February 15, 1989 Volume 33 Number 22

Gray memo

A memorandum on educational costs, tuition and student financial aid by President Paul E. Gray appears on page 8 today. The memorandum was prepared as background for a meeting the President will have with students on Thursday, Feb. 23, at 4pm in Rm 54-100. Accompanying the President's memorandum is an article concerning the financial outlook for MIT.

Faculty meeting

A regular meeting of the faculty will be held today (Wednesday, Feb. 15) at 3:15pm in Huntington Hall (Rm 10-250). Agenda items include:

-Comments on pending changes in the Institute Retirement Plans from the Faculty Administration Committee by Professor Ruina.

-A motion to recommend a change to Course XXI degree designation by Dean Friedlaender.

-Working group reports from the Committee on the Undergraduate Program by Dean MacVicar, Professor Wormley and Dean Kerrebrock.

Alternative jobs

An alternative jobs fair featuring recruiters from small, nondefense oriented high tech and consulting firms, nonprofit organizations and government agencies will be held Friday, Feb. 24, 10am-4pm in the Sala de Puerto Rico.

To launch the annual event, Ben Cohen, cofounder of Ben & Jerry's Ice Cream, will speak on "Careers in Peach, Politics and Ice Cream" Wednesday, Feb. 22, at 2pm in Huntington Hall (Rm 10-250).

There will also be two speakers during the jobs fair. Paul Rosier, vice president of Career Concepts will discuss "Alternative Jobs in the Software Industry" at 11am and Chuck Coldert and Anna Aurolio of Mass PIRG will address "What is Public Interest Science?" at 2pm in the West Lounge. All events are open to the public.

League talk

Jeanne Melvin of the Arthritis and Health Resource Center in Wellesley will give a talk today, (Wednesday, Feb. 15) at noon in the Emma Rogers Room (10-340) on Fibromyalgia, a stress-related syndrome that is widespread among women.

The talk is part of an ongoing series on Women's Health Issues sponsored by the Women's League.

CU reminder

Tickets for the annual banquet of the Credit Union will be on sale Friday, Feb. 17. Tickets are \$10 per person and limited to two per member. They can be bought as follows: On campus, E18 Lobby,11:30am-2pm; at Lincoln, Rm A-263, noon-1pm, and at Draper, Rm 2112, noon-2pm. The banquet will be held Saturday, March 11, at Caruso's Diplomat in Saugus.

Faculty to resume consideration of undergraduate education

By CHARLES H. BALL Staff Writer

The faculty at its monthly meeting today (Wednesday, Feb. 15) will begin consideration of reports by two ad hoc committees, one bearing on the science component of the General Institute Requirements and the other on certain aspects of the freshman year, including the pass/no record grading system.

The reports move the Institute's reassessment of its undergraduate program

In considering what the nature and character of the overall four-year bachelor's degree program should be to prepare graduates suitably for the 21st century, both the

core program and the relationship of departmental programs to it are under consideration. Within the core, work is turning now to the science area.

As the result of actions already taken in 1987, the School of Humanities and Social Science is in the process of implementing a reformulated HASS distribution requirement and a new HASS minor option. At today's faculty meeting, degree designations for majors in humanities disciplines will be offered to complete the HASS phase of the undergraduate academic program

Professor Margaret L.A. MacVicar, dean for undergraduate education, recently dis-

(continued on page 6)



Members of MIT's Gospel Choir performing at the Martin Luther King observance last week. From left they are: Charles Robinson, Lynore Taylor, Clint Grimes, Felicia Washington, Mark Dunzo and Linda Lifsey. Directing the choir (back to camera) is Crystal Lawson. See story on page 3.

—Photo by Donna Cove -Photo by Donna Coveney

Outage caused little damage

By ROBERT C. Di IORIO

Staff Writer

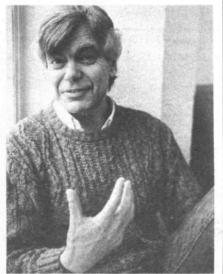
The extensive power outage that hit Cambridge between 5 and 10pm on Saturday, Feb. 11, caused a variety of problems on the campus and hit at a time when the main MIT emergency generator was off line for repairs and maintenance.

Athena crashed, but was 80 to 90 percent restored by Monday morning, said Professor Earll M. Murman, Athena director. There appeared to be minimal data loss, he said.

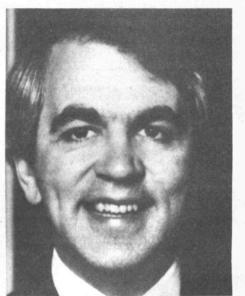
The Institute's new digital phone system handled the situation well, said Morton Berlan, director of telecommunications systems. The main switching centers shifted automatically to their eight-hour batteries and the voice mail system stayed up. Analog phones were not affected. Individual digital phones remained in use for about an hour, powered by battery clusters in various phone closets.

Some lab experiments were lost. For example, in Professor William Thilly's Center for Environmental Health Sciences in E18, stirrers turning very dense cell mixtures stopped. The cells died in minutes because the lack of stirring caused oxygen depletion. Other researchers in E18 and in other buildings had similar experiences.

Some people were stuck in elevators in a few buildings for a time. Stephen C. Miscowski, electrical supervisor for Physical Plant, who returned to the campus to coordinate emergency electrical operations, said elevator technicians from a company (continued on page 6)



The appointment of Alan Brody as Professor of Theater Arts has been announced by Professor Ann F. Friedlaender, dean of the School of Humanities and Social Science. Former chairman of the Department of Theater at Skidmore College, Dr. Brody has published and produced two novels and five plays. See an account of his first major Dramashop production on Page 7, the Arts Page.



Paul Tsongas to be speaker at graduation

Former Massachusetts Senator Paul Tsongas, the newly appointed chairman of the state Board of Regents of Higher Education, will be the MIT commencement speaker on June 5, MIT President Paul E. Gray announced Tuesday.

Dr. Gray said Mr. Tsongas' new position, along with his interest in the relationship between education, economic development and societal well-being, "make it wonderfully appropriate for him to address this particular academic community."

"MIT has been concerned with those same issues for more than 128 years and is credited with contributing widely to economic development generally and to the Commonwealth in particular," Dr. Gray noted.

Mr. Tsongas, who is a partner in the Boston law firm of Foley Hoag and Eliot, was named to the unpaid state post in January by Governor Michael Dukakis, who termed him "one of the most able and respected citizens of Massachusetts." The Board of Regents sets policy for the state's 29 colleges and universities, which enroll some 180,000 students.

In accepting the position, Mr. Tsongas linked the status of public higher education to the future of the United States as a major economic power. "I want to raise the question of whether this state wants quality first-class higher education or doesn't it,' Tsongas said at the time. "This country is

(continued on page 6)

Nakasone to address **US-Pacific relations**

Former Japanese Prime Minister Yasuhiro Nakasone will speak at MIT as a Compton Lecturer on Wednesday, March 1, at 4pm in Kresge Auditorium. The title of his talk will be "United States and the Future of the West Pacific."

A long-time leader of the Liberal Democratic Party of Japan, Mr. Nakasone served as Prime Minister of the country from 1982-87. President Paul E. Gray will introduce Mr. Nakasone at the lecture.

The Compton Lecture was established in 1957 to bring persons who have made important contributions to modern thought to the campus. The Lecture, which is open to the MIT community, is presented from time to time. It was established in honor of the late Karl Taylor Compton, president of MIT from 1930-48 and chairman of the MIT Corporation from 1948-54.

- Open to MIT Community only *** - Open to members only

Announcements

February Degree Candidates Reminder - Post cards must be returned promptly to Rm E19-335 to indicate whether diplomas are to be mailed or called for in person, or whether attendance at Commencement is planned (June 5).

