

October 22, 1986
Volume 31, Number 11

Giving update

MIT's United Way campaign, launched three weeks ago, has reached 20 per cent of its goal of \$250,000. As of the end of last week, some \$53,000 from 425 donors was in hand.

The United Way last week announced a new program under which \$240,000 over the next two years will be allocated to 16 Cambridge agencies for new programs aimed at helping troubled teenagers. The money is part of United Way's \$700,000 Teen Initiative grant established last year in response to growing teenage problems including suicide, pregnancy and drug and alcohol abuse.

Day care

The Technology Children's Center has one immediate opening in its full-day program (8am-5:30pm) for a child aged 2.9-5 years old. For further information, call x3-5907.

New series

Women in Post-Revolutionary China will be the topic in a new film and lecture series beginning Friday, Oct. 24, sponsored jointly by the Anthropology/Archaeology Program and the Women's Studies Program. The series is focused on Women and Technology in the Third World: From Farming to the Global Assembly Line.

The film "Small Happiness" will be shown at the first meeting, followed by a talk by Marilyn Young of New York University. The program will run 4-6pm in Rm 2-136.

Winter outing

A meeting for those interested in organizing or helping out with outdoor activities during IAP will be held Thursday, Oct. 23, at 5:30pm in the Outing Club Office, Rm W20-461. Refreshments will be served.

Suggested activities include skiing, skating, snowshoeing, sledding, animal tracking, igloo building, kayaking (in the pool) and expeditions.

No smoking

Effective November 1 the MIT Libraries will adopt a no smoking policy for all public areas of the libraries. The policy was announced by Jay K. Lucker, director of Libraries, who said the cooperation of the community in observing the policy will be appreciated.

It's Kosher

Members of the community who eat only kosher food can now get a hot dog at the the ARA Services food cart on the Student Center plaza.

MIT Rabbi Daniel Shevitz said he has given ARA a letter certifying the hot dogs and related food sold at the cart as kosher, meaning that the products, utensils and handling all meet kosher standards.

The products certified as kosher are the hot dogs, buns, sauerkraut, onions, ketchup, mustard, relish and beans.

Enjoy.



Dean Shirley M. McBay presents a copy of the report, "The Racial Climate on the MIT Campus," to President Paul E. Gray.
—Photo by L. Barry Hetherington

Report finds black students face special problems here

By KENNETH D. CAMPBELL
Staff Writer

MIT President Paul E. Gray has sent to the faculty a report on a two-year internal study of the racial climate at MIT.

"The report carries a clear and disturbing message: that the environment for living and learning at MIT poses special problems for black students," Dr. Gray said. "Facing up to this reality at MIT is not easy for us as individuals or as an institution. Each of us who lives, studies, works and teaches here must acknowledge that serious problems exist, and accept personal responsibility to do everything within his or her power to help in solving them."

"We must spare no effort to improve the experience here for minority students. The issue of racism on this campus must continue to be addressed openly and directly

by all members of the faculty and by every member of the MIT community as we strive to identify and eliminate inadvertent or deliberate behavior that is inappropriate for our community and for this university," Dr. Gray said.

The report, "The Racial Climate on the MIT Campus," is by the Minority Student Issues Group (MSIG), chaired by Shirley M. McBay, dean for student affairs. The study was initiated because of concerns among MIT staff about the quality of life for undergraduate minority students, and was not a response to outside events, said McBay.

She said, "We believe the situation at MIT is similar to that faced in most predominantly-white institutions. We feel that MIT should show leadership in racial mat-

(continued on page 8)

Committee to review arts at MIT

By PAULETTE BOUDREAUX
Staff Writer

MIT is undertaking a major review of its visual and performing arts programs and facilities with the expectation that it will lead to more resources being devoted to the creative arts at MIT.

An ad hoc committee to Review the Creative Arts has been established by Professor John Deutch, MIT provost, at the request of President Paul E. Gray. The committee will be chaired by Professor of Economics Paul L. Joskow.

The committee of MIT faculty and arts professionals from outside the Institute is expected to convene later this month. It

will review the role, organization and support of the visual and performing arts and make recommendations for enlivening and expanding the arts in the academic program and in campus life.

"Our intention is to devote more resources to the arts at MIT and we are relying on this committee to point the way," Professor Deutch said in a letter to the committee members. During an interview later he added, "More activity and academic programs in the visual and performing arts will enrich our lives, both here at MIT and later."

Professor Deutch said the review of the

(continued on page 5)

MIT education for undergrads is examined in 3 reports

By CHARLES H. BALL
Staff Writer

MIT's undergraduate education examination took a major step forward this month when the faculty formally received three reports from committees studying the engineering and the core science and core humanities programs.

"We're now at a point where there is something in hand to debate and refine," said Professor Margaret L.A. MacVicar, MIT's dean for undergraduate education and a key figure in the Institute's reassessment of its undergraduate educational program.

"The Committee on the Undergraduate Program (CUP) is intent on going forward from here. We have invited the faculty and the larger MIT academic community to review these ideas and recommendations. A great deal of work looms ahead to develop ways they might fit together into a total program."

The three documents, which examine the main features of the MIT undergraduate academic program, are:

—The final report of the Institute Committee on the Humanities, Arts, and Social Sciences Requirements (HASS), chaired by Professor Pauline R. Maier, head of the history faculty;

—The first report of the School of Science Education Committee, chaired by Professor Robert J. Silbey of the Department of Chemistry; and

—The Progress Report of the Commission on Engineering Undergraduate Education, chaired by Professor Jack L. Kerrebrock, associate dean of the School of

(continued on page 10)

Memorial planned for J.R. Zacharias

A memorial gathering for Jerrold R. Zacharias will be held Friday, Oct. 24, at 4pm in Huntington Hall (Rm 10-250).

Dr. Zacharias, who was Institute Professor Emeritus, died suddenly in July at the age of 81. He was internationally recognized as a leader in nuclear physics and in educational reform.

Speakers at the program will include Professor Emeritus Albert G. Hill, Institute Professors Emeriti Philip Morrison and Jerome B. Wiesner, and Dr. Edward Purcell, professor emeritus at Harvard. In addition, the Concord String Quartet, with Professor Marcus Thompson as guest artist on viola, will play Mozart's C Minor Quintet, K. 406.

Gray states his position on divestment

(Following is the text of an October 14 letter from President Paul E. Gray to the Coalition Against Apartheid (CAA) stating his position against the divestiture of Institute funds in companies that do business in South Africa.)

To Members of the Coalition,

I write in response to your letter of September 29 urging the governing board of the Institute to divest MIT's holdings in corporations that operate in South Africa and asking that the MIT community be involved more directly in the formulation of investment policy.

While this response expresses my own views and judgments and has not been

discussed specifically with the MIT Corporation, I believe it reflects the judgments of the Executive Committee of the Corporation, as well as the views of many Corporation members.

Let me begin with the question of divestment. There are two principal reasons why I believe such a step is inappropriate and inadvisable.

First, while, for many people, divestment holds important symbolic value as a means of expressing abhorrence of apartheid, I believe it is ineffective as a means of influencing events.

The argument for divestment appears to be based on two premises: (1) that divest-

ment by shareholders will cause US corporations that operate in South Africa to reconsider their presence there and to disinvest, and (2) that disinvestment will bring pressure on the South African government to eliminate apartheid.

To date, there seems to be no evidence that validates either of these premises. Very few of the corporations under discussion have a major stake in their South African operations; for most, those operations represent a small fraction of assets, sales, or revenues. Divestment by shareholders is unlikely to influence either share prices or managerial judgments about

(continued on page 9)

INSTITUTE NOTICES

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

Announcements

Seniors—Wishing to apply for graduate study in the Department of Electrical Engineering and Computer Science during 1987 are urged to apply by Nov 1, 1986. Applications available in Rms 38-444 and 3-103.

October: IAP Planning Month—IAP Guide Deadline and Applications for Funding of Activities deadline, Thurs, Oct 30. See your coordinator or IAP Office, Rm 7-108, x3-1668.

Career Planning and Placement Company Recruitment Presentations—TRW Electronic Systems—Oct 22, 4:30-6:30pm, Rm 4-149. National Security Agency—Oct 22, 4:50-6:30pm, Rm 4-402. The Boeing Company—Oct 22, 5-7pm, Rm 4-145. Canaan Computer—Oct 27, 4-6pm, Rm 4-149. Goldman, Sachs & Co—Oct 27, 7-9pm, Rm 4-149. Honeywell, Inc./Job Fair—Oct 28, 10am-4pm, Lobby 13. ESL—Oct 28, 7-9pm, Rm 4-149. Morgan Guaranty/Research Analyst Recruiting—Oct 29, 7:30-9:30pm, Rm 4-149. Pacific Gas & Electric—Oct 29, 7-9pm, Rm 4-149. Intel Corp—Oct 30, 7-9pm, Rm 4-149. The Analytic Science Corporation (TASC)—Mon, Oct 27, 4-6pm, Rm 4-153. Monitor Company/Strategic Consulting—Tues, Oct 28, 7-9pm, Rm 4-153. General Dynamics—Wed, Oct 29, 5-7pm, Rm 4-149. Hercules, Inc.—Sun, Nov 2, 7-9pm, Rm 4-153.

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 MIT chapter of Tau Beta Pi, the Engineering National Honor Fraternity. Also, reduced admission to special exhibits.

Vegetarian Cooking Classes—Bhakti Yoga Society classes and feasts of ancient Indian cuisine, Fri, Oct 24 & 31, Nov 7, 14 & 21, Dec 5, 12 & 19, 5:30pm, Senior House Fasset Lounge. Info: x5-6685 dorm.

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.

Office of Minority Education Open House—The OME has moved from Rm 12-185 to newly renovated facilities in 7-143. The Institute community is invited to view the new office and meet the staff on October 29, 4-6pm.

Attention Students Interested in Law—The 1986 law school will be held in Boston on Fri, Oct 31, noon-7pm and Sat, Nov 1, 10am-3pm, at Plaza Castle Exhibit Hall, Columbus and Arlington Streets. Info: Office of Career Service and Preprofessional Advising, x3-4737, Rm 12-185.

Club Notes

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

MIT Student Center Committee—Do you like band concerts, parties, comedy acts, movies, and good times? Join us Sundays, 7pm, Student Ctr Rm 347 or call x3-3916 for more info.

MIT/DL Bridge Club—Duplicate bridge, Tues, 6:30pm, Student Center 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, 272-8428. Admission: \$1/students, \$2/non-students.

MIT Chess Club—Chess tournaments and informal play, Sats, 1pm, Student Ctr Rm 491. Info: Richard Seitz, x5-8944 dorm or George Yu, x5-8452 dorm.

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 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 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.

Women Graduate Crew—Seeks coxswains and experienced rowers. Info: Sophie Fallou, x3-5483.

MIT Rugby Club—Practices T/Th, 5pm, Briggs Field. New members welcome. Call Jim Boyd (Capt), x3-1817 for info.

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 Wushu-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 Yoga Club—Rejuvenate your mind and body with Kundalini Yoga, the ancient science of awareness. Beginner's classes everyday: M/T/W/F, 5:30-6:30pm, Burton House Dining Hall; Special sessions on effective study techniques to reduce problem set overload. Info: Fred or Jeff, 623-7907 eves.

MIT Wu-Tang Chinese Martial Arts Club—Northern Chinese Kung Fu practice, T/Th, 8pm; Sat, 9am, outside Athletic Ctr. Open to beginners.

MIT Nautical Association—Sailing Pavilion open every day from 9am to sunset until mid-November. Three levels of shore school (beginners') classes offered M & Th, 5:15pm; boardsailing classes, Tues, 5:30pm; racing, Mon, 5:30pm, all levels welcome. Info: x3-4884.

Religious Activities

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

MIT Hillel—Eat in the Sukkah through Oct 24—Bring your own lunch; dinner served by the Kosher Kitchen. **Shabbat for MIT and U-Mass Hillels, Oct 24-25—Oct 24:** Conservative/Reform Service, 5:30pm, Hillel; Orthodox, 5:30pm, Rm 50-010; Shabbat dinner, 6:45pm, Ashdown House DR (call Hillel for reservations); **Oneg—An Evening of Tall and Short Tales**, with storyteller Don Futterman, 8:45pm, Ashdown House DR; **Oct 25:** Orthodox services, 9:05am, Rm 50-010; Holiday lunch, 1pm and Seudah Shlishit, 5pm, both in Kosher Kitchen, Rm 50-007 (call Hillel for reservations). **Simhat Torah—Sat, Oct 25**, Celebrate with other area college students and community, Tremont Street Shul, Central Sq, meet 6pm at rear door of Hillel.

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.

Christian Meditation—Prayer utilizing a mantra, originated with the early desert fathers, dating back to the 3rd century. Sponsored by Tech Catholic Community, Tues, 7pm, MIT Chapel Basement.

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.

Baptist Student Fellowship—Tuesday Celebration, Tues, 6:30-8pm, Rm W-2A. Supper served, \$1.50. **Graduate Students Bible Study**, Wed, 8pm, Rm C-1 Westgate.

United Christian Fellowship—Large group meetings every Fri, 7pm, Student Ctr Mezzanine Lounge. Come and join us for worship, prayer, Biblical teaching, singing and fellowship. Small group studies in dorms at various times. Info: Gail Sadlo, x5-8957 dorm.

Graduate Christian Fellowship—Large Group Meeting, With worship, teaching and fellowship, Thurs, Nov 6, 6:30-8:30pm, Student Ctr Mezzanine Lounge. Also prayer groups and Bible studies. Info: Eric Birghbauer, x3-3027 or 776-4507.

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, 5:45pm, 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: 225-9153.

Graduate Studies

Unless otherwise indicated, contact Dean Jeanne Richard at the Graduate School Office, Rm 3-136, x3-4869 for further information.

The Fannie and John Hertz Foundation Awards. Graduate fellowships to students of outstanding potential in the applied physical sciences. Fellowship may be used at one of 20 institutions, including MIT. Applicants must be US citizens, or have documented proof of intent to acquire it. The proposed field of graduate study must be concerned with applications of the physical sciences to human problems. High previous scholastic performance is expected of all applicants, including at least an A- average during the last two years of undergraduate work. For 1987-88, the fellowships will cover \$7,000 towards tuition and a \$12,500 stipend. It is the student's responsibility to make up the difference between the educational allowance and tuition at MIT. Applications in Rm 3-138. Deadline: Nov 1, 1986.

Winston Churchill Foundation Scholarships. The Churchill Foundation of the US awards nationally 10 scholarships each year to US citizens between the ages of 19 and 26 to pursue one to three years of graduate study in science, engineering or mathematics at Churchill College, Cambridge University, England. Only two candidates can be recommended for this program from MIT. Info: Rm 5-106 by 5pm, Tues, Nov 11, 1986.

Marshall Scholarships. Established by the British government as a gesture of thanks to the US for Marshall Aid, awarded annually to approximately 30 US citizens under the age of 26 for two years of graduate study in any field at British universities. Applications available Rm 5-106, x3-3795. Interviews held by appointment with Prof Alar Toome, Rm 2-371, x3-4326. Submit applications directly to the British Consulate General, 4740 Prudential Tower, Boston, MA 02199.

Rhodes Scholarships. Awarded for two years of study at Oxford University. Applicants must be US citizens between the ages of 18 and 24. The most important requirement of a Rhodes Scholarship is quality of both character and intellect. Further information and applications can be obtained from Prof Eugene B. Skolnikoff, Ctr for International Studies, x3-3140, Rm E38-648.

Luce Fellowships. The Luce Fellows Program provides a year of professional-level activity in an East Asian country for young Americans who have completed their undergraduate work and are under 30 years of age. It is not for Asian specialists. MIT nominees are selected early in the fall. For information contact Prof Eugene B. Skolnikoff, Ctr for International Studies, x3-3140, Rm E38-648.

St. Andrew's Society Scholarships. Scholarship Program of the St. Andrew's Society of The State of NY offers graduate scholarships to American students of Scottish descent to study in any of the universities of Scotland and to, therefore, promote cultural interchange between Scotland and the US. Only one application will be considered from any individual college or university. Each scholarship provides funds up to a total of \$10,000.

ITT International Fellowship Program. A maximum of 25 fellowships are awarded to US university graduates to study abroad in any of 25 countries for one academic year. Candidates submit the standard Fulbright application forms for this award. Additional information available in Rm 5-106.

Fulbright Collaborative Research Grants, 1987-88. Designed for teams of 2-3 graduate students or recent post-doctoral researchers to perform joint research in most countries in the world (except most East European countries, the USSR, and Indochina). There are no restrictions on fields of study. Applicants should check with IIE (Institute of International Education) regarding country availability, prior to applying. Applicants must be US citizens at the time of application, have received the majority of their high school and undergraduate education at US educational institutions and must hold a BA degree or equivalent before the beginning date of the grant. Applicants with a PhD at the time of application may have obtained the degree no earlier than June, 1984. Applicants in medicine must have an MD degree or equivalent (e.g. OD, DDS) at time of application. Applicants are expected to have written and spoken proficiency in the language of the host country. The statement of proposed research submitted by team members may be identical, complementary to, or present a different dimension of the team's research. Also, evidence of affiliation abroad with a host country institution on-going project that will oversee the research must be presented with the application. Grants are normally for 6-10 months and will provide fixed sum awards to each member of the team, in addition to basic health and accident insurance coverage. It is expected that each member of the team will carry out research in one country abroad for a minimum of six months during the same academic year, although all members of the team do not necessarily have to be in the host country concurrently. Applications available Rm 5-106. Deadline: December 1, 1986.

Bell Laboratories Graduate Research Programs for Women: This program provides financial support for outstanding women students pursuing full-time doctoral studies in the following fields: Chemistry, Chemical Engineering, Computer Science, Electrical Engineering, Communications Science, Materials Science, Mathematics, Mechanical Engineering, Operations Research, Physics, and Statistics. The Fellowship Program provides full tuition and fees plus a stipend of \$925/month for the academic year (9 months) plus an allowance for books, fees, and related travel expenses. The Grant Program provides an annual award of \$1,500 which the recipient may use during the following academic year in any way that benefits her professional development. Fellowships and grants will be renewed on a yearly basis for the normal duration of the graduate program provided the student maintains satisfactory progress toward the doctoral degree. Applications must be received by January 15 and all supporting material by January 31, 1987. Three fellowships and six grants are awarded annually in early April for graduate study beginning in September. Applications are usually submitted during the candidates senior year in college. For further information, please contact The Office of the Dean of the Graduate School, Rm 3-138, x3-4860. If you are interested in meeting with two Bell Labs representatives they will be on campus Oct 28. Please call Phyllis Jackson, Office of Career Planning & Placement for an interview.

Massachusetts Graduate Scholarship Grant Program: Funds are available for direct financial assistance to needy graduate students who are US citizens and have been permanent legal residents of Massachusetts for at least two years prior to September 1985. These individuals must also be full-time students enrolled in degree programs requiring at least two years of college work prior to admission. Students who meet the eligibility criteria should file a Financial Need Determination Form with the Student Financial Aid Office (Rm 5-119) if they have not already done so, and then contact Linda Peterson in the Office of the Dean of the Graduate School (3-138) for an application form.

The Josephine de Karman Fellowship Trust has announced the availability of twelve fellowships of \$3,000 each for the regular academic year (9 months). Students in any discipline who are entering their senior undergraduate year or graduate students entering their third year or after of graduate study in the Fall 1987 are eligible to apply. Study must be carried out in the US; tenure is for one academic year, non-renewable. For further information and applications write on or before January 15, 1987 to: Ms. B. J. Brown, Secretary, Josephine de Karman Trust, P.O. Box 446, La Verne, CA 91750.

The Lady David Fellowship Trust—seniors, graduate students, and those who have recently completed doctoral studies in any field are eligible to apply. Fellowships are tenable at the Hebrew University of Jerusalem and the Technion-Israel Institute of Technology, Haifa. Grants cover tuition, travel and living stipends in Israel. Renewal for a second year is possible. Applications are available in Rm 2-138. DEADLINE: Nov 30, 1986.

International Research & Exchanges Board (IREX) announces a program for faculty, postdoctoral researchers, and graduate students in all fields to participate in research exchange with the Countries of East Central and Southeastern Europe and the USSR. To be eligible applicants must have US citizenship; in most cases a full time affiliation with a North American college or university as a member of the faculty, postdoctoral researcher, or advanced doctoral or professional degree candidate; a command of the language of the host country sufficient for research. To find application deadlines and further information for all programs contact: Lillian Whelpley, Rm 4-237, x3-1939.

International Fellowship Awarded by the American Association of University Women: Approximately 60 fellowships are awarded for one year's graduate study or advanced research at a United States institution for women who are citizens in countries other than the US. (Six awards for advanced research in any country other than the Fellow's own, for women who are members in their own country of National Associations affiliated with the International Federation of University Women, are also available). PERIOD OF AWARD: 9 months beginning September 1987 and are not renewable. AWARD: \$10,000 -travel and research costs are not covered. DEADLINE FOR REQUESTING APPLICATIONS: Nov 15, 1986. For further information, please contact The Office of the Dean of the Graduate School, Rm 3-138, x3-4860.

The National Science Foundation award 3-year graUate fellowships for study leading to master's or doctoral degrees in the mathematical, physical, biological, engineering and social sciences, and in the history and philosophy of science. The fellowships provide a cost-of-education allowance in lieu of tuition and required fees, plus a stipend of \$925 per month. Applicants must be US citizens or nationals at the time of application and must not have completed postbaccalaureate study in excess of 20 semester hours in any field of science, engineering, social science or mathematics. Scores of GRE's taken since October 1, 1984 are required. Pre-applications for both the graduate fellowships and the minority fellowships are available in the Office of the Dean of the Graduate School, Rm 3-138. Application deadline is Nov 14, 1986.

Fellowships Awarded by the American Association of University Women: Dissertation Fellowship: Available to women who will have completed all course requirements and examinations for the doctorate degree except the dissertation by Dec 31, 1986 and whose degree will be received by the end of the fellowship year. Applicants must be US citizens or hold permanent resident status. PERIOD OF AWARD: 12 months beginning July 1, 1987. AWARDS: \$10,000. DEADLINE: Nov 15, 1986.

For American Women in Selected Professions: These fellowships assist women in their final year of professional training in the fields of law, dentistry, medicine, veterinary medicine, and architecture or their final year of a 2-year Master's in Business Administration (MBA program). PERIOD OF AWARD: 9 months beginning Sept, 1987. AWARDS: \$3,500-9,000. DEADLINE: Dec 1, 1986 (Feb 1, 1987 for MBA applicants).

Postdoctoral Fellowships: For postdoctoral research for women who hold the doctorate at the time of application.

Applicants must be US citizens or hold permanent resident status. Funds may not be used for research equipment, publications costs, travel grants, or tuition for further course work. PERIOD OF AWARD: 12 months beginning July 1, 1987. AWARDS: UP to \$15,000 and one Founders Fellowship of \$20,000. DEADLINE: Dec 1, 1986. For further information on all of the above, contact The Office of the Dean of the Graduate School, Rm 3-138, x3-4860.

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.

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 internships:

Internships Offering a Stipend:

Student Jobs

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

Off Campus: Technical

Japanese-speaking person who is familiar with NEC computers (Japanese version) needed to translate the technical of a manual. Total hours and wage are negotiable. Contact: Shohachi Arai, Instron Corp, 100 Royall Street, Canton, MA 02021, 828-2500, ext. 402.

Students needed to work on object-oriented data base in a cluster environment for an on-line transactional processing system. "C" language required, VAX/VMS knowledge desired. Data base experience is a plus. Work 20-40 hrs/wk at \$10-15/hr, depending on experience. Contact: Denise Dorgan, Saddlebrook Corporation, 101 Main Street (convenient Kendall Square location), Cambridge 02139, 661-8100, ext 609.

Programmer for IBM-BC in "C BASIC". Experience required. Hours are part-time, flexible, and wage is negotiable. Send resume or call: Karen Farrelle, Union International Systems, 1372 Hancock Street, Suite 302, Quincy, MA 02169, 770-3800.

Programmer/engineer needed to work on automated DNA sequencing devices. Should have strong background in VAX/VMS and FORTRAN or "C". Some knowledge of image processing, graphics, device drivers, robotics, and molecular biology would also be helpful. Hours are flexible, and wage is negotiable. Contact: George Church, Dept of Genetics, Harvard Medical School, 732-7561.

Programmer needed for development of graphic system. Good programming and mathematical skills desired. Work 12-15 hrs/wk, wage negotiable with experience. Contact Martin Schatzoff, APL Programming (located at the IBM Cambridge Scientific Center) 101 Main Street, Cambridge, 02142, 576-9235.

Good MS-PASCAL/Assembler and Lotus add-in programmer. Work part-time, and earn at least \$15/hr. Contact Tom Turner, leave message at 286-2997 or dial/login to MIT BBS 258-7784.

UROF

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.

Brain Neurotransmitter Activity Project. Project aims at determining whether neurotransmitter metabolites in the blood can provide reliable indices of Central Nervous System neurotransmitter release, first in experimental animals and then in human subjects. UROPer will be exposed to various aspects of neuroscience: neurochemistry, neuropharmacology and neurosurgery. MIT faculty supervisor: Prof Richard J. Wurtman, MD. Contact: Tony Nader, MD, x3-6732, Rm E25-604.

Violence and Public Health. Positions available working on a statewide conference and research project addressing violence as a public health issue. The project will look at the epidemiology of assault and homicide in Massachusetts, with particular emphasis on violence between family members, friends, and acquaintances. The purpose of the project is to develop strategies for the prevention of interpersonal violence. Work includes: research of model preventive programs and policies, data collection and analysis, workshop planning. Contact: Jane Sherwin, x3-5049, UROP Office, Rm 20B-141.

Clinical Research Center. Coordinate collection of clinical data from several on-going research protocols involving an investigational new drug. Responsibilities will be to set up and maintain a data base on a micro and/or minicomputer (DEC MicroVax) and generate reports in format required by pharmaceutical company and federal agencies. Will require regular hours, working with several investigators, and commitment of at least one year. Working knowledge of Lotus 1-2-3 or Symphony, dBASE III, RBASE 5000 or similar software preferred. 10-15 hours per week. Pay. Send resume with description of computer experience. Faculty supervisor and contact: Robert Hoerr, Rm E18-445.

Nuclear Engineering. Failure of a bearing in a piece of rotating machinery can progress to a situation which results in major damage to the machinery. If the problem were discovered early enough to allow for motor shutdown, the cost of the repair would be relatively small and the required downtime would be reduced greatly. Various methods have been proposed for obtaining the required early warning. This project involves the measurement of the electrical resistance of the piece of rotating machinery under test between the rotating shaft and the housing. Faculty supervisor and contact: Richard Lyon, x3-2214, Rm 3-366.

Cardiac Electrophysiology Laboratories. At Massachusetts General Hospital. Research into the mechanisms of fatal cardiac rhythm disturbances, and their treatment. Projects include: computer mapping of cardiac electrical activity; signal averaging-high frequency electrocardiography; computer graphics and representation of the cardiac process; biomedical instrumentation and materials engineering for cardiac electrophysiology. Credit or pay. Contact: Jane Sherwin, UROP Office, x3-5049, Rm 20B-141.

(continued on page 11)

TECH TALK



October 22, 1986
Volume 31 Number 11

Tech Talk is published 35 times a year by the News Office, Massachusetts Institute of Technology. Director: Kenneth D. Campbell; Associate Director: Robert C. Di Iorio; Assistant Directors: China Altman, Charles H. Ball, Joanne Miller, Tech Talk editor; Staff Writer: Paulette Boudreaux, Tech Talk assistant editor; Reporter: Lynn Heinemann (Institute Calendar, Classified Ads, Institute Notices).

Address news and editorial comment to MIT News Office, Room 5-111, MIT, Cambridge, MA 02139. Telephone (617) 253-2701.

Mail subscriptions are \$18 per year by first class mail. Checks should be made payable to MIT and mailed to Business Manager, Room 5-113, MIT, Cambridge, MA 02139.



Michael Villalba, a graduate student in aeronautics and astronautics, feeds a morsel to one of MIT's ubiquitous squirrels. —Photo by L. Barry Hetherington

RLE to mark 40th anniversary

The Research Laboratory of Electronics, MIT's oldest interdisciplinary lab, will celebrate its 40th anniversary on Friday, Oct. 31, with a day-long symposium on "Future Directions in Electronics." The event will be held in Rm 34-101, the Edgerton Lecture Hall.

Professor Jonathan Allen, director of the RLE, has invited the MIT community to

5-College Symphony to play here Tuesday

An orchestra made up of student musicians from five colleges in the Amherst, Massachusetts, area will give a special free concert in Kresge Auditorium Tuesday, Oct. 28, at 8:30pm.

Pianist Gary Steigerwalt, an active recitalist and chamber musician in this country and in Europe, will be soloist in Liszt's Piano Concerto No. 1 in E-flat.

Steigerwalt was the first American to receive a prize at the prestigious Liszt-Bartok Piano Competition in Budapest where he placed second in 1976. A graduate of Juilliard and faculty member at Mount Holyoke College, he has recorded the piano concertos of William Schuman and Walter Piston and solo works of Johannes Brahms, as well as two albums of solo works by Ruth Schontal.

The Orchestra is conducted by Dennis Burkh, its musical director since 1982. Made up of students from Amherst, Smith, Mount Holyoke and Hampshire Colleges and the University of Massachusetts, it plays at all five campuses and in the western Massachusetts area during its busy concert season.

In addition to his activities in Amherst, Mr. Burkh makes frequent appearances with European orchestras such as the BBC of London and the Prague Symphony.

The program will begin with Bohuslav Martinu's Sextet for String Orchestra, composed and arranged by the composer in 1932. It was received with enthusiasm by European and American audiences and was subsequently awarded the Elizabeth Sprague Coolidge Prize.

Completing the program will be Schumann's Symphony No. 2 in C, Op. 61.

attend the symposium. The speakers will include eight RLE faculty members and two guests—Ralph E. Gomory, IBM senior vice president and chief scientist, and David Packard, chairman of Hewlett-Packard Corp.

The faculty members who will speak and their subjects are: Professors Henry I. Smith, submicron structures technology and future electronics; Patrick Lee, quantum transport and fluctuations in small devices; Alan V. Oppenheim, signal processing and representation; Kenneth N. Stevens, understanding the links between language, speech and hearing; Bernard F. Burke, radio astronomy; Bruno Coppi, space physics and fusion research; Daniel Kleppner, atomic physics and the frontiers of high precision, and Erich P. Ippen, high-speed optics.

Professor Allen, Professor John M. Deutch, MIT provost, and Professor Kenneth A. Smith, associate provost and vice president for research, will open the symposium at 8:30am with words of welcome. The symposium will conclude at 5pm.

The RLE was established in 1946, a year after World War II ended. Its original mission—to encourage interactions between the Department of Electrical Engineering and the Department of Physics—has broadened to include projects involving participants from several academic departments. The RLE has two major research thrusts focused on electronics and optics, and the area of language, speech and hearing. In addition, there are seven smaller focus groups: atomic, molecular and optical physics; plasma physics; radio astronomy; digital signal processing; image processing; electromagnetic propagation, and communications. Professor Allen, noted for his research and teaching in the areas of speech processing, computational linguistics, computer architecture and integrated electronics, has been director since 1981.

About 60 faculty members work together with several hundred students and research staff at the RLE. Almost half of the lab's participants are from the Department of Electrical Engineering and Computer Science. Also represented are the Departments of Physics, Materials Science and Engineering, Chemistry, Nuclear Engineering and Linguistics.

Two at Sloan named to chairs

Dean Abraham J. Siegel has announced the appointments of two faculty members at the Sloan School of Management to two newly established professorships.

—Dr. John C. Cox has been named to the Nomura Professorship of Finance, endowed at the Sloan School by The Nomura Securities Co., Ltd., of Tokyo, Japan.

—Dr. Robert M. Freund has been named as the first three-year term occupant of the Elisha Gray II Career Development Chair, newly endowed at MIT and centrally administered by the provost. This chair was established by Elisha "Bud" Gray, former chairman of the Whirlpool Corporation, a 1928 MIT graduate in business and engineering administration, a former member both of the Sloan School's Visiting Committee and the MIT Corporation, and an MIT benefactor for many years.

Dean Siegel said that Professor Cox is recognized as "a brilliant and meticulous scholar" who is "consistently ranked as the best financial economist of his cohort and surely one of the top finance people in the world."

"With an excellent background in mathematics, a creative grasp of finance theory, a well of technical ability, an intuition for selecting interesting yet amenable problems, his truly creative insight already has produced work of exceptional import," he added.

Professor Cox's principal work has been in two areas. The first has to do with the development and application of equilibrium models which integrate real and financial variables, including studies of term structure of interest rates. The second focuses on contingent claim valuation theory, especially option pricing. More recently, he has done important work in intertemporal consumption and portfolio theory.

His recent coauthored book on *Options Markets* has become a standard text at many business schools.

Professor Cox received his BA degree at Louisiana State University in 1965 and his PhD from the University of Pennsylvania in 1975.

He taught at the University of Pennsylvania, the University of Wisconsin at



Dr. Freund

Dr. Cox

Madison, at Stanford University and as a visiting faculty member at MIT before joining the Sloan School faculty in 1983 as an associate professor of finance. He subsequently was promoted to professor.

Dean Siegel said the phrase that perhaps best characterizes the work of Professor Freund is "balanced excellence," meaning "excellence in scholarly research and in teaching."

His research interests have evolved from an initial focus on fixed-point theory to a broader domain of research problems in mathematical programming—both theoretical and applied. The theoretic problems he has worked on include methodological domains such as linear and quadratic programming, nonlinear duality theory and convex analysis. The application domains include problems in production planning, capacity expansion and flexible manufacturing investment planning.

Professor Freund received his BA degree from Princeton University in 1975, and both his MS and PhD from Stanford University in 1979 and 1980.

Trained in operations research at Stanford, he served several years as a senior associate with a Washington, D.C., firm before joining the Sloan faculty in 1983 as an assistant professor of management science.

He has been active in MIT's Operations Research Center and in a variety of professional activities.

IAP via Athena

As the deadline for IAP Guide listings approaches, the IAP Office and Project Athena remind the MIT community that the activity listing form is available on Athena to both account holders and non-account holders.

Use of the Athena form, an improved, easy-to-use version of last year's model, will ensure that listings are published more accurately and efficiently. A copy of the completed listing is sent directly to the IAP Office and to the proper coordinator, when appropriate.

For detailed instructions, consult your coordinator, or contact the IAP Office, x3-1668. The deadline for all listings is Thursday, October 30.

Halloween concert to be Wednesday

Imagine the ingredients for a fantasy Halloween concert: It would have costumes, strange and wonderful music; it would be where you would never expect it; it would last for only one hour, and it would be free!

All these are characteristics of the annual Halloween concert of the MIT Concert Band. From six to seven pm on Wednesday, Oct. 29, MIT student musicians will play music chosen for sound effect potential in the unusual acoustics of high-domed Lobby Seven.

All 80 musicians will be dressed in Halloween costumes of their choice or making. Informal seating will be on the floor of the Lobby and of the two tiers of balconies. An invitation is extended to the public and to the entire MIT community—especially to children and their adults.

The MIT Concert Band, made up entirely of wind instruments and percussion, has been conducted since 1948 by John D. Corley, Jr., lecturer in music. It has been known since 1953 for its performance and commissionings of new works.

The program includes mostly music written in this century. Among them are works from three contemporary composers: Suite from The Social Beaver by MIT alum Andrew Kazdin '63, Dance of Black-Haired Mountain Storm by Alan Hovhaness (b. 1911), and St. Lawrence Suite by Morton Gould (b. 1913). Also: *Ye Banks and Braes* by Percy Grainger (1882-1961), Fanfare

MIT Press Bauhaus books shown at BPL

Several MIT Press publications are being featured in an exhibit at the Boston Public Library as part of "Bauhaus Boston," a collaborative multi-institutional series featuring a concert, symposia, exhibits, films, lectures, tours and discussions on the seminal influence of Bauhaus design, education, philosophy and ideals.

The Bauhaus was a design and architecture school started in Germany in 1919 and closed in 1933. It has been the most important influence on all phases of design in this century.

The MIT Press has been the major English language publisher of books on the Bauhaus since 1969 when it first published Hans Wingler's definitive book, *Bauhaus: Weimar, Dessau, Berlin, Chicago*. At that time Hilton Kramer, writing for the New York Times, said it was, "One of the essential documents for understanding the modern era. Certainly no institution has influenced contemporary art, architecture and design more than the Bauhaus. The book is a collection of some 200 documents, materials for the institute's history—manifestos and speeches by such luminaries as Gropius, Moholy-Nagy, Kandinsky, Klee and Mies van der Rohe, articles, faculty and students memorandum—as well as some 800 black and white illustrations of work in the Bauhaus spirit."

Other Press books on display at the Boston Public Library include *Bauhaus Photography*, Herbert Bayer: *The Complete Work*, *Pioneers of Modern Topography* and *Mies van der Rohe: The Villas and Country Houses*.

The exhibit, in the Boston Room, 666 Boylston Street, Boston, runs now through Friday, Oct. 31. It is free and open to the public. For more information on the MIT Press Bauhaus books, call 253-5643.

