \$2,000

**20.48s**  
Fermentation Technology  
Daniel I.C. Wang  
August 3-August 7  
\$1,250\*

\* Combined tuition for:  
20.45s and 20.48s: \$2,100

## Center for Transportation Studies

**CTS 31s**  
Public Transportation Service and Operations Planning  
Nigel H.M. Wilson  
August 10-August 14  
\$1,200

## Chemical Engineering

**10.35s**  
Modelling, Simulation, and Optimization of Chemical Processes  
Lawrence B. Evans  
July 20-July 29  
\$1,500

**10.97s**  
Expert Systems in Process Engineering: Development, Design, Control, and Operations  
George Stephanopoulos  
July 20-July 24  
\$1,200

## Chemistry

**5.03s**  
Electrochemistry and Chemically Modified Electrode Surfaces: Preparation, Characterization and Applications  
Mark S. Wrighton  
Allen J. Bard  
August 17-August 21  
\$1,200

**5.31s**  
Biomolecular Modelling  
Gregory A. Petsko  
Dagmar Ringe  
June 8-June 12  
\$1,500

## Civil Engineering

**1.23s**  
Knowledge Based Expert Systems for Engineering  
David H. Marks  
Duvvuru Sriram  
June 22-June 26  
\$1,200

**1.59s**  
Recent Advances in Finite Element and Boundary Element Methods  
Jerome Connor  
Theodore H.H. Pian  
August 3-August 7  
\$1,000

**1.96s**  
Practical Methods for Improving Construction Productivity  
Yecheil Rosenfeld  
June 8-June 12  
\$1,200

## Computer Related

**2.13s**  
Computer-Aided Experimentation: Real Time Data Acquisition, Processing and Control  
William Unkel  
Jerome H. Milgram  
June 22-June 26  
\$1,200

**2.83s**  
Robot Design and Control  
Jean-Jacques E. Slotine  
Haruhiko Asada  
June 15-June 19  
\$1,500

**6.01s**  
Structure and Interpretation of Computer Programs  
William M. Siebert  
June 8-June 19  
\$2,500

**6.02s**  
Communication Security and Public-key Cryptography  
Shafi Goldwasser  
July 6-July 10  
\$1,200

**6.20s**  
Data Networks  
Robert G. Gallager  
Dimitri P. Bertsekas  
Pierre A. Humblett  
August 17-August 21  
\$1,200

**6.74s**  
Planning and Policy for the Security and Privacy of Emerging Computer and Telecommunications Systems  
Gary Marx  
June 22-June 26  
\$1,100

**6.83s**  
Parallel Computing: Dataflow Architecture and Languages  
Arvind  
August 3-August 7  
\$1,250

**6.84s**  
Parallel Algorithms and Architectures  
F. Thomson Leighton  
Charles E. Leiserson  
June 22-June 26  
\$1,250

**6.87s**  
Robot Manipulators, Computer Vision, and Artificial Intelligence  
Berthold K.P. Horn  
July 27-July 31  
\$1,250

## Decision Analysis

**14.37s**  
Design and Analysis of Scientific Experiments  
Harold Freeman  
July 13-July 18  
\$1,050

**14.61s**  
Discrete Choice Analysis: Theory and Application to Consumer Demand and Market Shares  
Moshe Ben-Akiva  
Steven R. Lerman  
Daniel McFadden  
June 15-June 19  
\$1,300