Applications for June SB and Advanced Degrees - Due Fri, Feb 24 in Registrar's Office, Rm E19-335. \$25 fee after this

Career Planning and Placement Company Recruitment Presentations** – General Electric – Feb 15, 4:301-6pm, Rm 6:120. ESL a subsidiary of TRW – Feb 15, 7:9pm, Rm 8:105. General Dynamics – Feb 15, 7:9pm, Rm 4:145. McKinsey & Co – Feb 15, 7:30-9:30pm, Rm 4:231. Varian – Feb 16, 4:30-6:30pm, Rm 4:145. C.U.C. International Compucard Division – Feb 16, 5:7pm, Rm 4:149. Amdahl Corp – Feb 16, 6:30-7:30pm, Rm 4:153. Salomon Brothers – Feb 16, 7:9pm, Rm 8:105. Gen Rad – Feb 22, 4:30-6:pm, Rm 4:149. MIT Lincoln Lab – Feb 22, 4:30-6:30pm, Rm 4:153. Digital Equipcoin Lab - Feb 22, 4:30-6:30pm, Rm 4:153. Digital Equipment - Feb 22, 7-9pm, Rm 4:231. Hughes Aircraft - Feb 23, 9am-3pm, Student Ctr West Lounge. Intel Corp - Feb 23, 5-7pm, Rm 8:105. Acuson Inc - Feb 23, 7-9pm, Rm 4:149. Control Data Corp - Feb 27, 5-7pm, Rm 4:149. Analogue Devices - Feb 27, 7-9pm, Rm 4:153. Hewlitt Packard - Feb 20, 6:20pm 28:241. 28, 6-9pm, Rm 34-101. Sematech – Feb 28, 7-9pm, Rm 8-105.

Quantum Chemicals – March 1, 6-8pm, Rm 4-149. Lockheed Aeronautical Systems Co - March 1, 7-9pm, Rm 8-105.

February School Vacation Guide '89** - MIT Child Care Office guide listing vacation child-care options and activities for parents and children during the week of Feb 20-24. Call x3-1592 or stop by Rm 4-144 to get a copy.

Army ROTC Seeks MIT Faculty and Staff - To sit on its two- and three-year scholarship boards. A typcial board lasts less than an hour, with another half-hour required to write-up the results. Sophomore interviews being conducted now. Freshmen interviews conducted in Feb. Call Major Gabriel, x3-4471 to volunteer

MIT Pistol & Rifle Club Basic Pistol Marksmanship Course** - Starts March 2, 5 consecutive Thurs, 6pm, DuPont Pistol Range. Course covers safe handling, storage and use of firearms as well as developing marksmanship skills to meet local police department requirements for pistol permits. Fee covers everything. Info/registration: Frank Gauntt, x8-1476

Hosts to International Students Program - MIT Women's League program to host foreign students coming to MIT for the first time. Provide a welcome, occasional hospitality and friendship. All financial and academic problems handled by specific MIT offices. Info/volunteer forms: Kate Baty, 861-6725 or Pam

MIT Language Conversation Exchange** - Medical Dept program to assist members of the MIT community to practice a language with a native speaker. Applications accepted throughout the year. To exchange English or another language and be matched with someone with your interests, call the secretary of the Language Conversation Exchange, x3-1614.

MIT Student Furniture Exchange** - MIT Women's League store, Tues/Th, 10am-2pm, 25 Windsor St (N52), x3-4293.

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

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

** - a student-run campus hotline open every evening of the term, 7pm.7am. If you need information about anything or you just want to chat, give us a call. We're here to listen. x3-7840.

Club Notes

MIT Student Television Channel 36** - Seeks people inter-McDonald, x5-7461 dorm.

MIT Radio Society and UHF Repeater Association Monthly Ham Exams** – All classes, Novice to Extra, Feb 15, March 22, April 19, May 24, June 21, July 19, Aug 23, Sept 20, Oct 18, Nov 22, Dec 20, Rm 1-150. Reservations requested 2 days in advance. Contact Nick Altenbernd, 437-0320. Exam fee: #4.50. Bring copy of current licence (if any), 2 forms of picture ID and completed form 610 available from FCC, Quincy, MA,

MIT/DL Bridge Club* - Duplicate bridge, Tues, 6:30pm, Student Ctr Lobdel balcony. ACBL masterpoints awarded; come with or without partner, newcomers always welcome. Handicap game, 3rd Tues every month. Info call Gary Schwartz, x8-2459 Draper, or Mark Dulcey, 868-5518. Admission for regular s: \$1/students, \$2/non-students.

MIT Student Bridge Club* - Duplicate games Mon, Thurs, Sat and Sun and teams following 7:30pm, usually at Student Ctr (see poters). Lessons, 7pm, if required. Refreshments. Info: Bo-Yin, x5-9865 dorm or David, x5-7522 dorm.

MIT Chess Club* - Anybody interested in chess, novice or expert, is invited, Sat, 2pm, Rm 5-232. Info: Fred,

MIT Go Club* - Meets every Wed, 5-7pm, Rm 24-612 (ESG

MIT Entrepreneur's Club* - Regular meetings, Tues, 6pm, Rm 66-144. Club members present new idea; support source for undergraduates with business interests. Info: Doug Ling, x3-0757 or Richard Shyduroff, 876-2271.

MIT Science Fiction Society* - The world's largest open collection of science fiction books and magazines is located in Stu-dent Ctr Rm 473. Meetings, Fri, 5:30pm. Info: x5-9144 dorm. MIT Figure Skating Club** - Regular ice sessions: Sat, 8-10am and Sun, 10-12noon; Ice Dance Club, Sat, 4-6pm, Sun 12-1pm. Group lessons, Sat morning. New members welcome. Info: 782-4324.

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

COCA (Committee on Central America)* - Meets at least ce a month to plan activities relating to events in Central America. Info: Charlie Welch, 783-1668 eves/message

Amnesty International MIT Group** - Meets about twice a nonth to plan activities. Info: Richard Koch, x3-7826.

MIT Table Tennis Club* - Competition and training for all levels from beginner to advanced, Fri. 8-10pm; Sat, 6-9pm, Du-Pont T-Club Louge. Info: Albert Tam, x3-2211 or x5-9866 dorm.

MIT Outing Club* - Camping, cycling, climbing, canoeing, cabins. Meets 1st Mon of month, 6pm, W20-461. Rental hours, M/Th, 5-6pm, W20-461. Also, see our bulletin board in "Infinite Corridor" next to Athena. Info: Dave Campbell, x5-9623 dorm.

MIT Soaring Association* - Weekend Soaring - Learn the exciting sport of soaring. We fly from the Mansfield airport every weekend and some holidays (weather permitting). Mansfield is 45 minutes south of Cambridge, off Rt 95. Student membership: \$175; typical flight: \$16. Contact: Bob De Saro, 264.4426 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 Aikido Club** - Non-competitive martial discipline, meets M.F, 5:30pm, DuPont Exercise Rm. Beginners always welcome. Info: Mitch Hansberry, x8-1272.

MIT Judo Club** - Meets M/Th, 5:30-7pm, Dupont Gym Wrestling Rm. Info: Donna Duffy, x3-5773 or 661-9469.

MIT Wu Tang Martial Arts Club** – Learn Northern Chinese kung fu. Long fist and praying mantis styles, short sabre and sword. Meets T/Th, 8-10pm; Sat, 9am-12noon, Burton Dining Hall. Info: Jeff, Cohen, x3-6204 or 621-0559.

MIT Karatedo Doshinkan Club* – Classical (non-competitive) Okinawan-Japanese karate, teaching a system for for lifelong good health and self-defense. Men and women of all ages and in different states of health participate. Beginners always welcome to join in or just observe. Mon/Fri, 4:30-6pm, W31-225 Dance Studio; Wed, 7-9pm, Exercise Rm W31. Info: Jim, x3-0472 (w) or 491-1931(h).