The entire "Bauhaus Boston" was organized by the Goethe Institute, Boston and the MIT Museum. For more information call 262-6050.

from La Peri by Paul Dukas (1865-1935), Chorale and Alleluia by Howard Hanson (1896-1981), Original Suite by Gordon Jacob (1895-1984), and Canzon per Quarta Toni by Giovanni Gabrieli (1557-1612).

Magnetic resonance imaging and spectroscopy

A Revolutionary New Tool for Medical and Biological Research

(This article by David R. Lampe originally appeared in the September issue of *The MIT Report*, a journal of research and educational developments published by the Industrial Liaison Program. To receive a copy of the magazine, call x3-2691.)

By DAVID R. LAMPE
Editor, *The MIT Report*

Being unable to see exactly what goes on inside a living body makes it much harder not only to understand how the body works, but also to diagnose its many ills. X-rays, discovered in 1895 by German physicist Wilhelm Roentgen, revolutionized the practice of medicine by offering a way to look into a body without cutting it open. But the view that x-rays provide is a cloudy one at best. While they can show the bone structure with remarkable detail, the softer tissues of the organs, muscles, and nerves don't show up well. Moreover, over-exposure to X-rays can be harmful.

Now, a new imaging technology is emerging that may have an even greater impact on the study and practice of medicine and biology than X-rays have. Called magnetic resonance imaging, the technique can produce extraordinary pictures of the details of soft living tissue with unprecedented clarity, and at no risk to the patient. And in addition to visual images, it can also be used for in vivo chemical spectroscopy, providing researchers with "snapshots" of biochemical changes in the body. These techniques hold great promise for applications to the diagnosis of disease and for following the course of therapy in a variety of ailments.

At MIT's new Magnetic Resonance Facility, researchers are collaborating with industry in a multimillion dollar project to build a new generation of advanced magnetic resonance imaging systems. They are also collaborating across disciplinary lines to develop a new mode of performing biological and medical research that involves biologists, neurologists, physicists, physicians, engineers, and computer scientists. A series of recently completed imaging devices takes advantage of innovations in electronics, superconducting magnet technology, electronics, computers, software, and graphics to produce clear images of any part of the body in minutes.

Working with investigators from several departments at MIT as well as the Boston area medical community, researchers are now beginning to explore the potential of the enhanced technology to shed light on such diverse areas as Alzheimer's disease, diabetes, neurobiology, and cancer. "With this technology, we can study anatomy without scalpels, and biochemistry without biopsies," explains Dr. Leo Neuringer, a physicist and leader of the 20-person team which designed and built the new systems.

Physicists discovered magnetic resonance about 40 years ago. They found that when placed in a static magnetic field, certain atomic nuclei—such as hydrogen, carbon, and nitrogen—will re-emit absorbed energy at a characteristic resonant frequency when excited by radio frequency radiation. This happens in much the same way that a bell re-radiates as sound some of the energy input by a blow from its clapper.

Moreover, investigators found that the resonant frequency of a particular nucleus will shift predictably in the presence of other atoms—as in a chemical compound—producing a chemical "fingerprint." Thus,

by tuning the detector to respond to a range of frequencies, it is possible to identify not only the various elements in a sample, but also specific compounds. This technique, called nuclear magnetic resonance spectroscopy, has long been an important tool in chemical and biochemical analysis. MIT's Francis Bitter National Magnet Laboratory, for example, has operated a high-field nuclear magnetic resonance facility for biomolecular research for more than a decade.

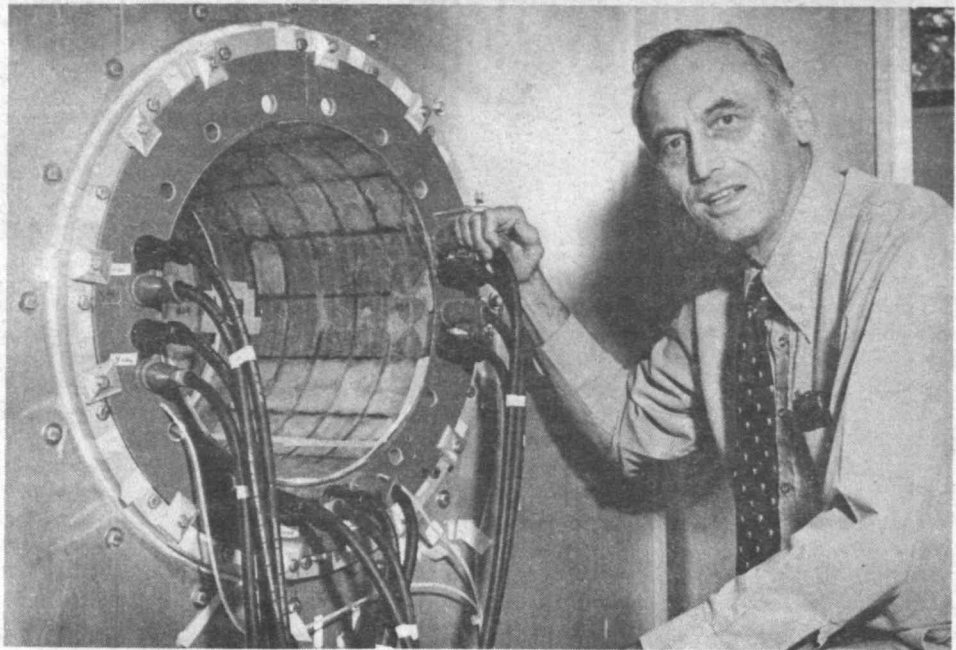
To produce an image of a particular cross-section or three-dimensional volume requires some way to extract spatial information from the detected signal. Scientists and engineers took advantage of the fact that the characteristic resonant frequency of a nucleus varies in direct proportion to the strength of the applied magnetic field. By setting up a gradient magnetic field which varies linearly in space, it is possible to define uniquely the field strength at each point in a certain volume. A hydrogen nucleus in such a gradient field, for example, would then have a different resonant frequency depending on where it was in space. Typically, researchers choose to detect hydrogen nuclei when producing images of human bodies because they are the most abundant nuclei in human tissue and because they have the highest sensitivity for detection.

Medical applications of this imaging technology first appeared in the early 1970s. Commercial interest grew steadily through the decade because of the clear advantages it could offer, including spatial resolution comparable to, and perhaps exceeding, that of x-rays; better soft tissue discrimination; biochemical information; and harmless and painless operation.

Seeing the extraordinary promise of the technology to the scientific and medical community as well as the significant technological challenges that remained to be overcome to realize its full potential, MIT's Whitaker College of Health Sciences, Technology, and Management joined forces with the Francis Bitter National Magnet Laboratory to form the Magnetic Resonance Facility in 1982. These two interdisciplinary divisions of the Institute brought together the perspectives of the diverse fields of physics, chemistry, biochemistry, neurobiology, computer science, medicine, and electrical engineering to develop the basic technology and methodology of magnetic resonance and to apply them to the study of human biology and disease.

A major focus of the Facility since 1982 has been to overcome some of the technical barriers to producing sharper images. One objective was to figure out how to produce a magnetic field in the bore of the magnet—where the patient lies—at least ten times more homogeneous than in existing systems. Researchers met this goal by using a combination of electric shim coils, ferromagnetic shimming, and careful quality control during magnet construction.

Another problem was that when a current pulse is applied to a gradient coil, the changing field due to the coil induces eddy currents in any surrounding conducting media. These eddy currents cause heating in the cryogenic components—thereby increasing cryogen boil-off—and they interact with any superconducting coils in the system, causing background field and shim field decay. Worse, however, from the



Dr. Leo Neuringer, program director of the Magnetic Resonance Facility, shows the cables which supply the power to drive the actively shielded pulse gradient coil system in one of the prototype imaging systems at the Facility. This device consumes about one kilowatt of electrical power during normal operation. —Photo by Paula M. Lerner

standpoint of imaging, the eddy currents create time-varying fields which are superimposed on the gradient fields. The superimposed fields perturb the pulse gradient coil fields temporally and spatially, adversely affecting the spatial encoding of information and degrading the quality of the image. To overcome these problems, the MIT team developed a novel pulse gradient coil system which is unique in its ability to eliminate eddy currents.

These advances, and others, have been incorporated in three prototype imaging/spectroscopy systems built at MIT through a collaboration between the IBM Corporation and the Institute. Scientists and engineers from IBM and MIT have worked side by side for four years in designing and building these systems. Two systems have chambers with a diameter of 120 centimeters—large enough to accommodate an entire human body—and the third has a diameter of 60 cm for head imaging. They generate magnetic fields of up to 1.5 tesla—30,000 times stronger than the earth's magnetic field. Two of the systems will be located Brigham and Women's Hospital in Boston, and the third will remain at the Magnetic Resonance Facility.

Medical investigators will have access to other MRI systems at the MIT Facility as well. Siemens, Digital Equipment Corporation, and Analogic Corporation have donated a Siemens Magnetom whole-body 1.0 tesla imaging/spectroscopic system. The facility will also house an imaging/spectroscopic system with a 4.7 tesla, 40 cm bore magnet for animal studies, obtained with support from the National Institutes of Health and the Naval Blood Research Laboratory. Plans also call for a central host computer system with three gigabytes of mass storage, an array processor, and color display to serve as the heart of a distributed data processing network for linking the imaging units and for analyzing images off-line. The computer system will also be linked to the image processing facility at MIT's Whitaker College, which has a true three-dimensional display.

All of this equipment is housed in a new 11,000 square foot laboratory on the northwestern edge of the MIT campus specially designed for magnetic resonance imaging and spectroscopy. It contains large, "mag-

netically clean" scan rooms for the spectrometers. To avoid degradation of the all-important homogeneity of the magnetic field, the supporting beams for these scan rooms are wooden and contain no iron nails. In addition, the Facility has an array of shops, animal laboratories, offices, conference rooms, and patient facilities.

One of the main goals of the Facility is to serve as a resource to the Boston medical/academic community, providing students, postdoctoral fellows, and medical investigators with training in the use of the technology. Researchers at the facility will be able to pursue long-term basic research goals, developing and improving the methodology of magnetic resonance imaging and spectroscopy as well as investigating new areas of application. The MIT Facility is unique in that it is the only such center in the country where important biological, medical, and methodological research can be performed in an atmosphere free of the pressures of a clinical environment. This feature has helped attract many of the distinguished researchers who have proposed work there.

As the Facility enters into the research phase, interest in the new technology among the local research community is intense. Investigators have already proposed at least twenty projects aimed at using the technique to study such diverse areas as schizophrenia, tumors in the eye, clinical neurology and neurosurgery, muscle energy metabolism, perfusion, Parkinson's disease, and the body's response to chemotherapy. According to Dr. Neuringer, the potential of this versatile technique cuts across many fields and disciplines, and it is likely that there are many applications that no one has even thought of yet.

The Whitaker College, with its current emphasis on brain sciences, will provide an interface with the medical community and coordinate the education and training of students. Several faculty investigators from the College are key to the project. The National Magnet Lab will furnish a resident core of magnetic resonance experimentalists who will develop and implement the methodology, aid medical researchers in their research, and maintain and enhance the technology. As Dr. Neuringer says, "We want to stay always at the leading edge."

Comptroller lists staff promotions

MIT Comptroller Philip J. Keohan recently announced several personnel changes within the Comptroller's Accounting Office.

The changes include promotions, retirements and transfers. They are:

—Senior Accounting Officer Laurence J. Connelly, promoted to Assistant to the Comptroller. In addition to his present responsibilities he will assume overall control of computation systems and development in the the account reporting system. He will also direct Travel Accounting and its related systems.

—Assistant Accounting Officer Alan E. Harrington, promoted to Accounting Officer with responsibility for Accounts Payable processing.

—Assistant Accounting Officer Mary Ann Donofrio, promoted to Accounting Officer responsible for computation input and control. She will play a substantial role in

the development of the account reporting system.

—Assistant Accounting Officer Robert M. Slauzis, promoted to Accounting Officer with the day-to-day responsibility for Travel Accounting.

—Assistant Accounting Officer Paul J. Arsenault, promoted to Accounting Officer in the Sponsored Accounting Group.

—Senior Staff Accountant Demetri A. Karageorge, promoted to Assistant Accounting Officer in the Sponsored Accounting Group.

—Assistant Accounting Officer Stephen J. Gorman, promoted to Accounting Officer responsible for Investment Accounting.

—Assistant Comptroller William J. Duggan, has transferred to the Energy Laboratory as its business manager.

—Accounting Officer Dorothy R. Latsey, transferred to the Treasurer's Office.

—Assistant Comptroller Richard A. May, who plans to retire after 27 years with the Institute.

—Accounting Officer Roberta F. Burns, who has retired after 33 years at MIT.

Catholic community welcomes new priest

The Tech Catholic Community has a new spiritual leader and MIT has a new religious counselor.



He is the Rev. Bernard J. Campbell, a member of the Paulist Fathers. Father Campbell succeeds the Rev. Robert O'Donnell, also a Paulist, who has taken a new post in Washington, D.C. The Paulist Fathers, the first order of priests founded in America, have been at MIT since 1945.

Father Campbell, 44, who was born in New York City and raised in the Bronx, attended Holy Cross College, Worcester, from 1959 to 1961 when he entered the Paulist Fathers' Novitiate. He holds the AB in philosophy and the MA in theology from St. Paul's College. He has spent the

last eight years in campus ministry, seven at the University of California, San Diego, and a sabbatical year at UCal-Berkeley.

"I am delighted to be here," he said. "I thoroughly enjoy the university environment. I relish the opportunity to be with women and men engaged in the educational enterprise. I look forward to praying with, nurturing and being nurtured by the Catholic community at MIT. I hope the result of all of our encounters, liturgical, educational and social, will be a certain holy restlessness that is concerned with justice for the human family both on campus and throughout the world.

"Can we rejoice if the young leave our campuses with the wondrous technical training that the world so desperately needs and yet they leave with the fundamental confusion that justice is spelled 'just us?' I hope that holy restlessness energized with others (consciously religious or not) will help me/us to be good spellers—good men and women," Father Campbell said.



Another milestone was reached in MIT's Project Daedalus when the Michelob Light Eagle, right, was shown publicly for the first time at a press conference October 15 at Hanscom Field and Lois McCallin, above, was introduced as a leading candidate to pilot the human-powered aircraft in a record-attempting flight scheduled for January in California. Ms. McCallin, a 29-year-old triathlete and pilot, is shown demonstrating a training machine. The aircraft, driven by pedal power, will attempt a 30-mile flight of about two hours to exceed the current distance record of 22.5 miles. This would be the forerunner to a planned 69-mile flight next year in a nearly identical aircraft from Crete to the Greek mainland, recreating the legend of Daedalus. It was disclosed at the press conference that the Michelob Light Eagle, which has a wingspan of 102 feet and weighs under 90 pounds, had successfully completed its first test flights.

—Photos by L. Barry Hetherington

High pulsed magnetic field reached

By ROBERT C. Di IORIO
Staff Writer

A substantial increase in pulsed magnetic fields has been achieved by Dr. Simon Foner at MIT's Francis Bitter National Magnet Laboratory using newly developed high-strength materials.

The magnets provide a relatively inexpensive and efficient research tool for studying the electronic and magnetic properties of metals, semiconductors, superconductors and magnets.

Dr. Foner, chief scientist at the Bitter National Magnet Laboratory and senior research scientist in the Department of Physics, is directing the research program funded by the National Science Foundation.

Using an ultra-strong, metal-matrix, microcomposite copper-niobium wire for the magnet winding, he has achieved fields of 68 tesla, more than one million times the earth's magnetic field, for 5.6 thousandths of a second. (The tesla is an international unit of magnetic flux density equal to about 20,000 times the earth's magnetic field.)

Sunday concerts: Brass Ensemble, Chamber Chorus

Forty student musicians will perform two free concerts in separate places at 3:30 this Sunday (Oct. 26). In the MIT Chapel will be the 26 voices of the MIT Chamber Chorus while 10-250, also known as Huntington Hall, will resound to the 14 musicians of the MIT Brass Ensemble.

Both groups are known for their directors. Affiliated artist Richard Given, conductor of the Brass, has just returned from a year's leave of absence in which he was on tour with *42nd Street*.

John Oliver, director of the MIT Choral Society and senior lecturer in music, has been described in the Boston Globe as one of the great choral leaders of this country. He founded the Chamber Chorus last spring through auditionings of student members of the Choral Society. It is the newest of MIT's 14 music performing groups.

The Brass Ensemble will offer a 45 minute program of varied selections and arrangements of music ranging from the 16th to the 20th century. These include the works of Goldsmith, who wrote the theme from Star Trek, and composers Gabrieli, Prokofiev, Shostakovich, Nelhybel, Joplin, Cheetham, Stoltzer, and Tull Premru.

Trumpeteer Richard Berg '89 is president of the Brass Ensemble while graduate student Doug Carlson, a tuba player, is properties manager.

MIT senior Joyce Y. Wong will play a special violoncello part in the Chamber Chorus' version of Monteverdi's *Messa A Quattro Voci Da Cappella*. Other special voice solos will be sung by soprano Chinny Yue, also a senior; and by three members of the junior class: baritone Michael Prichard, mezzo soprano Deborah Lerner, and tenor Theodore Leung. The program will include works of Orlando di Lasso, Igor Stravinsky, Claude Debussy, Robert Vaughan Williams and Hugh Robertson.

The wire is composed of millions of sub-micron (less than one millionth of an inch in cross section) filaments of copper separated by and bonded to submicron niobium filaments. Forces above 50 tesla destroy copper-wound solenoids, even when reinforced with hardened steel.

Professor Peter A. Wolff, director of the Francis Bitter laboratory, termed the work "a breakthrough in generating very high pulsed magnetic fields."

Dr. Foner's work is significant because the study of important classes of materials—semiconductor superlattices and high field superconductors—requires fields exceeding those produced by direct-current magnets. The magnet laboratory holds the record for direct current magnetic fields—33.4 tesla.

To achieve pulsed fields of above 50 tesla, scientists have had to resort to elaborate, high-resistance, machined coils driven by high-voltage capacitor banks.

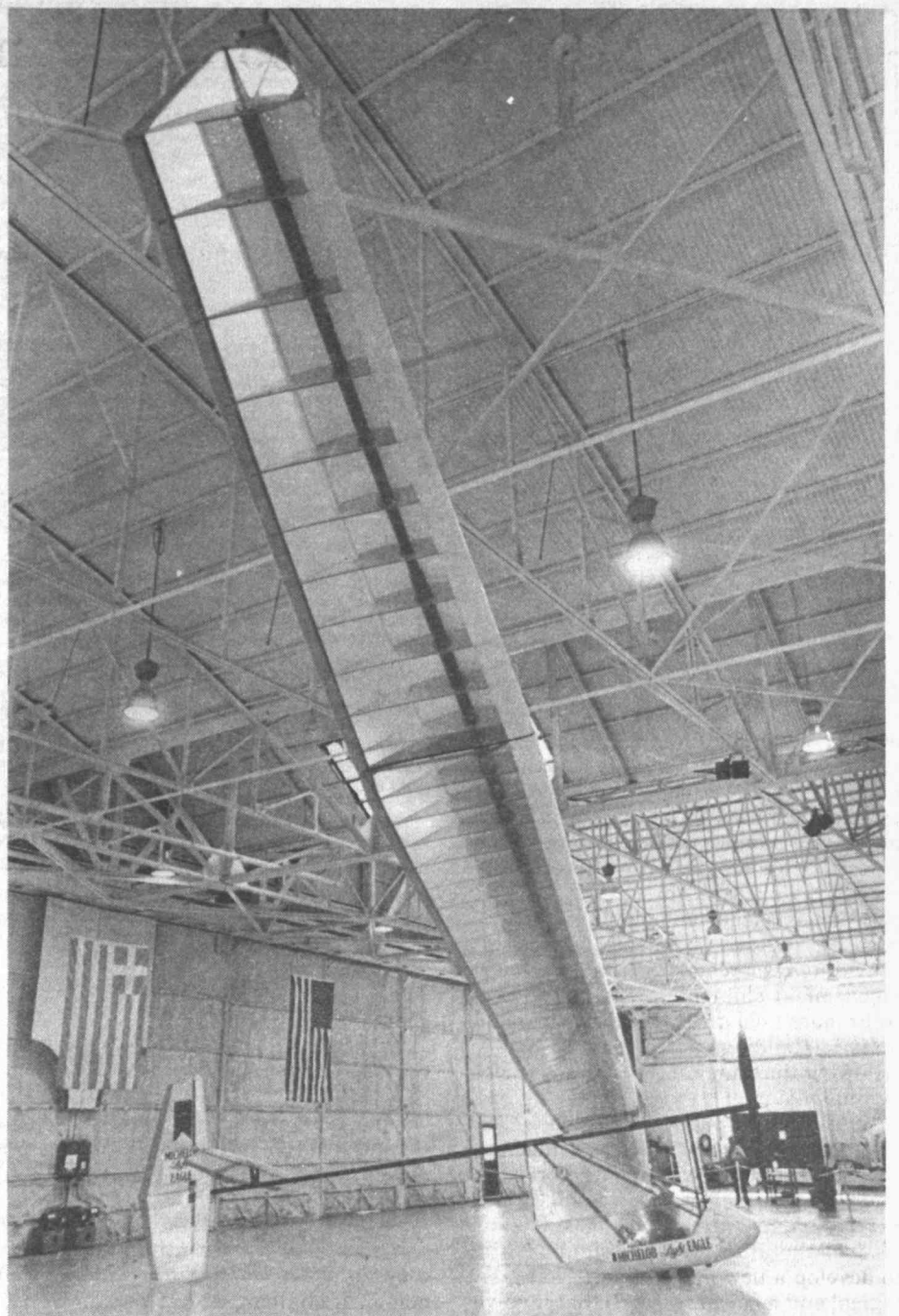
Dr. Foner developed the wire-wound coil technology with copper wire to achieve 50 tesla. The present work extends the field range attainable with the wire-wound coil technology to at least 68 tesla. This work suggests that energy-efficient, 75-tesla pulsed-field systems, with pulse lengths nearly 100 times longer than those currently attainable with machined coils, can be economically built with this new materials technology.

The new microcomposite wire was developed by Supercon, Inc., of Shrewsbury, Mass.

"As the manufacturing technology is developed," Dr. Foner said, "these microcomposites will find practical applications in many large-scale devices, including fusion machines, advanced dc magnet structures, rocket engines, high-pressure vessels, electrical contacts, and others which require conductors with low electrical resistance combined with high mechanical strength and high thermal conductivity."

The microcomposite was originally developed on a laboratory scale with both basic and applied research funds as an alternative approach for fabrication of high-performance, high-field superconductors. MIT researchers are now using the novel features of this material in a non superconducting state for other technologies. The development has been cited as a classical example of how basic research in one area is has led to a significant advance in another.

The Magnet Laboratory is a multidisciplinary laboratory where researchers have been involved in both the basic and the applied aspects of these microcomposites as superconductors as well as in the development of high magnetic fields. Dr. Foner said that the direct involvement of a local industry, Supercon, Inc., was essential in extending the superconducting materials fabrication technology to large-scale conductor fabrication. He expects the new materials will change the directions of high-field technology. "For example, we plan to build an advanced pulsed field facility at the National Magnet Laboratory using these copper niobium microcomposite conductors in the near future."



Committee to review arts at MIT

(continued from page 1)

creative arts is part of a major reappraisal of MIT's undergraduate program. That reassessment has as a goal the creation of a new educational program based on a better balanced, more integrated approach to science, technology, humanities and the arts. "It is therefore a particularly auspicious time to evaluate what we are—and could be—providing in the way of opportunities for doing, studying and observing the arts at MIT," he wrote in his letter. "I hope you will come up with imaginative proposals that are especially suited to the special environment and strengths of this university."

The programs and organizations to be reviewed by the group include ones in the School of Humanities and Social Sciences in drama, dance, and music; programs in the School of Architecture and Planning including art history and visual studies, relevant archives in the media arts and the Center for Advanced Visual Studies; the Committee on the Visual Arts and the List Visual Arts Center; the Council for the Arts at MIT; the MIT Museum; and MIT's relationship to the Wellesley College programs in the arts.

"The committee also will be evaluating the arts acquisition policies and responsibilities and will be assessing the need for additional facilities on campus," said Professor Joskow.

"This is a very exciting undertaking," he said. "The range of activities in the creative arts here is really amazing. And we will be examining those activities with the idea that if it's not broken we won't fix it. We want to make sure that the arts are getting the attention they need and that they have the resources to make them a worthwhile productive part of life at MIT."

"This review is a terrific idea," said Dean Ann Friedlaender of the School of Humanities and Social Sciences. "There is a great deal happening at the Institute in the arts, but as you look around you see that the arts, both in the academic and nonacademic areas, have no unified focus. I hope the review will provide new educational initiatives that draw on both the visual and performing arts and permit a unified view of arts resources and activities here at MIT."

Said Professor John de Monchaux, dean of the School of Architecture and Planning, "I hope the committee will give us some insight into one of the more difficult questions that arises when we look at the creative arts at MIT. That question is how

to strike a balance between the demands for experience in the creative arts and the development of the outstanding skills that students and faculty at MIT expect in areas such as biology, engineering and architecture." He added, "We have the extraordinary opportunity here to be able to chart new paths in the creative arts."

"Nurturing the visual and performing arts at MIT is an important task," said Professor Deutch. "I am very grateful to the committee members for devoting themselves to this task."

Other committee members include: Lawrence B. Anderson, dean emeritus, School of Architecture and Planning; Lillian Armstrong, professor of art history, Wellesley College; Muriel R. Cooper, associate professor of visual studies, head, Visible Languages Workshop, Media Laboratory; William K. Durfee, assistant professor of mechanical engineering; Albert R. Gurney, professor of literature, playwright; Arthur Kaledin, associate professor of history; Laurence Lesser, president, New England Conservatory of Music; Myra Mayman, director, Office for the Arts at Harvard and Radcliffe; Henry A. Millon, Visiting Professor of Architecture and dean, Center for Advanced Study in the Visual Arts, National Gallery, also committee vice chairman; William M. Siebert, Ford Professor of Engineering, Department of Electrical Engineering and Computer Science; Marcus A. Thompson, professor of music, coordinator of performing arts and head of the music section, and Peter A. Wolff, professor of physics, director, Francis Bitter National Magnet Laboratory.

Helvi McClelland, executive director of the Council for the Arts, will serve as executive officer for the committee.

Spring 1987 is the target date for the committee to complete the review and present its recommendations.

Quasiquintennial Fact

A human-powered aircraft designed and built by MIT students, the Monarch B, established a world speed record of 1,500 meters in two minutes, 56 seconds at Hanscom Field, Bedford, Mass., on May 11, 1984.

THE INSTITUTE CALENDAR

October 22-November 2

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 9-030. 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

Undersea Teleoperators and Intelligent Autonomous Vehicles*—MIT Sea Grant Seminar Series, Oct 22-23, 8:30am-4pm, Wiesner Bldg Bartos Theatre, Rm E15-026. Information on seminar registration and fees, contact Ree Quinn, x3-7041, Rm E38-308. **Autonomous Underwater Systems: An Advancing Technology for the 1990s***—Robert W. Correll, director, Marine Systems Engineering Lab, University of New Hampshire, MIT Sea Grant Lecture, Oct 23, 9am, Wiesner Bldg Bartos Theatre, Rm E15-026. Free.

And Now for Something Completely Different**—Graham Chapman, member of Monty Python, Lecture Series Committee Lecture, Thurs, Oct 30, 8pm, Kresge Auditorium. MIT/Wellesley ID required. Admission: \$3.

The Impact of Military Spending on the American Civilian Economy*—The Technology and Culture Seminar at MIT Symposium, Nov 1, 9am-3pm, Rm 26-100. **Are We Focusing on the Military Confrontation with the USSR While Ignoring (and Losing) the Trade War with the Japanese?**—Bernard O'Keefe, chairman, Executive Committee, EG&G; **Impact of the Military Economy on the Productivity of American Industry: Do Present Rates of Military Spending Make Capital Effectively Unavailable for Civilian Industries?**—Seymour Melman, professor of industrial engineering, Columbia University; **If Military Spending is "Only" About 6-7% of the GNP, Why Worry?**—Alice Tepper-Marlin, executive director, Council on Economic Priorities; **Where Will the Funds for our National Infra-Structure Come From?**—Frederick Salvucci, secretary, Mass Executive Office of Transportation and Construction; **Arms Race and Employment**—Barry Bluestone, economics professor, Boston College; **Does the Military-Industrial Complex Really Exist and What is its Impact?**—John Kenneth Galbraith, economics professor, Harvard University.

MIT Libraries**—are sponsoring a sale of books on the subjects of art, architecture and urban planning on Wednesday, Oct 22 from 10am-3pm, Rotch Library, Rm 7-238.

Seminars and Lectures

Wednesday, October 22

Very Wide Band Single-Mode Fiber Networks: The New Questions They Raise and the Devices They May Need**—R.S. Kennedy, MIT, Electrical Engineering and Computer Science/Research Lab of Electronics Optics and Quantum Electronics Seminar, 11am-12noon, Rm 36-428.

MacDraw and MacDraft**—Diane Moore, Apple Computer, Information Services Seminar, 12-1pm, Rm E40-298. Demonstration of two Macintosh software packages that produce structured graphics such as flowcharts, architectural drawings, and forms.

Salt Fingers: Models and Optical Microstructure Observations*—Eric Kunze, WHOI, Oceanography Sack Lunch Seminar, 12:10pm, Rm 54-915.

Varying Your Sentences**—The Writing Ctr Writing Workshop, 12:30-1pm, Rm 14N-317.

Running Meetings**—Campus Activities Office Leadership Education and Development (LEAD) Program, 12:30-1:30pm, Student Ctr Center Lounge. Bring your lunch. Info: Barbara Chuck, x3-7975.

The Large-Scale Programs Institute, Austin, Texas**—Dr Stewart Nozette, The Macro-Engineering Research Group presents an Isambard Kingdom Lecture, 4pm, Rm E51-058 (basement). Dr. Nozette will describe the origin, development and program of LSPI and will relate its objectives to an emerging focus for national development and policy.

BBN Butterfly Machine**—Dr. David Fram, Bolt Beranek & Newman, Dept of Civil Engineering Intelligent Engineering Systems Lab, 4-5pm, Rm 6-120. Donuts & coffee served, 3:30pm.

Glacialmarginal Sedimentation and Deformation, Skunk Hill Southeastern Massachusetts*—Dr. B. Stone, US Geological Survey, Constructed Facilities Division Seminar, 4-5pm, Rm 1-350. Refreshments served, 3:30pm.

Fluid Flow Simulations Using Spectral and Spectral Element Techniques**—Tony Patera, MIT Dept of Mechanical Engineering, Dept of Mathematics Numerical Analysis Seminar, 4pm, Rm 4-163. Refreshments served, 3:30pm, Rm 2-349.

The Genesis and Metamorphosis of Underwater Work Vehicles*—James R. McFarlane, president, International Submarine Engineering Ltd, Dept of Ocean Engineering Robert Bruce Wallace Lecture, 4pm, Rm 10-250.

Regional Variations in Volcanism in Central America**—Prof Michael Carr, Dept of Geological Sciences, Rutgers University, Dept of Earth, Atmospheric and Planetary Sciences Conoco Lecture, 4-5pm, Rm 54-915.

The Japanification of the American Automobile Industry**—Dr James Womack, MIT, MIT Japan Science and Technology Program Forum on the US Automotive Industry: Crises and Lessons from Japan, 5:30pm, Student Ctr Mezzanine Lounge.

Saying What You Mean: Workshop on Clarity, Focusing on Grammatical Agreement and Logical Consistency**—Writing Ctr ESL Workshop, 6:15pm, Rm 14N-317.

Thursday, October 23

Freelance**—Christina McCarthy, Lotus Development Corp, Information Services Seminar, 12-1pm, Rm 37-252. Freelance lets you create word slides, charts, and maps, or customize graphs from Lotus 1-2-3 or Symphony.

The Impact of US Laws and Policies on Foreign Aircraft Manufacturers*—Alan Boyd, chairman and CEO, Airbus Industrie of North America, Inc; first Secretary of Transportation; former chairman, Civil Aeronautics Board; and Undersecretary of Commerce for Transportation, Flight Transportation Laboratory Seminar, 2:30-3pm, Rm 33-319.

Tribology Research in Japan*—Dr. Nobuo Ohmae, Dept of Precision Engineering, Osaka University, Japan, Laboratory for Manufacturing and Productivity Seminar, 3pm, Rm 35-250. Refreshments follow.

Israel at the Crossroads*—Jac Friedgut, financial advisor, Koor Industries, Israel's major industrial grouping; former vice president, Citibank, NY, Ctr for International Studies Seminar, 3:30-5pm, Rm E38-615.

Heterotic String Theory of Everything*—Prof David Gross, Princeton University, Dept of Physics Colloquium, 4pm, Rm 10-250. Refreshments served at 3:30pm in lobby.

Computer Assisted Osteotomy*—Richard Tello, MSME, Harvard-MIT Div of Health Sciences & Technology, 4:10-5pm, Rm E25-117(Whittaker Bldg).

Group Decision Support Systems*—Prof Paul Gray, Claremont College, Operations Research Center Seminar, 4-5pm, Rm E40-298. Coffee & cookies follow.

Western Shipping in Transition: Causes and Consequences**—Dr. Gunnar K. Sletmo, Ecole des Hautes Etudes Commerciales, Montreal, Quebec, International Shipping Club Seminar, 4:15pm, Rm E51-328.

Friday, October 24

British Petroleum: IT in Business*—David J. Eggleton, coordinator, Information Systems Administration, British Petroleum, p.l.c., Sloan School, Management in the 1990's Research Program, 12-2:30pm, Rm E51-332.

Fatigue of Turbine Blade Coatings*—Prof Frank McClintock, MIT, Ctr for Materials Science and Engineering Colloquium, 12noon, Rm 12-132. Lunch served.

TBA*—Ruth Lehmann, Cell Biology Seminar, 12:15pm, Whitehead Auditorium.

Catalyst Deactivation During Hydrodemetallation**—Barbara J. Smith, Chemical Engineering Seminar, 2pm, Rm 66-110.

Formation and Adhesion of Vapor Deposited Ultra Thin Polyimide Films on Metal Surfaces*—Prof Michael Grunz, Dept of Physics, University of Maine, Program in Polymer Science and Technology Seminar, 2-3pm, Rm 66-360. Refreshments served, 1:30pm.

Personal Perspectives from the Space Shuttle Challenger Inquiry*—Prof Eugene Covert, head, Dept of Aeronautics and Astronautics, Dept of Mechanical Engineering Seminar, 3pm, Rm 26-100.

Scale Model Studies of Natural Convection in Enclosures at High Rayleigh Number*—Douglas A. Olson, Dept of Mechanical Engineering graduate student, Dept of Mechanical Engineering doctoral thesis defense, 3pm, Rm 5-233.

Evident, but Rationally Unacceptable*—Earl Connee, University of Rochester Philosophy Dept, MIT Linguistics and Philosophy Dept Lecture, 4pm, Rm 37-212.

Whistler Instabilities in ECRH Mirror Plasmas*—Dr. Richard Garner, Photometrics, Inc, Plasma Fusion Ctr Seminar, 4pm, Rm NW17-218.

The Case for Animal Rights*—Jessica Kespohl, Evelyn Kimber and Troy Soos, all members of CEASE, Coalition to End Animal Suffering and Exploitation, Black Rose Lectures, 8pm, Rm 9-150.

Monday, October 27

Suppression of Delamination via an Interlaminar Shear Layer**—Douglas B. Weems, Dept of Aeronautics and Astronautics graduate student, Aero and Astro Division of Structures, Materials and Aeroelasticity Research Conference, 3pm, Rm 33-206. Refreshments served.

Block Implicit One-Step Methods for Solving Smooth and Discontinuous Systems of Differential/Algebraic Equations**—Prof Iris Mack, MIT Dept of Mathematics, Applied Mathematics Colloquium, 4pm, Rm 2-338. Refreshments served, 3:30pm, Rm 2-349.

Scheduling and Operation of Colombian Electric System**—Prof Davio Valencia Restrepo, Universidad de Minas, Medellin, Colombia, Dept of Civil Engineering Division of Water Resources and Environmental Engineering Seminar, 4pm, Rm 48-316.

The Search for Captain Midnight*—Michael J. Marcus, Visiting Professor, Dept of EECS, MIT (on leave from FCC) LIDS Seminar, 4-5pm, Rm 37-212.

Gottfried Bohm*—Visiting Professor, Dept of Architecture and 1986 Winner of the Pritzker Prize in Architecture lectures on his work, Dept of Architecture lecture, 6:30pm, Rm 10-250.

Tuesday, October 28

Berry's Phase: An Optical Analog of the Aharonov-Bohm Effect**—Raymond Chiao, University of California-Berkeley, Laser Research Center Spectroscopy Laboratory/Research Laboratory of Electronics/School of Engineering and Plasma Fusion Center Seminar on Modern Optics and Spectroscopy, 11-12pm, Rm 37-252. Refreshments follow.