**DA 1s**  
Fundamentals of Decision Analysis  
Alvin W. Drake  
Ralph L. Keeney  
June 15-June 19  
\$1,200\*

**DA 2s**  
Advanced Decision Analysis and Applications  
Ralph L. Keeney  
Alvin W. Drake  
June 22-June 26  
\$1,200\*

\* Combined Tuition for:  
DA 1s and DA 2s: \$1,950

## Dispute Resolution

**11.00s**  
Bargaining and Negotiation  
Lawrence Susskind  
Max Bazerman  
June 8-June 12  
\$1,100

## Electrical Engineering

**3.14s**  
Electro-Ceramics: Processing, Properties, and Applications  
See Materials Science and Engineering

**6.071s**  
Introduction to Electronics  
Louis D. Braida  
August 10-August 21  
\$2,600

**6.24s**  
Design of Analog MOS Integrated Circuits  
See Microelectronics and Microfabrication

**6.33s**  
Introduction to Power Electronics  
John G. Kassakian  
George C. Verghese  
Martin F. Schlecht  
June 15-June 19  
\$1,800

**6.37s**  
Power Systems Planning and Operation: Methodologies for Dealing with an Uncertain Future  
Fred C. Schweppe  
Richard D. Tabors  
June 8-June 12  
\$1,200

**6.43s**  
Fundamentals of Detection, Parameter Estimation, and Kalman Filtering, with Applications in Tracking, Control, and Signal Processing  
Alan S. Willsky  
Robert R. Tenney  
June 22-June 26  
\$1,225

**6.51s**  
High-Speed Photography and Videography  
Charles E. Miller  
June 8-June 12  
\$900

**6.64s**  
Computer-Aided Multivariable Control System Design  
Michael Athans  
June 15-June 19  
\$1,600

## Engineering and Applied Science

**16.38s**  
Lasers and Optics for Applications  
Shaouf Ezekiel  
July 6-July 17  
\$1,700

## Health and Safety

**2.77s**  
Non-Ionizing Radiations: Biophysical and Biological Basis, Applications, and Hazards in Medicine and Industry  
Padmakar P. Lele  
August 10-August 14  
\$1,150

## International Affairs

**17.62s**  
Economics and Politics in Southern Africa: Political Risk Assessment  
Robert I. Rotberg  
June 8-June 10  
\$1,125

## Finance and Investment

**15.41s**  
The MIT Executive Program in Financial Management  
Stewart C. Myers  
July 19-July 24  
\$2,800 (includes housing and meals at MIT Endicott House)

## Management

**15.05s**  
Operations Management in the Services Industries  
Richard C. Larson  
Gabriel R. Bitran  
Amedeo R. Odoni  
June 22-June 26  
\$1,375

**15.21s**  
Corporate and Economic Policy Design with Microcomputers: A System Dynamics Approach  
David P. Kreutzer  
John D. Sterman  
July 13-July 17  
\$1,475

**15.52s**  
Corporate Planning and Control Systems  
Paul Healy  
Morris McInnes  
June 8-June 12  
\$1,400

**15.53s**  
The MIT Executive Program in Corporate Strategy  
Arnoldo C. Hax  
July 12-July 17  
\$3,000 (includes housing and meals at MIT Endicott House)

**15.76s**  
The MIT Executive Program in Operations Management  
Harlan C. Meal  
July 26-July 31  
\$2,500 (includes housing and meals at MIT Endicott House)

**15.86s**  
Medical Technology Assessment for Health Professionals  
Stan Finkelstein  
June 22-June 26  
\$1,250

**15.90s**  
Management of Research, Development, and Technology-Based Innovation  
Edward B. Roberts  
June 15-June 26  
\$4,000 (includes daily luncheon)

## Manufacturing Systems and Technology

**2.87s**  
Intelligent Manufacturing Systems  
George Chryssolouris  
July 27-July 31  
\$1,200

**3.07s**  
Applied Materials Technology: Materials Processing for Process-Sensitive Manufacturing  
Donald R. Sadoway  
July 6-July 10  
\$1,000

**3.37s**  
The Science and Control of Welding and Joining Processes  
Thomas W. Eagar  
David E. Hardt  
June 15-June 19  
\$1,100

## Materials Science and Engineering

**3.07s**  
Applied Materials Technology: Materials Processing for Process-Sensitive Manufacturing  
See Manufacturing and Systems Technology