Religious Activities

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

MIT Hillel** – Wed, Feb 15: Student Jewish Appeal Orienta-tion and Pizza Dinner, 6pm, Burton Conf Rm. Thurs, Feb 16: Travel, Kibbutz or Study in Israel, David Leichman, 2:30-5pm, for appt call Hillel, x3-2982. Fri, Feb 17: Shabbat Candles, 5:01pm. Feb 22-23: Student Jewish Appeal, Booth in Lobby 10. Fri, Feb 24: Torah & Chocolate, 12-1pm; Orthodox Services, 5:05pm, Burton; Conservative-Reform Services, 5:30pm, Hillel; Community Dinner, 6:45pm, Walker Blue Rm; Oneg Shab-bat: Three Hillel Alumni Speak: Jewish Observance and Ethics in the Work World, 8:30pm, Walker Blue Rm. Hillel: x3-2982.

Tech Catholic Community* – Roman Catholic Masses: Sats, 5pm, Suns, 10am & 5pm, MIT Chapel. Tues & Thurs: 5:05pm (school days only), MIT Chapel. Fri, 12:05pm, MIT Chapel. Info:

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

United Christian Fellowship** - Large group meetings. Join us for worshipful singing, prayer, sharing and Bible teaching, and small group Bible studies during the week in various dorms, Fri, 7pm, Student Ctr Mezzanine Lounge. Info: Tracy,

Graduate Christian Fellowship** - Come join other grad students, faculty and staff in learning about and growing in the Christian faith. Activities open to both Christians and those interested in learning more about Christianity. Info: Curt Bronkhorst, x3-4414 or Roz Picard, x3-7314.

Baptist Campus Ministry** – Tues night supper and Bible study, 5:15pm & 6pm, 312 Memorial Dr (W2A).

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 Vedanta Society* - Meditation and Discourse on the Bhagavad Gita, Swami Sarvagatananda, minister, Ramakrishna Vedanta Society, Fri, 5:15pm, MIT Chapel.

Christian Science Organization at MIT* - Weekly Testimony meetings, Thurs, 7pm, MIT Chapel.

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,

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

MIT Campus Crusade for Christ* - Fridays, 7:17pm, Marlar Crusade for Christ. We "thank God it's Friday" every week with singing, biblical input, discussion and fun. Info: x5-9153 dorm.

Graduate Opportunities

LINKS Grants. The Boston Chapter of LINKS announces the availability of grants averaging \$1,000 each, to be awarded for the Fall semester, 1989. Applicants must be African American graduate degree candidates, must provide proof of need, and nust be registered Boston area voters or must have grown up in the area and attended Boston area schools. Application deadline: March 20, 1989. Forms available in the Graduate School Office, Rm 3-138.

Other Opportunities

Eloranta Summer Undergraduate Research Fellowships Several \$4,000 stipends available to MIT undergraduates (including students graduating in June 1989), planning to spend the summer on an independent investigation, conducting an inquiry of their own devising, or branching out in a new direction inspired by some previous work. Planned work should be student-organized or student-directed. It may be in any field. Proposals of about 5-10 pages, with accompanying recommenda-tion, should be submitted to N. McGavern, Undergraduate Education Office, Rm 20B-141 by April 3. Info: x3-7909

John Asinari Award for Undergraduate Research in the Life Sciences. Nominations sought. Open to undergraduates in Course VII, VII-A and VII-B. For details see Pat Turner, Rm 56-511, x3-4729. Deadline for submissions: April 21, 1989.

International Opportunities

MIT-Japan Science and Technology Program. A unique op-portunity to science and engineering students to spend a year working at a major Japanese company or laboratory. Students are trained in Japanese language and culture at the Program's expense before being placed in Japan. Placement is tailored to the student's background and experience. Travel to/from Japan and living expenses will be covered. For further information, call Patricia Gercik, x3-3142, Ctr for International Studies, MIT-Japan Science and Technology Program, Rm E38-656.

National Academy of Sciences Soviet and East European Exchanges Jan 1990-Dec 1990. The National Academy of Sciences sponsors exchange programs of individual scientists with the Academies of Science of the USSR, Bulgaria, Czechoslovakia, the German Democratic Republic (GDR), Hungary, Poland, Romania, and Yugoslavia. Eligibility requirements: US citizenship and a doctoral degree, or research training and experience equivalent to a doctoral degree, in the disciplines included, or who will possess both by June 1989. For a list of disciplines and further information contact: Lillian Whelpley, Office for International Visitors, Rm 4-237, x3-1939. Applica-tions must be postmarked no later than Feb 28, 1989.

Summer Student Research Internship Program in Broadcasting Research. One award in audience and opinion research, East European area, for 8-12 weeks, in Munich, West Germany. Analyze a wide range of research projects concerning media usage. Info: Marianne Wisheart, Office of Career Ser-vices, Rm 12-170, x3-4733.

Kawamura Electric Industrial Co. Lte Summer Internship. Students to spend July in Nagoya with this mid-sized manufac-turer of electrical equipment, and travel to Tokyo and Kyoto in a program designed to serve as a cultural exchange and to pro-mote better understanding. All costs for travel, accomodation and other related activities will be borne by the sponsor and a stipend will be provided. Info: Marianne Wisheart, Office of Career Services, Rm 12-170, x3-4733.

Student Jobs

There are more job listings available at the Student Employ-

ment Office, Rm 5-119.

Special Note: The Student Employment Office has many "one time only" jobs. Many students find these jobs a good way to earn

On Campus: Non-Technical

On Campus: Non-Technical Student needed to work in accounting office as office assistant and possibly receptionist. Duties include working with figures and computer related projects. Must have legible handwriting and a pleasant disposition. Hours: 1-15/wk. Salary: \$5.75/hr. Contact: Phyllis Cerrone, Rm E19-545, x3-4763.

Book review assistant for MIT Press. Keep track of and organize reviews from newspapers, magazines, and journals of MIT Press books. Xerox and distribute them to authors and MIT Press peronnel, Record all information of MAC computer, Hours: flex ible. Salary: \$6/hr. Contact: Debra Hoard, Rm E39-233, x3-5643

Office assistant needed to do some light typing, answering phones, filing, other clerical duties, and occasional special projects as they arise. Hours: 15-20/wk. Salary: \$7.50/hr. Contact: Nancy or Karen, Rm E32-200, x3-2813.

Off Campus: Technical

Off Campus: Technical Doctor at Mass General is doing research and needs assistant. Research involves immunogenetics, mapping mouse genes by RFLP analysis, gnetics of infectious-disease susceptibility in man, and expression of plasma proteins. Hours: flexible. Salary: negotiable. Contact: Dr. James Michaelson, Bldg 149, 13th St, Charlestown, MA 02129, 726-5600.

Off Campus: Non-Technical

Museum of Fine Arts has many openings including cashiers, secretaries, and security guards. Inquire at the SEO desk for a complete list. Hours: flexible. Salary: to be discussed. Contact: Museum of Fine Arts, Human Resources Dept, 465 Huntington Ave, Boston, MA 02115, 267-9300 x413.

Off Campus: Summer

Off Campus: Summer Consortium on Financing Higher Education seeks summer research assistant. Work involves production of statistical reports from computer data files, preparation of graphics, data analysis, report writing and library research. Application should be made by April 18, 1989. For more information, contact SEO desk. Hours: 20/wk. Salary: \$7.10/hr. Send application to 238 Main St, Suite 500, Cambridge, MA 02142, x3-5030 for interview appointment.

UROP

MIT and Welleslev students are invited to join with faculty members in pursuit of research projects of mutual fascination. New IAP and Spring term projects or mutual fascination.

New IAP and Spring term projects are now posted on the bulletin boards located in the main corridor and in the UEO. Faculty supervisors wishing to have projects listed should send project descriptions to the UEO. Questions? Contact UEO at x3-7909, Rm 20B-141.