Cognitive and Emotional Changes in Aging**—Dermot A. O'Rourke, MD, asst director, Clinical Research Ctr, Clinical Research Ctr Seminar on Aging, 12:15-1:15pm, Rm 66-350.

CEMU-MOS Timing Simulation on a Message Based Multiprocessor**—Bryan D. Ackland, AT&T Bell Laboratories, Holmdel, NJ, VLSI Seminar, 4pm, Rm 34-101. Refreshments served, 3:30pm.

Multiplexing and Optics in the Network of the Future*—Dr. Howard L. Lemberg, Bell Communications Research, Local Communication Network Group Seminar, 4pm, Rm 35-308.

Computations of Horseshoe Vortex Flows**—Dr. C.S. Tan, MIT Dept of Aeronautics and Astronautics, Dept of Aeronautics and Astronautics Gas Turbine Laboratory Seminar, 4:15pm, Rm 31-161. Refreshments served, 4pm.

Gravitational Lenses: Recent Observations and a New Application*—Prof. Edwin L. Turner, Princeton University & Center for Astrophysics and MIT, MIT Center for Space Research Seminar, 4:15pm, Rm 37-252 Marlar Lounge. Refreshments served at 3:45pm.

Tissue Characteristics Using Laser-Induced Fluorescence*—Sune Svanberg, Lund Institute of Technology, Sweden, Laser Biomedical Research Ctr/MGH Wellman Laboratory/Harvard-MIT Division of Health, Science and Technology Lasers in Biomedical Research Seminar, 5-6pm, Rm E25-111. Refreshments served, 4:30pm.

Wednesday, October 29

GaInAsP/InP Mass-transported Lasers and Laser Arrays**—J.N. Walpole, MIT Lincoln Laboratory, Electrical Engineering and Computer Science/Research Lab of Electronics Optics and Quantum Electronics Seminar, 11am-12noon, Rm 36-428.

Excel and Helix**—Diane Moore, Apple Computer, Information Services Seminar, 12-1pm, Rm E40-298. Excel is a powerful integrated package for the Macintosh, that combines spreadsheet, graphics and database features. Helix is an innovative database product that makes use of the Mac's graphics interface.

On the Estimation of Mesoscale Vertical Derivatives of Potential Temperature and Density from Hydrographic Data*—Arthur Mariano, Harvard, Oceanography Sack Lunch Seminar, 12:10pm, Rm 54-915. Coffee and tea served; bring your lunch.

Selecting the Right Word**—The Writing Ctr Writing Workshop, 12:30-1pm, Rm 14N-317.

The Use of Bilinearly Weighted Cross Sections for Few Group Theory**—Myung-Hyun Kim, Dept of Nuclear Engineering Seminar, 3-4pm, Rm 24-213.

Nonlinear Wave-Wave Interactions Using High-Order Zakharov Equations**—D. Dommermuth, Depts of Ocean and Civil Engineering Informal Hydrodynamics Seminar, 3:30-5pm, Rm 5-314.

The Expert Cost and Manufacturability Guide: Technical Issues in Delivery of Expert Systems and 3:30PM, Rm 2-349.

Textural Constraints on the Degree of Partial Melting and Melt Extraction From the Mantle**—Prof Bruce Watson, Dept of Geology, Rensselaer Polytechnic Institute, Dept of Earth, Atmospheric and Planetary Sciences Conoco Lecture, 4-5pm, Rm 54-915.

Yesterday and Today in French Technology*—Jean-Jacque Salomon, Dir, Center for Science, Technology and Society, Paris, Center for International Studies Seminar, 4-6pm, Rm E38-615.

Giving Oral Presentations**—Writing Ctr ESL Workshop, 6:15pm, Rm 14N-317.

Thursday, October 30

Inside Your IBM PC**—Glenn Bloom, IBM, Information Services Seminar, 12-1pm, Rm 9-150. A guided tour of the insides of an IBM Personal Computer to show what the different parts are, what functions they perform, and how they work together to meet your computing needs.

Physics of Electrophotography**—Dr. Larry B. Schien, IBM Almaden Research Ctr, San Jose, CA, Lab for Electromagnetic and Electronic Systems Seminar, 2pm, Rm 34-401B. Discussion of the technology at the heart of the copier and laser-printer industry; its 6 steps defined; and their implementation by different corporations.

The Impending Airline Industry Struggle with Government Forces to Obtain Airport/Airways Capacity to Accommodate Present Operations and Future Growth, or, the Impact of Hub-Spoke Operations*—Gabriel Phillips, Executive Vice-President for Administration and Industry Programs, Air Transport Association of America, Flight Transportation Laboratory Lecture, 2-3:30pm, Rm 33-319.

What's Hot in X-ray**—Dr. Paul Bernstein, Skiametrics, Laboratory for Manufacturing and Productivity Seminar, 3pm, Rm 35-250. Refreshments follow.

Physics in the TeV Region**—Prof. Edward Farhi, MIT, Department of Physics Colloquium, 4pm, Rm 10-250. Refreshments served at 3:30 in Rm 10-250 lobby.

Desktop Publishing*—Muriel Cooper, MIT; Philip Francis, Digital Equipment Corp; Arthur F Shufelt, Interdyne, Inc, MIT Communications Forum Seminar, 4-6pm, Bartos Theatre, Rm E15-070.

Friday, October 31

Computational Convergence of Chemically Reacting Flows*—Dr. Chul Park, NASA Ames Research Center and The Johns Hopkins University Applied Physics Laboratory, Dept of Aeronautics and Astronautics Seminar, 12noon, Rm 33-206. Informal CFD Seminar.

Gap Junction Assembly During Mouse Embryogenesis: A Model for the Control of Cellular Morphogenesis*—Gerald Kidder, Cell Biology Seminar, 12:15pm, Whitehead Auditorium.

Electronic Organization and Expert Networks: Beyond Electronic Mail and Computer Conferencing*—Dr. Chandler Harrison Stevens, Network Technologies International, Sloan School Management in the 1990s Research Program, 12-2:30pm, Rm E51-332. Paper available, Rm E40-294.

Precipitation Polymerization and Fractionation in Supercritical Fluids**—Sanat Kumar, Chemical Engineering Seminars, 2pm, Rm 66-110.

Perspective of Hypersonic Vehicle Technology*—Dr. Chul Park, NASA Ames Research Center and The Johns Hopkins University Applied Physics Laboratory, Dept of Aeronautics and Astronautics Seminar, 3pm, Rm 37-252.

Selective Tungsten CVD: The Ultimate Multilevel Interconnect**—Prof Carol McConica, Dept of Agricultural and Chemical Engineering, Colorado State University, Chemical Engineering Seminars, 3pm, Rm 66-110.

Low Frequency Tropical Variability in a General Circulation Model**—David Neelin, Geophysical Fluid Dynamics Program, Princeton University, Ctr for Meteorology and Physical Oceanography Seminar, 4pm, Rm 54-915.

Films

Secondary Flow**—Fluid Mechanics Film, Oct 23, 4-5pm, Rm 3-270.

Artists Under the Big Top: Perplexed*—directed by Kluge, Dept of Foreign Languages and Literatures German Cinema, Oct 27, 7pm, Rm 66-110. In German with English subtitles. Free.

Flow Instabilities; Turbulence**—Fluid Mechanics Films, Oct 30, 4-5pm, Rm 3-270.

Kings of the Road*—directed by Wenders, Dept of Foreign Languages and Literatures German Cinema, Nov 3, 7pm, Rm 66-110. In German with English subtitles. Free.

Community Meetings

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

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.

MIT Women's League Informal Needlework Group**—Wednesday lunchtime gatherings, 10:30am-1:30pm, Rm 10-340. Meeting dates: Oct 22, Nov 12 & 26, Dec 10. Come during your lunch hour. Coffee & tea served. For more info, call Lillian Alberty (491-3689).

From Super-Mom to Betty Crocker Fantasies: Finding the Middle Ground**—Prenatal and Parent Meeting. Barbara Chuck, Office of Dean for Student Affairs; Janet Van Ness, Health Education Service, Med Dept. Our meetings are scheduled at noon to make it convenient for both parents to come. Lap babies are welcome. Bring your lunch. Juices will be provided. Tues, Oct 28, Noon, Rm E23-297 (2nd fl conference room).

MIT Women's League Open House**—Mini-programs and displays illustrating the League's interest groups and volunteer activities. Sponsored by Women's League (open to MIT women only), Wed Oct 29, Emma Rogers Room, 10-340, 11am-3pm. Refreshments served. We hope that lots of women working at MIT will come.

Alumni Activities

MIT Athletics is Alive and Well**—Royce N. Flippin, Dir of Athletics, MIT, MIT Alumni Association presentation, Oct 27, Faculty Club, 6th floor, following dinner. Cocktails 5:30pm; dinner 6:15pm.

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 and MARES (Mass Assoc of Recreation and Employee Services).

Fall River Shopping Madness, Sat, Oct 25. Stock up on jeans, linen, chamois shirts, handbags, cosmetics, children's clothing and more, all at factory outlet prices on MITAC's fifth annual Fall River Shopping Outlet Spree. First stop (and lunch stop too; bring your own or stand in line at the cafeteria) is in "the heart" of the district—51 outlets. Stop 2 is Vanity Fair with nearly 2 dozen outlets. Bus leaves West Garage, 8:30am; returns to MIT approx 6pm. Tkts, \$8.50/pp, available in Rm 20A-023.

A Streetcar Named Desire, Thurs, Nov 6, Lyric Stage, 8pm. Don't miss this American classic by Tennessee Williams. Tkts, \$8/pp (reg \$9/pp), available in Rm 20A-023.

Boston Classical Orchestra, Fri, Nov 21, 8pm, Faneuil Hall. Concert includes the first modern performance of Ponchielli's Concert for Trumpet and Band, the Hummel Trumpet Concert, Mozart's Impresario Overture, and the "London" Symphony by Haydn. Directed by Harry Ellis Dickson. Tkts, \$6.50/pp (reg \$12/pp) available in Rm 20A-023.

New York City Shopping Madness Spree, Sat, Nov 22. Munch on hot chestnuts, admire the Rockefeller Center ice skaters, see the "real" Santa at Macy's, window shop on Fifth Avenue. Bus leaves West Garage, 8am sharp; returns for Boston at 8pm. Cost: \$18/pp bus only. Make your reservations NOW in Rm 20A-023.

Sleeping Beauty, Sat, Nov 29, 2pm, New England Life Hall. Boston Children's Theatre production of this classic children's fairy tale. Holiday entertainment for the whole family. Tkts, \$4.25/pp (reg \$5/pp), available in Rm 20A-023.

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). Don't miss tyrannosaurus rex and the dinosaur exhibition, through Nov 30.

Greater Boston Books are coming. Look for them in mid-October. The 2-volume, 820+ page discount coupon book offers discounts on fine and casual dining, theatre, opera, ballet, museums, and more for the Greater Boston area and beyond. Only \$20/ea (reg \$30/ea).

City Books are coming. Look for them in mid-October.

Parent Connection Book are Here! Offers savings on everything from juvenile furniture to children's clothing to pre-and post-natal services, and more. The discount coupon book is only \$2/ea (reg \$7.95/ea).

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.

Massachusetts Institute of Technology



October 22, 1986

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

MIT POSITIONS AVAILABLE

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.

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

PERSONNEL OFFICE NEWS

More Positions Available!

For the month of October, the Personnel Office will be publishing eight, rather than four, pages of Positions Available. This increase will allow us to list complete job descriptions for almost all open positions. Other openings will continue to appear in an end list.

Extended Interview Hours!

In order to make the Personnel Office more accessible to new applicants who have other commitments during working hours, we are adding extra hours to our interviewing schedules for outside applicants. In addition to our normal 9-5 hours, we will be available by appointment in the early mornings, in the evenings and on Saturday mornings to interview qualified support staff candidates. Applicants may arrange an appointment by contacting the Personnel Office at 253-4251.

ADMINISTRATIVE AND ACADEMIC STAFF

DIRECTOR OF CAMPAIGN SYSTEMS, Resource Development, to manage the systems used for identification, research, rating of giving potential and tracking of individual, corporate and foundation prospects for significant gifts. These systems provide support to the cultivation and solicitation activities of senior officers, deans and faculty, Resource Development and other staff and volunteers. Requirements: five years of experience in educational or other not-for-profit fundraising, including familiarity with prospect research techniques, university governance and organization, and a sound knowledge of campaign activities and related programs. AB6-842

ANALYST PROGRAMMER II, Administrative Systems, to assist in the development of external system specifications and translation into internal system specifications and computer programs. Will prepare logic diagrams and overall data flow; test and document programs for operational use and future maintenance; assist applications programmers in programming, testing and debugging techniques; prepare program modification or enhancement specifications; establish file requirements and processing techniques; perform the functions of applications programmer as required; and assist users with program problems. Requirements: associate's degree in computer science or equivalent programming experience; two years of experience as a programmer in a business environment; and knowledge of COBOL, IBM VM/CMS and IBM OS JCL. Knowledge of PL/1, ADABAS, NATURAL, CMS Batch, EXECII and REXX helpful. AB6-841

ADMINISTRATIVE ASSISTANT, Project Athena, to plan, develop and carry out orientation lectures and demonstrate the Athena system. Will deliver daily two-hour lectures/demonstrations to groups of 25-30 visitors. This position will include contact with M.I.T. faculty who have developed educational software; visitors

will come from national and international academic and industrial institutions. Requirements: bachelor's degree or equivalent combination of education and experience, including some computer science education, and a minimum of one year of directly related experience in computer science (software side). Must have excellent communicational skills and the ability to deal very well with a wide variety of people. AB6-840

CONSTRUCTION COORDINATOR, Physical Plant, to work for the space renovation program. Will supervise and monitor assigned multiple renovation projects; review and approve requisitions; and consult with the M.I.T. community, general/subcontractors, architects and engineers during construction period. Requirements: extensive experience in building construction field, including familiarity with construction processes and cost estimating, and good communicational skills. Bachelor's or associate's degree in architecture or civil or construction engineering desirable. AB6-838

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. CB6-189

DIRECTOR OF INFORMATION SERVICES, Information Systems. Information Services is responsible for providing end-user computing support services to MIT's academic, administrative and research communities. The director will be responsible for the design, development, implementation and marketing of new services to support the changing needs of the Institute's diverse end-user community in a rapidly changing technological environment; for developing close relationships with the principal end-users; for establishing performance measurement systems to monitor and improve the effectiveness of services offered; for preparing short and long range goals for Information Services; for preparing and administering budgets; and for hiring, evaluating and developing professional staff. Requirements: bachelor's degree or equivalent combination of education and experience with a minimum of five years of experience in the management of computing activities (preferably in an academic environment), and the ability to work at both strategic and operational levels. Familiarity with microcomputers, telecommunications, mainframes, fourth generation languages and marketing principles required. Excellent communicational skills, demonstrated ability to build effective teams and service orientation extremely important. AB6-835

MICRO LAB COORDINATOR, Information Services. Will schedule lab and maintain and distribute software for training and open-lab sessions; ensure proper lab setup for hands-on training sessions; perform basic diagnostics and schedule routine maintenance of equipment; and track and order expendable supplies. Will also assist instructor during scheduled training sessions; provide basic assistance during open lab; and evaluate CBI, audio and audio/visual training materials. Requirements: bachelor's degree or equivalent combination of education and experience; and three years experience using personal computers and at least two of the following types of software: word processing, spreadsheets, databases or integrated packages. Experience training others to use computers and/or software packages preferred. Willingness to learn about hardware and perform minor machine upkeep necessary. AB6-834

ASSISTANT DIRECTOR, Student Financial Aid Office, to exercise stewardship over the use of the scholarship and grant funds under MIT's control; administer the scholarships awarded directly to students by agencies outside MIT; and perform other regular duties of an aid officer, such as counseling, need analysis, award preparation, etc. Requirements: bachelor's degree or equivalent and 1-3 years of direct experience in financial aid or 3-5 years of related experience. Well-developed human relations skills and written and oral communicational skills are necessary. A high level of analytical skills is desirable. NON-SMOKING OFFICE. AB6-833

FACILITIES COORDINATOR, Operations and Systems, to support Athena operations by coordinating and tracking workstation deployment. Will translate deployment plans into activities and schedules to accomplish the plans; coordinate the functional areas of operations; identify bottlenecks and problems and resolve them; and track actions to completion. Requirements: bachelor's degree in computer science or equivalent work experience; 2-3 years of computer operations experience;

UNIX expertise; familiarity with computer and communications hardware; and familiarity with databases. Knowledge of computer workstations helpful. Strong communicational and project management skills essential. AB6-832

REACTOR RADIATION PROTECTION OFFICER, Environmental Medical Service, to manage the radiation protection program at MIT's research reactor. Will review new reactor research protocols, including the review of available facilities and equipment; train reactor and research personnel in appropriate radiation protection techniques; train emergency response personnel in reactor emergency procedure; and supervise two reactor radiation protection technicians. Requirements: bachelor's degree, preferably in physics or nuclear engineering, and master's degree in radiological health or health physics. Some experience in health physics applications in reactor programs desired. Must be eligible for certification by the American Board of Health Physics within 5 years from start of employment. CB6-188

ASSISTANT TO THE DIRECTOR, Laboratory for Manufacturing and Productivity, to foster communication between the Lab and its industrial partners, and to oversee day-to-day Lab operations. Will provide administrative support to the LMP Industry Collegium and Industrial Advisory Board; supervise the library; prepare annual report; act as laboratory safety coordinator; act as liaison to the MIT Industrial Liaison Program; handle student-related affairs; work with the Director to develop planning documents, perform fund raising and execute action items from faculty meetings; and perform other general duties. A minimum of a bachelor's degree is required; technical background preferred. Knowledge of MIT policies and procedures very helpful, but not essential. AB6-830

STAFF ASSOCIATE, Undergraduate Academic Support Section, Office of the Dean for Student Affairs, to help coordinate and plan the overall freshman residence/orientation program and provide ongoing academic support services, with special emphasis on programs for the living groups, to all students. Will have responsibility for the associate advisor program, including recruitment and training, and for developing specialized programs in areas such as study skills and choosing a major. Requirements: bachelor's degree and 3-5 years of experience in university academic administration. Master's degree in administration, counseling or an academic discipline preferred. Excellent organizational and communicational skills are essential. Familiarity with the undergraduate academic program at MIT and experience in working with students on academic matters are highly desirable. AB6-829

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. AB6-824

SLOAN SCHOOL OF MANAGEMENT DIRECTOR OF INFORMATION SYSTEMS, to manage the full range of information system facilities and services required to support the Sloan School's teaching and research programs and its internal administrative functions and staff. Will develop the annual information systems plan; make major policy and personnel decisions; handle matters involving relations with other MIT academic or administrative units; and advise on planning and implementing office automation and related systems. Master's degree or equivalent combination of education and experience and prior information systems project management experience, knowledge of university environment and familiarity with microcomputers and/or mainframe technologies required. Excellent written and oral communicational skills and demonstrated effectiveness in team-oriented work necessary. AB6-818

ADMINISTRATIVE OFFICER, Applied Biological Sciences. Will allocate departmental monies and monitor expenditures; monitor grant and contract management and review research proposals; serve as liaison between department head and faculty and other senior personnel on a variety of administrative matters; serve as department safety coordinator; represent department to the rest of the Institute and the outside in administrative matters; oversee physical state of buildings; handle affirmative action monitoring and reporting; and assist with special projects including preparation of five-year plan. Bachelor's degree in business administration or equivalent background with prior MIT administrative experience or experience in a similar academic research environment required. Master's degree preferred. Must be able to work effectively with a large faculty and staff. AB6-817

POSTDOCTORAL FELLOW, Francis Bitter National Magnet Laboratory. A two-year position funded by IBM for research in condensed matter physics at low temperatures and high magnetic fields. Will plan and carry out original research in lower dimensional systems, magnetic materials, superconductors or semiconductors. Will develop new experimental techniques

exploiting the low temperature, high magnetic field environment. Ph.D. in condensed matter physics or related field required, as is ability to plan and carry out original research in the above areas. Must have strong capability in a number of experimental techniques. CB6-187

PLANNING OFFICER FOR INSTITUTIONAL RESEARCH, Planning Office, to provide research and analytical support for Institute planning activities. Will design, develop and produce decision support materials through a program of institutional research; manage production schedules and coordinate information resources; design and implement planning and management information system; coordinate research and analysis with primary data sources; prepare and manage institutional research projects; assist Planning Office staff in use of office information system; recommend consultants; and supervise research project staff. Master's degree in planning, education, management or related field plus 3-5 years experience in management information systems or institutional research required, as are demonstrated analytical and communicational skills; experience in both quantitative and qualitative research methods; and familiarity with techniques of statistical analysis. Ability to motivate staff and work cooperatively with diverse departments and personalities essential. AB6-812

POSTDOCTORAL ASSOCIATE, Division of Comparative Medicine. Postdoctoral training program for veterinarians seeking careers in comparative pathology and laboratory animal medicine. Program emphasizes research training and in-depth clinical investigations. Additional training will include clinical rotations in affiliated research institutions. Eligibility credit earned toward board certification by ACLAM and/or ACPV. D.V.M. or equivalent required. Previous experience in the field is desirable but not mandatory. CB6-186

PREVENTATIVE MAINTENANCE APPRAISER, Physical Plant, to perform building/equipment surveys, prepare preventative maintenance work packages for the various shops, perform inspections of completed work and maintain required records and reports. Five years of experience in the maintenance and repair of mechanical and electrical equipment required; a B.S. in engineering may be substituted for experience. Familiarity with the use of computers necessary. Good interpersonal skills essential. AB6-809

MAINTENANCE SUPERVISOR, Physical Plant, to supervise maintenance employees and contractors at the Bates Linac. Will make recommendations to the Manager regarding the hiring of hourly personnel; assist in the development of plans and specifications for projects under consideration; develop a maintenance activities chart and integrate it with preventative maintenance activity; and handle the day-to-day implementation of Institute policies relating to attendance, discipline, safety, etc. Three to five years of experience in the maintenance and repair of mechanical and electrical equipment required; B.S. in engineering may be substituted for experience. Familiarity with the use of personal computers necessary. Good interpersonal skills essential. This position is located in Middleton, MA. AB6-808

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. AB6-807, AB6-823

DIRECTOR, ALUMNI INFORMATION MANAGEMENT, Alumni Association, to develop information systems which provide operational, analytical and planning support to the senior administration and to be a part of the management team of the association. Will develop recommendations for the long term goals of the information systems; plan necessary programs, systems and hardware and software enhancements to accomplish these goals; establish policies on access to alumni records; manage enhancement and maintenance of the interactive database system; research and respond to requests for alumni related information; provide training in database usage; hire staff, evaluate performance and recommend promotions and salary adjustments; and develop operating budgets for information management. Bachelor's degree in business administration or related field or the equivalent combination of education and experience and five to seven years of related experience required. Experience should include data processing, accounting and fiscal management, office systems and supervision. AB6-806

POSITIONS AVAILABLE SUBSCRIPTION INFORMATION

Positions Available may be obtained on a regular basis by subscribing to Tech Talk, which is published 35 times a year by the News Office. Mail subscriptions are \$18 per year by first class mail. Checks should be made payable to MIT and mailed to Business Manager, Room 5-113, MIT, Cambridge, MA 02139.

PROGRAM MANAGER, Alumni Association, to work in Alumni Relations' New York Office and interact with MIT's 8,000 New York area alumni. Will coordinate the Center's educational, social and fundraising programs; provide support to the suburban MIT clubs and the MIT Enterprise Forum; write and edit the Center's monthly calendar; and direct the Center's secretarial and bookkeeping functions. Bachelor's degree or equivalent required. Previous experience with educational or other non-profit institutions desirable. Must have strong interpersonal and public relations skills as well as creativity, self-motivation and basic managerial and organizational abilities. **AB6-803**

MANAGER, Academic Computing Facility, Harvard-MIT Division of Health Sciences and Technology, to design and implement a computer network for members of the Division. Will coordinate the development and procurement of innovative software; draw upon existing resources in MIT and Harvard to provide support for hardware and software; and achieve compatibility between MIT's Project Athena and Harvard Medical School's New Pathway computer efforts. Bachelor's degree in electrical engineering and/or computer science and three to five years experience required; experience should include UNIX, DOS and MUMPS; C programming language; developing portable software; computer networking; source code control; man-machine interaction, particularly graphics; and scientific systems programming. Demonstrated managerial skills and excellent interpersonal and communicational skills essential. Familiarity with Project Athena helpful. **AB6-802**

PRODUCTION ANALYST II, Operations and Systems - Production Services, to assist and evaluate systems development and periodically produce evaluation and progress reports for management. Will evaluate the external system specifications related to the production processing of the end product; translate external specifications into internal production processing specifications; evaluate and assist in production documentation; assist in planning test procedures and parallel runs of the end product; and perform other related duties as assigned. Bachelor's degree or equivalent combination of education and experience required. Considerable experience in programming languages, JCL and other technological tools such as CRT's and pc's essential. **AB6-797**

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. **AB6-794, AB6-793**

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 communicational 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. **AB6-787**

SYSTEMS PROGRAMMER II, Operations and Systems, to provide programming expertise to maintain systems and procedures. Will identify, specify and implement fixes and enhancements to the Athena system software; specify, design and implement utilities for software distribution, data backup, database distribution, etc.; and investigate and resolve problems involving a large complex network of systems. Bachelor's degree in computer science (or equivalent) and 3 years systems maintenance experience required. Experience in systems programming, program maintenance and quality assurance, or combined experience in systems programming with related programming activities necessary. Must be fluent in C as well as UNIX commands and utilities and have a familiarity with operating systems and procedures. Good communicational skills essential. **AB6-786**

CONSULTANT I, Project Athena (part-time, 20 hours/week), to develop and deliver educational services to end users. Will work with User Services staff to identify software training needs and to develop appropriate training programs; prepare and produce training materials; help select and test methods of delivery; provide training for students and faculty; assist in the scheduling of facilities and courses; collect performance measurements; and help prepare, maintain and distribute training documentation. Bachelor's degree, or equivalent combination of education and experience, and experience with UNIX or a similar operating system, UNIX utilities, full-screen editors and one or more computer languages required. Experience with training users of software products and computer systems desirable. Must have excellent communicational skills. Training experience in an academic environment highly desirable. **NON-SMOKING OFFICE. AB6-781**

TRAINING MANAGER, Project Athena (part-time, 20 hours/week), to provide training programs for users of Athena's standard applications and systems software. Will evaluate the training needs of general users; plan and implement training for students and faculty; select and manage the User Services training team; plan and implement training courses for users; prepare and produce training materials; supervise the scheduling of courses; coordinate the preparation, maintenance and distribution of training documentation and the development of training modules; and participate in the preparation of budgets and control expenses. Bachelor's degree, or equivalent combination of education and experience; experience preparing technical educational materials and establishing training services; and experience with UNIX or a similar operating system required. Excellent communicational skills and ability to work well with users and to resolve conflicts essential. Experience in an academic environment and familiarity with the design of user interfaces, software verification and graphics systems desirable. **NON-SMOKING OFFICE. AB6-779**

SENIOR CONSULTANT, Information Services, to provide support services for scientific use of supercomputers. Will consult, write documentation and train on access and use of Cyber 205 at John Von Neumann Center, Princeton; provide technical support for code conversion and algorithm redesign; track technology trends in supercomputing research for planning purposes; optimize algorithm development; coordinate supercomputing activities local to MIT; and function as technical liaison to JVNC staff. M.S., Ph.D. or equivalent combination of education and experience in a field relating to computational physics or chemistry required. Experience with numerical analysis as applied to large scale scientific computing on supercomputer and experience with code development on a CDC Cyber 205 preferred. Good communicational skills essential. **AB6-778**

CONSULTANT I, Project Athena, to support students and faculty using standard end-user software, assist the Manager of Consulting and participate in the design of systems and services for end-users. Will learn and use standard end-user software and on-line consulting tools; provide approximately 20 hours/week consulting to users; provide feedback about operations in the field; hire, train and supervise student consultants; assist in the administration of consulting tools; evaluate pre-release software and monitor changes to the released system; prepare and distribute technical information to other members of the consulting team; and work with the documentation and training staffs to help provide documentation and training to end-users. Bachelor's degree or equivalent combination of education and experience required. Experience with UNIX (especially 4.2BSD); computing experience in a university setting and in a networked environment; and experience with text formatters, data analysis and graphing packages preferred. Experience with programming or computer system administration, supervisory skills, technical writing skills and teaching skills desirable. **NON-SMOKING OFFICE. AB6-770.**

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. **NON-SMOKING OFFICE. AB6-769**

DIRECTOR OF COMMUNICATIONS IN RESOURCE DEVELOPMENT, Resource Development, to direct the definition, research, writing and editing of proposals, publications, correspondence and other communications used to support major gift solicitations of individuals, foundations, corporations, and other development activities. Coordinate and implement a program of overall communications for the forthcoming capital campaign, from planning through distribution or presentation. Bachelor's degree or equivalent combination of education and experience. Five to eight years experience; three to five years in development writing; and two or more years in related areas such as news or feature writing, advertising, fundraising, publishing, or science writing preferred. **AB6-752**

AUDITOR II - EDP SPECIALIST, Audit Division, to evaluate preventive, detective and corrective controls in the data processing environment. Will participate in new or proposed systems development efforts; participate in Data Center reviews; verify the functioning of current computer systems; investigate and evaluate vendor-supplied software, hardware and applications systems and their interfaces; assist other audit staff members in EDP oriented aspects of their audits; improve audit scope and efficiency using computer assisted audit techniques and software; prepare audit reports and recommend corrective action where necessary; and review audit reports and workpapers to ensure that there is adequate EDP documentation. Bachelor's degree or equivalent combination of education and experience required. Must have extensive knowledge of computer systems, analysis, design and multiple programming languages; detailed understanding of computer logic, data, security and operations; sound technical knowledge of application planning, design, review and implementation; general understanding of accounting and control procedures; and working knowledge of basic audit concepts and exposure to advanced practices. Accreditation as a C.P.A., C.I.A. or C.I.S.A. desirable. **AB6-748**

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. **AB6-745**

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**

SYSTEMS PROGRAMMER III, Project Athena, to report to the Manager of Systems Development. Will create an InterNet subdomain to support thousands of workstations; coordinate this subdomain with MIT Telecommunications and others both inside and outside MIT; develop software to allow general, centralized network-based service management in a large distributed system; keep Athena abreast of related technical developments; link off-campus Athena installations to the main campus net; provide planning and budgeting assistance to the manager; and perform other skilled systems programming as may be required. May supervise student employees. Bachelor's degree or equivalent combination of education and experience; three to five years of professional experience in systems and network programming; and extensive experience with the UNIX operating system and C. Professional experience should include work in most of the following areas: management of local area networks, source code control for large projects, system engineering and tuning of operating systems. Good communication skills are vital. **AB6-725**

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. **AB6-724**

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

POSTDOCTORAL ASSOCIATE, Applied Biological Sciences, to design and synthesize radiopharmaceuticals for detection of human atherosclerosis (see Nucl. Med. 26:1056, 1985). Chemical synthesis, antibody production, animal and human studies are all involved. M.D., or Ph.D. in Chemistry, Biochemistry, or Pharmacology preferred. Position available immediately or by July 1, 1986. **C85-169**

LIBRARIAN IV, Head, Engineering Libraries, MIT Libraries, will administer MIT's Barker Engineering Library and its branch and the Aeronautics and Astronautics staff, under the Associate Director for Public Services. Will manage a staff of eight librarians and sixteen support staff and will participate in and oversee the provision of information services and the development of collections. In addition, will participate in systemwide policy formulation as a member of the Divisional Librarians Group which coordinate the public services of the MIT Libraries and as a member of Library Council. MLS from an ALA-accredited library school required. Minimum of five years increasingly responsible professional experience in an engineering or science research library required. Demonstrated effective management skills required. Experience in information services and collection management as well as demonstrated knowledge of the application of technology to libraries are essential. Degree in engineering or science highly desirable. Final candidates must demonstrate well-developed interpersonal skills and the ability to work in groups. **C85-168**

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**

ASSISTANT MANAGER, Housing and Food Service, to work with manager in managing building maintenance, renovation and construction work in the housing system. Will work with house managers and contractors on projects necessary to meet department objectives; supervise maintenance and renovation work to meet quality, cost control and time schedule goals; act as project manager for construction jobs; develop and implement building preventive maintenance programs; analyze contracts and estimates and negotiate and administer contracts for maintenance, renovation and construction programs; perform housing inspections and recommend and implement necessary work to support housing quality; and recommend house management actions. Requirements: associate's degree and/or equivalent combination of education and experience and one to two years building maintenance/renovation experience; construction experience preferred. **AB5-516**

SPONSORED RESEARCH STAFF

TECHNICAL ASSISTANT, Center for Cancer Research (part-time), to prepare tissue culture and specialized media for group of four or five laboratories. Will prepare, sterilize and test solutions to specification with stringent quality control. B.S. in chemistry or biology required; previous laboratory experience preferred. Must be able to work independently. **R86-120**

RESEARCH SPECIALIST, Cell Culture Center, to manage the day-to-day operations of the Cell Sorter Laboratory. Will operate a computer-interfaced system 60 H cell sorter as a service for research laboratories and centers. Requirements: B.S. or M.S. and some cell sorter experience. Direct experience with Ortho system 60 H preferred. **R86-118**

ELECTRICAL ENGINEER, Plasma Fusion Center, to install, maintain and upgrade complex experimental research electrical power systems. Will participate in the upgrade and operation of a 6 source, 6 MW neutral beam system for a mirror fusion experiment. The work will involve design modification, testing and operation of 2 MW

high voltage power supplies, 400 kW arc supplies, 40 kV filament supplies and control electronics. Requirements: B.S. in electrical engineering and a good understanding of the neutral beam system including electronics, ion sources and vacuum systems. Several years of experience in a research-oriented environment desirable. R86-116

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

TECHNICAL ASSISTANT, Applied Biological Sciences, to work with a group using molecular genetics to study bacterial photosynthesis. Will be responsible for the department's oligonucleotide synthesis facility. B.S. in chemistry, biology or related field required. Familiarity with molecular biological techniques desirable. R86-113

TECHNICAL ASSISTANT, Applied Biological Sciences, to work in a small genetic toxicology group studying the effect of chemical carcinogens on oncogene activation during liver tumor progression. Responsibilities will include tissue culture, transformation assays, preparation and analysis of DNAs from cell lines and tumors, DNA sequencing and DNA hybridization techniques. Bachelor's degree in life sciences required. Laboratory experience in techniques related to cell culture and/or molecular biology desirable. Some microbiology experience helpful. R86-112

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

TECHNICAL ASSISTANT, Brain and Cognitive Sciences (half-time), to schedule, administer and score neuropsychological tests given to detect changes in behavioral function that occur with brain pathology. Will enter scores into the computer database; perform descriptive analyses, by hand and by computer; schedule patients, physicians and other testers for testing at MIT; keep track of return visits for patients in longitudinal studies; attend in-house meetings in order to give updates on individual patients and families; evaluate test procedures; relate problems and interesting issues to the research group; and remain alert to new variables that may be important to study. Requirements: bachelor's degree in psychology, biology or psychobiology; and experience in devising and running experiments and working with computers. Experience in testing patients and some knowledge of neuropsychology and psychobiology preferred. R86-108

ELECTRICAL ENGINEER, Laboratory for Nuclear Science, to head the AC/DC power area for the electrical engineering group at the Bates Accelerator Center. In the AC area, will manage, maintain, upgrade and develop low, medium and high voltage power distribution systems. In the DC area, responsibilities will include the specification, installation, upgrading and maintenance of several dozen high and ultrahigh precision DC power systems. Requirements: bachelor's degree in electrical engineering, oriented toward power applications; seven to ten years of applicable experience; strong background in AC energy systems; theoretical and practical command of electrical circuits and apparatus; and design familiarity with high precision analog control and instrumentation systems. Industrial or accelerator experience and knowledge of legal regulations on electrical systems valuable. This position is located in Middleton, MA. R86-107

ELECTRONICS SPECIALIST, Francis Bitter National Magnet Laboratory, to have primary responsibility for the state of electronics hardware in the Magnet Resonance Imaging Facility. Will work closely with other staff to design and implement new rf circuitry as well as diagnose, troubleshoot and repair the computer-controlled consoles of the magnetic resonance imaging units. Will be in charge of the electronics shop and supervise the electronics technician. Requirements: extensive experience with modern digital and analog circuitry and radiofrequency networks; and hands-on experience with modern digital and analog laboratory test equipment such as vector impedance analyzers, vector voltmeters, spectrum analyzers and circuit emulators. Should have some rf design experience. Experience with programming in Z80 code helpful. R86-106

RESEARCH ASSOCIATE STAFF, Francis Bitter National Magnet Laboratory (one to two year position), to participate in a research project to develop advanced magnetic resonance techniques, including composite and multiple-pulse sequences, as well as magic angle spinning. Position is for one year with a second year option depending on funding. Requirements: Ph.D. in chemistry; experience in NMR techniques and some electronics experience. R86-105