**3.14s**  
Electro-Ceramics: Processing, Properties, and Applications  
Harry L. Tuller  
Yet-Ming Chiang  
July 27-July 31  
\$1,350

**3.30s**  
Transmission Electron Microscopy of Materials  
Linn W. Hobbs  
John B. Vander Sande  
June 8-June 12  
\$1,100

**3.54s**  
Corrosion: The Environmental Degradation of Materials  
Ronald M. Latanision  
Gregory J. Yurek  
July 13-July 17  
\$950

**3.55s**  
Strategy of Mathematical Modelling in Materials Processing  
Julian Szekeley  
August 3-August 7  
\$1,100

**3.60s**  
Methods in Viscoelastic Polymers and Composites Engineering  
David K. Roylance  
July 6-July 10  
\$1,000

**3.76s**  
Engineering of Semiconductor Materials: GaAs and Si  
Harry C. Gatos  
Jacek Lagowski  
August 3-August 7  
\$1,100

## Mechanical Engineering

**2.02s**  
Machinery Noise and Diagnostics  
Richard H. Lyon  
August 10-August 15  
\$1,250

**2.14s**  
Design of High-Efficiency Gas Turbines  
David Gordon Wilson  
June 15-June 19  
\$1,025

**2.63s**  
Modern Methods for Nonlinear Control System Design  
J. Karl Hedrick  
July 13-July 17  
\$1,050

**2.81s**  
Tribology: Friction and Wear  
Ernest Rabinowicz  
June 22-June 26  
\$1,100

## Microelectronics and Microfabrication

**6.22s**  
VLSI Design  
Jonathan Allen  
June 8-June 19  
\$3,000

**6.23s**  
Advanced VLSI Design  
Lance A. Glasser  
July 13-July 24  
\$3,000

**6.24s**  
Design of Analog MOS Integrated Circuits  
Hae-Seung Lee  
Charles Sodini  
June 8-June 12  
\$1,500

**6.77s**  
Microsensors  
Stephen D. Senturia  
Roger T. Howe  
Rosemary L. Smith  
August 10-August 14  
\$1,250

**6.78s**  
Submicron Structures Technology  
Henry I. Smith  
July 20-July 24  
\$1,200

**10.61s**  
Plasma Processing for Microelectronic Fabrication: Plasma Deposition Etching, and Sputtering of Thin Films for VLSI  
Herbert H. Sawin  
Rafael Reif  
June 8-June 12  
\$1,250

## Nuclear Engineering

**22.80s**  
Modern Nodal Methods for Analyzing Light Water Reactors  
Allan F. Henry  
June 22-June 26  
\$1,050

**22.96s**  
Nuclear-Power Reactor Safety: Part 1 - Thermal Power Reactors  
Neil E. Todreas  
July 6-July 10  
\$1,100\*

**22.95s**  
Nuclear Power Reactor Safety: Part 2 - General Safety Issues  
Norman C. Rasmussen  
July 13-July 17  
\$1,100\*

\* Combined tuition for:  
22.96s and 22.95s: \$1,800

## Polymer Science and Technology

**3.60s**  
Methods in Viscoelastic Polymers and Composites Engineering  
See Materials Science and Engineering

**PST 102s**  
Rheological Behavior of Polymeric Fluids with Laboratory Workshop  
Robert C. Armstrong  
Robert E. Cohen  
June 22-June 26  
\$1,400

**PST 104s**  
Electrical Properties of Polymers  
Gary E. Wnek  
July 20-July 24  
\$1,250

**PST 105s**  
Composite Materials  
John F. Mandell  
Frederick J. McGarry  
July 27-July 31  
\$1,250

## Technical Writing and Editing

**21.10s**  
Communicating Technical Information (Thirty-first Edition): Writing and Editing  
James Paradis  
June 15-June 19  
\$925

**Writing for the Computer Industry**  
Edward Barrett  
August 15  
One-Day Seminar  
\$195

# April brings potpourri of cultural offerings

By CHINA ALTMAN  
Staff Writer

Though "cruel" sometimes was thought to be a good word for the month of April, it would never work for April and the expressive arts at MIT.