Biopolymers: Structure-Property-Function Relationships. Student needed for experiments involving use of differential scanning calorimetry, viscometry, light scattering, colloid titration, and radiolabelled biopolymers. The objective is to establish the relationship of solution properties of biopolymers to floccula-tion and dewatering. Hard-working and commited students only. Contact faculty supervisor: Prof ChoKyun Rha, x3-3493,

Characterization of Industrial Polysaccharides. Student needed to characterize physical and solution properties of polysaccharides: hydrodynamic volume, chain stiffness, chain expansion factor, etc. The objective is to determine the relation-ships between chemical structure and physical properties of biopolymers. Contact faculty supervisor: Prof ChoKyun Rha, x3-3493 Rm 56-137

Electromagnetism. A bright student is needed to work on de termining the beam loss mechanisms at the Bates South Hall electron ring. Computer simulations of ring operation will be performed. The project will require a knowledge of programming and familiarity with basic electromagnetism. Contact faculty supervisor: Prof Richard Milner, 26-447, x8-5439, or

Alcator C-Mod Tokamak. One or two students needed in assisting in the design and construction of a model of the Alcator C-Mod Tokamak experiment and test cell. Excellent op-portunity to learn about fusion research at the Plasma Fusion Center. Requirements: some mechanical drawing ability. Contact: Tom Hsu, NW17-245, x3-8640 or 932-8068. Faculty super-

Magnetization Measurements. Students needed to design and build a small apparatus to conduct magnetization measurements in liquid nitrogen. Students must complete the design and carry it through to the implementation of the working device. Requirements: some rudimentary understanding of relatively simple machining techniques. Contact: Phil Michael, NW17-281, x3-8602, or Yuki Iwasa, NW17-201, x3-5548.

What Induces Directed Mutation in E. Coli? This question is currently being explored. One possibility is that the cell "measures" some consequence of lactose consumption and uses the information on improved well-being to preserve the favorable change in the lac gene. Finding the activator of directed mutations is the main goal of this project. Faculty supervisor: Kim Lewis, x3-0542, Rm 16-229.

Analytical and Geometrical Figures. Student needed to compute analytical and geometrical figures. Experience: calculus and advanced calculus and integrate multiple integrals. Contact: Jim Sullivan, NW16-166, x3-7537.

X-Ray Sources and Detectors. Students interested in building and characterizing X-Ray sources and detectors. Experience and requirements: laboratory skills; willingness to work hard. Possible senior thesis. Contact: Richard Petrasso, NW16-132,

X-Ray Modelling Calculation. Students interested in doing numerical and analytic X-ray modelling calculations. Ex-perience and requirements: computational skills; willingness to work hard. Contact: Richard Petrasso, NW16-132, x3-8458.

Oral History of MIT Women. A pilot program is underway to interview MIT alumnae in depth about their lives. Two UROPers will train in oral history techniques and then interview one subject each. Students will also be responsible for transcribing and reviewing the taped material. Faculty supervisor: Prof Charles Weiner. Contact: Jane Sherwin, 20B-141,

Building System Simulation for Indoor Quality Analysis. Student needed to participate in development of a graphics-based simulation program for contaminant dispersal analysis. based simulation program for contaminant dispersal analysis. Future projects will add airflow and heat transfer capabilities. Experience in C programming and some knowledge of system simulation is required; experience in programming for a Mac or similar graphics-interface desirable. Contact faculty-supervisor: Prof Jim Axley, Rm 3-434, x8-7352.

Rail Car Scheduling System. An undergraduate programmer is needed to work with a Micro Vax II in developing code for forecasting and operations research based algorithms. The work involves the development of a rail car scheduling system which will be used by a major US railroad. Knowledge of VAX Fortran and willingness to learn about data-base management systems will be helpful. Faculty supervisor: Yosef Sheffi, 1-163, x3-5316.

Epistemology and Learning Group. A UROP student is needed to work on a variety of tasks for the Media Lab's Epistemology and Learning Group. These include logging and editing videotapes, setting up demonstrations on principles of pressure and airborne dynamics to children, etc. Faculty supervisor: Seymour Papert, Contact: Carol Strohecker, x3-0380 or x3-7851, E15-390, carol@media-lab.media.mit.edu.

Algorithms for Computer-Aided Design. A student is needed in the Design Laboratory of the Department of Ocean Engineering to work on developing algorithms for various CAD/CAM applications. A knowledge of the C Language is desirable. An interest in geometry and modelling of physical objects is helpful. Faculty supervisor: N. Patrikalakis, Rm 5-428, x3-4555. Contact: G.A. Keiezis, Rm 5-424, x3-7950.

Mass General Hospital. Mech. E. student wanted to assist in the redesign and construction of a portable heater used for shap-ing orthopedic splints. 1) Mech. E. student wanted to work on an electrode array to be used in the mapping of cardiac elec-trical activity. 2) Elec. E. student wanted to help develop an expansion circuit that would allow a patient simulator to drive many patient monitors. Knowledge of analog circuits helpful. Contact: Alan Shapiro, 726-2453 and UROP x3-7909.

Cable Television Schedule

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

This schedule is subject to change. For up-to-date information, call Randy Winchester, x3-7431.

Thursday, February 16

Channel 8: 9-10pm - 6.013 Demo 4.7.1, "Charge Induced in Ground Plane by Overhead Conductor"

5pm - Physics 8.02 Help Session 2. Program will repeat until 5pm, 2/23.

Friday, February 17 Channel 8:

9-10pm - 6.013 Demo 4.7.1, "Charge Induced in Ground Plane by Overhead Conductor"

Thursday, February 23

Channel 8:

9-10pm - 6.013 Demo 5.5.1, "Capacitance Attenuator" Channel 10: 5pm - Physics 8.02 Help Session 3. Program will repeat until 5pm, 3/2.

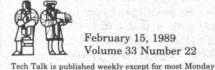
Friday, February 24

Channel 8: 9-10pm - 6.013 Demo 5.5.1, "Capacitance Attenuator"

Tuesday, February 28

4:30-6pm - Live coverage of the MIT VLSI Seminar, Dennis Buss, Analog Devices Semiconductor, "Mixed-Signal Technology for High-Performance Analog Integrated Circuits"

TECH TALK (USPS 002157)



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The MIT community honored the late Dr. Martin Luther King Jr. on Friday, February 10, with critical self-appraisal as

well as prayer and song.

President Paul E. Gray, in introducing the keynoter, graduate student and Jesuit seminarian Gregory C. Chisholm, said "a colonial attitude" on the part of MIT is one of the reasons the Institute hasn't made more progress in enrolling minority students and attracting minority faculty members.

"We-the powers that be, so to speakhave seen it as our responsibility to help the underprivileged, to be compassionate, to create opportunities for those who have had less than we have. We have tended to look at our equal opportunity programs as doing the right thing for someone elsedoing a favor to others by opening up our doors. No wonder we've not made much progress. It hasn't occurred to many of us that we have something to gain, culturally and intellectually: and that is the vitality and richness that comes from incorporating and learning from differences.'

Mr. Chisholm, the man Dr. Gray introduced, provided in his address a view of MIT from the perspective of an African-American student who arrived in 1969 and who, in his own words, has rarely left. It was a view uniquely informed by Mr. Chisholm's unusual background: an engineer with two-soon to be three-degrees from MIT who is studying for the Roman Catholic priesthood. He was the first keynote speaker from MIT in the 15-year history of the Martin Luther King observances here.

Mr. Chisholm fascinated his audience of about 400 people with an insider's view of MIT, at one point suddenly reciting the famous Tech cheer, which includes the lines "cosine, secant, tangent, sine, 3 point 14159, square root, integral, u dv, slip stick, slide rule, MIT."

In remarks titled "In Behalf of Justice," Mr. Chisholm issued challenges on behalf of justice to MIT the institution, to white men and women at MIT, and to black men and women at MIT.

"Can MIT buck the national trend and stand uniquely among its great peers as an institution where any man or woman on Earth can find encouragement and support in pursuit of an education? Can you see that true greatness lies in incorporating the unique gifts of many diverse people? We are diminished when any group is marginalized.