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

LIBRARIAN, Plasma Fusion Center, to coordinate all library-related functions for PFC's research library. Will handle technical services (cataloging, collection development, coordination of desk copy orders); revise files and records; issue monthly acquisitions list; provide reference services, including online research, to PFC community; disseminate PFC reports to ensure that sponsor's technical requirements are met and maintain an online file for this purpose; prepare or initiate correspondence, reports and purchase orders and monitor budget; participate in development of library policies and procedures; supervise and train support staff; and occasionally travel to other fusion libraries and professional meetings. Requirements: knowledge of library principles and practices and 4 - 6 years library work experience. Master's degree in library science and MIT experience are desirable. R86-099

SCIENTIFIC PROGRAMMER, Earth, Atmospheric, and Planetary Sciences (full- or part-time), to work with research group, including other programmers. Will convert, edit, manage and analyze large quantities of oceanographic data. Will also explore possibilities for exploiting workstations and networks, including recommendations on choice of equipment. Requirements: experience in FORTRAN; knowledge of UNIX and SUN/APOLLO-type workstations helpful. Bachelor's degree in related field, or equivalent experience, and experience in scientific data handling preferred. R86-094

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

TECHNICAL ASSISTANT, Harvard-MIT Division of Health Sciences and Technology, to work with a group investigating messenger RNA translational efficiency, RNA secondary structure and RNA-protein interactions in plant and animal systems. Will prepare DNA and RNA samples, perform *in vitro* transcription and translation experiments and handle routine maintenance of laboratory supplies. Requirements: bachelor's degree in biology or chemistry. Familiarity with molecular biology techniques desirable. R86-082

TECHNICAL ASSISTANT, Center for Cancer Research, to work in a laboratory investigating the molecular biology of animal viruses. Will maintain animal cell lines in tissue culture; prepare and titer virus stocks; collaborate in experiments on the molecular biology and biochemistry of animal viruses and mammalian cells; and maintain some laboratory supplies and equipment. The techniques involved are nucleic acid biochemistry, hybridization and general analysis of macromolecular components of mammalian cells. Requirements: bachelor's degree in basic science and a working understanding of current research in molecular biology. Experience in research in a modern biological laboratory, particularly experience with tissue culture techniques, nucleic acid or protein biotechnology, helpful. Should be able to work well with others on a common problem. R86-079

SCIENTIFIC PROGRAMMER, Biomedical Engineering Center, Harvard-MIT Division of Health Sciences and Technology, to develop advanced software for the analysis of physiologic signals. Major responsibility is to code, test and debug software modules. Will also design software modules and methodologies for testing them; develop and maintain database; and produce and maintain readable documentation. Master's degree in electrical engineering, computer science or mathematics or equivalent experience required, as are excellent programming skills and experience with C and UNIX. Must be able to prepare both textual and graphic material for inclusion in periodic progress reports and papers for publication. Familiarity with electrocardiography, pattern recognition, real-time programming, digital filters, assembly language programming and expert systems helpful. R86-077

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 ASSOCIATE, Earth, Atmospheric, and Planetary Sciences, to perform real-time forecasting and analysis in support of aircraft field studies of stratosphere-troposphere exchange project. Will participate in field experiment in Australia and manage MicroVAX computer system. Requires a Ph.D. in meteorology specializing in large-scale dynamics of the tropical atmosphere with a thorough knowledge of the general circulation and its variability at time scales from several days to several years and of trace constituent distributions. Minimum of 5 years scientific programming in FORTRAN, including experience with VAX systems, also required. R86-067

TECHNICAL ASSISTANT, Brain and Cognitive Sciences, to assist principal investigator and postdoctoral associates in neurophysiology laboratory studying eye movement and vision. Will handle and care for animals; set up and assist in sterile surgery and provide postoperative care; construct electrodes; process brains for histology; analyze data, set up and assist during experimental procedures; manage and maintain laboratory; edit and proofread journal articles; prepare grant proposals, budgets and reports; provide photographic assistance and prepare illustrations; and provide clerical assistance. Bachelor's degree, preferably in biology, psychobiology or related area, and good typing skills required. Knowledge of or willingness to learn word processing necessary. Good organizational skills, flexibility and ability to work independently required. Laboratory and secretarial experience preferred. Must be willing to work odd hours as necessary. NON-SMOKING OFFICE. R86-065

RESEARCH SPECIALIST, Energy Laboratory, to have responsibility for the Sloan Automotive Laboratory's computer facility and data acquisition system, which includes a VAX 11-750, Micro VAX II and CSPI Array processor, used for scientific computations, word processing and real time data acquisition. Will manage, develop, operate and program system; have extensive interaction with students, faculty and staff; and provide partial support for laboratory instrumentations, controls and related electronics. B.S. in electrical engineering or mechanical engineering with computer background or B.S. in computer science with engineering background required. Good working knowledge of FORTRAN and VMS necessary. R86-063

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

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 prepare the device for animal studies to be done by another group. Independent projects are encouraged. Bachelor's degree with "wet chemistry" laboratory experience required. Concentration in chemistry, biochemistry, material science or applied biology preferred. R86-057

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 (through 12/88), to work on projects including advanced instrumentation for waterborne vessels, involving real-time data from physical transducers, radars and radio navigation devices with onboard computers; preparation and debugging of computer programs for calculating derived functions from real-time data; development of mathematical models and computer programs for predicting performance of waterborne vessels; and determination of relationships between hull forms and hydrodynamic characteristics. Master's degree in ocean engineering and bachelor's degree in ocean engineering or naval architecture and marine engineering required. Ability to design, construct and carry out model tests along with all subsequent data analysis essential. Must be fully familiar with concepts of dimensional similitude and be able to apply these concepts to the design of model tests. Experience programming in FORTRAN and BASIC; familiarity with marine engines, shipboard electricity generating systems, marine propellers and sail propulsion; familiarity with marine electronics and interfacing between marine electronics and computers; and ability to work with as well as supervise others necessary. At-sea experience mandatory. R86-049

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

TECHNICAL ASSISTANT, Mechanical Engineering, to assist researchers working with artificial skin and similar devices, combining skills from engineering, chemistry and biology to solve medical problems. Will wash and sterilize glassware; use laboratory equipment such as centrifuge and freeze dryer; operate scanning electron microscope; and prepare small animals for surgery and assist during such surgery. At least one year of experience with the above techniques required. Associate's or bachelor's degree in biology or related field preferred. R86-036

TECHNICAL ASSISTANT, Division of Comparative Medicine (part-time, 20 hours/week; temporary), to prepare and run serology. Will prepare sera, keep records and interpret test results. Bachelor's degree or equivalent required. Prior experience with ELISA technology preferred. Background in immunology and molecular virology helpful. R86-035

STATISTICAL PROGRAMMER, Department of Brain and Cognitive Sciences, to organize and analyze neuropsychological data on a VAX/VMS system. Will update, maintain and transform data files; program; and perform statistical analyses using SAS package and summarize the results. Extensive programming experience (C, Pascal, FORTRAN), including use of data management and statistical procedures (especially SAS) and a general background in applied statistics required. Must be able to work well under pressure and independently. Excellent skills for organizing and documenting work essential. Bachelor's degree preferred, but practical experience may substitute. NON-SMOKING OFFICE. R86-033

SYSTEMS PROGRAMMER, Laboratory for Computer Science, to develop systems and applications software for networks and distributed systems. Will design and implement network protocols and network monitoring tools; maintain network hardware; document, test and tune performance of network software; and perform other assignments required to support computing services. B.S. in computer science or equivalent combination of education and experience required, as are familiarity with UNIX and some family of network protocols (e.g., TCP/IP), fluency in C and experience with protocols and operating systems internals. Experience with Lisp machines and MSDOS helpful. **R86-020**

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, Harvard-MIT Division of Health Sciences and Technology (part-time, one day/week; temporary), to support faculty members in charge of an anatomy course to be presented at the Harvard Medical School. Will coordinate prosecutions for this course. Bachelor's degree required. Must be familiar with human anatomy and general biological laboratory procedures. **R86-015**

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 SPECIALIST - MTL COMPUTER SYSTEMS MANAGER, Electrical Engineering and Computer Science, to manage UNIX operating systems on VAX-785 and Microvax II's; supervise computer maintenance by DEC field service; supervise software backups; support networking software; maintain software of terminal concentrators; assist users with software applications; and supervise the installation of additional computer peripheral equipment as it is acquired. Undergraduate degree in electrical engineering and/or computer science, or equivalent combination of education and experience, required. Experience in C and PDP-11 Macro Assembler programming, installation of UNIX system software and the fixing of both systems and applications level software bugs necessary. Ability to diagnose whether a problem is hardware or software related important. **R86-982**

RESEARCH ASSOCIATE, Laboratory for Computer Science, to work on the LCS Common System, a distributed computer system supporting heterogeneous program invocation. Will contribute to the overall system design, with responsibility for major components (possible areas include remote invocation semantics, management of abstract data types, display semantics and data storage services); publish papers; implement and debug code; and work with students and staff. Some teaching involvement is possible. Ph.D. in computer science, or equivalent combination of education and experience, and successful research experience as demonstrated by papers or artifacts are required. Specific experience with one or more of the following: programming language design, distributed systems, network protocols, network based services, operating system design, Lisp or CLU, also necessary. **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. NON-SMOKING OFFICE. **R86-965**

RESEARCH ASSOCIATE, Center for Computational Research in Economics and Management Science, to assist with research and development of new statistical software aimed towards producing a sophisticated software environment for statistical modeling, data analysis, and graphics. This environment will borrow much from the A.I. community, including expert systems technology. Ph.D. in statistics and experience in LISP, FORTRAN and C programming required. Knowledge of statistical graphics very desirable. **R86-961**

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**

POSTDOCTORAL ASSOCIATE, Division of Comparative Medicine. Postdoctoral training program for veterinarians seeking careers in comparative pathology and laboratory animal medicine. Program emphasizes research training and in-depth clinical investigations. Additional training will include clinical rotations in research institutions affiliated with the Division. Previous experience in the field is desirable, but not mandatory. Eligibility credit earned toward board certification by ACLAM and/or ACVP. D.V.M. required. **R86-931**

RESEARCH ASSOCIATE, Materials Science and Engineering, to work in the H. H. Uhlig Corrosion Laboratory at MIT. Will be expected to work in the areas of photoelectrochemistry and a.c. impedance studies of passive films on pure metals and amorphous alloys. A Ph.D. in Materials Science and Engineering or related subject and have research experience in electrochemistry and photoelectrochemistry is required. At least two years of experience is preferred as well as publication and proposal writing experience. Will be expected to work with graduate research students as well as with research staff from other groups in the department of Materials Science and Engineering. **R86-917**

LIBRARY SUPPORT STAFF

LIBRARY ASSISTANT IV, Humanities Library, to carry out technical processing procedures with primary responsibility for serials. Will process newly received serials; search and type serial orders; process claim and replacement orders; maintain current periodical shelves; maintain holdings information; identify and prepare volumes for binding; handle repair procedures for damaged serials and monographs; and assist with special projects as needed. Will also serve an average of one to two hours per day on the reference/information desk. Occasional weekend or evening shift duty involved. Requirements: graduation from high school or equivalent and a minimum of 2.5 years of direct/related experience; post high school education may count toward experience. Must have excellent organizational skills and capacity for detail. Reading knowledge of at least one foreign language and experience with automated library systems desirable. Good communicational skills essential. NON-SMOKING OFFICE. **L86-736**

LIBRARY ASSISTANT III, Barker Engineering Library (part-time, 17.5 hours/week), to provide circulation services to library patrons: charge and discharge books, renew material and perform other circulation functions using an online computer system; instruct patrons in the use of public access terminals; and perform other assignments as necessary. Requirements: graduation from high school or equivalent and a minimum of one year direct/related experience; post high school education may count toward experience. Experience with an interactive computer system helpful. Ability to interact successfully with other staff members and with patrons in a hectic environment essential. Punctuality and attention to detail necessary. The work schedule for this position is Mon - Thurs, 3 - 6:30 pm; Fri, 3:30 - 7 pm. NON-SMOKING OFFICE. **L86-695**

JUNIOR MICROFILMER, Microreproduction Laboratory, to perform elementary tasks in the production of microforms and receive instruction in additional technical disciplines. Will be responsible for meeting production goals, while observing quality standards, and help to maintain equipment. Will be expected to work in one or more of the following activities: operation of a planetary microfilm camera in the production of roll film or microfiche; operation of a rotary camera; darkroom work; operation of microfiche step and repeat camera; operation of a microfiche printer/processor; and operation of binding equipment. Graduation from high school preferred. Mechanical ability desirable. **L86-683**

LIBRARY ASSISTANT III, RetroSpective Collection (part-time, 17.5 hours/week, mornings), to perform circulation routines: charge and discharge books, retrieve materials from stacks, receive telephone requests on renewals and collect statistics. Will also perform general stacking routines: clear tables and book trucks; sort, distribute and reshelve material; shelfread and search for missing items; and perform other related duties as assigned. Requirements: graduation from high school or equivalent and minimum one year direct/related experience; post high school education may count toward experience. Familiarity with typewriter keyboard desirable. Must have good organizational skills and ability to work with minimal supervision. Punctuality and regular attendance are essential. Physical stamina needed for stacking duties. **L86-680**

LIBRARY ASSISTANT III, Catalogue Department (part-time, 17.5 hours/week, mornings), to input catalogue records on the OCLC terminal from workforms prepared by cataloguers. Will edit online contributed and Library of Congress records; participate in maintenance of the Libraries' database, including holdings and heading changes; remove and correct cards in the Institute Library Catalogue; and perform other related duties as required. High school diploma, accurate 40 wpm typing and minimum one year direct/related experience required. Attention to detail essential. Experience using CRT terminal desirable. **L86-571**

SECRETARY/STAFF ASSISTANT

ADMINISTRATIVE SECRETARY, Treasurer's Office, to support the manager of special investments and the assistant to the treasurer. Will prepare data and reports necessary to maintain records and track performance of investments; prepare correspondence; interact with external firms to obtain necessary information for tracking investments; and perform other duties to support overall office activities: word processing, transcription, filing, handling phones and planning travel and meetings. Requirements: 50 wpm typing skills, word processing proficiency (preferably including knowledge of Wordstar 2000) and a minimum of 4.5 years of direct/related experience. Must be able to prioritize workload with minimal supervision. **B86-726**

ADMINISTRATIVE SECRETARY, Office of the Dean for Student Affairs, to support the assistant dean, advisor to fraternities and staff associate for residence programs. Will respond to complicated telephone and in-person inquiries; serve as the primary source of information on ODSA and Institute policies and procedures; schedule appointments; type and proofread reports, correspondence and other materials; assist with administration of faculty and graduate resident programs; handle mail; prepare Institute forms; maintain files; order supplies; and perform other related duties as assigned. Requirements: graduation from high school or its equivalent, 65 wpm typing skills, knowledge of word processing (preferably IBM or DECmate) and a minimum of 4.5 years of direct/related experience; post high school education may count toward experience. Must have strong organizational and interpersonal skills and the ability to handle detail and work well under pressure. Knowledge of M.I.T. helpful. **B86-724**

SR. EDITORIAL ASSISTANT, News Office (part-time, 20 hours/week; temporary, through 6/30/87), to research and write or rewrite articles and notices about arts at MIT. Will secure source approvals for drafted articles when necessary; code and keystroke articles into word processor; proofread; and maintain targeted mailing lists. Will also perform general office duties such as answering telephones and greeting visitors, and provide backup services to support staff members as necessary. The work schedule for this position is Mon - Fri, 10 - 2. Non-smoker preferred. **B86-708**

ADMINISTRATIVE SECRETARY, Alumni Association, to support the regional director for the New England area. Will transcribe and type correspondence and general materials; provide information to alumni, Institute staff and faculty and outsiders about alumni programs; assist special programs and ongoing alumni activities in running smoothly and efficiently; and perform other related duties. Will also work with other secretaries in Alumni Relations group to balance out and cover workload requirements for entire group. Will be trained to use word processor and database system. Requirements: excellent typing and transcription skills and a minimum of 4.5 years of direct/related experience. Good interpersonal skills and discretion in handling confidential materials essential. NON-SMOKING OFFICE. **B86-707**

ADMINISTRATIVE SECRETARY, Political Science, to support the administrative officer. Will prepare, maintain and review files and records including pay-rolls, requisitions and vouchers; answer telephones; photocopy; order supplies; issue keys; prepare Institute forms; and type and proofread correspondence and reports. Will also act as information source on established department and Institute procedures; review some monthly accounting statements; and perform special projects when appropriate. Requirements: 50+ wpm typing skills, word processing skills and a minimum of 4.5 years of direct/related experience. Discretion and excellent interpersonal, communicational and organizational skills essential. Knowledge of basic accounting and MIT experience desirable. **B86-706**

ADMINISTRATIVE SECRETARY, Brain and Cognitive Sciences, to support a busy research neuroanatomy laboratory office including one professor and several post-docs, graduate students and technical staff members. Will type reports and manuscripts on IBM word processor (using Final Word) and prepare correspondence from dictaphone tapes; maintain and review files and records for office operation; coordinate and schedule meetings and appointments; act as information source on established department 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 minimum 4.5 years direct/related experience; post high school education may count toward experience. Must be well organized and able to work calmly and with very little supervision. Excellent interpersonal and communicational skills essential. Ease with scientific terms or some knowledge of neuroscience desirable. NON-SMOKING OFFICE. **B86-670**

ADMINISTRATIVE SECRETARY, Resource Development, to support two staff members. Will handle busy telephones; route mail; photocopy; maintain files; make travel arrangements and prepare itineraries; analyze monthly detail transaction reports and prepare budgets; prepare various financial reports such as requisitions for supplies and requests for payment of bills; and schedule appointments and help coordinate on-campus visits and luncheons. Will work extensively on the DEC VT-100. Excellent typing skills and minimum 4.5 years direct/related experience required. Good communicational skills essential. Experience using a transcribing machine and knowledge of M.I.T. helpful. **B86-647**

ADMINISTRATIVE SECRETARY, Office of the Dean of the Graduate School (part-time, 25 hours/week), to support the Associate Dean/Assistant Provost. Will type, proofread and edit; review mail and initiate replies; monitor monthly statements; process vouchers, invoices and financial awards; maintain filing system and mailing lists; answer phones and direct visitors; arrange complex travel and heavy appointment schedules; assist with meetings and special programs; coordinate reproduction of various student brochures; assist in organizing minority student forums; and assist minority graduate students organizations. Excellent typing skills and minimum 4.5 years direct/related experience required. Excellent organizational skills and knowledge of or willingness to learn word processing and IBM PC essential. Flexibility and ability to work as part of a team important. MIT experience helpful. NON-SMOKING OFFICE. **B86-628**

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**

ADMINISTRATIVE SECRETARY, Alumni Association, to support the Regional Director for the West. Will transcribe and type correspondence and general materials; perform research from various records; prepare and coordinate printing and mailing pieces; file; serve as primary source of information regarding alumni clubs and programs; support ongoing alumni activities; assist Regional Director with special programs and activities; and work with other Administrative Secretaries to balance and cover workload requirements. Excellent typing and transcription skills and minimum 4.5 years direct/related experience required. Good interpersonal and organizational skills essential. Must be responsible, responsive and cooperative. Will be trained to use word processor and database system. Should be at ease working independently. NON-SMOKING OFFICE. **B86-538**

ADMINISTRATIVE SECRETARY, Chemistry, to support two professors. Will type and edit manuscripts, proposals and correspondence on an IBM pc system. Will also maintain calendar, answer telephones,

i/s

News about information systems throughout MIT

The Media Lab: Inventing the Future

Susan Jones
Information Services

In Building E15, there is a garden with no flowers. Instead it blossoms with computer terminals. In this garden, researchers explore the limits of information technology, learning to use the computer as the tool that will change our world at least as dramatically as radio and television have already changed it.

This is the Garden of the Media Lab. Set deep in the building on floors suspended over cables and wires, the Garden is filled with computer and television equipment, comfortably upholstered chairs, tables, and a wandering cat. The lighting is cocktail-lounge incandescent. "Oy-veh, oy-veh," cries an electronic voice, and someone reaches for his telephone. (Phones don't ring here, they call their owners.)

In this Garden, and similar areas throughout the building, faculty, researchers, students, and staff play with today's technology to create the communications systems of the next century. The Media Lab brings together eleven previously separate or new research groups: among them are Electronic Publishing, Film and Video, Learning Research, and Human-Machine Interface. The explorations of these groups

Due to the Thanksgiving holiday, the next issue of *i/s* will appear December 3.

IN THIS ISSUE:

- BITNET Turns Five
- Superkey Reviewed
- The Spirit of Shareware
- Athena Surveys Students

are as mind-boggling today as television must have seemed in 1935.

So, when Walter Bender, Principal Researcher of the Electronic Publishing Group, speaks of electronic publishing, he does not mean using a software package for the layout of the Media Lab's newsletter. He is describing a "newspaper" sent to your large-screen home computer.

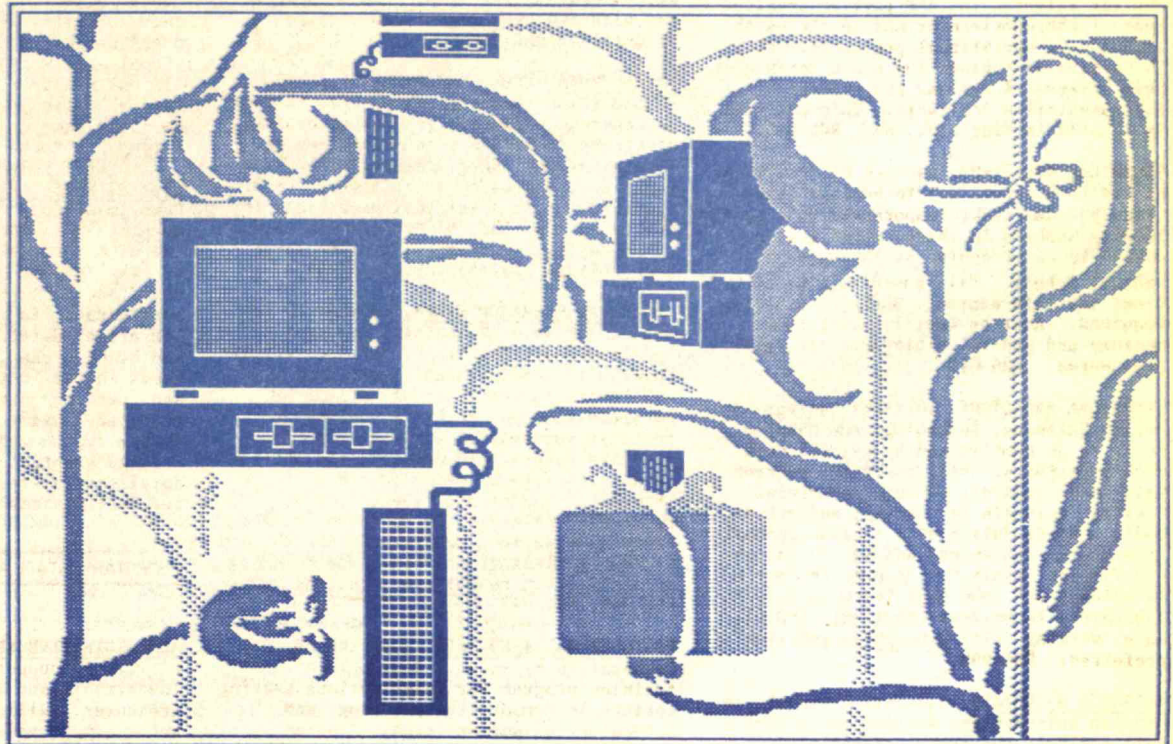
You and your computer edit the hundreds of articles culled from wire and video news services worldwide. The computer combines items of international and professional interest with items of interest only to you (like electronic mail from your mother) to create a dynamic, personalized news source.

In the around-the-corner future of Professor Andrew Lippman, you'll buy your movies as you now buy paperbacks. By making images and sound understandable by machine, the digitized compact movie disk is expected to change the way movies are made, evaluated, distributed and watched.

Seymour Papert, the director of the Learning Research Group, has described the computer as the biggest technological innovation in the classroom since the pencil. In today's classrooms, computer literacy is taught as an end in itself. High school students are taught programming languages and word processing. Elementary school classrooms sometimes have a personal computer sitting in the back of the room for extra activities.

In the classroom envisioned by the Learning Research Group, computer literacy is a by-product on the road to understanding other subjects. Not only will the computer assist in the child's understanding of physical principles, but it will also aid her in expressing ideas before she has acquired the mechanics of composition and spelling.

And then there are those talking telephones. They are



part of the Conversational Desktop, the Lab's talking computer system. Not only can this computer call particular people to the phone, but it can perform other secretarial tasks such as making phone calls and reminding the boss of important meetings.

Although they are not trying to replace the secretary,

the researchers of the Human Interface Group believe that they can create a computer that will be so user-friendly that tomorrow's executive will be able to use it by talking to it, pointing at it, or even looking at it.

The Media Lab researchers are investigating the technical questions of the future. Their visions raise

other questions about the quality of that future. Nicholas Negroponte, the Lab's director, has said, "Improving the quality of life is probably the single driving force here. Our image of the future is that computers will be easier to talk to than people. And we intend to predict the future by inventing it." ●

Strategic Plan: Advisory Council Formed

Cecilia d'Oliveira
Information Systems

William R. Dickson, Senior Vice President, recently announced the appointment of an advisory council for MIT's administrative information systems. The Council will provide input from the academic, research and administrative communities on the implementation of the strategic plan published earlier this year.

Professor Jonathan Allen, Director of the Research Laboratory of Electronics, will serve as chairman. Other members include:

Shirley K. Baker, Libraries; Vera J. Ballard, Whitaker College; Laurence J. Connelly, Jr., Comptroller's Accounting Office; Professor Frederick C. Hennie III, Electrical Engineering and Computer Science; John J. Hynes, Office of Sponsored Programs; Francis H. McGrory, Treasurer's Office;

Doreen Morris, Provost's Office; Wanda Osborn, Sloan School; Joan F. Rice, Personnel; John F. Rockart, Sloan School; Barry M. Rowe, Purchasing and Stores; and Lawrence W. Ryan, Chemistry.

Professor James D. Bruce, Vice President for Information Systems, said "As the plan made clear, the next generation of information systems at the Institute must support the needs of the community. The formation of the Council is a vital step toward this goal."

The Council is expected to work closely with the Strategic Plan Working Group (SPWG) over the next year to establish priorities for the plan, and to provide feedback regarding ongoing and new activities. The Council will also meet independently with the administrative vice presidents to

review and evaluate progress.

An important function of the Council will be to assist SPWG and the administrative vice presidents in identifying opportunities for productivity increases as well as financial and other benefits from the plan. The Council will also play a major role in moving the plan's products—including software, policies, procedures, and changes in responsibilities—into standard Institute operations.

Successful implementation of the plan will enhance automation of many administrative functions that continue to be paper-oriented. With the advice of the Council, any changes in administrative procedures that accompany such enhancements—for example, on-line forms replacing paper forms—will be accomplished as smoothly as possible. ●

BITNET: Celebrating Five Years of Connections

In the beginning, two men — both directors of information systems — envisioned a cooperative, global computer network for colleges and universities. Ira Fuchs, then at the City University of New York, and Greydon Freeman, then at Yale, saw their model in IBM's worldwide corporate network. Their dream took shape in the spring of 1981, when computers at CUNY and Yale first exchanged data via a phone line and two modems.

BITNET — the BIT stands for "Because it's time" — now connects over 800 computers at 189 institutions in 44 states. Gateways interconnect BITNET with ARPANET, CCNET, CSNET, EDUCOM's Mailnet, and USENET. Add BITNET's connections to networks in Canada, Europe, the Middle East and Japan, and Fuchs' and Freeman's idea of a global academic network is close to a reality. BITNET now operates on more than 30 different systems, including Control Data, Cray, DEC, Honeywell, and Sperry machines.

BITNET is unique in that connection is not restricted by funding source, main-frame type, or disciplinary specialty. It is open to any institute of higher education, regardless of size or mission. Each member must have a computer capable of supporting the BITNET networking protocols, provide a leased-line connection to another member, and provide facilities for at

least one new member to connect. Through these links, faculty, researchers, administrators, and students can exchange text and data files; communicate via electronic mail; and gain access to server machines and associated data services.

With BITNET, scholars in far-flung locations collaborate on research projects and papers. Scientists also use it to access databases,

and to share and analyze experimental data. Software can be exchanged quickly and easily between sites, while developers and maintainers are only an electronic message away.

Professional and educational support organizations use BITNET to exchange mail, send out conference announcements, and distribute minutes of meetings. Papers and manuscripts also move between authors, editors, and publishers.

In its first years, BITNET grew primarily by word-of-mouth, while CUNY, Yale, and other early members voluntarily maintained the network. As the number of member institutions grew, the need for a central coordinating body became crucial.

With a substantial 30-month grant from IBM, the BITNET Network Support Center was established in 1984. The Network Support Center is composed of the Network Information Center (BITNIC) and the Development and Operations Center (BITDOC).

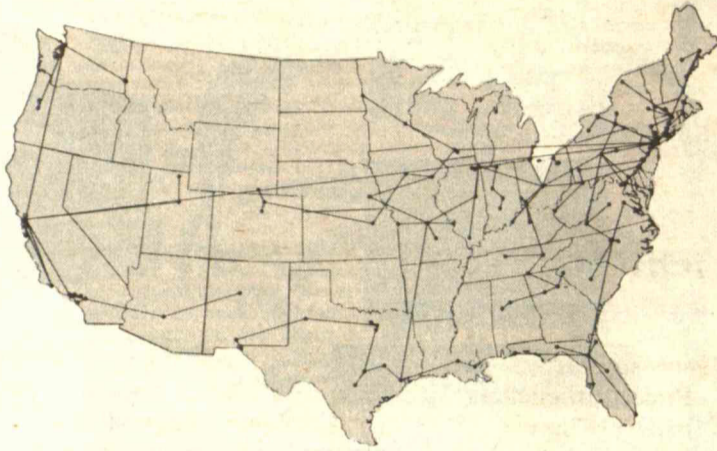
BITNIC is run by EDUCOM, a nonprofit

consortium of 500 colleges and universities, founded to facilitate the use of information technology. The Network Information Center provides information and technical expertise to institutions desiring to connect to BITNET, thus enabling the network to expand rapidly in an orderly, informed fashion.

BITDOC, based at CUNY, develops tools and utilities for the network, and implements specifications for services such as gateways, group mailing lists, and file retrieval facilities.

What might come after BITNET? Fuchs, now Vice President for Computing at Princeton, says "the next step is clear—a World University network, WUnet, linking all of higher education and research with the same power and simplicity of the world telephone system."

If you're interested in using BITNET from an MIT computer, see Memo IS-10, *Networks at MIT*. It's available from IS Publications and Software Sales, Room 11-209.



The 1985 BITNET configuration. BITNET is a store-and-forward network with files and messages sent from host computer to host computer across the network. Services provided include electronic mail, file transfer, and remote job entry. (Courtesy of Texas A&M University. Reprinted with permission from *Science*, Feb. 1986, Vol. 231.)

Credit Union Speeds Service

The MIT Employees Federal Credit Union has had a face lift and more. In April the Credit Union moved to newly remodelled office space in E19-437. On May 5 it went "live" with a new interactive computer system.

The new system means improved services for Credit Union members. For example, if you want to withdraw

savings from your Credit Union account, you need no longer phone in your request a day in advance. Just come to E19-437 on a weekday between 10am and 3pm. A check is printed while you wait, your account is updated immediately, and you receive a printed record of the transaction showing your new account balance.

The software for the new system is a package pur-

chased from ECOM, a company in Memphis that specializes in credit union systems. Other users of ECOM products include HP Hood and the Kendall Square Credit Union. Harvard University is also considering the package.

The MIT Credit Union purchased a DEC PDP 11/84 minicomputer to run the new software. Desks in the Credit Union office now

support DEC VT220 terminals, used for data entry. Desktop printers create instant checks and transaction records.

Except for printing of quarterly statements, the new system makes the Credit Union an independent computing installation. It replaces a batch system, on which files were updated only about once a week.

Enhanced Phone Services for MIT Dorm Residents

Karen McCarty
Telecommunications Systems

On August 15, 1986, the Massachusetts Department of Public Utilities (DPU) issued a ruling that will significantly improve local exchange phone access for MIT dormitory residents. Ruling DPU 86-13 compelled the New England Telephone Company (NET) to provide flat-rate residential trunk service to students who live in MIT dorms or other residential quarters owned, leased or under the control of MIT.

The ruling applies to all educational institutions in Massachusetts. It flows from a case initiated by MIT in December 1985. The case was argued by MIT's Direc-

tor of Telecommunications Systems, Morton Berlan, who received his JD from Suffolk University in 1978.

The DPU's ruling allows MIT to obtain both measured business trunk lines for institutional and business purposes, and flat-rate residential trunk lines for social and residential purposes. This will enable MIT to provide local exchange phone access to dormitory students via the Institute's new 5ESS digital switching system, which will begin service in June 1988.

NET had previously provided only measured business trunk lines. For student use, this would have required a complex and

prohibitively expensive billing system to accommodate local calls to the Boston metropolitan area. Instead, 1,000 dorm residents annually elect to receive local exchange service directly from NET, in addition to Dorm Line service. This dual service will no longer be necessary after installation of the 5ESS switch.

Case DPU 86-13 is seminal in that it recognizes the diversity of communities within educational institutions. Prior to the ruling, NET considered educational institutions as one community of business users. They now acknowledge that both a business and a resi-

dential community co-exist on one physical campus, and that the two are entitled to different classes of service from local telephone exchange carriers.

In a related matter, MIT's Telecommunications Systems is negotiating with intercity and long-distance common carriers to develop a plan for direct billing of dorm residents who place long-distance calls via the 5ESS switching system.

If these negotiations succeed, dormitory residents will need only one MIT-provided phone to have full access to the universal switched-message telephone network.

5ESS Booklet

In order to provide the MIT user community with more detailed information on the new telecommunications system to be installed in June 1988, the Telecommunications Systems Department has recently published the booklet *5ESS: An Integrated Telecommunications System for the Massachusetts Institute of Technology*.

First released at the Senior Vice President's September meeting of Administrative Officers, copies are now being mailed to faculty, academic and administrative staff members. Additional copies may be obtained by contacting Telecommunications Systems, E19-741, x3-3651.



i/s

October 22, 1986
Volume 2, Number 2

i/s is published monthly by MIT Information Systems, Room 11-309, 77 Massachusetts Avenue, Cambridge, MA 02139; Editor: Robyn Fizz (617) 253-0540 (Fizz@MIT-Multics).

Those wishing to receive *i/s* regularly are asked to subscribe to *Tech Talk*. Subscriptions to the newsletter are available on an exchange basis with other computer installations.

The newsletter is formatted using Aldus' *PageMaker*, version 1.2. Articles may be reprinted, provided that source credit is given. Comments are welcome.

Meet Jenny Wagner

Susan B. Jones



Jenny Wagner is an MIT graduate student preparing a thesis proposal. Her advisor is a professor at the Technion in Israel. She and her advisor maintain a good working relationship thanks to BITNET on MITVMA, the IBM academic computer at IS.

Jenny became acquainted with her advisor, Professor Uri Shamir, when he visited MIT several years ago to do a joint research project with Professor David Marks of the Department of Civil Engineering. Jenny wanted Dr. Shamir to advise her Ph.D. research on "Managing Ground Water Quality Under Uncertainty" — the uncertainty being related to soil properties — and BITNET made it possible.

On average Jenny and Dr. Shamir exchange BITNET messages about three times a week. They relay details of research

plans and progress, plus more personal items.

Although BITNET messages take only about 15 minutes to travel between them, the two correspondents must also cope with a six-hour time difference. Since Jenny is a "night person" and Dr. Shamir a "morning person," they've developed a routine for their on-line correspondence: she sends him mail at the end of her day, which he reads at the beginning of his day and answers before the beginning of hers.

From the user perspective, using BITNET is like sending local electronic mail — except that the node in Jenny's NAMES file is a computer in Israel. Her messages travel to Israel by way of computers at BU, Brown, Cornell, City University of New York, and Zurich. Except for CMS computing charges at MIT, BITNET is free.

Sampling SIPB

The Student Information Processing Board (SIPB) is a student service organization whose purpose is to make access to computers easier for the MIT community. SIPB (pronounced "sip-bee") accomplishes this goal by providing students with free computer accounts for individual projects, and offering consulting services and documentation to interested community members.

Sponsored student projects can involve text processing for course papers, advanced research topics, or learning to use a computer or programming language. SIPB funds computing on two large IS computer systems: the Honeywell DPS 8/70M and the IBM 4381.

Members of the MIT community may want to look into SIPB's consulting services. Users can drop by the SIPB office (Room 11-205) to ask questions about computing, or call x3-7788 any-time. SIPB also publishes and distributes free documentation on Multics and

Athena, such as the popular *Underground Guide to Text Editing on Project Athena*.

SIPB has enjoyed close relations with Project Athena from the start. SIPB relays student feedback to Project Athena; such feedback led to the opening of the Student Center Cluster in 1985. SIPB also administers a VAX 11/750, Charon. This computer is used to develop software—like the Xerox 9700 print service—for Athena users.