Only an outburst of words could even begin to do the arts of April justice here: Crunching, crashing, singing, dancing, hacking (by artists with computers), hacking on a world level (by an artist with a slide projector). And not the least of it: get your mojo working.

It's a time when it's easy to see people making openings, tunnels, pathways, bridges and secret doors through real and imaginary boundaries between the arts and other disciplines, such as technology.

To mix metaphors on an even more extended scale, look at the somewhat frayed barriers that once were thought to separate the territories of music: classical, rock, gospel, computer, jazz, electronic, new wave. In their thoughts and visions, people here can be imagined as running every kind of contrivance from cog railways to laser beams back and forth among these countries. Here's an introduction to some of the riches of April. For specifics, see the listings below.

For those who love the works of the great chamber repertoire, MIT has an unusual gift in the Chamber Players. Professor of Music Marcus Thompson founded the Players so that selected musicians from the Institute's faculty, staff, alumni and student body could present concerts with professional guests from Boston's rich community of professional musicians.

The MIT Gospel Choir will hold its second annual celebration of gospel music this Saturday. Later this month the MIT Choral Society will be coming home to Kresge Auditorium after quite a few seasons of singing off campus.

There's an all-Bach program scheduled as one of the Thursday noon concerts in the Chapel. Is Bach really the composer of choice for computer hackers? See if you can find out why.

Other kinds of music at MIT in April include South Indian, computer, works scored only for winds and percussion, folk, Renaissance, and music from newly invented instruments.

What about that Mojo? Artist Betye Saar comes from Los Angeles to be in residence at the List Visual Arts Center and to make an installation she is naming "Mojotech." Since the late '60s Saar's work has moved from charged statements about the social and political concerns of black people to more intimate, internalized explorations of her own heritage and beliefs.

Partially inspired by the tradition of African tribal sculptures made up of diverse decorative elements and power symbols, she will accumulate part of her installation, including items students and other visitors may bring to her.

The first of April brings the final days for three important exhibitions at the List Visual Arts Center in the Wiesner Building. Though art critics have written in considerable length and seriousness about these exhibits, it is also valid to consider them from any number of points of view.

For instance, the Polish-born artist, Wodiczko. Is he a master hacker because he goes around the world shining images at night on large architectural structures and monuments? Could these works be considered as pranks? Or serious political statements? Can they be both?

Sculptor Tony Smith. The exhibition of his works in the Bakalar Sculpture Gallery has been acknowledged as saying so much about this sculptor who was also an architect. But the exhibit consists really of only two objects, major works in welded bronze. Can two pieces do it?

The photographs from Eastern Europe. We take for granted the right and obligation for self expression of every artist, in any scale, subject matter, or medium. Yet this exhibition consists entirely of work that cannot be shown in the context of the art world where these artists live. Can we see what in these photographs might be considered to fall outside the guidelines considered acceptable in their countries? Why does someone continue to make art for which there is no market, which must be seen in secret, if at all?

Artist Ebon Fisher has planned two performances that "work with the visual languages of science and the theatrical

structure of a rock concert." See "Existence" below.