He challenged white men and women at MIT to make their offices, labs, classrooms and living groups places where all races

To black men and women at MIT he said: "I challenge you on behalf of justice as I challenge myself. Is there an area of concern in which you are uniquely qualified to lend assistance to our needy community, whether in education, business, day care, drug rehabilitation, athletics, or jobs: Can you teach your children with pride about their African ancestors, their journey through slavery, the fight against Jim Crow, Martin Luther King's dream, and love of self?"

His remarks drew a prolonged period of standing applause.

President Gray, in his introduction of Mr. Chisholm, said MIT has gathered for 15 years to "rededicate ourselves to the shining principles of freedom and justice that invested Dr. King's life and vision." Recalling the practice of using the King commemoration as a time for taking stock, Dr. Gray said he is concerned about a "me first" attitude and the "what's-in-it-for-me" question that pervades so many decisions in business, education, government or personal life.

"We have strayed from the idea of common cause. . . Perhaps it was easier, in earlier times, to have a shared national vision-when social values and goals were defined by a clear majority, when simple patriotism was a universal value, and patriotism was indeed simple. But in many ways that consensus was illusory, because it did not take into account-did not valuethe differences among us."

MIT, he said, has tended to regard differences as stumbling blocks, "rather than seeing them as sources of complementary



Gregory Chisholm speaking at the Martin Luther King observance.

strengths-resources to be tapped for the common good, for the development of a richer, more vigorous intellectual and social community.

"Until we can regard each other as partners in our own evolution. . .we won't succeed in developing policies and programs that really do make a difference—at MIT, or in the society as a whole."

Dr. King, he said, captured this thought eloquently when he said that we are all 'caught in an inescapable network of mutuality, tied in a single garment of destiny." This single garment of destiny is a coat of many colors-providing comfort, stimulation, beauty and hope to all who seek its folds. I believe that if each of us takes just one step toward embracing and learning from the differences among us, we will be forging a partnership that will strengthen and enrich the quality of all of our lives, even as we fulfill that common destiny."

The audience gathered first at Lobby 7, where there were musical selections, and then silently marched across Massachusetts Avenue to Kresge Auditorium.

A small group of students who accuse MIT of racism were present in Lobby 7 and at Kresge, where they gathered in the orchestra pit, holding signs. They climbed onto the stage when Dr. Gray began his talk. At one point, when the small group began to chant "divest now," Dr. Gray departed from his text and addressed the small group of students. "If you have a bone to pick with me, don't pick it now, at this event." There were no further comments from the group. -Robert C. Di Iorio

HSSP announces spring schedule

Do you know any students in grades 7 through 12 who'd be interested in taking a course on bicycle repair, reviewing for the SAT, or computer programming?

These and many other creative academic and nonacademic classes will be taught by MIT students and area professionals in the spring 1989 term of the MIT High School Studies Program (HSSP).

Classes meet for nine Saturdays from March 11 through May 6 in three class periods between 10am and 5pm. Students can take up to three courses for a total cost

Registration for the spring term will be Saturday, March 4, 10am-noon in Lobby 7.

For more information call Steve Worley, Class of 1990 and director of HSSP, at x3-4882, or write to HSSP, Rm W20-467.

Writing competition opens

The 1988-89 Writing Prize Competition, sponsored by the Writing Program, is accepting manuscripts from undergraduates through April 13. The 24 prizes carry cash awards and are given to students whose essays, plays, poetry, short stories and technical papers are judged to be of the highest quality by a committee of faculty and staff members.

Thomas Simmons, assistant professor in the Writing Program and this year's competition chairman, hopes all interested students will submit their best efforts to the competition. He is also encouraging faculty members who receive outstanding undergraduate papers to urge the student writers to enter the competition.

The prizes are:

-The Ellen King Prize for Freshman Writing-for writing in all categories (fiction, short story, essay, drama). First prize, \$150; second, \$75; honorable mention, \$25.

-The Robert A. Boit Writing Prize-for undergraduates in the categories of essay, poetry and short story, with prizes in each category. First prize, \$200; second, \$100; honorable mention, \$50.

-The Boit Manuscript Prize-for under-

Stress management sessions offered

The Medical Department's five-week stress management workshop will begin Wednesday, Feb. 22, noon-1:30pm in Rm E23-297. The leader will be Scott Borrelli, PhD, a licensed psychologist who has a private practice and teaches at Boston University. Participants will learn to recognize stress warning signals, to be aware of their body's response to stress, and to use relaxation techniques that work best for them. Group members will be challenged to look at how they may be creating stress for themselves and how their attitudes may affect their quality of life. Relaxation methods will be taught and practiced.

The fee is \$45; \$35 for students and MIT Health Plan members. A workbook and relaxation tape are included in the fee.

Advance registration is required. Call or visit the Health Education Service, x3-1316, Rm E23-205.

Annoying mail, calls? Here's who to call

There has been an upswing in the number of complaints to the Campus Police concerning annoying telephone calls and unwanted mail during the past year, Chief Anne P. Glavin re-

The community should know, she said, that it is a violation of the laws of the Commonwealth to make annoyance calls. It is a violation of Federal law to make obscene or harassing calls in interstate or foreign communications. It is also a Federal offense to send obscene mail.

For those being bothered, help is available from the following sources:

-MIT Campus Police, x3-1212. -Telecommunications Office, x3-

-Special Assistants to the Presi-

dent, Mary Rowe, x3-5921; Clarence Williams, x3-5546.

-Office of the Dean for Student Affairs, x3-4051.

Departmental administrative officers can also advise on how to handle annoying or obscene calls or deal with annoying mail.

ACM conference seeks student papers

Undergraduates are encouraged to sub- UROP projects, summer jobs, in-progress mit short papers on computer science by this Friday, Feb. 17, for the first MIT-ACM (Association for Computing Machinery) Undergraduate Computer Science Confer-

The author of the best paper will receive \$1,000. Authors of the ten best papers will present their works at the April 8 conference, which was developed to recognize and display research done by MIT undergradu-

Possible sources of papers include term projects for classes (e.g., 6.111 or 6.036),

theses, and personal hacks that others would find technologically interesting.

Papers should be about six typed pages, or 1500 words, and must not have been published or submitted elsewhere for publication. They will be judged on technical content, cleverness, how interesting they are and quality of writing.

Submit three copies of your paper to General Chairman David J. Goldstone, Class of '89, at 410 Memorial Dr., Cambridge, Mass., 02139, or call him for more information at x5-8261.

graduate work in fiction, poetry, drama or essay of substantial length, completed or in progress. This prize is for longer works or collections that give evidence of publishable quality. First prize, \$300; second, \$150; honorable mention, \$75.

-The S. Klein Prize-for outstanding interpretive writing on scientific and technological subjects by undergraduate and graduate students. Entries should be specifically intended for a nonspecialized, but educated audience. First prize, \$300; second, \$150; honorable mention, \$50.

-The DeWitt Wallace Prize for Science Writing for the Public-writing by undergraduates for lay audiences on issues and developments in science, medicine or engineering. First prize, \$300; second, \$150; honorable mention, \$75.

The Writing Program Prize for Engineering Writing-undergraduate writing on any topic of professional interest to engineers. First prize, \$200; second, \$100, honorable mention, \$50.

For more information, visit The Writing Program office, Rm 14E-303, where applications and prize guidelines are available.

Diamond to hold MacDonald Chair

Dr. Peter A. Diamond, professor of economics, has been named as the first holder

of the John and Jennie S. MacDonald Professorship, effective January 1, the provost, Dr. John M. Deutch, has announced.

The professorship was established by a gift from Edmund MacDonald, a 1921 graduate of MIT, in memory of his parents. Professor Diamond,

who was head of the

Department of Economics in 1985-86 and associate head before that for a number of years, is an authority on taxation, social, security and uncertainty theory. He is beginning to work in macroeconomics.

He received a BA in mathematics from Yale University in 1960 and the PhD in economics from MIT in 1963. He began his teaching career as an assistant professor of economics at the University of California, Berkeley, in 1963-65 and was acting associate professor there in 1965-66. He came to MIT as an associate professor in 1966 and was promoted to professor in 1970.