Recently, SIPB has purchased modems to allow students dial-up access to the Student Center, and has acquired an Apple LaserWriter. Free mathematical output from the LaserWriter is available to Athena users.

Anyone interested in learning more about SIPB may stop by their office any-time, or attend one of their weekly Monday evening meetings. As a volunteer organization, SIPB has no regular office hours, but there is often someone around. New members are always welcome.

Starting a User Group

Starting a user group is no different from starting any other kind of group. Basically, you must consider four points: where and when you will meet, how you will communicate with group members, how you will support the group's activities, and what you will do at the meeting.

Choosing a time and place. Try to find a regular meeting time, like the third Thursday of every month. This helps members remember the date and plan ahead. Try to find a room that's free of charge. For information

about rooms at MIT, call Joni Bubluski at 253-1744 (Bubluski@MIT-Multics).

Communicating with members. Even at the start, some kind of mailing is important. Many groups simply send copies of their minutes to members. Including the agenda of the next meeting helps spark interest and increase attendance.

Supporting the group. Find simple ways to pay for your activities. Pass the hat. Charge dues. Try to find a sponsor. And keep good financial records, even when it's only nickels and dimes. Later, when you

have more money, you can think about the legal and formal aspects of becoming a recognized organization.

Setting the agenda. Whether your group meets physically or on-line, an agenda is a must. Try to make meetings informative, entertaining and open to everyone's contributions. Any formal presentation should last no more than half an hour. This leaves time for questions after the presentation and other informal discussions. Finally, set aside a few minutes to plan your next meeting.

Athena Surveys Students

Since its start in 1984, Project Athena has had a profound impact on student use of computers at MIT. A recently completed survey, which tracks changes in student use of Athena and other MIT computer systems, indicates that 87% of MIT undergraduates have used, or are using, Athena computers. This is an increase of over 29% from the spring of 1985.

Moreover, only 29% of the survey respondents reported that they were enrolled in courses that required the use of Athena—over 70% of MIT's undergraduates are using Athena voluntarily.

How are these students using Athena? Sixty-five percent are writing papers and lab reports, while 46% use the system to communicate with one another. Writing and debugging

programs are also popular activities (32%), as are doing problem sets, analyzing data, and storing personal records. Use in all of these areas has increased significantly since 1985; however, word processing tops the list, with users reporting a 30% increase for this one application.

Although male students still use computers more than female students (9.8 hrs/wk as opposed to 6.3), and seniors more than others, Project Athena is changing these ratios. Athena users are evenly distributed across gender, class, and type of living group.

Athena also seems to be having an impact on student attitudes toward computers. Students are slightly more confident about their ability to use computers than they were a year ago, and more assured about the security of

Athena computers. Although students still feel that computers make it easier to work collaboratively, they feel less strongly about this than they did a year ago.

Although Athena is an educational experiment, students see the project as a service. They express little concern about the implementation of Phase II, the workstation environment, but are critical of current problems: overcrowded and inaccessible facilities, poor printers, and the relative slowness of the system.

Despite these misgivings, 70% of those surveyed agreed that MIT should develop a university-wide network of personal computers. That consensus suggests that Athena has played a positive role in shaping how students use, and want to use, computers.



Coming Events

October 23: Group Decision Support Systems. Sponsored by the MIT Operations Research Center. MIT Room E40-298, 4pm. Info: 253-3613 or 253-6185.

October 31: Artificial Intelligence Conference. Sponsored by New England Regional Computing Program (NERComp). Babson College, Wellesley. Info: (617)848-6494.

November 5: Computer Graphics Broadcasting. Sponsored by SIGGRAPH/NE. BBN, Cambridge, 7:30pm. Info: 975-0000, ext. 5481.

November 8: Symposium on Statistical Graphics. Sponsored by the Boston Chapter of the American Statistical Association. Bentley College, Waltham. Info: 891-2967.

November 11-14: At the Point — Where Education, Research, and Technology Converge, EDUCOM '86 Conference. Pittsburgh, PA. Info: (609)734-1888.

November 17: Parallel Computing — New Directions in Data Flow. EECS Colloquium Series. MIT Room 34-101, 4pm.

December 11: Networks Conference. Sponsored by NERComp. Western New England College, Springfield. Info: (617) 848-6494.

Main-frame Tip



Tired of retyping user IDs each time you want to send mail to the same group of people? On CMS you can create a mailing list that will do it for you.

To create a mailing list for your staff, for instance, type: NAMES STAFF. This creates a NAMES file called STAFF.

A menu will appear on your screen that lets you enter, change, or remove user IDs, names, phone numbers and addresses. Once you have created and saved the file, you can send mail to your staff by typing MAIL STAFF.

For more information, type HELP NAMES on CMS.

MICROCOMPUTER CORNER

The Spirit of Shareware

Remember the snack commercial in which an old man asks a child what he learned in school? "Sharing," the child answers, offering him a box of Crackerjacks. In the more prosaic world of computing, shareware offers much the same spirit of generosity.

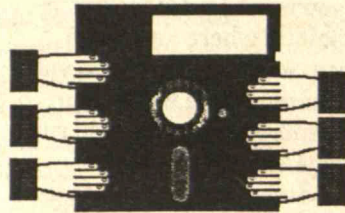
Shareware, or user-supported software, is copyrighted software designed to be passed around and used. Shareware authors encourage you to copy their programs. However, they do request donations (usually \$10-50) for well-liked applications.

Shareware is written and distributed by users as well as developers. These users believe that software should be straightforward, bug-

free, and reasonably priced. Programs range from small desk accessories to complete applications. Because shareware is produced for and by users, expenses that contribute to a program's cost, like packaging, corporate administration and publicity, are cut to a minimum.

There are several ways to obtain shareware. Most electronic bulletin boards support software libraries that members can access to copy programs. If a bulletin board doesn't support a library, it may provide electronic mail service so that users can send copies of programs to each other.

User or special interest groups are another avenue for obtaining shareware. Groups meet to review and



swap software, as well as to discuss technical issues. The Boston Computer Society (BCS) sponsors a variety of user groups and maintains software libraries for most kinds of microcomputers. BCS software librarians can help you determine your software needs and answer questions.

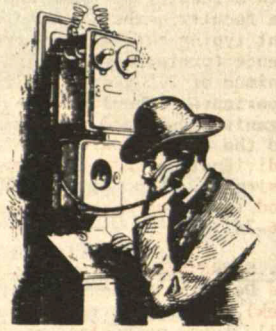
Shareware authors offer varying levels of support and maintenance for their programs. It's good etiquette and advantageous to send donations to program authors. When you pay for

a program and register with its author, you may receive documentation and program updates. The opening screens of most programs contain author, donation and copyright information.

There are many well-liked shareware packages for the IBM PC and the Macintosh circulating today. PC File III, for example, is so popular that readers from *Consumer Reports* voted it the standout in its class of file management systems. The program costs one-tenth the price of comparable commercial programs.

If you want to learn more, check the BCS libraries or a local user group. The book *How to Buy Software* by Alfred Glossbrenner (St. Martin's Press, 1984) is also a valuable guide. ●

Consultant's Hotline



Microcomputer Center consultants often hear similar questions from different people. This column features a few such questions and their answers, gleaned from our consulting logs. For answers to your micro questions, call 253-7686.

Q: Can Apple's 800Kb external disk drive be used with the Macintosh 128K or 512K?

A: The 800Kb drive can be used with a 512K Mac; you will need the newest versions of both the System (3.2) and Finder (5.3), and a special startup file that the Micro Center can provide. With a 128K Mac you must upgrade. Apple will soon announce a 512K/E upgrade kit that includes an internal 800Kb disk drive.

Q: What is the difference between a program language interpreter and a compiler?

A: An interpreter translates programming instructions one at a time, as the program runs; a compiler translates the entire program before it is run. The BASIC programming language that runs on IBM PCs is an interpreted language. For a more complete explanation, see IS Memo MC-2, *An Introduction to Microcomputers*, page 11.

Q: I need a color monitor for my IBM PC. What do you recommend?

A: If your work involves reading a lot of text on the monitor, IBM's Enhanced Graphics Display and Adapter would be best. Otherwise, use the less expensive Color Graphics Display and Adapter. Due to the latter's lower resolution, text characters are not as sharp as those on the Enhanced Display, and not as many colors are available. ●

Superkey Boosts Productivity

Do you find yourself performing the same sequence of operations or keystrokes each time you use a certain piece of software? Wouldn't it be convenient to use one keystroke in place of that sequence?

You can with software utilities called keyboard enhancers. They allow you to incorporate strings of data, text and computer instructions into single keystrokes by creating programs called keyboard macros. One of the most popular keyboard enhancers for IBM PCs is *Superkey* by Borland International.

Superkey is loaded at the DOS level and then resides invisibly in random-access memory (RAM) until you type a specific command to

bring it into action. You can be in the middle of your spreadsheet application or editing a document and call on *Superkey* with a single keystroke.

Once in *Superkey*, you create a macro by giving a command to record subsequent keystrokes, including text, to the desired key. For instance, you could choose F2 to perform all the steps necessary to update employees' salaries. You could then give this macro a name, save it to disk, and load it each time you entered your database. When you were ready to make an update, one touch of the F2 function key would run all the preprogrammed steps.

Superkey allows you to have variables in the macro. When the macro is

played back, it will stop and wait for a value for the variable. In the above example an employee's name could be entered when the macro is run.

While *Superkey* is worth its price for its macro facilities alone, it has a number of other useful functions. One of these is its "command stack," which remembers the last 255 characters typed at the DOS command level. Commands in the stack can be edited and reissued.

Superkey has two file encryption facilities. Its own proprietary algorithm is very fast. With a hard disk it can encrypt or decrypt a 7,300-byte file in 2 seconds. The government standard DES mode is also available but takes 15 seconds for the same file.

Some of *Superkey's* other goodies include a screen protect utility that turns off the screen to prevent burn in. A cut-and-paste option allows you to take text from the screen and place it in an application. Data printed from a database can thus be incorporated into a document or spreadsheet.

At the stroke of a key you can turn the screen on and off for privacy. The keyboard can also be locked to prevent tampering. Finally you may define your keyboard layout as you wish.

If you are interested in increasing productivity and security while decreasing keystrokes, take a look at *Superkey*. It can be special-ordered for \$52 from the MIT Micro Center. ●

New User Groups

There are two new user groups on campus: the MIT Macintosh Group and the *WordPerfect* Group. The Mac group meets on the 2nd Wednesday of each month in Room 26-100 at 6:30pm. Call Becky Waring, x3-1588, for more information. Rosalie Allen, x3-3115, is the contact person for the *WordPerfect* group. Their first meeting will take place Monday, October 27 in Room 4-109 at noon.

To find out about other MIT user groups, or to tell us about yours, call Joni Bubluski at x3-1744 (Bubluski@MIT-Multics). A list of MIT user groups is also posted on the IS bulletin board, near the Project Athena Fishbowl.



The MIT Microcomputer Center
Room 11-209, 253-7686
Hours: Monday-Friday, 10am-4pm

New Graphics Board for IBM PC/AT— High resolution graphics and high quality text for the AT and compatibles. The AST 3G Plus/256 graphics board provides IBM Enhanced Graphics and MDA compatibility, as well as Color Graphics and Hercules Graphics Card emulation. Comes with 256K of memory. Price is \$368.

New Graphics Board for IBM PC/XT— High resolution graphics and high quality text for the XT and compatibles. The AST 3G PAK/256 graphics board also provides IBM Enhanced Graphics and MDA compatibility, as well as Color Graphics and Hercules Graphics Card emulation. Comes with 256K of memory, plus serial and parallel ports, a clock/calendar and SuperPak software. Price is \$383.

Planning to Purchase Multiple Systems? If your office has plans to purchase a number of personal computers, the Micro Center can assist you in determining the best mix of systems, printers and other devices to meet your needs. Advance notice of your plans will also give us time to make sure that all of the components are available when you need them.

arrange appointments and travel, maintain files and monitor research accounts. Excellent typing skills and minimum 4.5 years direct/related experience required. Familiarity with technical typing and MIT accounting and administrative systems desired. Experience with or willingness to learn IBM pc necessary. B86-537

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, Laboratory for Information and Decision Systems (part-time, 30 hours/week), to support two faculty members. Will type correspondence, technical reports and papers; coordinate class preparation and meetings; schedule appointments and arrange travel; answer telephone; receive visitors; process mail; photocopy; and maintain student records and files. Requirements: good typing skills and a minimum of 2.5 years of direct/related experience. Must have experience with or be willing to learn word processing. B86-739

SR. SECRETARY, Spectroscopy Laboratory, to support the director and associated staff. Will compose routine correspondence, take dictation, receive visitors, file, answer phones, photocopy and distribute mail. Some overtime may be necessary. Requirements: excellent typing, proofreading and word processing skills and a minimum of 2.5 years of direct/related experience. Shorthand desired. Good organizational and interpersonal skills essential. NON-SMOKING OFFICE. B86-733

SR. STAFF ASSISTANT, Admissions Office, to operate word processor and coordinate word processing for the office on a DECmate II system. Will process letters concerning all aspects of the applications process; work closely with the travel coordinator in running notices for fall recruiting trips; and interact with all staff. Will perform other related duties including overflow typing in support of 4 secretaries, data entry and a variety of special projects. Requirements: excellent typing skills; word processing experience and a minimum of 2.5 years of direct/related experience. Must be able to work independently with accuracy and attention to detail under deadline pressure. Good organizational skills and the ability to set priorities essential. NON-SMOKING OFFICE. B86-728

SR. SECRETARY - MEDICAL, Medical Department, to support medical director and assistant medical director in their clinical function. Will schedule patient appointments; maintain records; prepare patient test requisitions; transcribe patients' notes and related correspondence; handle mail and office supplies; and assist administrative assistant with typing and other projects as required. Will also share in relief reception coverage and with other office duties within the general administration area as needed. Requirements: graduation from high school or its equivalent, excellent typing and transcription skills and a minimum of 2.5 years direct/related experience. Previous medical secretarial experience preferred. Must have excellent organizational skills, ability to work effectively under pressure and good judgment in dealing with sensitive patient information. B86-725

SR. SECRETARY, Materials Processing Center, to support editors, laboratory manager and research group in the Ceramics Processing Research Laboratory. Will assist editors in preparing reports and proposals; type and input material into IBM; handle paste-up, library research, photocopying, mailings and report files; maintain and monitor accounts; keep records of purchase orders; pay invoices; and prepare bills for facility usage. Will also answer phones, schedule appointments, arrange travel, make primary contact with CPRL sponsor organizations, assist in organization of Consortium review meetings and perform other clerical/secretarial duties as necessary. Requirements: graduation from high school or equivalent, good typing skills and a minimum of 2.5 years of direct/related experience. NON-SMOKING OFFICE. B86-720

SR. SECRETARY, Center for Cancer Research (part-time, 20 hours/week), to support two professors. Will type letters, grants and manuscripts; file; answer phones; order lab and office supplies; and maintain files for research grants, purchase orders, requisitions, etc. Requirements: 55 wpm typing skills and a minimum of 2.5 years of direct/related experience. Good knowledge of English grammar and ability to work both independently and as part of a team essential. Some familiarity with biological and chemical terminology helpful. Experience with dictaphone and word processing desirable; willingness to develop word processing skills necessary. The work schedule for this position is Mon, Wed, full days and Fri afternoon. NON-SMOKING OFFICE. B86-703

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. NON-SMOKING OFFICE. 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

EDITORIAL ASSISTANT, Biotechnology Process Engineering Center, to work closely with the editor of *Biotechnology and Bioengineering* and be responsible for all duties associated with the journal. Will log in manuscripts, send them to referees and send them to publisher; act as liaison between editor and authors, reviewers and publisher; process mail; maintain files and supplies; and provide secretarial support to BPEC director and his assistant as necessary. Requirements: excellent typing skills and a minimum of 2.5 years of direct/related experience; editorial experience desirable. Must be able to work independently with accuracy and attention to detail. Excellent communicational and organizational skills necessary. Word processing skills on DECmate II highly desirable; willingness to learn essential. B86-691

SR. SECRETARY, MIT Libraries - Catalogue Department, to support the Head, Catalogue Department and three associate heads. Will type and proofread correspondence, reports and other documents; answer telephone; make appointments; photocopy; sort and distribute mail; use microcomputer for word processing, spreadsheets, etc.; maintain staff records and prepare weekly support staff and student payroll reports; prepare paperwork related to student assistant hiring; schedule student training sessions; maintain office files; order equipment and maintain inventory; monitor operating expenses; and perform other related assignments as required. Requirements: graduation from high school, excellent typing skills and a minimum of 2.5 years direct/related experience; post high school education may count toward experience. Good organizational skills and the ability to work efficiently with minimal supervision essential. Experience with microcomputers highly desirable. B86-682

SR. SECRETARY, Sloan School of Management, to support three members of the Marketing faculty. Will help administer research projects (coordinate meetings, distribute materials, monitor accounts, etc.); edit manuscripts; coordinate course preparation (assemble readings packet, type handouts and create visual aids); maintain calendars and schedule; and arrange travel. This position involves daily interaction with faculty, students and outside visitors as well as busy telephones. Requirements: excellent typing skills (preferably including some technical typing), word processing experience and a minimum of 2.5 years secretarial experience. Excellent organizational skills necessary; knowledge of MIT helpful. Desire to learn about office automation and computers essential; training on the computer equipment will be provided. NON-SMOKING OFFICE. B86-681

SR. SECRETARY, Office of the Dean for Student Affairs, to support the Assistant Dean, Residence and Campus Activities, the Advisor to Fraternities and the Administrative Officer. Will greet visitors, answer telephones, and direct students and visitors to appropriate offices. Serves as an information source on established Dean's Office and Institute procedures, especially related to residence concerns. Requirements: high school graduation or equivalent, 50 wpm typing, knowledge of word processing (preferably DECmate or IBM) and minimum 2.5 years direct/related experience. Excellent communicational, interpersonal and organizational skills are essential, as is the ability to work under pressure with frequent interruptions in a very busy environment. Attention to detail and ability to handle several tasks simultaneously very important. Knowledge of M.I.T. helpful. B86-673

SR. SECRETARY, Alumni Association (part-time, 20 hours/week), to support the Coordinator for Reunion Programs and assist in the preparation and production of the publicity for 13 reunion classes. Will act as liaison between printer, mailer and Alumni Class Programs office; handle reunion housing and transportation arrangements; and tabulate reunion responses. Responsibilities also include

typing, travel and meeting arrangements and providing support during reunion week. Overtime sometimes necessary. Requirements: excellent typing and minimum 2.5 years direct/related experience. Word processing experience helpful. Good interpersonal and organizational skills, a good command of English and a pleasant telephone manner are essential. The ability to work well under pressure with an even disposition and a good sense of humor is very important. B86-672

SR. SECRETARY - TECHNICAL, Ocean Engineering, to support two professors. Will answer telephone, maintain calendar, maintain office files, open and route mail, arrange office purchases, use IBM PC to type and proofread documents, transcribe dictation, maintain research contract files and course materials, and arrange travel and meetings. 50 wpm typing skills and minimum 2.5 years direct/related experience required. Technical typing skills or willingness to learn necessary. Word processing experience helpful. NON-SMOKING OFFICE. B86-665

SR. SECRETARY - TECHNICAL, Ocean Engineering, to support three professors. Will type, proofread and reproduce reports, manuscripts, exams and correspondence; answer telephone and receive visitors; maintain and originate files and records as necessary; handle moderately complex schedule of appointments, meetings and seminars; make travel arrangements with advances and prepare expense vouchers; prepare Institute forms; and maintain course and schedule records for students. Requirements: 50 wpm typing skills, including some technical typing, and minimum 2.5 years direct/related experience. Knowledge of word processing on IBM PC and compatible computers helpful. B86-664

SR. SECRETARY, Civil Engineering (part-time, 24 hours/week), to support one professor and research assistants. Will type general office correspondence, technical manuscripts and theses; arrange travel, conferences and research meetings; answer telephones; photocopy; and file. Will share office and work with laboratory director's secretary. Requirements: good typing skills and minimum 2.5 years direct/related experience. Knowledge of or willingness to learn word processing on IBM computer necessary. Excellent organizational ability and good rapport with students and visitors essential. NON-SMOKING OFFICE. B86-663

SR. SECRETARY, Civil Engineering (part-time, 21 hours/week), to support one professor and research assistants. Will perform general and heavy technical typing from handwritten copy of correspondence, class notes, theses and technical manuscripts; photocopy; answer telephone; process mail; maintain files; monitor accounts and make travel arrangements. Will also maintain reference room, including shelving new material and arranging for binding of theses. Requirements: excellent typing skills and minimum 2.5 years direct/related experience. Technical typing experience helpful; word processing experience or willingness to learn necessary. Must have good organizational ability and ability to work independently. B86-662

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. NON-SMOKING OFFICE. B86-661

SR. SECRETARY, Media Laboratory, to support the Office of the Director. Will handle extensive phone contact including receiving and screening messages; proofread and edit correspondence and documents; use electronic mailing system; file and maintain accurate office records and maintain database; make travel arrangements; and handle petty cash. This position involves frequent contact with faculty, Institute offices and outside agencies and sponsors. Good typing skills and minimum 2.5 years direct/related experience required, as is word processing experience. Strong organizational skills, good attention to detail and the ability to work well under pressure and with interruptions important. Some overtime will be required. Knowledge of MIT helpful. NON-SMOKING OFFICE. B86-655

SR. SECRETARY - TECHNICAL, Plasma Fusion Center, to support the Division Head and other members of the Fusion Systems Division. Will type/word process and proofread technical research reports, manuscripts and general correspondence; arrange travel; monitor office supplies; maintain files; arrange meetings; schedule appointments; answer telephones; receive and screen visitors; photocopy; and interact with other fusion laboratories and MIT operations. Will also support the *Journal of Fusion Energy*, including corresponding with the authors, publishers and referees to insure consistent and timely publication. Excellent (60 wpm) typing skills and minimum 2.5 years direct/related experience required. Willingness to learn word processing necessary. Scientific equation typing experience preferred but

not essential. Must have good interpersonal and organizational skills. B86-650

SR. STAFF ASSISTANT, Sloan School of Management, to support Deputy Dean and his Administrative Assistant. Will interact with faculty and staff within and outside the Institute; coordinate and schedule appointments, meetings, seminars, meals, etc., sometimes involving large groups; disseminate materials and organize agendas as needed; type, proofread and reproduce reports, manuscripts, correspondence and similar material from rough draft; maintain extensive confidential personnel files of faculty; sort, distribute and review mail; prepare and issue calendar of seminars; arrange travel and prepare expense vouchers; and order supplies. Excellent typing skills required. 4 to 5 years of secretarial experience preferred. Should be familiar with word processing and office automation systems. Excellent telephone manner and interpersonal skills essential. B86-644

SR. SECRETARY, Center for Information Systems Research, to support CISR seminars, special projects and accounting activities and to support Associate Director. Will prepare correspondence and reports, often using word processor; answer phones and screen calls; make travel arrangements; help arrange seminars and meetings involving CISR's corporate sponsors; and assist in accounting-related tasks, such as preparing requisitions and reconciling monthly statements. Will have frequent contact with industry and government and with faculty, students and administrators at MIT. Excellent typing skills and minimum 2.5 years direct/related experience required. Excellent interpersonal and organizational skills and ability to handle detail with accuracy important. Bookkeeping experience helpful. Some word processing experience and desire to learn more about office systems essential. NON-SMOKING OFFICE. B86-639

SR. SECRETARY, Political Science (part-time, 20 hours/week), to handle heavy manuscript typing and word processing for professor. Will also handle some editing, file, answer phones and photocopy. Excellent typing (80 wpm) and minimum 2.5 years direct/related experience required; post high school education may count toward experience. Knowledge of word processing desirable; must be willing to learn Word Perfect, DEC Rainbow and DECmate II. B86-637

SR. SECRETARY, Civil Engineering (part-time), to support the undergraduate officer. Will type class notes, technical papers, proposals and reports; arrange meetings, conferences and travel; and perform other related duties as required. This position involves very heavy interaction with students. Requirements: good typing skills and a minimum of 2.5 years of direct/related experience. Must be able to function effectively with several projects going on at one time. Strong interpersonal skills important. Knowledge of and experience with word processing helpful. B86-634

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. SECRETARY, Sloan School of Management, to support three faculty members. This busy group is looking for someone to coordinate course preparation (assemble readings packet, type handouts, create visual aids, etc.); type and edit manuscripts; and help administer research projects (coordinate meetings, distribute materials, monitor accounts, etc.). Position will also involve daily interaction with faculty, students and outside visitors; busy telephone contact; maintaining calendars and schedules; and arranging travel. Technical typing and general office work will be done on personal computers. Excellent typing skills and minimum 2.5 years direct/related experience required. Training will be provided on the PC, but prior word processing experience and/or willingness to learn essential. Must have excellent organizational skills. Knowledge of MIT helpful. NON-SMOKING OFFICE. B86-606

SR. SECRETARY, Brain and Cognitive Sciences, to serve as secretary to the Undergraduate Brain and Cognitive Sciences Major Program and assist its director. Will type, handle telephone and in-person contact with students and faculty, schedule regular meetings and the special open-house, and take notes at regular monthly meetings. Will also support two faculty members, including use of word processor and handling telephones; provide information to people entering building E10; supervise use of building facilities such as postage meter and photocopy; and handle petty cash. Good typing skills and minimum 2.5 years direct/related experience required; post high school education

may count toward experience. Experience with or willingness to learn word processing necessary. College graduate preferred. NON-SMOKING OFFICE. B86-604

SR. SECRETARY, Materials Processing Center, to support two faculty members, research staff member and research group. Will type class material, correspondence, memos, forms, reports and proposals; organize and maintain files; handle telephone inquiries; interact with faculty, staff and students; and perform other clerical and secretarial duties as required. High school diploma, good typing skills and minimum 2.5 years direct/related experience required. Must be self-motivated, versatile, innovative and able to work both independently and as part of a team. Good organizational and interpersonal skills essential. IBM word processing skills desirable. NON-SMOKING OFFICE. B86-597

SR. SECRETARY, Aeronautics and Astronautics, to support three faculty members and one research associate in the Gas Turbine Laboratory. Will type and proofread reports, examinations, correspondence and other materials from rough draft; answer telephones and receive laboratory visitors; maintain files; arrange travel; prepare vouchers; distribute mail; maintain office supplies; issue keycards; and prepare and distribute laboratory reports. Will use word processing system on Corvus computer. Excellent typing skills, including technical typing, and minimum 2.5 years direct/related experience required; post high school education may count toward experience. B86-596

SR. STAFF ASSISTANT, Materials Science and Engineering, to support the Department Head and the Administrative Officer. Will assist in preparation of candidates files for faculty searches; type correspondence, technical papers, proposals and talks; assist with faculty mailings; assist with preparation for faculty meetings; process mail; handle telephones; maintain inventory of office supplies; maintain mail machine; and perform other related duties as necessary. Excellent typing skills and minimum 2.5 years direct/related experience required. Experience with IBM AT and dictaphone necessary. Should be able to work well with many distractions. NON-SMOKING OFFICE. 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. STAFF ASSISTANT, Artificial Intelligence Laboratory, to support two associate professors and one research scientist. Will prepare and proofread manuscripts, reports, coursework, correspondence and similar materials using computer text editing system; answer telephones and receive visitors; schedule appointments, meetings and seminars; arrange complex travel; maintain files; and perform other similar duties as necessary. Good typing skills and at least 2.5 years direct/related experience required; experience in a university research laboratory preferred. Must be willing to learn computer-based text editing system. Good communicational skills and ability to work under pressure essential. College graduate preferred. B86-582

SR. STAFF ASSISTANT, Office of the Chairman, to support a Special Assistant to the Chairman and assist in activities related to MIT's external community relations, the MIT Community Service Fund and MIT Corporation meetings. Will type letters and reports; schedule meetings and appointments; process Institute requisitions and accounting statements; and assist with routine office procedures. Excellent typing skills and minimum 2.5 years direct/related experience required; post high school education may count toward experience. Excellent communicational and organizational skills, enthusiasm, reliability and initiative essential. Should enjoy working with a wide variety of people and have a pleasant telephone manner. B86-577

SR. SECRETARY, Office of Sponsored Programs, to support two contract administrators who are responsible for submission of research proposals, negotiation of grants, contracts and post-award administration. Will type correspondence, maintain filing system and provide telephone coverage. Good typing skills and minimum one year direct/related experience required. Discretion, tact, willingness to work as part of a team and good organizational and interpersonal skills essential. B86-574

SR. SECRETARY, Sloan School of Management, to support three professors in the Applied Economics, Finance and Accounting area. Will coordinate course preparation (assemble readings packet, type handouts and exams and create visual aids); type and

edit manuscripts and reports (often of a technical nature); coordinate meetings, schedule calendars and make travel arrangements; and interact daily with faculty, students and outside visitors and handle busy telephones. Excellent typing skills and minimum 2.5 years direct/related experience required; post high school education may count toward experience. Proofreading skills and willingness to learn Wang word processing necessary. Good organizational skills and ability to work with minimal supervision important. Technical typing skills and dictaphone experience desirable. Interest in learning IBM PC and desire to become involved with office automation essential. Knowledge of MIT helpful. NON-SMOKING OFFICE. B86-560, B86-559

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, Materials Science and Engineering (part-time, 25 hours/week), to support one professor. Will type classwork, scientific papers, proposals and correspondence; monitor research accounts; schedule meetings; order supplies; maintain calendar; and keep track of orders and pay bills on research accounts. Excellent typing skills and minimum 2.5 years direct/related experience required. Familiarity with word processor and familiarity with MIT helpful. NON-SMOKING OFFICE. B86-536

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. NON-SMOKING OFFICE. B86-450

SR. SECRETARY, Applied Biological Sciences, to support faculty member and research group. Will type proposals, manuscripts, class materials and correspondence; arrange travel, schedule meetings and keep calendar; answer phones; prepare requisitions and vouchers; order office supplies; photocopy; and conduct occasional library searches. Minimum 2.5 years direct/related experience and excellent typing skills required. Should be able to work independently and on numerous projects at one time. Good organizational ability, attention to detail and telephone and communication skills essential. Knowledge of or willingness to learn CPT word processing necessary. NON-SMOKING OFFICE. B86-434

SR. SECRETARY, Industrial Liaison Program, to support two Liaison Officers. Will compose and type correspondence, reports and visit and travel agendas; assist in scheduling appointments between company representatives and MIT faculty and staff; arrange for company research briefings; make travel arrangements; assist with coverage of telephones and answer inquiries related to servicing member companies; reply independently to correspondence when appropriate; reproduce reports and manuscripts; input and retrieve statistics on computer; and perform other related duties as required. Minimum 2.5 years direct/related experience and excellent typing skills required. Must have excellent organizational and interpersonal skills. Flexibility and initiative important. Ability to work as a member of a team and prioritize work load essential. Experience with and/or willingness to learn word processor (DEC system) necessary. B86-405

SR. SECRETARY, Laboratory for Computer Science, to perform a variety of secretarial and administrative duties. Will act as an information resource for the Laboratory; receive visitors; provide telephone coverage; type, edit and reproduce manuscripts, reports and correspondence; schedule appointments, conferences and seminars; arrange domestic and international travel; maintain and update office files and computer files; and perform other duties as necessary to ensure coverage of the Director's Office and the Administrative Office. Minimum 2.5 years direct/related experience and good typing skills required. Very good organizational and interpersonal skills necessary. Attention to detail and ability to handle sensitive information important. The capacity to manage workloads under pressure of deadlines with frequent interruptions is vital. Excellent telephone manner and willingness to learn computer system essential. B86-378

SR. SECRETARY, Materials Science and Engineering, to support Department Head for a minimum of four months and later to support two faculty members. Will type technical reports, assist Head's secretaries in overflow of work, answer phones, open mail, maintain office supplies, fill in for Administrative Officer's secretary when necessary, and maintain postage meter. Minimum one year direct/related experience required. Word processing experience (DECmate II) and ability to use dictaphone essential. Ability to set priorities and ability to work well with people necessary. NON-SMOKING OFFICE. B86-334

SR. SECRETARY, Aeronautics and Astronautics, to support three faculty members in the Fluid Dynamics Lab. Will type correspondence, reports, and class notes; answer telephones and take messages; and arrange meetings and travel. Will prepare travel vouchers and copy billing vouchers. Good typing and interpersonal skills required. Ability to work independently and familiarity with and/or willingness to learn word processing desirable. Minimum 2.5 years direct/related experience required. B86-291

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

SR. SECRETARY, Bursar's Office, to provide secretarial support for Bursar, Associate Bursar, Assistant Bursars (2), and Student Counselors (4). Duties will include answering or redirecting routine student inquiries, scheduling appointments, arranging travel, copying and maintaining files, ordering supplies, preparing various types of Institute forms, handling payment of invoices, and screening incoming mail and telephone calls. Will also be custodian of petty cash. Will perform additional duties as necessary. Attention to detail, good organizational skills, and flexibility important. Minimum 2.5 years direct/related experience required. B86-176

SR. SECRETARY, Fiscal Planning and Budget, to answer phone and greet visitors, type all correspondence and statistical tables using either personal computer or typewriter. Will maintain and order office supplies; key operator for copier machine. Responsible for various clerical duties as instructed by Administrative Assistant and Budget Officers, including copying, logging budget changes, filing, mailing budget authorizations. Will assist in arranging meetings and office functions. Must have strong organizational skills to provide secretarial support for nine staff members. Familiarity with statistical typing, calculator, personal computer and dictating equipment as well as a pleasant telephone manner is necessary. Minimum 2.5 years direct/related experience required. B85-115

SR. SECRETARY, Treasurer's Office, to perform secretarial duties related to the management of investment real estate including letter and report preparation, filing, billing and processing of rent and mortgage payments. In addition, individual will prepare real estate property status reports and mortgage reports, and will monitor the fraternity mortgage program. Excellent typing, organizational, and interpersonal skills are required. A knowledge of and/or willingness to learn word processing is necessary. Familiarity with real estate business helpful but not required.