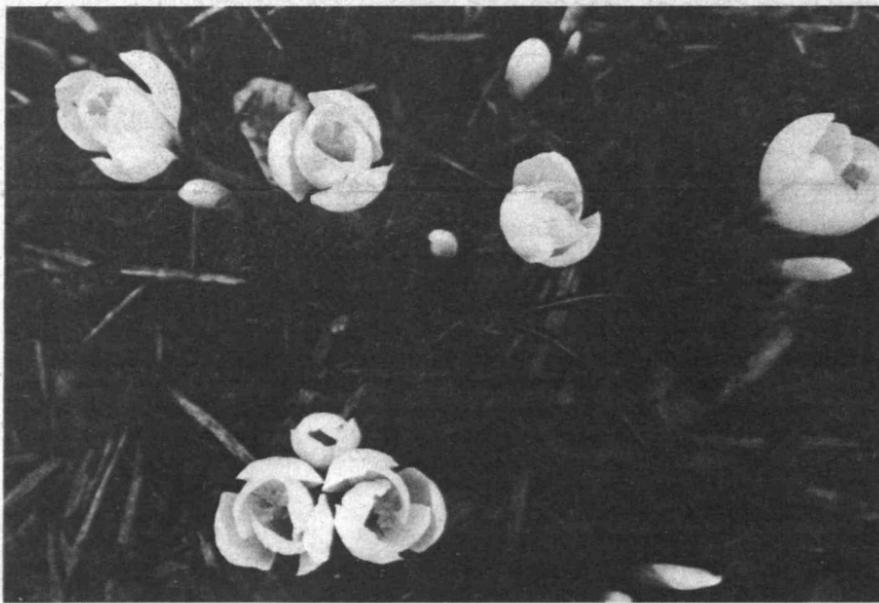
In theater, both MIT's major enterprises will have productions ready: *Measure for Measure* by the Shakespeare Ensemble and two contemporary plays from the world of the London stage by the Drama Program.

Actor Lee Higgins, Wellesley College '87 gave a pithy account of the two modern plays: "*Womberang* is very crazy and off the wall. It's set in a gynecologist's waiting room. It becomes more and more hilarious, although there are serious comments too.

"The other play, *Groping For Words*, is more serious although it has comic tones at times. It deals with an upper middle class woman trying to teach illiterate adults to read: One is a 19-year-old who left school and became head custodian at the school. Another is an older homeless man who lives secretly at the school, being sheltered by the custodian. . . The two plays work extremely well together," Ms. Higgins said.

The listing below for April could not have been prepared without the help of many people in the arts network, with special contributions from Katy Kline and Dana Friis-Hansen of the List Visual Arts Center, Marcia Conroy of the MIT Museum, Clarise Snyder of the Music Section, Judy Whipple of the Experimental Music Studio, Jeanette Mitrano of the Drama Program, and Charlotte Peed of the Shakespeare Ensemble.

—April 2, Thursday. Noon Chapel Series. Swiss musician Juerg Neuenschwander, organist at the legendary Town Church in Burgdorf, Switzerland, comes to the MIT Chapel Building to perform a program of Du Mage, Kotter, Vogt, Scherrer, Bach and Bruhns. He was brought here by James David Christie, organist for Boston Symphony Orchestra and affiliated artist at MIT. 12:05pm. Free. x3-2906.



—April 3, Friday. Paul Orgel, an affiliated artist at MIT, presents a piano concert featuring Beethoven's Sonatas Op. 78 & 53; Janacek's four pieces from "On an Overgrown Path"; Chopin's Ballade No. 3, Op. 47, & Scherzo No. 4, Op. 54. The New York Times described Mr. Orgel in 1985 as a thoughtful and serious young pianist, especially praising his understanding of Janacek's austere impressionism—"He made each composition an epic in miniature." 8pm. Kresge Auditorium. Free. x3-2906.

—April 3-5, Friday-Sunday. Beth Soll, director of the MIT Dance Workshop, will dance in the tenth anniversary concert of her professional ensemble, Beth Soll and Company. Massachusetts College of Art, 621 Huntington Avenue, Boston. 547-8771.

—April 4, Saturday. The second annual spring celebration of gospel music at MIT. "Walking in the Spirit", a concert by the MIT Gospel Choir, Jerryl Payne, musical director. Contemporary and traditional gospel music. 7:30pm. Kresge Auditorium. \$3 general. \$1 students/seniors. Angela Conley, x3-4791.