He has held visiting appointments at Churchill College, Cambridge; University College, Nairobi; Hebrew University, Jerusalem; Nuffield College, Oxford; Balliol College, Oxford; and Harvard Univer-

He is a member of the National Academy of Sciences, and a fellow of both the Econometric Society and the American Academy of Arts and Sciences. He served as vice president of the American Economic Association and currently is second vice president of the Econometric Society. He has twice been a Guggenheim Fellow and he received the Mahalanobis Memorial Award in 1980. He is the author of more than 65 papers and he has been co-editor of the Journal of Public Economics since 1986.

Indian educator to speak Thursday

Norbert S. Hill, executive director of the American Indian Science and Engineering Society (AISES), will give a lecture Thursday, Feb. 16, from 7:30-9pm in the Bush Room (10-105).

Mr. Hill will address American Indian education, how it has improved and how it affects economic conditions on reservations. He will also talk about AISES, what it is, its major functions and what the organization hopes to accomplish.

Mr. Hill has been active in the development and administration of educational programs for American Indians for more than 15 years. He is an Oneida Indian, and was raised on a tribal reservation in Wis-

The lecture is free and open to the public.

THE INSTITUTE CALENDAR

February 15-February 26

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

 ***Open to members only

Events of Special Interest

Fifth Annual MIT Alternative Jobs Fair* – Recruiters from small, non-defense oriented high-tech and consulting firms as well as non-profit and government agencies, Fri, Feb 24, 10am-4pm, Student Ctr Sala de Puerto Rico. Come explore your options.

Seminars and Lectures

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

Wednesday, February 15

Ni-Fe-Cr Alloys in Nuclear Technology: An Overview – Il-Soon Hwang, post-doctoral student, Dept of Materials Science and Engineering, Dept of Nuclear Engineering Seminar, 4pm, Rm 24-121.

International Relations Theory Revisited: Explaining Cooperation Under Anarchy** – Benjamin Miller, visiting fellow, Ctr for International Studies, Defense and Arms Control Study Group Seminar, 4-6pm, Rm E38-615.

Real-Time Arrhythmia Analysis** - Dr. Roger Mark, codirector, Harvard-MIT Division of Health Sciences and Technology, Harvard-MIT Division of Health Sciences and Technology Lecture on Technology in Medicine, 4:15pm, Rm E25-117. Refreshments.

Birdsong: From Behavior to Molecule** - Dr. Masakazu Konishi, Bing Prof of Behavioral Biology, California Institute of Technology, Dept of Brain and Cognitive Sciences Colloquium, 4:30pm, Rm E25-111.

Composition and Cognition* - Prof Fred Lerdahl, University of Michigan, Media Laboratory Forum, 4:30pm, Wiesner Bldg Bartos Theatre.

A Comparative Look at Japan and US Space Programs*
- Prof Daniel Hastings, MIT Dept of Aeronautics and
Astronautics, MIT Japan Science and Technology Program
Forum, 5:30pm, Rm 4-153.

Who Slew the Dreamer* – Jeff Cohen, member, Senate Select Committee on Assassinations, Lecture Series Committee/Black Student Union Lecture concerning the assassination of Dr. Martin Luther King, Jr., 8pm, Rm 26-100.

Thursday, February 16

Mode Competition in Free Electron Leers and Gyrotrons*
- Dr. B. Levush, University of Maryland, Plasma Fusion Ctr Seminar, 11am, Rm NW17-218.

T.S. Eliot: His Reputation and Reception in China Since 1949* - Prof Qiu Xiaolong, Academy of Social Sciences, Shanghai, Ctr for International Studies/Dept of Foreign Languages and Literatures Seminar, 12-2pm, Rm E38-714. Bring brown bag lunch; soft drinks, tea, coffee and cookies provided.

The Pro Forma as a Basis for Investment Decision Making** - David Weinberg, senior vice president, Cadillac Fairview, Toronto, Ctr for Real Estate Development Rose Lunchbox Seris, 1pm, Rm W31-301. Bring bag lunch.

The Traveling Salesman Problem** – David S. Johnson, AT&T Bell Laboratories, Laboratory for Computer Science Distinguished Lecturer Seminar, 3:15pm, Rm 34-101.

Women and the 1988 Election* – Prof Ethel Klein, Dept of Political Science, Columbia University, author of Gender Politics, Ctr for International Studies/Program in Women's Studies/Dept of Political Science Women and Politics Seminar, 4-6pm. Rm E38-615.

Scanning Tunnelling Microscopy: The Revolution in Surface Science** - Dr. J.E. Demuth, IBM Research Ctr, Yorktown Heights, NY, Physics Colloquium, 4:15pm, Rm 10-250. Refreshments, 3:45pm, Rm 26-110.

The Future of the Broadcast Networks* - Carolyn Wall, WNYW, Fox Television Stations, Inc; William Rubens, NBC, MIT Communications Forum Seminar, 4-6pm, Wiesner Bldg Bartos Theater.

Harmonic Analysis on Semisimple Symmetric Spaces** – Toshio Oshima, Tokyo University/Japanese American Mathematical Institute, Johns Hopkins University, MIT-Harvard-Brandeis Mathematics Colloquium, 4:30pm, Rm 2-390. Tea served, 4pm, Rm 2-290.

Friday, February 17

Real Spin Glasses* - Prof Daniel Fisher, Princeton University, Ctr for Materials Science and Engineering Seminar, 12:15pm, Rm 12-132. Lunch available, 12noon.

Induced Flocculation of Animal Cells in Suspension Culture** - John Aunins, Dept of Chemical Engineering Seminar, 2pm, Rm 66-110.

Parallel Computational Strategies for Hydrodynamic Interactions Between Complex Microstructures in Viscous Fluids: The Role of Linear Operator Theory** – Prof Sangtae Kim, University of Wisconsin, Madison, Dept of Chemical Engineering Seminar, 3pm, Rm 66-110.

Isotopic Constraints on Processes of Crustal Growth (Greater than 3.5-1.8 Ga), Northwest Canadian Shield** – Dr. Samuel A. Bowring, Dept of Earth and Planetary Sciences, Washington University, Dept of Earth, Atmospheric and Planetary Sciences CONOCO Lecture, 4-5pm, Rm 54.015

Tuesday, February 21

Molecular Biology and Genetics of Scrapie Prions** – Dr. Stanley Prusiner, Dept of Neurology, UC School of Medicine, San Francisco, Biology Colloquium, 4:15pm, Rm 10-250. Coffee served, 3:45pm, outside Rm 10-250.

Wednesday, February 22

Careers in Peace, Politics and Ice Cream* – Ben Cohen, cofounder, Ben & Jerry's Ice Cream, Alternative Jobs Fair Keynote Address, 3pm, Rm 20-250.

A Highly Parallel Method for an Underwater Acoustics Problem** - Dept of Mathematics Numerical Analysis Seminar, 4pm, Rm 4-163. Refreshments precede, Rm 2-338.

Cadre, Bureaucrat, Manager, and Adviser: Key Roles in China's Current Development Program* – Harry Harding, Brookings Institution, Foreign Policy Studies Program, Ctr for International Studies Institutional Perspectives on Third World Development Seminar, 4-6pm, Rm E38-714.

Effects of Capacitive Loading on Parallel Signal Lines on Printed Circuit Boards** - Dr. C.S. Chang, IBM, Electromagnetic Wave Theory Group Seminar, 4pm, Rm 36-372.

Thursday, February 23

The New Suburban City** - Roger Lewis, School of Architecture, University of Maryland/columnist, The Washington Post, Ctr for Real Estate Develoment Rose Lunchbox Series, 1pm, Rm W31-301. Bring bag lunch.

High Rise Building Systems and Design Process** - Hal Iyengar, Skidmore, Owings, Merril, Chicago, IL, Dept of Civil Engineering Abraham Wolf Lecture, 3-5pm, Rm 1-190.