Applicants with a Business School degree are preferred. In addition, 2.5 years direct/related experience is required. B85-024

SECRETARY, Materials Processing Center, to support MPC headquarters. Will maintain files of research accounts, maintain mailing lists, perform periodic mailings, type letters and reports, answer telephones, photocopy, file, run errands, order supplies and maintain mailing machine and photocopier charges. Will also perform other related duties as required. Requirements: graduation from high school, basic typing skills and a minimum of one year of direct/related experience. Must be willing to learn Xerox word processing system. NON-SMOKING OFFICE. B86-721

SECRETARY, Earth, Atmospheric, and Planetary Sciences, to support the administrative officer and a small group of faculty in the Center for Meteorology and Physical Oceanography. Will answer busy telephones, arrange travel, sort and deliver mail, handle mailings, photocopy and order office supplies. Requirements: good typing skills, familiarity with or willingness to learn word processing and a minimum of one year of direct/related experience; post high school education may count toward experience. B86-715

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

SECRETARY, Environmental Medical Service, to provide general support, including typing, filing, record keeping and delivery of materials within the Institute. Requirements: graduation from high school or equivalent, good typing skills and a minimum of one year related experience. Knowledge of DECmate II preferred. Good communicational skills and poise in dealing with people and emergency situations essential. B86-689

SECRETARY, Applied Biological Sciences, to support the administrator of the Student Office and the Graduate Admissions/Registration Officer. Will receive visitors and provide information about the Institute and Department; respond to written requests for information on academic programs, etc.; type correspondence, brochures, departmental manuals, catalogue copy and memos on typewriter or word processors; maintain Department lists and student files; answer telephone and screen calls; handle mailings, photocopying, filing and ordering of office supplies; schedule meetings; and provide support for activities related to admissions, registration, doctoral exams and the undergraduate open house. Requirements: good typing skills and minimum one year direct/related experience. Strong organizational and interpersonal skills essential. Familiarity with or willingness to learn word processing (DECmate, Finalword) necessary. Must be able to work independently and under pressure. B86-668

SECRETARY, Environmental Medical Service, to perform receptionist and clerical duties for the Biohazard Assessment Office. Will type regular and technical documents, file, keep records and deliver materials within the Institute. Will also act as secretary to Committee on Biohazards. Good typing skills and minimum one year direct/related experience required. Knowledge of DECmate II word processor preferred. Excellent written and oral communicational skills and excellent poise in dealing with people essential. Must be able to act independently. B86-627

SECRETARY, Office of Sponsored Programs, to support two administrators who are responsible for submission of research proposals, negotiation of grants, contracts and post-award administration for various departments within MIT. Will type, prepare correspondence, maintain filing system and cover telephones. Minimum one year direct/related experience and good typing skills required. Discretion, tact, organizational skills and willingness to work as part of a team necessary. Good interpersonal skills essential. Shorthand or speed writing helpful, but not necessary. B86-478

SECRETARY, Applied Biological Sciences, to support one faculty member. Will type and proofread correspondence, using DECmate II word processor; schedule appointments, answer telephones and make travel arrangements; establish and maintain files; photocopy; process mail; greet students and visitors; order supplies; and perform other general office functions. Minimum one year direct/related experience and strong typing skills required. Word processing skills important. Good attention to detail and ability to organize work with minimal supervision necessary. B86-368

HEAD HOUSEKEEPER, Endicott House, to schedule (under supervision) the housekeeping staff seven days a week, including nights and weekends. Will run laundry; coordinate laundry orders for all sheets and tablecloths; order housekeeping supplies and paper goods for the kitchen and pantry; maintain cleanliness of staff facilities, attic and all storage areas; fill in when necessary for the housekeeping staff; and help with the coordination of coffee breaks as required. Graduation from high school or equivalent required. Previous experience in the position of head housekeeper desired. This position is located in Dedham, MA. T86-738

OFFICE ASSISTANT/ADMINISTRATIVE ASSISTANT

ADMINISTRATIVE ASSISTANT, Plasma Fusion Center, to support the preparation and/or coordination of personnel matters. Will give new employee orientations; assist with research staff search and hiring; coordinate research appointment information with associated departments; assist with arrangements for visitors; participate in special projects associated with fusion energy; compile and/or develop data for reports; and assist in matters related to space assignments, safety, employee inquiries and other related matters. This position involves data entry using a DECmate II. Requirements: good, accurate typing and proofreading skills; willingness to learn word processing and data entry procedures; and a minimum of 4.5 years of direct/related experience. Must be detail oriented, well organized and able to work independently and under pressure. Excellent interpersonal and communication skills essential, as is sensitivity to confidential matters. S86-750

ADMINISTRATIVE ASSISTANT, Laboratory of Architecture and Planning, to support the director and administrative officer. Will provide scheduling and general assistance to research development and general fundraising missions; prepare LAP administrative reports; assist LAP international visitors; act as liaison with research staff and faculty; and arrange meetings and travel. Will also be responsible for many aspects of office management, processing of some fiscal reports and general guidance to LAP staff regarding word processing and related computer support systems. Requirements: excellent typing and word processing skills and a minimum of 4.5 years of direct/related experience. Must be able to set priorities and exercise independent judgment in a busy environment. Excellent organizational and interpersonal skills essential. Familiarity with PC-based systems and software packages and MIT experience helpful. S86-735

SR. ACCOUNT REPRESENTATIVE, Operations and Systems, to ensure the quality and timeliness of production commitments. Will direct the work of and assign tasks to Jr. and Sr. Account representatives and maintain attendance and vacation log; monitor preparation of input/jobs for processing; review outputs to ensure that production runs meet clients' requirements and specifications; meet with clients to establish schedules and requirements, receive job orders and report on the status of production runs; coordinate input and file flow to the computer; analyze production problems; initiate recovery action to complete or rerun jobs; and maintain daily log of all problems and their resolution. Requirements: graduation from high school or equivalent and a minimum of 4.5 years of direct/related experience in data processing, including at least two years in operations. Ability to direct others; knowledge of hardware concepts, data processing, operating systems, job control language and production control; and analytical ability important. S86-734

ADMINISTRATIVE ASSISTANT, Sloan School of Management, to support the director of finance and administration. Will handle the distribution for the Sloan School's working paper series and respond to inquiries; prepare correspondence for alumni fundraising and process alumni gifts; respond to a variety of inquiries for general information; prepare and maintain Sloan calendar of events; process undergraduate hourly payroll and maintain related documents; and perform other related duties as assigned. Requirements: excellent typing skills, word processing experience (or willingness to learn) and a minimum of 4.5 years of direct/related experience. Excellent telephone manner and communication and interpersonal skills essential. Must have facility with numbers and attention to detail. Experience at MIT and within the Sloan School very valuable. S86-732

ADMINISTRATIVE ASSISTANT, Sloan School of Management, to support the associate dean for master's and bachelor's programs in the design and execution of an effective alumni/ae relations and fundraising program for graduates of the Sloan master's program. Will also work closely with the coordinator of the master's program, the master's program advisor and the editor of SLOAN. Will have frequent contact with alumni/ae and with other areas of Sloan and M.I.T.; 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. Must have excellent knowledge of English and sense of detail. Ability to effectively make arrangements and interact with many other people essential. S86-731

ADMINISTRATIVE ASSISTANT, Center for Real Estate Development. Will maintain and update existing database files and develop programs to enhance the efficiency of these databases; train new office personnel in DOS, Wordstar and Dbase III Plus; assist office staff and students with all microcomputer-related questions and/or problems; order hardware and software as needed and be responsible for the upkeep of all equipment; oversee the proper use of student computer room; use laserjet to print materials produced by office staff; use Wordstar to format documents to achieve desired output; provide data entry and word processing support as needed; and input prospective student data and produce statistical reports to aid the admissions selection committee. Requirements: knowledge of MS-DOS and a PC word processing system and a minimum of 4.5 years of office experience including 2 years of word processing experience. Must be willing to learn Wordstar, Dbase III, Symphony and other software packages. Ability to communicate with others and balance priorities essential. Flexibility and ability to identify problems and initiate corrective action important. S86-729

EMERGENCY MEDICAL SERVICE ASSISTANT, Campus Police, to be responsible for ambulance operations (primarily during day shift), including handling of medical emergencies and other general service calls and transfers. Will also maintain liaison with Medical Department with regard to equipment and supplies; and monitor automotive service needs of vehicles. May be required to work occasional overtime and irregular work shift. Requirements: emergency medical technician or higher certification, Massachusetts driver's license and a minimum of three years of direct experience. Ability to act as training instructor in various life support areas desirable. S86-717

ADMINISTRATIVE ASSISTANT, Earth, Atmospheric, and Planetary Sciences, to manage busy office and support two professors, their research staff and students. Will prepare research proposals, monitor research contracts, handle accounting, forecast budgets, arrange travel, analyze daily correspondence, and organize complicated international experimental program arrangements. Will also act as liaison with department headquarters with regard to personnel salary support, students and space allocations, and with OSP on contract and accounting matters. Requirements: good typing skills and a minimum of 4.5 years of direct/related experience. Prior MIT experience preferred. Must have good attention to detail, work well independently, and anticipate problems. Excellent interpersonal skills essential. Prior experience in scientific program management and familiarity with word processing and spreadsheets helpful. S86-700

ADMINISTRATIVE ASSISTANT, Alumni Association, to provide logistical support and assistance to the Associate Secretary of the Alumni Association in the following programs: the Boston Seminars Series, Alumni Council Program, AMITA, BAMIT, the Stein Club, Technology Day and National Alumni Conference. Duties and responsibilities include publicity and mailings; maintaining membership lists; arranging and attending committee meetings; arranging food and beverages; and providing on-site registration for on-campus events. Involves some typing of general correspondence and general office support. Requirements: good typing skills and minimum 4.5 years direct/related experience. Must have excellent interpersonal skills, flexibility and ability to take initiative. Word processing skills highly desirable. S86-669

ADMINISTRATIVE ASSISTANT, Humanities - History, to coordinate administrative details for several History faculty activities, including the MIT catalogue, book orders, monthly posting of bills and research grants. Will type and proofread correspondence, reports and scholarly manuscripts using DEC and/or IBM PC equipment; maintain accurate financial records; and handle some confidential projects. Requirements: 4.5 years office experience, 60 wpm typing and knowledge of and/or willingness to learn word processing. The ability to set priorities and juggle several projects at once is essential, as are attention to detail and strong interpersonal skills with the ability to relate well to students and faculty. S86-660

ADMINISTRATIVE ASSISTANT, Media Laboratory, to support the faculty member directing the Movies of the Future project. Will handle all administrative and secretarial aspects of this project including directing the work of temporary staff. Will independently reply to correspondence; schedule appointments; keep track of seminars, reports and sponsor interactions; maintain files; handle considerable telephone contact; monitor funded research programs; check monthly statements and monitor expenses; and provide assistance to other groups when necessary. Minimum 4.5 years direct/related experience required. Experience with word processing and knowledge of computing very helpful. Excellent interpersonal and organizational skills and the ability to work in a busy environment with frequent interruptions necessary. Post high school education and MIT experience very helpful. Some overtime required. S86-656

ADMINISTRATIVE ASSISTANT, Telecommunications Systems, to act as a customer service representative and process orders for equipment and services. Will prepare, issue and follow up on orders for telecommunications equipment, facilities and systems; interact with vendors about orders; make recommendations to depart-

ments regarding their communications needs and explain the capabilities of various systems; train departments in the use of SESS terminal equipment and feature activation; and answer telephones and perform other office tasks as needed. High school diploma and 4.5 years of experience and/or post high school education, including at least two years of telecommunications or related experience, required. S86-631

ADMINISTRATIVE ASSISTANT, Graphic Arts Service, to estimate, cost and bill offset orders. Will advise customers on preparation and methods of printing; write specifications for all printing operations; purchase various types of printing, special printing papers, envelopes, finishing, die-cutting and binding; and set up and complete time and method studies in the offset printing plant. Minimum 4.5 years direct/related experience, or equivalent combination of relevant education and experience, required; must have experience in offset estimating. Ability to work with figures, office calculators, catalogs, and price lists essential. S86-476

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. NON-SMOKING OFFICE. S86-406

SR. OFFICE ASSISTANT, Laboratory for Computer Science, to provide accounting support to LCS fiscal officer. Will monitor research expenditures, process requests for payment and billing vouchers for LCS central services, assist in research proposal preparation, maintain automated financial records for specific research activities and carry out special projects as assigned by supervisor. Requirements: a minimum of 2.5 years of direct/related experience. Excellent organizational skill and ability to set priorities and meet multiple deadlines essential. Must be willing to learn to use IBM XT and Lotus software. S86-719

SR. OFFICE ASSISTANT, Property Office, to review property copy of purchase orders; prepare change orders; maintain log of equipment purchase orders; keep daily count of purchase orders and invoices received; match equipment invoices with purchase orders; research missing purchase orders and invoice data that is required by inventory auditors to complete property records; maintain open purchase order files as well as completed property data form files; screen purchase order files for overdue invoices; prepare data forms for entry into database; and perform other related duties as required. Requirements: associate's degree or equivalent and a minimum of 2.5 years of direct/related experience. Ability to accurately handle large amounts of detailed information and to solve problems essential. S86-718

SR. OFFICE ASSISTANT, Registrar's Office, to assist in the preparation of the Institute's class schedule booklet and final examination schedule; input student registration and other data on CRT terminal; prepare schedules for make-up examinations and notify students; handle general office correspondence, including typing, proofreading and preparation of mailing lists; and perform special projects assigned by the associate registrar. Requirements: good typing skills and a minimum of 2.5 years of direct/related experience. Must have good telephone manner and ability to work well with the MIT community, especially faculty and students. Tact and initiative important. NON-SMOKING OFFICE. S86-710

SR. OFFICE ASSISTANT, Plasma Fusion Center, to handle all recording, reporting, expediting and verification of the Center's property acquisitions, dispositions and fabrications. Will act as liaison between requisitioner, vendor and appropriate MIT and PFC offices; these procedures involve the use of Supercomp 20 software. Will also assist the fiscal officer with researching, compiling and verifying information relating to Fiscal Office accounting requirements and help develop new applications for the computer software to better address these needs. Requirements: proficiency with calculator and a minimum of 2.5 years of direct/related experience. Basic keyboard/typing skills and knowledge of electronic and manual spreadsheets are strongly desired. Strong interpersonal skills essential. S86-705

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, Industrial Liaison Program (full- or part-time), to serve as office receptionist for busy office. Will receive, screen and assist visitors; answer incoming telephone calls; assist callers and visitors concerning inquiries regarding the services of the Program; distribute mail; maintain petty cash; order and maintain office supplies; update weekly travel calendar; distribute library cards to Program members; and perform other clerical duties as assigned. Requirements: accurate typing skills and minimum 2.5 years direct/related experience. Ability to learn word processing necessary. Excellent interpersonal skills and ability to take initiative essential. Should be flexible and able to relate well with diverse group of professionals, faculty, students and visitors. S86-659

SR. OFFICE ASSISTANT, Telecommunications Systems, to prepare purchase orders, process invoices and keep appropriate records. Will maintain and update the master file of telecommunications lines and equipment and other databases; process and distribute 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. High school diploma and minimum 2.5 years direct/related experience required. Telecommunications background/experience preferred. S86-633

SR. OFFICE ASSISTANT, Plasma Fusion Center, to provide reception, computer input and general support for the headquarters office of the Mirror Confinement Division. Will handle phones, assist visitors, type correspondence and short reports, proofread and file general correspondence, order office supplies, arrange travel and process travel vouchers, enter data into computer, photocopy, deliver mail messages and information, and mail correspondence and other announcements. High school diploma or equivalent, 40 wpm typing and minimum 2.5 years direct/related experience required. Good interpersonal and organizational skills important. S86-584

SR. OFFICE ASSISTANT, Office of the Secretary of the Corporation, Visiting Committee Office, to support the Assistant to the Secretary of the Corporation in the scheduling of meetings, arrangements and logistics for the 26 Visiting Committees of the Corporation. Will type correspondence, copy, file, maintain records, process travel reimbursements, answer phones, and perform other duties as required. This office works closely with those of the Vice President, President and Chairman of the Corporation. Minimum 2.5 years direct/related experience and 50 - 60 wpm typing skills required. This position calls for a detail-oriented person with excellent proofreading and organizational skills. Must have ability to work under pressure and as part of a team, good judgment, sense of service and sense of humor. Experience working with DECmate II helpful. S86-557

SR. OFFICE ASSISTANT, Alumni Association, to receive, log and schedule ad hoc requests for output from ADDS database. Will modify existing programs to produce output as requested by users; verify and distribute requested lists and labels; assist with documentation of programs and database; advise faculty, staff and students on procedures regarding ad hoc requests; and assist Information Output Manager in maintaining word processing equipment and supplies. Minimum 2.5 years direct/related experience, including data and/or word processing experience required. Knowledge of database principles preferred; knowledge of a programming language helpful. Flexibility and ability to work closely with others important. S86-539

SR. OFFICE ASSISTANT, Microreproduction Laboratory, to process telephone and in-person requests for microfilm and photocopies. Will receive, type, compute costs of and respond to requests; prepare invoices; tabulate various statistics; maintain general account information; retrieve requested material from the branch libraries; maintain and balance cash box; enter and proofread data in computerized microfiche titling system; and assist the Business Manager in the training of new employees. High school diploma, 55 wpm typing and a minimum of 2.5 years direct/related experience required; post high school education may count toward experience. Good communication skills and acquaintance with accounting procedures necessary. Must be able to set priorities and allocate time effectively. NON-SMOKING OFFICE. S86-530

SR. OFFICE ASSISTANT, Harvard-MIT Division of Health Sciences and Technology, to work in administrative office. Will compose routine correspondence; type, edit and proofread general correspondence, under the supervision of the Administrative Officer; process appointments and terminations and maintain personnel database; assist in search process; organize meetings; answer phones; and maintain office files and calendar. Will also act as liaison between staff, and non-division personnel; assist in the preparation of large consortium research proposals and compilation of HST Directory; and perform independent projects as needed. Minimum

2.5 years direct/related experience and good typing required. Ability to organize and synthesize information and willingness to perform duties at various levels of responsibility necessary. Discretion and good office manner important. Good command of English grammar and syntax essential. NON-SMOKING OFFICE. S86-472.

OFFICE ASSISTANT, Comptroller's Accounting Office, to process invoices using CRT's. Will perform occasional review of vendor statements; prepare invoices for CRT operators; and perform other duties as assigned. Some overtime will be necessary. Requirements: good typing ability, knowledge of CRT operation and a minimum of one year of direct/related experience. S86-737

OFFICE ASSISTANT, Medical Department, to support the enrollment services unit of the MIT Health Plans Office, including typing, filing and other clerical duties. Will process membership changes for the MIT Health Plan and Student Health Program, using on-line computerized databases to input and verify enrollment information. Other responsibilities include telephone contact with members and school to verify student status, use of word processor to maintain lists and generate form letters and assisting in redesign of current procedures. Requirements: graduation from high school or equivalent, good typing skills and a minimum of one year of direct/related experience. Excellent organizational skills and ability to handle detail with accuracy essential. Should be familiar with, or willing to learn, the IBM PC and word processing. S86-713

OFFICE ASSISTANT, Cell Culture Center (part-time, 20 hours/week, mornings), to perform diversified office work. Will use adding machine; type shipping slips, invoices and accounts receivables; file; and photocopy. Requirements: 50+ wpm typing skills and a minimum of one year direct/related experience. Must have excellent telephone manner and be able to use calculator. Willingness to work independently essential. S86-704

RECEPTIONIST, Center for Technology, Policy and Industrial Development (part-time, 20 hours/week), to answer telephones, greet and assist visitors and provide some secretarial support. Will take messages, sort mail, type, file and run errands. Will also assist other Center support staff as necessary. Requirements: basic typing skills and a minimum of one year of direct/related experience. Must have good interpersonal skills. S86-687

OFFICE ASSISTANT, Resource Development, to support one assistant director and the business and personnel manager. Will answer telephones and greet visitors; photocopy correspondence and act as key operator for photocopiers; type memoranda, letters and other documents; arrange appointment calendar; file; and assist in processing of payroll, invoices and requisitions for payment. Requirements: graduation from high school or equivalent, good typing skills and a minimum of one year of direct/related experience. Experience with or willingness to learn word processing necessary. Must have pleasant telephone manner, ability to handle details and good interpersonal skills. NON-SMOKING OFFICE. S86-678

OFFICE ASSISTANT, Registrar's Office, to assist in the registration of students. Will maintain student permanent records, use record keeping terminals (IBM), handle student requests and registration corrections, type form letters and file. Good typing skills and minimum one year direct/related experience required. Accuracy with figures and good attention to detail essential. College experience desirable. Should be versatile and able to work in a busy environment. S86-649

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

OFFICE ASSISTANT, Purchasing and Stores, to work in the Purchasing Field Office. Will type purchase orders using an electric typewriter; sort, distribute and mail purchase and change orders; maintain files; use a data terminal to screen adjustment forms; answer phone and assist Purchasing Agent with placing and expediting purchase orders. Graduation from high school or equivalent, 50+ wpm typing skills and minimum one year direct/related experience required. Prior experience in purchasing desirable but not necessary. S86-640

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 handling registration day activities. Good accurate typing skills and minimum one year direct/related experience required;

college experience desirable. Excellent attention to detail and willingness to work with students and faculty necessary. S86-629

OFFICE ASSISTANT, Endicott House (part-time, Sat and Sun, 8 - 4), to answer main switchboard, transfer and place calls, take messages and perform various clerical tasks which include typing, filing and other related projects. Will also post employee time sheets, prepare weekly payroll sheets, process accounts payable, assist with booking projects and daily planning notices and register and assist conference center guests. High school diploma or equivalent and minimum one year direct/related experience required. Ability to get work effectively with guests and staff, good organizational skills and pleasant telephone manner essential. Interest in bookkeeping and aptitude for figures important. This position is located in Dedham, MA. S86-626

OFFICE ASSISTANT, Personnel - Faculty and Staff Information Services, to process and maintain employment information concerning Faculty and Staff, under supervision of the Assistant Manager. Will use word processing equipment and/or typewriter to prepare notification letters; update computer files daily; respond to telephone and written inquiries; assist in salary verification and review process; and assist, as necessary, in preparation of various reports and special projects. High school diploma or equivalent, good typing skills and minimum one year direct/related experience required. Experience with word processing (Digital) and computer terminals highly desirable. Close attention to detail and absolute discretion in handling confidential information essential. S86-621

OFFICE ASSISTANT, Laboratory for Nuclear Science (part-time, afternoons), to support the director, associate director, personnel officer and headquarters staff. Will type standard forms, requisitions, travel vouchers, interdepartmental and outside memos and letters; type; handle office mail; answer telephones and provide general information; issue and keep track of all keys for LNS personnel; maintain inventory of office supplies, etc., used by headquarters; and photocopy reports, manuscripts, letters and large mailings. Will be required to assist in setting up luncheons for various meetings. Requirements: graduation from high school or equivalent, 40 wpm typing and a minimum of one year of direct/related experience. Knowledge of or willingness to learn Massll word processing necessary. Ability to handle detail and follow directions essential. S86-601

OFFICE ASSISTANT, MIT Press, to take telephone orders and act as customer service representative. Will receive incoming orders from bookstores and individuals; supply customers with book availability information; assist with customer order inquiries; correspond with customers concerning incorrect orders; handle bank charge card questions; and file. High school diploma or equivalent, 50+ wpm typing and minimum one year direct/related experience required. Must have excellent telephone manner and neat, legible handwriting. Business school graduate preferred. S86-592

OFFICE ASSISTANT, MIT Press, to input customer orders, returns, and credits on a computer terminal; maintain customer computer files including assigning new account codes, updating postage tables, etc.; and assist mail room operation with incoming mail as needed and occasionally serve as backup to mail clerk. High school diploma and minimum 2.5 years direct/related experience and accurate 60 wpm typing required. Business school training preferred. Maturity and ability to handle highly procedural, detailed work essential. S86-591

OFFICE ASSISTANT, Office of the Dean for Student Affairs - Residence and Campus Activities Section, to support the Director, Campus Activities Complex, the Campus Activities Director and the Operations Manager, Physical Plant. Will maintain appointment books; type forms and correspondence; process purchase orders and maintain accounts; answer telephone and in-person inquiries relating to the operations of the office and general procedures; and assist with special projects. High school diploma or equivalent, 40 wpm typing, and minimum one year direct/related experience required; experience should include working with the public in demanding situations. Knowledge of MIT helpful. S86-553

CLERICAL ASSISTANT, Student Financial Aid Office, to sort and open incoming mail and weigh and post outgoing mail. Will assist with general office overflow, processing of loans and the verification process. Six months to one year direct/related experience required. CRT experience a must; some typing helpful. Ability to work with minimal supervision and constant interruptions essential. Must be able to interact with staff, students and other Institute and non-Institute personnel. S86-579

SERVICE STAFF

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 room, etc. Will work in various groups doing repetitious work as assigned. Graduation from high school or its equivalent required. S86-490

2ND CLASS ENGINEER, Physical Plant, to perform a wide variety of duties and work any and all shifts, including day maintenance and repairs consistent with the self-sufficiency of the Central Utilities Plant. Requirements: Massachusetts 2nd Class Engineer's License (stationary) or higher grade; experience on high pressure boilers, oil and gas fired with automatic combustion controls, electric driven auxiliaries, AC and DC generation, turbine and electric driven refrigeration equipment and water treatment systems. S86-488

LOCKSMITH, Physical Plant. Requirements: minimum of 5 years of experience in the trade and knowledge of current trade practices in builder's hardware, lock repairing, master keying and key changes. Will undergo extensive personal and work background record check, due to the sensitive nature of the position. Must be able to secure bonding and be able to work irregular shifts and respond to after-hour call-ins. S86-485

TECHNICIAN A (ELECTRONIC), Plasma Fusion Center, to assist in laboratory, research or analytic work under direction or supervision of scientific personnel and operate highly technical experimental apparatus. Will construct and test prototype electronic circuits under the direction of a technical supervisor; breadboard analog and digital circuits; lead technicians of a lower grade in assembling and constructing electronic circuits and modules; take an active role in troubleshooting, repairing and calibrating electronic test, measuring and data acquisition equipment; and maintain fast control circuits used for SCR and high voltage switching circuits. Requirements: graduation from a two-year day technical school or its equivalent and a minimum of two years applicable experience. Must have a fundamental grasp of electronic circuit theory with emphasis on digital logic. S86-481

PATROLMAN/PATROLOWOMAN, Campus Police, to be responsible for protection of life and property, traffic control, policing of MIT parking lots, making foot patrols of all grounds and buildings, and administration of first aid including ambulance service to injured or ill people. Will also participate closely in emergency procedures for explosions, fire, chemical spills, etc., and handle investigations, report writing and general police duties. Requirements: a minimum of 3 years police experience in a municipal, state or campus police department; and experience in all phases of law enforcement, including criminal law, knowledge of procedures, criminal investigation, case preparation, investigation of complaints and report writing. Will be required to obtain Emergency Medical Technician Certification. May be required to successfully complete additional police academy training. Must qualify with use of firearms; have valid driver's license, honorable discharge from any earlier police service and ability to work long hours on occasion; qualify for Institute physical exams; and be able to handle top level public relations. S86-479

LABORATORY ASSISTANT, Haystack Observatory (temporary, up to 11 months), to perform electronic assembly work, chassis wiring, population of digital boards and other similar jobs. Training will be provided. Requirements: graduation from high school or its equivalent. Should have manual dexterity, patience in performance of repetitive tasks and ability to follow instructions carefully and maintain attention to details. This position is located in Westford, MA. S86-474

SR. TECHNICIAN (Electronic), Plasma Fusion Center, to assist in laboratory research or analytical work under direction or supervision of scientific personnel. Will operate highly technical RF experimental transmitters and may direct and train technicians of lower grade. Graduation from a two year day technical school or its equivalent and a minimum of five years applicable experience required. Must have demonstrated outstanding skill and performance in repair, construction and preventative maintenance on RF transmitters and associated equipment. S86-448

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. S86-423

STEAMFITTER, Physical Plant, to maintain high and low pressure steam systems consisting of pressure reducing valves, traps, expansion joints, boilers, etc. Minimum five years recent experience applicable to the trade. Ability to work with blueprints, verbal instructions or sketches necessary. Must be able to electric arc weld all piping systems as required, and should have or be working toward A.S.M.E. certification for steel pipe. The work schedule for this position is 4 p.m. to midnight; shift assignment is subject to change depending on plant operating requirements. S86-422

PLUMBER, Physical Plant. Will maintain complete plumbing systems including air, gas, and vacuum systems. Emphasis of work load is preventive maintenance. A minimum of 5 years applicable experience with Mass. State License required. Ability to work from blueprints, specifications, verbal instructions or sketches necessary. Must be available to work all shifts as required. Will be required to work on an

irregular schedule and as determined by the needs of the Pipe Shop. S86-382

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. S86-336

SR. TECHNICIAN (ELECTRONIC), Laboratory for Manufacturing and Productivity, to assist in laboratory research, or analytical work under direction or supervision of scientific personnel. Will operate highly technical experimental apparatus. May direct and train technicians of a lower grade. Has understanding of the theoretical aspects of the experiments, demonstrated outstanding skill and performance in the particular field of activity, and requires little or no supervision. Must operate, monitor, and record data on various experiments using oscilloscopes, computers, numerically controlled systems, and other electronic devices. Will select, install, troubleshoot, maintain and repair equipment and electronic parts. Will interact with computer data acquisition devices collecting test data. Work requires assembly of computers and related electronic and mechanical instrumentation performing modifications as needed. Will support scientific personnel, undergraduate and graduate students and visiting scientists in conducting their experiments. Occasional handling of toxic substances required. Graduation from a 2 year day technical school or its equivalent and a minimum of 5 years of applicable experience are required. Must be familiar with a variety of personal computers and associated hardware. S85-241

POSITIONS AVAILABLE END LIST

The following positions were still available at Tech Talk deadline. Complete descriptions of all available positions are posted in the Personnel Office (E19-239).

SPONSORED RESEARCH STAFF:

- R85-854, Research Associate, Earth, Atmospheric, and Planetary Sciences
- R85-846, Manager of Computer Services (Research Engineer), Aeronautics and Astronautics
- R85-796, Research Scientist, Laboratory for Electromagnetic and Electronic Systems
- R85-770, Research Specialist, Center for Materials Science and Engineering
- R85-743, Assistant Group Leader-Diagnostics, Plasma Fusion Center
- R84-333, R84-332, R84-331, Research Staff and Principal Research Staff, Electrical Engineering and Computer Science

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).

Social Activities

Technology Community Women Museum Mixer*—Fri, Oct 24, 6-8pm, MIT Museum, 265 Mass Ave. \$3/members; \$4/non-members. Wine, soda, hors d'oeuvres served.

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.

Hebrew Table**—MIT Hillel Hebrew Table to practice your Hebrew, every Tuesday at 5:30pm in the Kosher Kitchen (Walker Rm 50-007). Dinner available for \$5.75.

Movies

Bandits vs Samurai Squadron**—MIT Japan Science and Technology Program film, Oct 23, 7:30pm, Rm 10-250. Admission: \$2.

Thief of Baghdad*—LSC Silent Movie Classic, Oct 24, 7:30pm, Rm 10-250. \$1 MIT/Wellesley ID required.

A Chorus Line**—LSC Movie, Oct 24, 7 & 10pm, Rm 26-100. \$1 MIT/Wellesley ID required.

Gorky Park**—LSC Movie, Oct 25, 7 & 10pm, Rm 26-100. \$1 MIT/Wellesley ID required.

The Paper Chase**—LSC Movie, Oct 26, 6:30 & 9:30pm, Rm 26-100. \$1 MIT/Wellesley ID required.

Ososhiku (The Funeral)**—MIT Japan Science and Technology Program film, Oct 30, 7:30pm, Rm 10-250. Admission: \$2.

The Magician*—LSC Movie Classic in Swedish with subtitles, Oct 31, 7:30pm, Rm 10-250. \$1 MIT/Wellesley ID required.

Down and Out in Beverly Hills**—LSC Movie, Oct 31, 7 & 9:30pm, Kresge Auditorium. \$1 MIT/Wellesley ID required.

F/X**—LSC Movie, Nov 1, 7 & 10pm, Rm 26-100. \$1 MIT/Wellesley ID required.

Young Frankenstein**—LSC Movie, Nov 2, 6:30 & 9pm, Rm 26-100. \$1 MIT/Wellesley ID required.

Music

Noon Hour Chapel Series*—The Dunstable Singers perform *Insalata mista*, a selection of delicacies from Italy, France and Britain, Thurs, Oct 23, 12:05pm, MIT Chapel. Free.

Symphony Orchestra Concert*—Five College Orchestra of Amherst, MA, Dennis Burk, conductor with pianist Gary Steigerwalt, 2nd prize winner of Liszt/Bartok competition in Budapest perform Petrassi's Introduction and Allegro, Liszt's Piano Concerto No 1 in E-flat and Schumann's Symphony No 2, Tues, Oct 28, 8:30pm, Kresge Auditorium. Info: x3-2826, 1-5pm.

Princeton University Madrigal Society*—MIT Council for the Arts concert, Oct 29, 12:30pm, Wiesner Student Art Gallery, Student Ctr 2nd floor. Free.

MIT Concert Band Halloween Concert*—John Corley, director, Wed, Oct 29, 6pm, Lobby 7. Free.

Noon Hour Chapel Series*—Boston Saxophone Quartet performs works of Turpin, Poulenc, Bach, Puccini, Joplin, Gershwin, Lennon & McCartney, Thurs, Oct 30, 12:05pm, MIT Chapel. Free.

Theater

Dial "M" for Murder*—MIT Community Players, directed by Elisabeth Benfey, Oct 23-25, 8pm, Kresge Little Theatre. Tickets: \$6; \$5/students, seniors or MIT affiliates. Reservations: x3-2530.

Dance

Yemenite Dance: Lecture/Workshop*—Sara Levi Tanai, artistic director, Inbal Dance Theatre of Israel, MIT Hillel event, Sun, Nov 2, 3pm, Student Ctr Sala de Puerto Rico. Tickets: \$3.50 available from Hillel (W2a), x3-2982.

Inbal Dance Theatre Ensemble of Israel*—MIT Hillel event, Sun, Nov 2, 7:30pm, Kresge Auditorium. Tickets: \$8, \$12, \$16; \$6/students, available from Hillel (W2a), x3-2982.

MIT Ballroom Dance Club Workshops*—Oct 26: Beginning Hustle, 1-1:30pm, Intermediate Tango, 2-3pm, Professional Foxtrot, 4:30-5:30pm, Burton Dining Hall. Admission: Beginning—\$.25/members, \$.50/non-members; Intermediate—\$.50/members; \$1/non-members; Professional—\$2/members, \$3/non-members, \$4/public. General dance, 3:30-4:30pm. Info: x5-9171 dorm. **Halloween Party**, Sat Oct 25, 8pm-midnight, Burton Dining Hall. \$5/non-members, \$2/members. We need help with decorating and refreshments. Please call Liz, x3-3136.

MIT Dance Workshop**—Regular Meetings: Composition/Improvisation, Tues, 3-5pm, Dupont T-Club Lounge; Intermediate Technique, T/Th, 5:30-7pm, Walker 201; Beginning Technique, M/W, 3-5pm, Dupont T-Club Lounge.

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.

MIT Contemporary Dance Club*—Instructor, Cynthia Mallick: **Aerobix I**, M/W, 8-9pm, F, 6-7:30pm; **Jazz I**, M, 9-10; **Jazz II**, W, 9-10pm, T-Club Lounge (M&W); Dance Studio (F). Fee: \$3/MIT; \$4/non-MIT.

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

Western Square Dance*—Tech Squares class starts Sept 23, Tues, 8-11pm Student Center, 2nd floor; runs for 10 weeks. No partner or experience necessary. Caller/instructor: Don Beck; cuer: Veronica McClure. Recorded info: x5-9125 dorm.

MIT Dance Workshop*—Halloween Bake Sale, Oct 30, 10am-2pm, Lobby 10.

October Fete/Semi Formal Dance**—Class Councils, Social Council, Dorm Comm, Fraternities featuring the band "Ball and Pivot" and DJ Rob Mammola, \$15/person, Student Center, 2nd floor, 9pm-1am.

Exhibits

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

Hayden Gallery—Visionary Apparatus: Michael Snow and Juan Geuer. An exploration of works by two Canadian artists who create machines and devices which extend pro-

cesses of perceiving the natural world. Films, live video environmental installations, holographic/photographic work, and a computerized light sculpture; lectures, demonstrations, discussions and screenings presented. **Standard Time...** (*Back and Forth*)—Film by Michael Snow, Mon, Oct 27, 7pm, Bartos Theatre; **Creativity and Imagination in Art and Science**—Discussion led by Juan Geuer, with MIT artists and scientists, Thurs, Oct 30, 7pm; **Envisioning the Apparatus**—Discussion with Snow and Geuer, Sun, Nov 2, 3pm; **La Region Centrale**—Film by Michael Snow, introduced by the artist, Mon, Nov 3, 7pm, Bartos Theatre. Through Dec 21.

David and Sandra Bakalar Sculpture Gallery—Louise Nevelson: **Works in Wood.** A major thematic survey of work by this master sculptor, fourth in an ongoing series of exhibitions illustrating the development of 20th century sculpture. Through Dec 31.

The Reference Gallery—Victor Burgin: **In Residence.** British artist and theorist is known for works challenging the conventional notions of photography as it relates to cultural signs and language. Through Nov 2.

THE MIT MUSEUM

MIT Museum Bldg—Bauhaus Exhibition. Buildings, paintings, tables, teapots, weavings, sculptures, metal work, graphics, advertisements of the Bauhaus School, 1919-33. **Lecture: Mies and the Figurative Arts**—Franz Schulze, Hollender Professor of Art, Lake Forest College, Thurs, Oct 23, 7pm, MIT Museum. **Film: Memories of Berlin: Twilight of the Weimar Culture**—Oct 30, 7pm. Through Feb 28, 1987. Hours: Weekdays 9am-5pm, Saturdays 10am-4pm.

Compton Gallery—**Gyorgy Kepes.** An 80th-birthday retrospective of the founder of MIT's Center for Advanced Visual Studies. Through October 25. Hours: Weekdays 9am-5pm, Saturdays 10am-4pm.

Hart Nautical Gallery

Stoltenberg: Prints and Paintings. 20th-century industrial marine paintings and collagraph prints. Opening reception, Oct 29, 5-7pm. Oct 30 through Jan 31. **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.

Jerome B. Wiesner Student Art Gallery—Graftiti: Color Abstraction. Color photographs taken in South America showing the Latin "sense" of color. Through Oct 27.

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.

MIT Council for the Arts—Fifteen Experiments: An Artist's View of Molecular Biology. an exhibition of paintings and drawings by Susan Podshadley. October 30 through November 29, First floor lobby and hall of Bldgs 56 and 16. Opening reception: October 30, 5pm.

Exhibition of the Architectural Work of Gottfried Bohm, Dept of Architecture Exhibition Space, 4th floor, Bldg 7, Oct 27, 5pm.

Wellesley Events

Jewett Arts Center*—**Old Master Prints from the Wellesley College Museum Collection**, through Oct 26. **Contemporary Prints from the Permanent Collection**, continuing.

Women in Government*—Women in Action Career Program, Wed, Oct 22, 7-9pm, Margaret Clapp Library, Library Lecture Rm. Free/alumnae & members of the college community; \$5/general. Info: 235-0320 x2352.

Older Women: Surviving and Thriving*—Ruth Harriet Jacobs, visiting research scholar, Luncheon Seminar, Ctr for Research on Women, Thurs, Oct 23, 12:30-1:30pm.

Designing Your Own Life*—Sissela Bok, philosopher, author, wife of Harvard University president Derek Bok, Chaplaincy Panel Discussion with respondents including a faculty member, administrator and 2 students, Thurs, Oct 23, 4:15pm, Science Ctr Rm 377.

Political Opposition in Mexico*—Roderic Camp, Central College of Iowa, Spanish Dept Lecture, Thurs, Oct 23, 4:30pm, Margaret Clapp Library, Library Lecture Rm.