—An unusual opportunity to hear well over a hundred musicians playing wind instruments of all kinds, with percussion. The MIT Concert Band presents a joint concert with the Brown Concert Band. Conducted by John Corley, conductor of the MIT Concert Band. 3pm. Kresge Auditorium. 494-5284. Free.

—"Existence." A multimedia participatory dance with two ambitions: "to be fun and to ruminate on the squirming peculiarity of our biological existence." Films, slides, massive diagrams of human ana-

tommy, periodic performances and an energetic disc jockey. Produced by Ebon Fisher, instructor in the Media Lab's Visible Language Workshop, sponsored by the Student Center Committee. 9pm-1am. The DuPont Gym. \$2 at the door, open to all MIT/Wellesley students, staff and faculties. x3-0309 or 357-4061.

—April 5, Sunday. Last day of "Tony Smith: The Shape of Space." Two major works in welded bronze. Bakalar Sculpture Gallery, List Visual Arts Center, Weekdays 10-4, Weekends 1-5pm. x3-4400.

—April 6, Monday. "Artists in the Computer Age." First day of an eclectic selection of works illustrating the versatility and new possibilities of expression opened by use of the computer. Of the 20 professional artists represented, ten have affiliations, past or present, with the Media Lab or the Center for Advanced Visual Studies. There also will be work by eight MIT students now at the Media Lab. MIT Museum Building, 265 Mass Ave. Through July 31. x3-4444.

—April 8, Wednesday. A special ethnomusicology lecture, "Complementary Aspects of Kodaly's and Bartok's Folk Music Research," by Professor of Music Stephen Erdely. 4pm. Rm 4-160. Free. x3-2906.

—April 9, Thursday. Noon Chapel Series. Three of the most well-known early music people in the Boston area in concert: the Boston Renaissance Ensemble, made up of David Hahn, lute; Margaret Pash, gamba; John Tyson, recorder. 12:05pm. MIT Chapel Building. Free. x3-2906.

—Come to the Compton Gallery to meet Jeremy Gardiner, British-born artist based in New York, who will be here to celebrate the opening of his new exhibit. Called "Telegenic Charismas," it is made up of oil-on-canvas portraits of 37 media personalities such as TV evangelists, anchor-men and talk show hosts. The unusual wrinkle comes from his uses and combin-

ing of digital photography, electronic paint systems and the computer as a basic implement. They say he bridges the gap between painting and photography. Reception, 5-7pm. Presented by the MIT Museum in the Compton Gallery, off Lobby 10. x3-4444.

—Novelist and short story writer Sue Miller presents a reading from her work, sponsored by the Writing Program. Her first novel, *The Good Mother*, came out last year to enthusiastic notices, described by one critic as "smart, tough-minded, swift and sure." 8pm, Huntington Hall (10-250). Free. x3-7894.

—April 9-10, Thursday and Friday. A synthesizer which makes "bird calls" and a rotating "Marimba Wheel" sound sculpture will be among the instruments and sound pieces used in a performance at the Center for Advanced Visual Studies. Artist George Numrich, graduate student in the Master of Science in Visual Studies program, designed a program of new musical instruments and sound sculptures. Included will be "The 37 Strings," an instrument capable of separating the upper mode frequencies of the vibrating string, enabling one string to sound several pitches above its fundamental. 7:30pm, CAVS Bldg, W11. Free.

—April 10, Friday. First full day of "Telegenic Charismas," Compton Gallery. Continuing through June 27. Weekdays 9-5, Saturdays 10-4. x3-4444.

—New Music. The first live performance in this country of music by London-based Alejandro Vinao, presented by the MIT Experimental Music Studio. 8pm. Kresge Auditorium. x3-7418.

—April 12, Sunday. Last day of Polish emigre artist Krzysztof Wodiczko's nocturnal projections and also the collection of liberated photographs from Eastern Europe. Both at the List Visual Arts Center in the Wiesner Building. Weekdays 10-4, Weekends 1-5. x3-4680.