Voluntary Repatriation Patterns and Practices* - Prof Barry Stein, Dept of Social Science, Michigan State University, Ctr for International Studies/Inter-University Seminar on International Migration, 4-6pm, Rm E38-714. Refreshments.

The European Monetary System** - Peter Ludlow, Ctr for European Policy Studies, Brusels, Ctr for International Studies/Harvard Ctr for International Affairs/Harvard Ctr for European Studies Seminar on International Institutions and Cooperation, 4pm, CFIA, 1737 Cambridge St. Contact: Leah Pelligrino, 495-1669.

Recent Backsliding in the Sociology of Science** – Thomas F. Gieryn, visiting associate professor, Program on Science, Technology, and Society/Dept of Sociology, Cornell University, Science, Technology and Society Social Study of Science and Technology Colloquium, 4-6pm, Rm E51-136.

Exploring the Particle Desert with Rare K Decays** – Prof Robert Adair, Yale University** – Physics Colloquium, 4:15pm, Rm 10-250. Refreshments served, 3:45pm, Rm 26-110.

The Mechanical Design of a Hydraulically Steerable Ureteral Catheter* - Paul Cheney, MIT graduate student, Harvard-MIT Division of Health Sciences and Technology Medical Research Seminar, 4:15-5pm, Rm E25-117.

Biography and Langston Hughes* – Arnold Rampersad, author, *The Life of Langston Hughes*, The Writing Program Black History Month Special Lecture, 8pm, Killian Hall.

Friday, February 24

Alternative Jobs in the Software Industry* - Paul Rosier, vice-president, Careers Concepts, Alternative Jobs Fair Workshop, 11am, Student Ctr West Lounge.

Orientational Stability of Silicon Surfaces* - Prof Ellen Williams, University of Maryland, Ctr for Materials Sciences Lecture, 12:15pm, Rm 12-132. Lunch available, 12noon.

Dynamics of Distribution at Federal Express* - Michael Fisher, operations research advisor, Federal Express Corp. Ctr for Transportation Studies Seminar, 12:45pm, Rm 1:236. Optional luncheon, 12noon; \$2/students, \$4/others.

What is Public Interest Science?* - Chuck Caldert and Anna Aurolio, MassPIRG, Alternative Jobs Fair Workshop, 2pm, Student Ctr West Lounge.

Role of the Surfactant Interface in the Solubilization of Ions and Amino Acids in Reversed Micellar Solutions** – Epaminondas Leodidis, Dept of Chemical Engineering Seminar, 2pm, Rm 66-110.

Operations Research in the Airline Industries* - Thomas Cook, vice president operations research, American Airlines, Operations Research Ctr Seminar, 3-4pm, Rm E40-298. Refreshments follow.

Monday, February 27

The Evolution of Competitive Wholesale Electricity Markets* - Paul Joskow, MIT, MIT Industrial Organization Workshop, 2:30-4pm, Rm E51-317.

Analysis of Impacts to Composite Honeycomb Structures** - Simon Lie, MIT, Dept of Aeronautics and Astronautics Materials, Structures and Aeroelasticity Seminar, 3pm, Rm 33-206. Refreshments served.

Fire** - Prof Howard Emmons, Division of Engineering and Applied Sciences, Harvard University, Fluid Mechanics Seminar, 4-5pm, Rm 5-234.

Diagnosing the Cause of Human Genetic Change** - Prof William Thilly, MIT Program in Toxicology, Dept of Civil Engineering Division of Water Resources and Environmental Engineering Seminar, 4pm, Rm 48-316.

Flight Research Using a Remotely Piloted Research Vehicle** - Prof Dominic Andrisani, School of Aeronautics and Astronautics, Purdue University, Joint MIT/Draper Dyanamics, Guidance and Control Seminar, 4pm, Hill Bldg, Rm 1409 Draper.

Tuesday, February 28

Mixed Signal Technology for Analog VLSI** - Dennis Buss, Analog Devices, Inc, Wilmington, MA, VLSI Seminar, 4pm, Rm 34-101. Reception, 3:30pm.

N-Metabolic Genes in Plants: Unique Features of Gene Regulation in Multicellular Autotroph** – Dr. Gloria Coruzzi, Rockefeller University, New York City, Biology Colloquium, 4:15pm, Rm 10-250. Coffee served, 3:45pm, outside Rm 10-250.

Activity in Galactic Center Magnetosphere* - Prof Mark Morris, UCLA, Ctr for Space Research Seminar, 4:15pm, Rm 37-252. Refershments served, 3:45pm. Islamic Revivalism Revisited* - Prof Sadik Jalal Al-Azm, University of Damascus/visiting professor of Near East Studies, Princeton University, Ctr for International Studies Emile Bustani Middle East Seminar, 4:30pm, Rm E51-332.

Wednesday, March 1

United States and the Future of the West Pacific** – Yasuhiro Nakasone, former prime minister, Japan, 1989 Karl Taylor Compton Lecture, 4pm, Kresge Auditorium.

The French Revolution: What It May or May Not Have Achieved* - Prof David Ralston, MIT History Section, MIT History Faculty Lecture Commemorating The French Revolution, 4pm, Rm E51-311.

Biomedical Engineering at the Massachusetts General Hospital* – Dr. Ernest Cravalho, Edward Hood Taplin Professor of Medical Engineering, Harvard-MIT Division of Health Sciences and Technology/chief, Dept of Biomedical Engineering, Mass General Hospital, Harvard-MIT Division of Health Sciences and Technology Seminar, 4:15pm, Rm E25-117. Refreshments served.

The Role of Women in Development in the Past 25 Years*** - Harvard-MIT Joint Seminar on Political Development (JOSPOD), 5:30pm, MIT Faculty Club.

Thursday, March 2

Role of Plastics and Composites in the Design of Constructed Facilities** - Frank J. Heger, Simpson, Gumpertz & Heger, ILnc, Arlington, MA, Dept of Civil Engineering Abraham Wolf Lecture, 3-5pm, Rm 1-190.

Women in the New Right: Issues of Gender and Feminism* – Prof Rebecca Klatch, Dept of Sociology, University of California, Santa Cruz, DA01Ctr for International Studies/Program in Women's Studies/Dept of Political Science Women and Poltics Seminar, 4-6pm, Rm E38-615.

The Quark-Hadron Phase Transition in the Early Universe** – Dr. Charles Alcock, Lawrence Livermore National Laboratory, Physics Colloquium, 4:15pm, Rm 10-250. Refreshments served, 3:45pm, Rm 26-110.

Reflections on the Physical and Intellectual Environment at Hitachi Central Research Laboratories** – Dr. Lance A. Glasser, consultant, MIT Japan Science and Technology Program Seminar, 5:30pm, Rm 4:153.

Community Meetings

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

Al-Anon** – Meetings every Fri, noon-Ipm, Health Education Conference Rm E23-297 and every Tues, noon-Ipm, Rm 1-246. The only requirement for membership is that there be a problem of alcoholism in a relative or friend. Call Sarah, x3-4911.

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

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

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

MIT Faculty Club** - Mon-Fri, buffet luncheon, noon-2pm. Info: x3-4896, 9am-5pm daily.

4th Dimension Developer/User Group Meeting* - First meeting, Feb 22, 12noon, Rm E15-305. Info: Robert Murray, x3-0683.

MIT Wives' Group** - Afternoon Group - Feb 15: "Medical Insurance and Medical Care - What You Need to Know" - Mary Hertema and Leslie Patton, MIT Medical Dept. Feb 22: "Current American Literature" - Prof John Hildebidle, MIT Dept of Literature. Afternoon group meets 3-5pm, Student Ctr Rm W20-491. Babysitting provided in Student Ctr Rm W20-407; bring diaper if necessary.

Working Mothers Support Group** – Meets every other Tuesday, 12-1:30pm (drop in any time), Rm £25-202. Next meetings: Feb 24 & 28. Join an ongoing support group to help with the hassles of being a working mother with young children. We discuss the usual problems, including daycare, work conflicts, siblings, summer camps, awful behavior of kids in public, coping with sleep deprivation, etc. New members and potential parents always welcome. Info: Janette Hyde, x3-4290.