Talkin' and Testifyin'*—Black Theatre, Oct 24-25, 8pm, Jewett Auditorium.

Wellesley College Choir Concert*—Music of Poulenc, Faure, and others, Sun, Oct 26, 4pm, Houghton Memorial Chapel.

Authors on Stage*—Vicki Goldberg, Wellesley alumna & author of *Margaret Bourke White*; Robert Richardson, author of *Thoreau*; Irina Spanidou, author of *God's Snake*, Mon, Oct 27, 9am-12noon, Jewett Auditorium. Info: 235-5887.

Work of the Stinehour Press*—Roderic Stinehour, American Printing History Assn, New England Chapter/Friends of the Library, Wellesley College Lecture, Tues, Oct 28, 8pm, Margaret Clapp Library, Library Lecture Rm.

Atmospheric Research: Are We Changing the Climate? Does It Matter?*—Steven Schneider, National Ctr for Atmospheric Research, Boulder, CO, Margery Stone-man Douglas Lecture, Wed, Oct 29, 8pm, Science Ctr Rm 377.

Faulkner, Race, and the Forms of Fiction*—Prof Eric Sundquist, University of California-Berkeley, American Literature Lecture, Thurs, Oct 30, 8pm, Pendleton East Rm 105.

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

Send notices for Wednesday, October 29 through Sunday, November 9, to Calendar Editor Rm 5-111, before noon, Friday October 24.

←Here & There→



Workman is dwarfed in this construction picture in Kendall Square.

—Photo by L. Barry Hetherington

MIT political science professor **Peter H. Smith**, an authority on Latin American history and politics, has been named a staff director for a Ford Foundation-sponsored study of the future of United States-Mexican relations.

An independent bilateral commission has been formed to conduct the two-year study and issue recommendations in late 1988. The goal of the project is to explore constructive ways of managing US-Mexican affairs during the coming quarter century.

Professor Smith's Mexican counterpart as staff director will be Rosario Green, director of the Matias Romero Institute in Mexico. They also will jointly chair a research committee composed of prominent scholars from the two countries which will produce background papers for the commission.

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A newly published book by **Anne Middleton Wagner**, assistant professor of the history of art in the Department of Architecture, has been favorably reviewed by the London Times Literary Supplement.

The review of *Jean-Baptist Carpeaux: Sculpture of the Second Empire* (Yale University Press) was written by Richard Dorment and was the lead item on the supplement's cover listing.

"This is a genuinely original book, one of those rare works of art history that change the way we view not just the artist under discussion, but the art of the period," began the review. Dorment went on to praise the content of the book as well as Dr. Wagner's writing style, saying she "writes with a sense of humor and some very good turns of phrase."

Professor Wagner will focus on other aspects of 19th century art when she introduces a new subject next semester titled "Virgin, Harlot, Hysteric: Visual Imagery of Women in Nineteenth-Century Culture." The course will examine the century's fascination with representing women in works such as Manet's Olympia, Daumier's Bluestockings and Bartholdi's Statue of Liberty.

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Attention, past and present comic book readers: A new "Marvel" comics series,

"Spitfire and the Troubleshooters," is set at MIT, "known as 'Tute to its voluntary inmates.'"

According to reviewer **Julian West** in The Tech, "The eponymous Spitfire is a professor of structural engineering (whatever that is) called Jennifer Swensen, a fiery redhead who studies martial arts. In the most dramatic sequence so far, her father is murdered in his lab, leaving behind an 'AI project' called MAX, which is essentially a big robot suit. It falls to Jenny to don the mantle of MAX, keep it from evil para-military interests, and generally fight evil. She is helped in her quest by a gang of undergraduates sporting blue jeans and orange MIT T-shirts... They call themselves the "Troubleshooters" but they are mostly good at causing trouble, such as assembling a tractor in the dean's office or sabotaging the Yale scull."

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MIT President Emeritus **Jerome B. Wiesner** has been named a 1986 recipient of the C & C Prize—the initials stand for Computers and Communications—sponsored by the Nippon Electric Company of Tokyo through its Foundation for C & C Promotions. The award ceremony will be Nov. 7 in Tokyo.

Dr. Wiesner, a guiding light in the establishment of MIT's Media Laboratory, is being honored "for contributing to the development, growth and establishment of the field of computer science and media technology."

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CLIPPINGS AND QUOTES:

—A Fortune magazine special report on "The High Tech Race" features MIT-Whitehead Institute biologist **Robert A. Weinberg** and MIT alumnus **Daniel Hillis** in a section on "People at the Frontiers of Science"—Professor Weinberg for his research into the genetic causes of cancer, and Hillis of Thinking Machines Corp. for his work in artificial intelligence and super-smart computers.

—Professor **Ernest J. Moniz**, director of the Bates Linear Accelerator Center, was interviewed on radio station WNSH in Salem for its "North Shore Newsmakers" program. —Charlie Ball

Burchard Fellowship applicants wanted

A November 20 deadline has been set for nominations and applications from which the second group of Burchard Scholars in the School of Humanities and Social Science will be named.

Notices have gone out to all sophomores and juniors, who this year can nominate themselves provided they have a reference from a faculty member in the humanities and social sciences. In addition, those faculty members can nominate students on their own.

The Burchard Scholars are a group of MIT undergraduates appointed each year on the basis of having demonstrated unusual abilities and academic excellence in the humanities and/or social sciences, as well as in science and engineering.

The scholars are invited during the year of their appointment to a series of dinners at which an MIT faculty member, visiting scholar or Burchard Scholar makes a brief presentation of work in progress, followed by a general discussion.

This past year, the first group of 13 scholars attended sessions on the nuclear arms race, the fate of liberalism in America, the nature of political authority in Asian

societies and new ways of studying popular culture in America and Europe.

The co-conveners of the program, Professors Bruze Mazlish and Philip S. Khoury, said in their letter to students that such "intellectual feasting" allows both students and faculty a greater chance to mix and gives Burchard Scholars an opportunity to engage in the kind of intellectual exchange that characterizes scholarship in the humanities and social sciences.

The faculty selection committee will designate 10 to 15 students as 1987 Burchard Scholars. They will begin to meet in February and continue to do so for two terms. The committee is particularly seeking sophomores and juniors with strong intellectual interests in the humanities and social sciences who have done consistently excellent work in these fields.

Nominations and applications can be sent to Rm E51-210. Students will be notified of the committee's decision before the end of the fall term.

Report finds black students face special problems here

(continued from page 1)

ters, as well as in education and research." The report praised "the Institute's long-term support of special offices and activities on behalf of minority students, through the presence of minority staff in many of the offices that provide services to students, and through its willingness to support new initiatives on behalf of current and potential minority students."

The report said, however, that accounts by recent black alumni of "overt racist behavior" by some faculty and students made clear the existence of serious racial problems on the campus, and stated that such "racist behavior is unacceptable and should not continue."

A survey, conducted by telephone with black men and women who attended MIT between 1969 and 1985, revealed that relationships between black students and white faculty members "were often characterized by poor or inadequate support, negative expectations for black student achievement, and occasionally some shocking discriminatory behavior. This often led to reluctance on the part of many black students to seek academic help, and thus they lost the advantage of important educational resources," the report said.

President Gray's comments were contained in a letter to the Faculty which accompanied the report. The report and its recommendations are being discussed by various councils, committees, and groups throughout the university.

Dr. Gray has made the improvement of the racial climate one of his top priorities during a year of change at MIT. Other major priorities are the discussion of revisions of the curriculum and undergraduate program; new admissions procedures seeking a wider range of candidates interested in the science-based university; and preparations for the kick-off next Fall of a major fund-raising campaign.

The alumni survey was a series of open-ended, 75-minute telephone interviews with 42 women and 95 men of the 671 blacks who attended MIT between 1969 and 1985. Many (44 per cent) of the alumni reported that racism complicated their adjustment to MIT. The report states, "The negative attitude that most blacks in the survey held toward their student experience at MIT appears rooted in a number of serious institutional problems."

Despite these problems, however, most black graduates in the survey said they felt MIT "was their best choice, and said they would do it again."

In a preface to the report, Dean McBay said that MIT "must reaffirm its intent to provide a supportive and non-hostile environment for all who study, live and work here."

"Individual MIT faculty, staff and students can assist in meeting the Institute's commitment to provide such an environment by not permitting racist statements and acts in this community to go unchallenged."

"I am personally encouraged, by my own observations and experiences here, that MIT through its exceptional people, programs and policies can meet these challenges. The generous commitment of time and energy of each member of the MSIG is but one important indication that MIT has the will and the capacity for effective change," Dean McBay wrote.

John M. Deutch, Provost of MIT and the Arthur C. Cope Professor of Chemistry, commenting recently on trends in faculty appointments, addressed concerns raised in the report about the small number of minority faculty. "Increasing the number of minorities and women on the faculty is our number one priority in affirmative action, and is an important goal for MIT and other leading universities in this nation." He urged the deans of MIT's five schools to devote their personal attention to this matter. "I remind you," he said in a recent communication, "that our performance in our positions should be judged, in part, by our ability to succeed in... female and minority recruitment."

Constantine B. Simonides, vice president, secretary of the MIT Corporation, and MIT's equal opportunity officer, said: "Sad or painful as it may sound, it should be no surprise to anyone that racist thoughts and attitudes exist in the minds of people—

many people in our society and, yes, in our own institution.

"Racist behavior, however, has no place at MIT and will not be tolerated. When it does occur—in the classroom, the dormitories, or the work place—it must be met and be rooted out by quick and decisive action," he said.

In order to make progress, Simonides said, MIT should be a national leader against racism, willing "to recognize and to confront our problems, and make the commitment necessary to improve our environment for all who study and work here."

In its report, the MSIG said it used the word "minority" to refer to Native Americans, blacks, Mexican Americans and Puerto Ricans "who are underrepresented at MIT in comparison with their representation in the general population [of US citizens]. Asian-Americans, while a minority in the US population, are not underrepresented at MIT. Although not considered in these papers, there are issues to be addressed regarding the experiences of Asian students at MIT as well."

The MSIG endorsed the ideal of pluralism, in which different communities live next to one another with respect, affirmation, and the knowledge that each can learn from the other. Thus, a racial, religious, or ethnic group can maintain its cultural identity and enrich the life of the larger community.

Some of the black alumni had struggled over this ideal as they decided how best to negotiate the environment: whether to separate by forming "a more positive and affirmative environment than the one pro-

vided by the larger white community," or to assimilate.

The 22-page report included three pages of recommendations. The first one, to which President Gray responded with his public release of the report, called on the President, the Provost and the Corporation (trustees) to "take the lead in reaffirming the Institute's commitment" to improve the racial climate at the university.

Copies of the report were sent to every faculty member and to every student residential group, and will be made available to other members of the MIT community on request.

Among the recommendations are the formulation of new policies on "disciplinary responses to racist behavior," initiation by faculty of "strategies to help minority students deal with feelings of isolation," and greater attention to the problems of racism in student living groups and in MIT offices.

The report cited instances of inadvertent or deliberate racism experienced by the black men and women graduates. One reported: "The fact that I was black made me conscious of what my community needed. We [blacks] had to endure the perceptions of faculty, staff and students [predominantly white]. Additional pressure as a black [was on me], because I felt that if I failed, these people would think that all blacks fail."

Another alumnus said, "One professor had a hang-up about black people. I went to talk to him about a grade, and he said, 'Maybe you people should go somewhere and do things that you people can do.'"

Later this year, the Minority Student

Issues Group will study recruitment, admissions and financial aid procedures as they relate to minority students; ways in which faculty, staff and students can be increasingly supportive of black and other minority students; and recruiting of minority faculty.

The university's 1986 Equal Opportunity Report shows that as of Sept. 30, there are 1,053 members of the faculty (assistant professors, associate professors and professors). Ninety-seven (nine per cent) are US citizens who are members of minority groups: 15 (one per cent) are black, 72 (seven per cent) are of Asian background, and 10 (one per cent) are of Hispanic background.

MIT's overall employment record as of Sept. 30 shows that of 7,985 employees (including faculty), 1,042 or 13 per cent are US minorities: 403 (five per cent) are black, 505 (six per cent) are of Asian background, 126 (1½ per cent) are of Hispanic origin, and eight (less than one per cent) are Native Americans.

The undergraduate student body, the Registrar's Office reports, totals 4,443 students, of which 1,013 (23 per cent) are US minorities: 194 (four per cent) are black, 604 (14 per cent) are of Asian origin, 199 (four per cent) are Mexican, Puerto Rican or Spanish Americans, and 16 (less than one per cent) are Native Americans.

Graduate enrollment is 5,313, of which 205 (four per cent) are US minorities: 94 (two per cent) are black, 57 (one per cent) are of Asian origin, 49 (one per cent) are Mexican, Puerto Rican or Spanish Americans, and 5 (less than one per cent) are Native Americans.

BAMIT Conference cites need for excellence

By CLINTON ELLIOTT

Assistant Director of Admissions

The Black Alumni of MIT (BAMIT) sponsored the 14th annual Black Students' Conference on Science and Technology last weekend in honor of Ronald E. McNair, the late Challenger astronaut and MIT graduate.

The theme of the conference, "Commitment to Excellence: Attaining and Maintaining Excellence in a Technological Society," reflected the deep concern black Americans feel as they prepare to grapple with their "technological gap" in a society that is increasingly moving away from traditionally labor-intensive industries to a more scientifically and technically based service economy.

During the conference's opening dinner held in the Stratton Student Center's Sala de Puerto Rico, David Saxon, chairman of the MIT Corporation, said that MIT is committed to playing a supportive role in helping blacks and other underrepresented minorities attain and maintain excellence in areas of vital importance to American society.

"I am very pleased to be here," Dr. Saxon said, addressing an audience of about 100 people. "I am intrigued by the theme of your conference. America is a society which is not only technological, but is one that is becoming ever more technological, and doing so ever more rapidly," he added.

Explaining that he recently attended a White House conference convened to explore the role of the nation's historically black colleges and universities in improving black performance in science and technology, Dr. Saxon said that all the conference's participants agreed on the present and future importance of science and technology and that the "disappointing demographic data" concerning black performance in these areas had to be reversed if America was to remain healthy and technologically competitive in the 21st century.

In 1984 there were over 1,000 doctorates awarded to blacks out of 20,000 granted across the United States," said Dr. Saxon, noting that only 33 of these were earned in scientific or technological fields. "This is nothing short of a national disaster," he said.

"Progress is demanded on this issue by enlightened self-interest and simple justice," Dr. Saxon said, noting that at least one-third of the American population will be black, Hispanic or Asian by the first decade of the 21st century. "It is important that we maintain our world leadership in science and technology," he added, casting the issue in global terms.

During his keynote address, Rev. Charles Stith, senior pastor of the Union United Methodist Church in Boston's South End, challenged the audience not only to pursue excellence, but to seek greatness.

"Essential to the pursuit of excellence is preparation, perseverance and perfor-



Michael Dixon, left, a junior in physics, shared luncheon conversation with Col. Charles Bolden, who later addressed the BAMIT Conference on Science and Technology.

—Photo by L. Barry Hetherington

mance," said Rev. Stith. "These are the critical ingredients to living true to a commitment to excellence. Rather than challenging you to commit to excellence, I would rather challenge you to pursue greatness," he added.

You represent the best and the brightest, the strongest and healthiest we have yet to produce in black America. You have more access to opportunity than any other generation of black America and we expect greatness from you," the minister said.

Throughout his provocative and amusing address, Rev. Stith insisted that blacks who are successful in science and technology needed to recommit themselves to the ideals of inclusion and not become blinded by the seductions of materialism or the pursuit of hollow social status.

There was no elaborate plan for national action or plea for more resources, just a simple appeal for individual effort tempered by collective goals.

"You must be great for yourselves. It is not simply a concession to ego, it is really a concession to our essence," said Rev. Stith. "Aspire to greatness unabashedly and unashamedly," he added, employing the rhetorical cadence of a skilled black minister. "But understand that to be great, you must be willing to serve."

"If you are going to serve, and serve you must if you are going to be great, you must

defend down in your soul be prepared to care for those we call the least in our midst," Rev. Stith said.

On the second day of the two-day conference, United States Marine Corps Colonel Charles Bolden, the last successful pilot of a shuttle mission, told an audience of about 150 people that black Americans need to become more proactive in their quest for opportunities in science and technology.

In an address entitled "Excellence in the Space Program: Hanging it Over the Edge," Bolden maintained that he hesitated before becoming a NASA pilot because he thought that as a black man he could not overcome his perception of the racism in the field.

"You can't take part in the decision making process if you leave it to someone else," said Col. Bolden. "You have to constantly do a critical reassessment of your goals. If NASA, as an agency, was guilty of anything pre-Challenger, it was of not doing that. If your goals are in order, then press on."

Following his luncheon remarks, Col. Bolden showed a slide show of photographs from his mid-January shuttle mission, including the Amazon River, the first-ever American space photos of Africa's Niger River Delta, Lake Chad and the confluence of the Blue and White Niles in East Africa.

"Don't ever, ever, ever, be afraid of failure. You didn't come to MIT because you were afraid. Don't let this be the last challenge you accept."

Gray states his position on South Africa divestment

(continued from page 1)

operations in South Africa. My conversations with the chief executives of several of these companies leave me convinced that divestment by MIT will *not*, in any tangible way, influence their future course in South Africa. (Purchase restrictions or boycotts are another subject.) Further, any move toward disinvestment is likely to cause a transfer of assets to a South African or other foreign owner on fire-sale terms and to bring into the picture some alternative, non-US suppliers. Responses to the US sanctions of September 1985 support these observations. A number of subsidiaries have been sold to new owners, most of whom are South African nationals, and non-US suppliers, both European and Far Eastern, have become prominent in some markets. Such changes have neither weakened the state nor strengthened the black majority.

If you have evidence that provides some measure of the effectiveness of divestment as a tactic, I would like to know about it.

Beyond the question of whether divestment has any practical impact lies the question of the impact that disinvestment, were it to occur, would have on the people, the social fabric, and the future of South Africa. I recognize that responses to this question are in the arena of opinion—there are few facts to be adduced—and I recognize that your opinions differ depending on political views or on varied perceptions of the facts. I call your attention to the opinion of Helen Suzman, a member of the South African Parliament since 1953 and a courageous and outspoken critic of apartheid:

"While realizing that I lay myself open to the accusation of paternalism, I have to say that I have more respect for the American companies that have, so far anyway, remained in South Africa (and have set aside millions of dollars for the education, training and housing of their black employees) than for those that have left the country. The companies that have left have taken with them what influence they could have had inside South Africa, thereby abandoning desperate, jobless breadwinners in a country with no social security safety net, no dole and no food stamps.

"The moral outrage and desire for punitive action is something I understand very well, but the reality that will come as a result of a grievously afflicted economy will not be seen by those living thousands of miles away. That reality, compounded by decades of unequal employment opportunities and oppression, is bleak beyond belief. True, many black South Africans say they approve of disinvestment and sanctions, despite the additional hardships they will endure as a result. They fall into four categories: those who have no jobs and nothing to lose; those who have jobs in 'sheltered' employment and will lose nothing; those who want everyone to lose everything (therefore, 'roll on the revolution'), and, finally, those who believe that the South African Government will crack at the first (or, at worst, second) sign of sanctions. The last category brings to mind a former British prime minister who predicted that it would take 'weeks rather than months' to bring down Ian Smith's Unilateral Declaration of Independence in Rhodesia. In the event, it took another 15 years and 30,000 dead."

—New York Times Magazine, August 3, 1986.

In the midst of conflicting views and positions—even among those who are adamant in their stand against apartheid—how can you be so certain that disinvestment is desirable or that it will be in the interest of blacks in South Africa, or that it will hasten the end of apartheid?

In the midst of conflicting views and positions—even among those who are adamant in their stand against apartheid—how can you be so certain that disinvestment is desirable or that it will be in the interest of blacks in South Africa, or that it will hasten the end of apartheid?

There is another difficulty that I have with your call for divestment, and that has to do with the inconsistency or narrow focus of that position. Divestment obviously expresses a moral judgment on the activities of the target corporations. It is an act of strong disapproval, even if it does not produce the desired consequences. And, as an expression of disapproval it seems to me to have unavoidable concomitants,

which you have so far ignored. Does not disapproval also require:

—No academic associations with the corporation (e.g., Industrial Liaison Program, student internships, research sponsorship)?

—No solicitation or acceptance of corporate gifts?

—No purchases of the products of the corporation?

Is it logical that divestment, particularly if urged and undertaken as a symbolic statement of moral principle, be separated from these other considerations? My conversations with corporate leaders leave me with no doubts about their views of the significance of those couplings. As president, I cannot see MIT taking a stand to divest and then failing to follow up on the consequent actions that such a stand would dictate.

A further inconsistency in the call for divestment is the failure to recognize that the focus on companies that *operate* in South Africa misses the largest part of US business involvement there. There are about 150 US corporations that are Sullivan Principles signatories and that have demonstrated a commitment to those principles. There are many, many more—that trade with South Africa but do not operate there. It makes no sense to charge the small number of companies that have taken positive steps to weaken apartheid and support black South Africans with "propping up a racist government" while at the same time ignoring the activities of companies that do business there from a distance.

My *second* reason for opposing divestment is that such a policy would not be in MIT's interests as an educational institution. The action of divestment is a political statement—one that is directed toward an issue having no first-order connection to the activities of this academic institution. Expressions of institutional views on such political issues run the risk of exposing the university to political treatment of its own interests. I believe this is an inappropriate risk for this university to take.

Beyond these two principal reasons for resistance to calls for divestment, there are several secondary reasons that, for me, strengthen the case against divestment. They are the possible effects on portfolio performance, risk, and return, and the legal constraints that apply to university trustees as fiduciaries.

We have discussed these arguments before, and I realize that several people discount their importance and validity, but the Executive Committee, which holds responsibility for investment policy, takes them very seriously.

In summary, I believe that MIT should not divest because doing so would have little effect on the situation in South Africa (and that of the wrong sign) and because the local concomitants of divestment would harm the Institute.

I have to say that those who urge divestment tend to assert that those in our community who do not agree with this strategy are therefore in favor of apartheid or are more concerned with dollars than with people. Neither is true. Such assertions are intended to intimidate and question the motives of individuals whose integrity should not be in question. Ad hominum accusations do not foster communication and mutual understanding on this issue and are not worthy of this institution.

The Institute has made efforts to aid in the education of a small number of South African blacks, both here and in South Africa. And we continue to seek ways in which our capacities as an academic institution can be made to serve the needs of blacks there. While you appear to dismiss these efforts, they are, I believe, appropriate and effective actions for the Institute to take.

Your letter also expresses the view that members of the MIT Corporation have not given sufficient weight to the views of some members of this community. Of course, members of the Corporation have a responsibility to be informed about issues affecting MIT and, as part of being informed, to be aware of the views about those issues which are held within this campus community. They have been informed with respect to this issue on numerous occasions, and there may well be other ways in which they can learn more about the views held by members of our community. Two such meetings, specifically with CAA members, have been held—on June 26 and, most recently, in a session

following the October 3 Corporation meeting.

Corporation members' ultimate judgment as trustees, however, cannot and should not be substituted by community referenda, votes taken elsewhere, or demands by any one group. The trustees of MIT bear the full legal responsibility for the operation and policies of the Institute. They are accountable in these responsibilities not just to the students (not even if those students spoke with one voice) and not just to the faculty (not even if the faculty spoke with one voice). Rather, they discharge a *public trust*, and they are expected to act on the basis of their individual and collective judgments concerning what is appropriate—even what is best—for this university.

In this sense, I believe there is no legitimate end to be served by putting the trustees, individually or collectively, in a position in which they are expected to defend their judgments to you or to any one group. This does not mean that trustee views and decisions should not be visible or discussed widely or that they should not listen to people in our community. But community discussions must respect the responsibility of the trustees ultimately to exercise *their* judgment.

Your letter of September 29 concludes with a call to bring this issue to the

attention of the MIT Corporation during their fall meeting on October 3. A number of people acting on your call made a prolonged effort to enter or to disrupt that meeting—an effort which involved shouting and pounding on the sixth floor door, causing serious interference and near disruption of the meeting. In addition, as you know, two fires were set in the Sloan Building during the time of the protest—with the result that most of the faculty, students, and staff in the building were forced to leave on order of the Cambridge Fire Department. We do not know who is responsible for the fires, but we will do our best to identify the individuals involved in these acts of arson. I implore you to give more attention to the possible consequences of disruptive actions in the future.

I regard the attempt either to force your views on the Corporation or to prevent that body from meeting as a wholly unacceptable form of protest in this university and as an actionable offense to this community.

This letter is a candid and plainspoken effort to address the concerns you have raised and the concerns that I see. To the extent it reflects a degree of impatience, I would suggest that you are not exclusively entitled to be impatient.

Sincerely yours,
Paul E. Gray

Divestiture Endowment Fund created

An alumni and faculty group has formed the MIT Endowment for Divestiture, an escrow fund whose sponsors are among those urging MIT to sell its stock in corporations doing business in South Africa.

Several of the fund's originators and trustees spoke at a formal signing ceremony October 15 in the Student Center establishing the charitable trust. It will accept alumni contributions to MIT but withhold them from the Institute.

If the MIT portfolio is free of South Africa-related investments by 1994, the

group said, the contributions will be turned over to MIT. If not, they will go to Amnesty International and the United Negro College Fund.

Investment and fund-raising activities will be directed by a board of trustees. They are US Reps. Bruce A. Morrison '65 (D-Conn.) and Howard E. Wolpe PhD'62 (D-Mich.); Professors Willard R. Johnson, Gretchen Kalonji '80, PhD'82, Melvin H. King, John Parsons and Joseph Weizenbaum; and John Carlos Correa '81, Philip Katz '82 and Dr. Marc S. Miller '69.

Obituaries

Joseph A. MacDonald

Joseph A. MacDonald, a fabrication planner at Lincoln Laboratory, died October 3, following a brief illness. He was 62 and had worked at Lincoln since 1947.

Mr. MacDonald, a Navy veteran of World War II, was a past president of the Watertown Eagles.

He is survived by his widow, Helen Martin MacDonald, and a daughter Linda E. MacDonald of Watertown. Memorial contributions may be made to the American Cancer Society.

William B. Morrison

William B. Morrison, 73, of Melrose, former manager of the MIT Faculty Club, died October 6, following a long illness with cancer.

Mr. Morrison joined the Faculty Club at its inception in 1952 after having been general manager of the Naval Officers Club in Newport. He was a 1936 graduate of the Cornell School of Hotel Administration and held posts in Saratoga, N.Y., and Liberia before going to Newport.

A past president of the New England Chapter of the Cornell Society of Hotelmen, Mr. Morrison also had belonged to the Epicurean Club of Boston and the New England Club Managers Association.

He leaves his widow, Irene Backe Morrison; four sons, Bruce W. of Melrose, Jeffrey C. of Atlanta, Michael N. of Derry, N.H., and Kerry W. Morrison of Middlebury, Vt., and four grandchildren.

Ann G. Serini

Ann G. Serini, who retired in July from the Program in Science, Technology, and Society, died October 4. She was 65 and had worked at MIT since 1974.

She leaves a son, John P., of Denver, and a daughter, Lisa M. Serini of Belmont.

Edward R. Stec

Edward R. Stec, 70, of Dorchester, a retired heating and ventilation mechanic in Physical Plant, died October 2. He worked at MIT from 1956 until his retirement in 1981.

He leaves his widow, Anna Kashkin Stec; a daughter, Susan Bagarella of Quincy; a granddaughter; three brothers and two sisters.

Herbert M. Candow

A funeral service was held October 14 in St. Peter's Episcopal Church, Cambridge, for Herbert M. Candow, a retired mailman in Physical Plant, who died October 10. Mr. Candow, who was 82, lived in Arlington and had worked at MIT from 1925 until his retirement in 1970. He was a devoted member of the Quarter Century Club.

He is survived by his widow, Elizabeth Rose Candow, and a daughter, Elizabeth, both of Arlington.

Louis Hallowell

Word has been received of the September 27 death of Louis Hallowell, 68, of Westford. Mr. Hallowell was a staff member at Lincoln Laboratory from 1953 until his retirement in 1979. He leaves his wife, E. Virginia Hallowell.

John F. Hurley

John F. Hurley, 60, of Tewksbury, an office assistant at Lincoln Laboratory since 1984, died September 27.

Mr. Hurley, who formerly worked at First National Stores, leaves his widow, Geneva Stockbridge Hurley; two sons, Brian of Pittsfield, and John C. Hurley of Tewksbury; two daughters, Pamela Kania of Salem, N.H., and Kathleen Hurley of Tewksbury, and two grandchildren. Memorial contributions may be made to the Lowell Visiting Nurse Association Hospice.

Daniel J. O'Day

A service was held at the MIT Chapel Tuesday, Oct. 21, for Daniel J. O'Day, a senior in the Department of Electrical Engineering and Computer Science, who was found dead in his car in Lincoln, N.H., on Friday, Oct. 17. New Hampshire state police told MIT officials that the death was considered a suicide.

Mr. O'Day, from Dix Hills, N.Y., was a cadet captain in the Air Force ROTC and was active in the Undergraduate Association. He was a member of the Faculty Policy Committee and the Ad Hoc Committee on the Military Presence at MIT.

He is survived by his father and his sister.

Undergraduate education examined in 3 reports

(continued from page 1)

ment subjects that are highly specialized and oriented towards specific departmental programs, if not co-opted by them, has obscured the original aim "to encourage students to obtain a broad exposure in science."

Each of the committees, whether in final or tentative form, has offered specific recommendations and proposals with which to fuel Institute-wide engagement of the issues.

The HASS committee, making one of the most far-reaching suggestions, recommends that a new Institute Requirement be established "consisting of a subject or subjects on the human contexts that shape and are shaped by work in science and technology." Such a subject might be taken either freshman year, as a powerful time-setting experience for new students, or alternatively, junior or senior year, when perspective is more mature and concern is shifting to the postgraduate opportunities ahead. A critical attribute of such subjects would be that they involve two or more faculty in a collaborative, integrated manner—from across school boundaries.

The HASS committee also proposed that the current HASS requirements be revised to include a Distribution Requirement of four subjects, one to be taken in each of four categories "designed to identify understandings and capacities central to a liberal education for the late 20th century..." The four are: (1) Contemporary Societies and Cultures, (2) Historical Studies, (3) Literary Studies, and (4) the Arts.

It recommended that the present Concentration Requirement, under which students take three or four subjects in a single HASS field, be retained. But the committee said that no concentration in the future should consist predominantly "of subjects devoted to teaching (1) mathematical 'tools' rather than their use in understanding issues and developments in human society, (2) elementary language instruction, (3) the mechanics of writing, or (4) artistic performance alone.

The means for better achieving their goals listed by the Commission on Engineering Undergraduate Education for consideration echo the HASS committee in calling for establishment of "Context" subjects. These should be taught cooperatively by faculty across schools, believes the Commission, and the report looks toward the establishment of a working group to consider "context" models.

Additional innovative ideas put forth by the Commission report include the establishment of an Introduction to Engineering Subject for all MIT students; more emphasis on the teaching of design for engineer-

Engineering. [Excerpts from the reports appear below.]

Provost John M. Deutch provided a central focus for the effort to improve the undergraduate curriculum in the spring of 1985 by appointing Dean MacVicar to her newly created post and Professor Samuel Jay Keyser to another new position as Associate Provost for Educational Policy and Programs. The faculty, at the same time, dissolved its longstanding Committee on Educational Policy and established a new faculty governance structure that includes CUP.

Dean MacVicar said at the time that the impetus for review of the educational program is a pervasive sense across the faculty that the elements of the current MIT undergraduate education—including both the core Institute requirements and many specialized courses of study—are not sufficient in either character or breadth for students aspiring to make contributions of professional, personal and public significance to the world of the 21st century.

The reports presented to the faculty underscore that point.

The objectives for engineering education put forth in the school of engineering's progress report, the Commission said, "should be considered a firm commitment... to shift the emphasis in undergraduate engineering education toward a broader education... for its undergraduates and a culture more supportive of intellectual interaction within the MIT faculty and between students and faculty."

Two of the key objectives listed by the Commission are that all engineering graduates should:

"Have begun to understand the diverse nature and history of human societies, as well as their literary, philosophical and artistic traditions," and

"Have begun to understand and respect the economic, managerial, political, social and environmental issues surrounding technical developments."

According to Professor Kerrebrock, it is the commitment to these objectives as essential to engineering education, rather than as desired enrichment, which portends a change in attitude in the School of Engineering.

Independently, the committee on the HASS requirements said that these requirements should "lay the basis for a lifetime of learning and help students to enlarge their sense of social responsibility, live more richly and reflectively, and share in the pleasures of inquiries beyond those that are narrowly professional."

The School of Science Education Committee, for its part, said that a tendency over the years toward distribution require-

ing students; a program to divide students in departments with large enrollments into smaller interest groups; a minor in HASS for engineering and science students, and a minor in engineering or science for students majoring in the School of Humanities and Social Science; exploration of modifications to pass/fail in the second semester of the freshman year.

The Commission also proposed sets of expectations for the educational process, from the viewpoints of faculty and students, which it suggested will form a basis for collaboration in improving the educational process.

The School of Science Education Committee outlines a possible new 12-unit science distribution requirement and replacement of the present list of subjects "by a considerably smaller and more selective list of approximately 10 to 15 subjects." These, it said, "should exemplify the way science or mathematics is done by dealing with a broad subject, discussing major unsolved problems, and by treating both successful and unsuccessful attempts to solve the problems."

Excerpts from the Report of the Committee on the HASS Requirements:

"The committee recommends that a new Institute Requirement be established consisting of a subject or subjects on the human contexts that shape and are shaped by work in science and technology..."

"Modern science and technology are founded in part on a conviction that the understanding and control of Nature is a powerful means by which human affairs can be given rational direction and material prosperity can be achieved. A large body of research shows, however, that the development of science and technology does not take place in a political or social vacuum. Science and technology are intricately interwoven with society. They do not issue forth by some autonomous process. Nor is their impact simply internal unto themselves. Their development is both influenced and constrained by forces outside the domain of scientific discourse.

"MIT students need to be aware of those shaping forces and constraints. They need to understand the social, political, historical, ethical and cultural contexts in which they work. MIT students are, moreover, especially well qualified to inform modern society of scientific and technological achievements. But to do that effectively requires an understanding of how science and technology fit into the social order..."

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"The formal curricular structures of educational institutions give important signals as to their values. If the Institute is to encourage students to see the interrelatedness of the parts of their education, it may be necessary to express that interrelationship structurally.

"Would, for example, the institution of a new 'Liberal Arts' requirement encompassing the HASS and the science requirements indicate more effectively that those areas of learning are both of basic value to the general education of undergraduates and that both provide foundations for professional careers? And should the general education requirements at MIT perhaps include a technological component even for students who do not intend to major in engineering, but who will nonetheless live their lives in a highly technological world?"

"The institution of new undergraduate requirements, with strong general education components in the humanities, arts and social sciences as well as in science and technology might improve the appeal of MIT to high school students interested in fields beyond engineering, and so alter the composition of the undergraduate body in the direction of greater diversity and balance. The institution of such a curriculum could also make MIT a model for those educators seeking to define the elements of a liberal education for a modern technological world..."

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Excerpts from the Progress Report of the Commission on Engineering Undergraduate Education:

"Undergraduate education in engineering at MIT should prepare its grad-

The committee draws attention to the need for examination of ways to improve the coordination of physics and mathematics content and pedagogy, and reconsideration of certain elements of the current syllabus. The awkwardness of two different chemistry options is noted also.

Over the next few months CUP will seek responses to the ideas and recommendations put forth by the committee reports. CUP will move toward exploration of certain of them as experiments, at the same time seeking to develop formal proposals to the faculty as appropriate.

"Although particular recommendations will require considerable reworking and sharpening in order to be viable for formal faculty review at a later date, it is evident from the work so far that a definite direction for movement has been identified," stated Professor MacVicar. "The elements that comprise the core undergraduate academic program must be viewed as interrelated constituents of a whole education that looks toward preparing our students for a much enlarged social sphere of responsibility and influence as graduates.

uates for leadership in technology, for professional excellence and for rich lives of learning and reflection, through education in science and engineering with an emphasis on fundamentals, in essential partnership with the social sciences and the humanities, for the advancement of engineering and the betterment of society.

"At a higher level of specificity, the objectives which should be held for engineering undergraduate education at MIT are that all graduates should:

"—Have obtained a firm foundation in the sciences basic to their technical field..."

"—Have begun to acquire a working knowledge of current technology in their area of interest..."

"—Have begun to understand the diverse nature and history of human societies, as well as their literary, philosophical and artistic traditions..."

"—Have acquired the skills and motivation for continued self-education..."

"—Have had an opportunity to exercise ingenuity and inventiveness on a research project..."

"—Have had an opportunity for engineering synthesis on design project ['Synthesis' is defined as the creative assembly of a set of ideas, concepts and facts to yield a device or system to meet some set of needs... the essence of engineering—Editor]..."

"—Have developed oral and written communications skills..."

"—Have begun to understand and respect the economic, managerial, political, social and environmental issues surrounding technical development..."