—April 13, Monday. "Fictitious Models: Consistent Unreal Worlds." A talk by widely known writer/film producer Michael Crichton. MIT's School of Architecture and Planning presents this lecture as part of their "Virtual Worlds" Spring Lecture Series. Preceded by a reception at 5:30, the lecture begins at 6pm. Rm 9-150. Free. x3-5470.

—April 15, Wednesday. "The Score for D.W. Griffith's *The Birth of A Nation*, 1915," a special ethnomusicology lecture, by lecturer in music Marty Marks. 4pm. Rm 4-160. Free. x3-2906.

—April 16, Thursday. Noon Chapel Series. South Indian versions of the bamboo flute and the drum can be heard in this concert. On flute will be T. Viswanathan, a celebrity in South India where he comes from one of the most illustrious music and dance families in the country. On Mridangam drum, the main percussion instrument of South India, will be Trichy Sankaran who made his debut at age 13 and since has performed with all the leading musicians of South India. 12:05pm. MIT Chapel Building. Free. x3-2906.

—April 19, Sunday. Makiko Takedo, an internationally known pianist, is being brought to MIT by Dana Fine, a graduate student in mathematics in his first-time endeavor as an impressario. Born in Osaka, Ms. Takedo has won many European honors and now teaches at the Frankfurt Music School. She will play music of Mozart, Chopin and Akio Yashiro, sponsored by the MIT Symphony and funded in part by the Council for the Arts at MIT. 7:30pm. Kresge Auditorium. Free. Mr. Fine: x3-7578 or 646-0321.

—April 21, Tuesday. Artist/sculptor Betye Saar of Los Angeles begins the first day of her residency at MIT's List Visual Arts Center, extending through May 15. She begins immediately to create a new installation to be called "Mojotech," as in "I Got My Mojo Workin." For information: x3-4400.

—April 22, Wednesday. "The Creative Processes in Serbo-Croatian Epic Singing," an ethnomusicology lecture, by Professor of Music Stephen Erdely. 4pm. Rm 4-160. Free. x3-2906.

—April 23-26, weekend. MIT Shakespeare Ensemble: *Measure For Measure*. Directed by Derek Campbell, a fully staged production of the Shakespearean classic. 8pm. Sala De Puerto Rico, MIT Student Center. Free. x3-2903.

—April 23, Thursday. Noon Chapel Series. Carol Shansky, flute and Felice Pomeranz, harp. An interesting and unusual combination of instruments, with the harp proving to be particularly pleasant in the special acoustics of the Chapel building. 8pm. MIT Chapel Building. Free. x3-2906.

—April 24, Friday. Spring concert of the MIT Choral Society. John Oliver, director. Stravinsky's Symphony of Psalms and H.W. Henze's Muses of Sicily. 8pm. Kresge Auditorium. MIT/Wellesley students with ID, free. General \$8 and other students/seniors \$4. x3-2906.

—April 25, Saturday. MIT Choral-laries Spring Sing. An evening of a capella singing of fun songs and general wackiness. 7:30pm. Huntington Hall, Rm10-250. Free. 734-0648.

—MIT Chamber Players. Marcus Thompson, director. MIT affiliated artist Jean Rife will be featured in Mozart's quintet for horn and strings. 8pm. Kresge Auditorium. Free. x3-2906.

—The world premiere of a new work by composer Peter Child, assistant professor of music at MIT, will be presented by the Lydian String Quartet in the First and Second Church, 66 Marlborough St., Boston. 8pm. Special prices for students. 262-0650.

—Last day for Ben Thompson and Associates, Inc: 20th Anniversary Exhibit, 10-4, at the MIT Museum.

—A special family day at the MIT Museum as part of the celebration of April as Museum Goers Month. At 10am a special program, "Relationshapes," will be held for youngsters in grades one through six. Limited to 20 on a first-come basis.

At 11am people of any age whatsoever are invited to talk with MIT artist Sarah (continued on page 9)