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Excerpts from Science Education Committee Report:

"The present science distribution requirement was established with two ends in mind. First, it allowed departments to tailor their majors' exposure to science subjects to the needs of the department program; second, it sought to encourage students to obtain a broad exposure in science. Over the years, many subjects have been added to and few removed from the list... Since many of these subjects are highly specialized and oriented towards specific departmental programs, the second aim of the requirement has been obscured..."

"We believe the science requirement should continue to be separated from departmental programs. We therefore propose a new 12 unit science distribution requirement and believe that this would be acceptable, indeed desirable, to most faculty and students. At the same time, the present list of subjects must be replaced by a considerably smaller and more selective list of approximately 10 to 15 subjects taught in the School of Science. These subjects should be accessible to sophomores who have completed the Institute requirements; they should exemplify the way science or mathematics is done by dealing with a broad subject, discussing major unsolved problems, and by treating both successful and unsuccessful attempts to solve the problems. Although some subjects of this type are taught in the School of Science now, we recommend that others be created to fill this need..."

What to save and why? Archives at MIT searches for the answers

By ELIZABETH PESSEK

Project Archivist

At the turn of the century, an academic institution made several overtures to incorporate MIT as its school of engineering. Which was it?

The faculty is currently examining the humanities curriculum. In 1949 the Lewis Commission carried out a similar study. How do present concerns differ from those of 37 years ago?

MIT has close ties with Japan through its faculty and students. Is this a recent phenomenon?

How would you find the answers to these questions?

The information is contained in the records preserved in the Institute Archives and Special Collections of the MIT Libraries. There, materials which have been created by the Corporation, the office files of presidents, deans and department heads, the minutes of committee meetings, student course notes, and papers of faculty and staff document the history of MIT's administrative, educational, and research activities.

These records are collected so that we at MIT can better understand our institution, make administrative decisions based upon past experiences, find out about previous research in specific subject areas, and also study the role of our university in American society and its relationship with government, industry, and the community.

Quasiquintennial Fact

MIT has never awarded an honorary degree. When Winston Churchill spoke at MIT's Mid Century Convocation in 1949, he was given an honorary lectureship rather than an honorary degree.

But how do archivists at MIT, or any college or university, select from the overwhelming quantity of records created, when only 5-10 per cent are considered to be of long-term value?

The Andrew W. Mellon Foundation has recently awarded the Institute Archives a grant to investigate this problem. Activities common to all colleges and universities—administrative, educational, research, and social—will be examined in order to identify those records that document these activities. We will then evaluate the documentation and prepare recommendations for our colleagues on their long-term administrative and historical importance. This two-year project, directed by Institute Archivist Helen W. Samuels, will help archivists respond to the administrative needs of their institutions and provide material for future researchers in a variety of disciplines. The project team consists of permanent staff members Donna Webber, assistant archivist; Kathy Marquis, reference archivist; and Susan Chapdelaine, records management officer; and Beth Pessek, who will serve as project archivist.

The current study stems from an earlier project, which was also supported by the Mellon Foundation, that looked at records documenting the scientific and technological process and formulated guidelines on the retention of those records. These efforts resulted in a publication, *Appraising the Records of Modern Science and Technology: A Guide*. As in this first project, the Archives staff plans to draw upon the advice and expertise of the MIT community. Current project members will once again call upon staff, students, and faculty to gather information about the organization and functions of the Institute and to understand how records are created and used at MIT.

In case you are wondering, the institution that wanted to take over MIT was Harvard. To study the other issues, we encourage you to visit the Institute Archives (Rm 14N-118, x3-5136) and look at our collections on these topics.

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Deadline is noon Friday before publication.

For Sale

Chubby coal stv, exc cond, lots of extras, \$250 or bst. Deirdre, x3-6841 or 335-7263.

10 spd bike, gd for commuting, gd cond, med-sz frm, \$70. Lindy, x3-6505 or 923-4550.

2 snw trs, E78-14 Delta "Sure Trac II" mtd on 5-hole rims, \$35 for pr. Bob, x8-2357 Draper.

Br nw trn-sgnl assmby for '67 Mustang, still in box, nvr instlld, \$30 firm. Jan Blair, x8-2845 Draper 8-5pm.

Twn mtrss, wtrprf, nvr usd, \$60. Rosalie, x8-1201 Draper or 776-3748 eves.

2 snw trs to fit VW Beetle, 165-15, usd 1 seasn, \$45. Carrie, x3-3567.

Princeton grphcs sys HX-12 RGB colr mntr, 2-3 mo on warr, \$340; A *Mind Forever Voyaging* by Infocom for PC, complete & legal \$18. John, 926-6216 aftr 7pm.

UW camra eqpmnt: Nikonos SB-102 strobe, \$400; Nikinos 20mm f2.8 UW lens w/optical viewfinder, \$300; Sekonic Marine Metr II UW lt metr, \$75, all exc cond, barely usd. Thomas, x3-2381 or 662-8912.

10 c.f fridge, \$200. Joan, x3-1973 or 876-2308.

Harpichord, Flemish sgl, 2 8' stops, frm Zuckerman kit, maroon ext & bone int, nds some cbnt wrk & pntng, \$1,500 or bst. Sarah, x3-8462 or 641-3982.

15' Windmill sailboat w/trailer, grt boat for begnrs & exp'd, has main & jib. Call 232-4377 aftr 7pm.

Accessories for infnt/tddlr: porta crib, \$12; car seat, \$16; carriage, \$5; crib mtrss, \$8. Diana, x3-0408 or 449-7654 eves.

Symphny tkts, 1/4, 2nd blcny ctr, \$28/pr. John, x8-4265 Draper.

Old Smith Corona elctre typwrtr, \$50. Steven, x3980 Linc or 492-4915.

Chld's trike, bl, exc cond, \$20. Lee Linsky, x3-1782.

'48 Encyc Brit, \$100 or bst; grn wool rug, 8x11, \$30; pad, \$10; trnk, \$25; corn poppr, \$5; 2 Michelin trs, 185-14R, fair cond, \$15; 2 Delta snw trs, nw, A78-13, \$25; bck dr & 3 wndws w/strm & screen, bst off; tstr ovr, \$18; IBM typwrtr, \$35; ext strdy typng tbl, \$15; misc furn, cheap. Call x3-3175 or 332-8251.

Spkr stnds: 50% discnt, 18" tall, blk ebny fnsh, \$55. Peter, x3-0415.

Bell mtrcyl helmts, \$40 & \$15; Kryptonite mtrcyl lck, \$25; auto repr timing lt, \$15; Dwell tach mtr, \$15; jack stnds, \$6. Call x3-8641 or 492-4830.

24-pc bevrg set, nw anchr lockng, \$14; fondue set, nw, \$10; Oneida 32-pc silvrwr, like nw, \$22; macrame lmp shade, \$6; tennis rcqt, \$5; 2 W's hats & coats, sz 10 & 12, \$5 ea or bst; wdn spck rck w/12 jars, \$8. Call 876-3983.

LR couch/mtchg sofa chr, leafy ptrn in earth tones, wickr sides, \$295.00. Call x8-4612 Draper.

Apple cmpr, enhanced (65CO2, nw ROM), xtnded (128K RAM), w/8-colm dslpy, incl clock card, Mockingboard sound + spch synthesis card, disk drv & hi-resolutn monochrome monitr, Apple Pascal 1.2, ORCA/M assmblr, MICOL BASIC cmpr, mch more, software alone valud ovr \$600! Asking \$1,200. Call x3374 Linc.

'83 Sanyo microwve ovr, 1400WS, \$150; '81 GE rfrigrtr, 19cf, \$250. Call x2693 Linc.

Sgl ownr full lngth Mink Paw coat w/sapphire satn lining, mint cond, \$400 or bst. Call 536-8627.

Misc clothing sale, \$2-5; juicer, \$8; old piece of furn w/blt-in radio; saxophone. Barbara, x3-6925 or 876-9310 & lv mssg.

Scott Stamp Catalogs, 4 vol, 1985, \$15. Bob x3-2748.

Ross W's bike, 3-spd, exc cond, maroon, used only few times, \$80 inc kryptonite lck w/keys. Judi, x3-2778 days or 647-5349 eves & wkends.

Bikes: 18" G Rambling Rose, exc, \$25; 14" B or G w/training whls, \$12; plstc child's bike seat, \$8; 2 pr 120 cm child's skis w/bindngs, \$10 ea. Claude x3-7500 or 646-7190.

Back issues - Scientific American mag, 1977-presnt, National Wildlife, 1968-1983, Playboy, 1972-presnt, free to intrsted prty. Call 648-6389.

Silver Alto sax w/Selmer CStar mouthpiece, \$275. Call 225-7322.

Bike, 12-spd, 24" frm, 27" aluminum whls, Sountour deraileurs, Sugino crnkset, Avocat seat, fine bike, modest price, \$150. Bruce x3-5570 or 277-1470.

Wash/dry combo, Frigidaire, 2yrs old, rns fine, 24" W x 26" D x 65" H. Dryr reqs 240V line, \$450. Lee, x3-7727 wkdays, 267-8340 eves.

Panasonic 19" colr TV, exc cond, \$175 or bst; Sears Console Hmidfr & supplis, \$10; Radio Shack ape contrl ctr, \$10; AM/FM tbltp radio, \$3; smi stereo or TV std, \$5. Les x3-6903 days or 494-9084 eves.

3 pc colonial liv rm set, \$200 or bst. A. D'Amore, x3110 Draper or 354-2633.

2 whl shopng crt, 2 mos used, \$10. Kurt, x3-6647.

Vehicles

'66 Ford Falcon, 2-dr, 6 cyl, auto, ps, exc cond, rad trs, \$900. Joe, x4478 Linc or 935-7455.

'69 Pontiac Catalina for prts, 400, 85K, \$150 or bst. Jim, x5610 Linc or 433-5430 eves, lv mssg.

'71 Volvo 144, 4-dr sdn, rns well. Call x3-6801 or 237-6807 eves.

'71 Volvo sta wgn, gd operatng cond, \$700. Call x3-5578 or 862-8648.

'72 Mercedes 250, maroon, 130K, v gd shape, no rst, \$3,500. Darryl, x7505 Linc or 692-6650.

'73 Mazda RX3 for prts, eng nds seals, bdy brks, trs, exh, in grt shape, \$100. Gerry, x4635 Linc or 721-2768.

'74 Opel Manta, 77K, auto, pb, a/c, nw trs, nw muflr & tail pipe, nw altnatr, no rust thru, \$600. Call 494-1652 eves.

'74 Ford sta wgn, a/c, 87K, nds exh, askg \$400. Liz, x3-2260.

'74 Toyota Celica, exc cond, sunfr, AM/FM/cass stereo, rns perf, nw batt, well-maint eng, gd trs, rcntly paintd, int like nw, \$1,200 or bst. Call 264-0694 eves/wkends.

'74 VW Superbeetle, 90K, rns grt, gd trs, gd shcks, AM/FM, some rst, \$775 or bst. David, x3-7744 or 354-5274.

'75 Chevy Nova, yellow sdn, atuo, ps, sm rst, rns well, \$850. Pat x3-5717 or 358-4013.

'75 Mustang II, rns v well, only 67K, nw ign, exh, frnt brks, Michelin rads & mtd snws, \$1,200 or bst. Call 648-5368.

'75 Monte Carlo, 8 cyl, stereo tp, am/fm, a/c, cruse contrl, nw trs, well kept, \$900 firm, mst see to apprctate. Marsha x3-1501.

'75 Dodge Dart, 93K, orig ownr, some rst, gd rning cond, rlbl trnsprtn, \$450 or bst. Ron, x8-5227 Whitehead or 484-0834.

'75 Chevy cnvrtbl, American Dream Machine, 200K, rns grt, \$800. Steve, x3-3529 or 628-8874 eves.

'76 Toyota Corona wgn, nw brks, exh, tune-up, well-maint fmly car, 135K careful mi, \$750 cash. Dan, x7396 Linc or 453-7614 aftr 6pm.

'76 Jeep Wagoneer, 68K, quadra-trk, lo range, towng opts, auto trans, Michelins, cass, Ziebart. R. Lyon, x3-2214.

'76 Honda Civic CVCC wgn, br nw shck absbrs, nw wtr pmp, AM/FM/cass stereo, rns well, some rst, \$500 or bst. Prakash, x3-6762 or x5-9800 dorm, late eves.

'76 Ford mtr hm, 19'L, exc cond, 351 eng. George, x8-4640 Draper.

'77 Ford Granada, 4-dr, V8, 64K, a/c, ps, pb, AM/FM/tape dck, nw trs, brks, shcks & more, mst sell, \$875 or bst. Paul, x4493 Linc or 603-891-2324.

'77 Plymouth Volare sta wgn, 93K, 1 ownr, v gd cond, auto, nw trs, split bench recl. seats, \$950. Call x7956 Linc or 443-2614 eves.

'78 Honda Civic htchbk, 80K, gd cond, \$1,000 or bst. Dr. Nadim, x3-2688 or 576-4706 eves.

'78 Ford Fairmont wgn, 6 cyl, auto, pb, ps, a/c, no rst, 1 ownr, compl maint rcrds, 95K, \$1,150. Dave, x3-5576.

'79 Chevette, 4-dr, auto, bl, \$750 or bst. Call 232-4347.

'79 Mercury Monarch, 4-dr, auto, AM/FM/cass stereo, ps, pb, a/c, pwr wndws, lcks & seats, tlt whl, cruise contrl, nw brks, trs & batt, exc cond, 95K, \$2,500. Call 628-0176.

'79 Dodge Omni, 4-spd, 75K, a/c, AM/FM, ps, sev nw prts, 30mpg, mst sell immed, only \$900 or bst. Uli, x3-0949 or 641-3833 eves.

'79 Olds Cutlass Supreme, 48K, exc cond, \$2,500. Tom x3-4978 or 749-6645 eves.

'79 Dodge Colt, 2-dr htchbk, mnl trns, AM/FM, 83K, exc rning cond, \$800 or bst. Call x2930 Linc or 783-3674.

'79 Bertone X-1/9, 69K, Ital mid-eng, 2 seatr, spts car, removable roof panel, 5-spd, a/c, Blunkpunkt stereo, Chapman, remote radar, beaut in/out, nd big car, \$2,500. Makoto, x3-0985 or 577-8180.

'80 Chevy Monza htchbk, 2-dr, 4-spd, exc cond, nw trs & cltch, \$2,100 or bst. Patty, x3-7750.

'80 Chevrolet Monza 2+2, sprt htchbk, stnd, 4-spd, AM/FM cass stereo, rads w/spts caps, 83K, sup car, \$1,300. Demetri x3-6906.

'80 Honda CB750 Cstm, lug rck, cvr, 2 helmts, kryptonite lck, crash brs, hiway pegs, sissy bar, 5K, \$2,000. Marie x3-6334.

'80 VW Rabbit diesel, 77K, exc cond, a/c, AM/FM, cass radio, snow trs, 45mpg avg, \$1,100. Al, x3-4177.

'80 Datsun 510, 2-dr, std, nw muff, brks, tune-up, exc mech cond, Richard, x3-5520 or 646-8839.

'80 Plymouth Horizon, AM/FM, htr, 90K, gd trans, well maint, askng \$900. Call x3-8211 days or 491-4584 eves.

'81 Ford Fairmont, 63K, exc cond, 4dr, 6 cyl, auto, a/c, AM/FM stereo csst radio, 4 nw rad trs, asking \$2,800 neg. Call Vin Diorio, x3-6571.

'81 Silver Toyota Starlet htchbk, exc bdy out & in, 5-spd, std, AM/FM, v rlbl, hi mi, nw trs, \$1,200 or bst. Call 782-1899 eves.

'81 Ford Escort L htchbk, 4-spd, AM/FM, 49K, \$1,400 or bst. Mary-Claire, x3-4373.

'82 Chevy Citation, 4-dr htchbk, mnl, a/c, AM/FM/cass dck, ps, pb, nw rst, gd cond, rlbl, askg \$2,450. Karen, x3-8434 or 646-4356 for mssg.

'82 Chevy Chevette, 4-dr htchbk, 4-spd, 42K, exc cond, \$1,800. Call 862-1695.

'82 AMC Concord, gd cond, auto, V6, 4-dr, a/c, nw brks & stckr, \$1,600 or bst. Call x183-307 Bates or 975-0265 aftr 6pm.

'84 Kawasaki GPZ550, silvr, bght nw %5, case grds, alarm, nw Pirelli trs, dearl-maint, \$2,000. Paul, x3-6908 or 321-4654.

Housing

Cambridge, 7rm, 3BR, 1b hse, lrg mod ktchn, D/D, w/w carpt, mstr BR w/sliding drs to stdy, 2 car prkg, fncd yrd, hw, wshr/dryr, \$1,200/mo. Joan, 628-4688 tl 9pm or 661-7618 anytime.

Brighton, 3BR apt, ktchn, LR, DR, oak flrs, rear prch, lrg yrd, ez prkg, \$875+ utils. Toni, 783-3716.

Brookline, furn rm + prkg. Inquiries Mon, Tues, Fri eves & wkends. Call 566-5918.

Mersky named ASPG associate

Laura B. Mersky, formerly area coordinator of the Management Science Area at the Sloan School, has been appointed associate, for the Analytical Studies and Planning Group within Vice President Constantine B. Simonides' office in the Office of the President.



Ms. Mersky replaces David S. Wiley who is now the associate dean for Student Affairs in charge of the Undergraduate Academic Support Office.

In her new role Ms. Mersky will provide staff support for Professor Mary C. Potter, Chairman of the Faculty and professor of psychology, for the Faculty Policy Committee and for Professor Margaret L.A. Mac-

Vicar, dean for Undergraduate Education. She will also handle special projects for Mr. Simonides.

Ms. Mersky, a native of Newton, received her BA from Brandeis University in 1972 and her MEd from Tufts in 1973. Following graduation she was employed as a research assistant with Arthur D. Little, Inc., before heading for Maracaibo, Venezuela, where she taught English, social studies and psychology at the middle and high school levels for several years.

Upon her return to the US she worked as a teacher for inmates under 21 at the Massachusetts Correctional Institution at Norfolk for a year. She then became Title I Director, Massachusetts Department of Correction. She held that position for five years.

Ms. Mersky joined the staff of MIT as an administrative assistant in the Alumni Office in 1984.

Institute Notices

(continued from page 2)

National Science Foundation Program. Two undergraduate students wanted for special National Science Foundation Program for supplemental funding for support of women, minority, and handicapped engineering research assistants. The research project concerns electrokinetic measurements and electrofluidized beds. Program would start in the spring of '87 and continue for one year. Total funding for each student will be \$5,000. Students must apply immediately and must supply a brief biographical sketch and/or resume. If interested, please contact Prof. Zahn, in the department of electrical engineering and computer science and the Lab for electromagnetic and electronic systems, x3-4688, Rm N10-203.

Laboratory for Nuclear Science. MIT is constructing a large experiment called L3, which will be at the large electron positron accelerator in Geneva, Switzerland, starting in 1989. L3, the biggest detector built, is forefront in the quest for the origin of matter through the Higgs mechanism. To fully utilize the large magnetic field a detector is located inside. This project concerns obtaining precision by building structures of low expansion material at MIT to extreme accuracy. This is a unique chance to work with high technology equipment. Since it is part of an ongoing construction program, candidates must be able to spend at least 20 hours per week on the program. Faculty supervisors: Prof. U. Becker, x3-5822, Prof. J. Branson, x3-8418. Contact: D. Osborne, x3-4366.

Earth, Atmospheric and Planetary Sciences. Study concerned with the interpretation of radar echoes from lightning in thunderclouds. Simple models have been developed which involve a dilute distribution of perfectly conducting scatterers, each long and then compared to the radar wavelength. This structure, unlike real lightning, is disconnected. The revamping of a sophisticated electromagnetic scattering code, obtained from Lincoln Laboratory, is necessary to analyze the radar cross section of connected tree structures. These results will then be compared with the results from the simpler disconnected model. Contact and faculty supervisor: Prof. Earle Williams, x3-2459, Rm 54-1818.

Cable Television Schedule

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

Wednesday, October 22

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

Thursday, October 23

Channel 11: 10:30-12noon—12.975J Principals of Remote Sensing. Live from WHOI. 1:20-3pm—12.790 Introduction to Observational Physical Oceanography. Live from WHOI.

Friday, October 24

Channel 8: 5pm—Physics 8.01 Help Session No. 6. Program will repeat until 9am, Oct 27.

White Mtn, lrg pleasnt twnhse on golf course, nr lakes, maj ski areas. X-country and indr/outdr swimng pool on place, sleeps 8+, will sell ski/wks or June/wks (time shr resort), v reasble price, pics avail. Wolf x3-6781.

Malden, lrg 3BR apt, 8 rms in 2 fam home on quiet st, mod kitch/brth incl dw, hdwd flrs, \$825 unhtd. Call x3-8966 or 324-5904.

Wanted

Dehumidfr, med or lrg. Call x3-4981 M-Th, 9-2pm.

World Series tkts, Mets vs Boston only. Pete, x5-6351 dorm.

Trumpet playsr for MIT Brass Ensemble. Call x3-3261 or Rich Berg, x5-8354 dorm.

S/S pressure cookr. Call x3-8641 or 492-4830.

Swap Albany stckr for preferd Sloan or East. Call Kate x3-7947 til 10/17; x3-0126 aft; 846-0325 eves.

Swap Albany stckr for Amherst, East, Hayward or Sloan. Marianne, x3-7934 or 569-2442 eves.

Brookline, graduate cpl seeks reliable, loving person w/refs to care for our infant, starting late Nov, 3 days/wk, some eves, prefibly in our home. Ybet x3-1822 or Julia 734-2401.

Roommates

Neat, quiet, non-smkng F to shr 2BR Chelsea apt, 1st flr of rennovtd hse, rnsbl rnt, quick wlk to bus to Boston. Sarah, x3-2691.

I space avlbl in 3BR Fresh Pond 2nd flr apt w/2 wrkng W (20's) & cat, sunny, wshr/dryr, bck prch & yrd. Julia, x3-0238.

Grad stndt/prof to shr lrg sunny 3BR Somerville apt, nice nrhd, nr bus, huge ktchn, microwv, dshwshr, sunprch, grt view frm hilltop, W/D, \$333/mo+ utils. Tina, x3-1832.

Carpool

Rldr's wntd for vanpool frm NH to Kendl Sq-Camb area/Lve Hampstead via Salem, NH 7AM for 8:15 arvl; lv Camb 5PM for 6 ret. Info, Patti x3-5806.

Channel 9: 12-1pm—Live coverage of 12.950 General Circulation of the Oceans.

Saturday, October 25

Channel 8: Physics 8.01 Help Session No. 6. Program will repeat until 9am, Oct 27.

Sunday, October 26

Channel 8: Physics 8.01 Help Session No. 6. Program will repeat until 9am, Oct 27.

Monday, October 27

Channel 8: 5pm—Physics 8.01 Help Session No. 6. Program will repeat until 9am, Oct 28.

Tuesday, October 28

Channel 8: 5pm Physics 8.01 Help Session No. 6. Program will repeat until 9am, Oct 29.

Channel 10:

4:50pm—Live coverage of the MIT VLSI Seminar.

Channel 11:

10:30-12noon—12.975J Principals of Remote Sensing. Live from WHOI.

Wednesday, October 29

Channel 8: 5pm—Physics 8.01 Help Session No. 6. Program will repeat until 9am, October 30.

Channel 10:

11am—Live coverage of the MIT Optics and Quantum Electronics Seminar.

Thursday, October 30

Channel 11: 10:30-12noon—12.975J Principals of Remote Sensing. Live from WHOI. 1:20-3pm—12.790 Introduction to Observational Physical Oceanography. Live from WHOI.

Friday, October 31

Channel 8: 5pm—Physics 8.01 Help Session No. 7. Program will repeat until 9am, Nov 3.

Channel 9:

12-1pm—Live coverage of 12.950 General Circulation of the Oceans.

Saturday, November 1

Channel 8: Physics 8.01 Help Session No. 7. Program will repeat until 9am, Nov 3.

Sunday, November 2

Channel 8: Physics 8.01 Help Session No. 7. Program will repeat until 9am, Nov 3.

Tax reforms offer equity and efficiency

(The following article by Professor Emeritus Daniel M. Holland appeared August 24 in *The Boston Sunday Globe* and is reprinted here with the author's permission.)

By DANIEL M. HOLLAND
Professor Emeritus of Finance,
Senior Lecturer,
Sloan School of Management

Stepping back from the trees and looking at the forest, it seems clear that the country as a whole will benefit from the tax reform bill. In the aggregate, we all gain. We will have a more viable income tax and a more efficient economy. These are powerful achievements: to my mind, the benefits of the tax reform exceed its costs. Men of good will will differ in this judgment. Let me explain mine.

For evaluating tax policy there are two major criteria—equity and efficiency.

Equity refers to the distribution of the burden of a tax. Does it conform to perceptions of what is fair? The widely held belief is that the income tax does not.

Over the years, Congress has provided a proliferating variety of income tax preferences, all designed to encourage "good" activities. Consequently, an increasing fraction of the potential tax base has become tax-exempt. In fiscal year 1986, for example, the revenue lost because of "tax expenditures" (special treatment under the tax code) came to 89 per cent of the actual personal income tax revenue. The current tax code is larded with other mechanisms for legal avoidance, of which tax shelters are the prototype. And taxpayers have, to an increasing extent, resorted to illegal evasion and failed to report their income. In 1984, the tax revenue lost because of income under-reporting came to about 29 per cent of personal income tax collections, up from 18 per cent in 1973.

Because of tax expenditures, tax shelters and evasion, the income taxes of those who do pay are heavier, and there are pronounced differences in effective rates (tax liability as a per cent of economic income) among taxpayers with the same income. Not surprisingly, the income tax is considered unfair. Widely-perceived unfairness poses a clear and present danger for the viability of the tax. Taxpayer cooperation and self-policing are a sine qua non of a successful income tax. But taxpayer reporting zeal, reflecting resentment over its unfairness, has flagged. A destructive dynamic threatens the income tax.

But compared with the alternatives the income tax is a good tax and should continue as our primary revenue source. A major achievement of the tax reform likely to emerge in the next several months will be the restoration of the credibility and viability of the income tax. Because the base will be broadened, many loopholes closed and a meaningful minimum tax put in place, the dispersion of effective tax rates of income tax will be narrowed. Taxpayers should be more willing to pay their share of the load because it will be more fairly distributed.

Efficiency, too, requires equal tax treatment of equals. Efficiency requires that income from all economic opportunities be taxed at the same rate. If some activities are subject to "low" rates and others to "high" rates, more resources than appropriate will end up in the low tax-rate sectors and less in the high-rate sectors.

If industry A is exempt from tax, and Industry B is subject to a 40 per cent rate, entrepreneurs in Industry A would be satisfied with investment yielding 10 per cent, but those in Industry B would require a return of 16-2/3. Entrepreneurs in both

industries will earn 10 per cent after tax, but the economy will lose \$6.67 (a good fraction of the yield of the investment) for every hundred dollars invested in Industry A. Because of tax differentials, economic opportunities with high rates of return will be passed over in favor of those with lower rates of return, and the community will be the poorer for it. We will fail to produce as much output as our underlying capability and resources are capable of.

By curbing special tax breaks and bringing effective rates of tax in all economic activities closer to equality, the prospective tax reform will make our economy more efficient. Increased efficiency is tantamount in its effect on economic growth to an increase in investment. More efficient employment of our capital stock and human resources should allay the concern that tax reform may, in the short run, deter some investment.

It will be some time before we realize the full import of the Tax Reform Bill of 1986. In essence, it marks a major shift in industrial policy. For many years, to an increasing degree, under the aegis of the tax code, we have encouraged (and discouraged) specific kinds of economic activities. Tax policy in this respect has been an integral part of industrial policy. Congress and/or the president have decided they know better than the free market what's good for the economy, and have promoted incentives to get resources allocated accordingly. But the Tax Reform Bill reverses this policy. By cutting out a large number of tax incentives and curbing others, we are saying in effect: "We have in the free market an extremely useful mechanism for getting our economic work done at a minimum of cost and a maximum of output. We haven't been very good at second-guessing the signals of that market. Let's rely on it more heavily."

The Tax Reform Bill will be a major achievement, likely to fix the pattern of income taxation for many years. It has been an exciting political experience, and preoccupied the public well beyond its usual attention span. The experience probably precludes consideration of major tax changes for some time. This is regrettable because in the process of gathering a consensus, some major problems were swept under the rug.

The present version, the one that Congress will vote on, has no adjustment for inflation. The first pass at tax reform, the Treasury's proposal of November 1984, had a comprehensive set of recommendations for indexing depreciation, inventories, interest and capital gains. They posed some technical difficulties, and, in the last several years, inflationary pressures have died down. But this could well be a lull rather than the long-term course of the price level in the future.

The tax reform of 1986 does not address the relationship between the corporate and personal income taxes. We know that "business doesn't pay taxes," yet we talk about "shifting \$120 billion of tax from individuals to business." It is a difficult problem, and economic analysis does not furnish clear guidelines on what to do, but some degree of integration between the two income taxes is in order.

Finally, the forthcoming tax reform, as noted, pays due attention to equity in the sense of equal treatment of equals. However, in my view, it is not sufficiently concerned with the other dimension of equity—the distribution of tax burden among persons of different incomes. I think the top rate has been cut too sharply; a more progressive distribution of the tax burden—higher rates at the top—would be appropriate.

Several views from the bridge

(Following is an adaptation of remarks made to this year's entering class last month by Samuel Jay Keyser, associate provost for educational policies and programs.)

By SAMUEL JAY KEYSER
Associate Provost

There are many ways that one can look at the same object. Consider the Brooklyn Bridge. At the time of its construction between the years 1869 and 1883 it was, to its designers, John Augustus Roebling and his son Washington, an engineering project of monumental proportions, bridging a span almost twice as long as any span in existence at the time. To the poet Hart Crane in the first quarter of the 20th century the bridge became both an inspiration and the subject of his masterpiece, "The Bridge," from which the following stanza is drawn:

And Thee, across the harbor, silver-paced

As though the sun took step of thee, yet left

Some motion ever unspent in thy stride—

Implicitly thy freedom staying thee!

(It is a remarkable historical coincidence that Crane wrote these lines in the very same room that Washington Roebling used as an observation tower while supervising the construction of the bridge almost half a century earlier.)

At about the same time that Crane was writing "The Bridge," one of the leading painters of the American modernist school, Joseph Stella, was creating his own version of the Brooklyn Bridge in a number of remarkable paintings and drawings which are masterpieces of modern art in their own right.

Each of these individuals, the engineer, the poet and the artist, has given us the opportunity to view the Brooklyn Bridge from different perspectives. I stress this because of my belief that the mark of an educated person is his or her ability to appreciate all of the facets of a particular object of human endeavor, whether it be a bridge, a novel, a piece of music or a scientific theory.

Most of you are about to embark on an education in some field of science or engineering. Such an education will help to train you to see things in multiple ways since that is a crucial part of what it means to be a scientist. However the need for all of us, as scientists and engineers, to look at things in multiple ways, is more important

now than ever before. The reason is simple. Today we are beginning to see that not all scientific and engineering achievements have a positive value. Indeed, the negative values of some of our achievements promise to be devastating to all of us. A case in point is the engineering thrust which led to the use of chlorofluorocarbons, so-called CFC's, in everything from aerosol bombs to refrigerators and air conditioners in automobiles. The net effect of this innovation has been to place something like 12 million tons of CFC's in the atmosphere for the last eight years. And the net effect of this has been to cause a serious depletion in the ozone layer. Over Antarctica's Halley Bay, for example, a 40 per cent reduction has been measured by a team of British scientists and confirmed just one year ago by a NASA Nimbus 7 satellite. As F.S. Rowlands put it in an article quoting him in the June 1986 issue of the *New Yorker*, "... we find ourselves, one way or another, in the midst of a large-scale experiment to change the chemical construction of the stratosphere, even though we have no clear idea of what the biological or meteorological consequences may be." Since some of the possible consequences are catastrophic, including, according to a 1982 report of the National Academy of Sciences, an increase in the incidence of skin cancer on a worldwide basis and adverse effects upon the body's immune system, it seems clear that the scientists and engineers who were responsible for this particular experiment failed to view it from every angle. Of course, there is another possibility. It may have been that the scientists and engineers who were responsible for CFC technology were, in fact, aware of its negative value but it did not matter.

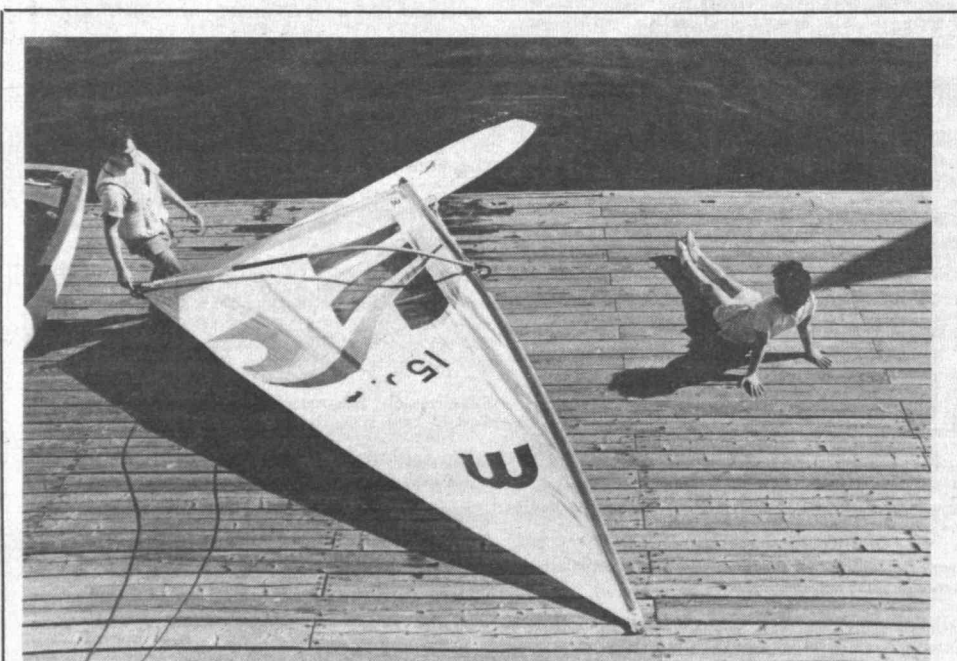
We have another, more recent, case at hand which suggests that this is a distinct possibility, namely, the Challenger disaster. It now seems clear that the destruction of the Challenger was not an engineering failure but rather a management failure. Thus, while it is true that a group of engineers at Morton-Thiokol were responsible for the original design of the faulty O-ring seals, it is also true that another group of engineers were able to spot the faultiness of the design and, indeed, said so in a series of memoranda. As we now know, it did not seem to matter. One of the commission members, Richard P. Feynman of the California Institute of Technology, put the matter this way: "The Challenger mission was the final accident of a sequence of things in which there was warning after warning after warning that something was

wrong. . . For 10 years they discussed this problem and didn't do anything about it. . . because it was hard for information to come up. But we know the information was there at the lowest levels. Why the engineers are at the lowest levels I have no idea, but the guys who know something about what the world is really like are at the lowest levels of these organizations and the ones who know how to influence other people by telling them how the world would be nice. . . they're at the top."

So you see, you have your work cut out for you. Over the next four years, you will have to learn how to look at a scientific problem from a multitude of perspectives. One of those perspectives is relatively new to the mainstream of our society and I am hoping that you will be among the first to help

make it a reality. Up until now scientists, engineers, even managers, have been doers, people who create and make things happen. That may well be why most of you have been attracted to this end of the spectrum of human activity. But now there is a new perspective that you must first acquire and then begin to teach to others. You must learn to be guardians as well. This means that you must learn to ask why you are learning to do what you are learning to do and above all you must learn to ask what the consequences of what you are learning to create will be. But even that is not enough. You must also learn to make sure that your voice is heard when you perceive those consequences to be harmful as in the case of the ozone layer or the Challenger.

Good luck to all of you.



The brisk days of fall offer some super sailing weather. Sailing is expected to continue through mid-November.
—Photo by L. Barry Hetherington

Goody Prize offered for building thesis

Applications for the Marvin E. Goody Prize, a \$5,000 award for a graduate thesis in the building arts, are available in the Graduate School Office, Rm 3-134.

The aims of the award are to extend the horizons of existing building techniques and use of materials, to encourage links between the academic world and the building industry and to increase appreciation of the bond between good design and good building. The award is given to a graduate student preparing a thesis for the SM, M.Arch or MCP degree to be completed not later than September 1987.

The Prize was established by Joan E. Goody, as a memorial to Marvin E. Goody, an MIT alumnus and faculty member. It is administered by a committee consisting of Dean John P. de Monchaux of the School of Architecture and Planning, Professor David H. Marks, head of the Department of Civil Engineering, Professor Frank E. Perkins, dean of the Graduate School, and William R. Dickson, senior vice president of MIT.

Application forms and further information are available from Jackie Sciacca in the Graduate School Office. Deadline for application is December 15, with the winner to be announced January 15, 1987.