Balancing Work and Family** – MIT Child Care Office 4-part workshop, March 2, 9, 16, 23, 12-1pm, Rm 4-144. Nationally known series developed at Wheelock College's Ctr for Parenting Studies by Frances Litman, led by Rae Goodell. Preregistering by phoning x3-1592 encouraged but not required.

MIT Employees Federal Credit Union Annual Business Meeting*** - Nominations and election of the Board of Directors and Credit Committee, Mon, Feb 27, 5:30pm, Rm 10-105.

MIT American Association of Retired Persons (AARP) Meeting*** - Slide Show of Amtrak trips through Canada, the Rockies to Vancouver by Horace Smith, Tues, Feb 28, 5:15pm, Student Ctr Twenty Chimneys. Refreshments, 4:30pm. New and

Lunch Hour Exercise** – Women's League program to gently and thoroughly exercise, relax and connect all parts of the body and mind. "Keepfit," Tai Chi, yoga. Wear loose clothing. \$4/session. Info: Jane Edwards, instructor, 247-9698 or Pam, Women's League office, x3-3656.

Informal Embroidery Group* – MIT Women's League Group meets Feb 22, March 8 & 22, April 12 & 26, May 10 & 24, June 14, 10:30am-1pm, Rm 10-340. Tea and coffee served.

Health Education

A Place to Go: "I Can't Get No Satisfaction (or How to Make it at MITY"** - Health Education 4-week series, Feb 27 (Pressures), March 6 (Relationships), March 13 (What Happens When It All Gets to You), March 20 (Coping Strategies), 4-5pm, Rm 10-280. Informal meetings for undergraduate or graduate students. Hosts: Jackie Simonis (ODSA) and Margaret Ross (Medical). No registration necessary. Juice and cookies.

Stress Management Workshop** – led by Scott Borrlli, PhD, licensed psychologist, MIT Medical Dept 5-session series beginning Wed, Feb 22, 12-1:30pm, Rm E23-297. Fee: \$45, \$35/students & MIT Health Plan members; includes workbook and relaxation tape. Advanced registration required; call x3-1316 or visit Health Education Service, Rm E23-205.

Spring Weight Control Program** - Medical Dept Health Education Service Program, beginning Feb 27, 1-2pm, Rm E23-297. Fee: \$70/students and MIT Health Plan members, \$85/others. Advance registration required. Info/registrations, x3-1316.

MITAC

MITAC, the MIT Activities Committee offers discount movie tickets for General Cinema (\$3.50) and Showcase (\$3.50). Please Note: Due to the recent purchase of USA Cinema by another cinema chain, USA Cinema tickets are no longer available.

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. Tickets are sold in
Lobby 10 and Lobby E18 on Fridays, 12-1pm. Lincoln Lab
employees may purchase tickets in Rm A-263 from 1-2pm, Tues

thru Fri only.

Check out our table of discounts for dining, musical and cultural events available to you through MITAC.

The following events are still available:

Boat Show. Sat-Sun, Feb 18-26, Bayside Expo Ctr. Ahoy, maties! Don the skipper's cap and imagine yourself at the helm of a luxury 42-footer...paddle yourself to relaxation with a cane-seated canoe...tug on the jib of a smooth-sailing catamaran...plus experience more nautical adventures on other seaworthy vessels at the 33rd New England Boat Show. Tickets \$2.50/ea (reg \$5/ea – adult tickets only).

Leontyne Price. Sun, Feb 19, 3pm, Symphony Hall. Join Leontyne Price, operatic soprano as she "champions the cause of living composers and celebrates the operatic favorites that make her name a household word. (Wang Celebrity Series). Tickets \$25 ea (reg \$28 ea), available in the MITAC office.

And, the new March events:

Cats Plain & Fancy All-Breed Cat Show. March 4-5, 10am-5pm, Marriott Copley. Admire the sophisticated, personable, and mundane felines of all distinctions: Turkish Angoras, Russian Blues, Chartreux (the "rooftop cats of Paris"), and more. Even cameo appearances, perhaps, by Morris and the Fancy Feast cat. Tickets \$5/adult; \$3/children (under 12); available in the MITAC office.

Civic Symphony. Sun, March 5, 3pm, Jordan Hall. Refresh the chilled winter spirits with an afternoon of musical rejuvenation. Program includes selections by Mussorgsky, Handel, Ravel, and Brahms, and features the East Coast premiere of William Marx's (son of Harpo Marx), "Images for Harp and Orchestra." Guest artist Ann Hobson Pilot, principal harpist of the BSO & the Boston Pops. Tickets: \$10/ea (reg \$12/ea); available in the MITAC office.

Flower Show: Thank Goodness It's Spring. March 6-12, Bayside Expo Ctr. It was an honored ritual every spring: the arrival of plump, purple blooms in the corner of Mrs. Peabody's third grade classroom. Relive the celebration of spring with the 118th Spring Flower Show. Crocuses, daffodils, and other botanical delights. Over 4 acres of blooms. Tickets \$5.50/ea (reg \$7/ea). *Note: Tickets are not valid March 4 & 5, the first 2 days of the show.*

Me and My Girl. Sun, March 12, 3pm, Colonial Theatre. Cockney Bill Snibson has just inherited the title of earl and now he must learn to adjust to the social flights and fancies of life among the upper crust – "...all the while remaining true to his beloved Sally." A toe-tapping, Tony award-winning musical. Tickets: \$38.50/ea (reg \$42.50/ea).

All's Well that Ends Well. Tues, March 14, 8pm, Huntington Theatre. Shakespeare's enchanting story where the "power of love is tested and triumphs." Tickets \$16/ea (reg \$19/ea).

Boston Ballet's Masterworks. Fri, March 31, 8pm, Wang Center. Experience the zest of life through dance, movement, and creative expression as the Boston Ballet pays tribute to a trio of master choreographers: Balanchine, Sir Frederick Ashton, and Maurice Bejart. Performing 3 magnetic ballets: Bourree Fantasque, Monotones I & II, & Le Sacre du Printemps (Rite of Spring). Tickets \$21/ea (reg \$34.50/ea).

Patriot's Weekend on Nantucket Island. April 15-17. Miss the summer crowds. Walk, bike, shop, and enjoy the early spring blooms. Trip includes: 2 nights' lodging at the Jared Cofin House, round-trip bus & ferry, arrival luncheon, dinner, 2 breakfasts — and more — for only \$198/pp/dbl occupancy. Bus leaves West Garage 6:45am April 15; returns approx 5pm, April 17. Reservations in MITAC office.

 ${\bf Ski}$ Cards. Still available. Only \$15/ea, offering discounts on lift tickets, lodging and more.

The City Books are Here. Only \$1 each. Super discount coupon books.

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 and \$1/pp/child. Don't miss the Gold Exhibit at the Museum of Science through April 30.

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

Alumni Activities

Plumbers of the Past: Shaping the Historic House: A Revealing Look at an Often-Hidden, Frequently Unmentionable Technology*** – Maximilian L. Ferro, FAIA, RIBA, MIT Club of Boston Dinner Meeting/Illustrated Talk, Wed, March 1, 6-7pm social hour; 7-8pm dinner; 8pm lecture. Cost: \$30, \$25 members, Cambridge Mariott Hotel, Kendall Sq. Reservations by Feb 24 to MIT Club of Boston, PO Box 668, Kendall Sq. Cambridge, MA 02142. Info: 227-8581.

Social Activities

Japanese Lunch Table** - Every Tues, 1pm, Walker Rm 220. Bring bag lunch and speak Japanese with native speakers. All levels welcome.

Movies

For the latest Lecture Series Committee movie and lecture information, call the LSC Movieline, x8-8881.

The Unbearable Lightness of Being** - Lecture Series Committee Movie, Feb 17, 7pm, Rm 26-100; 10pm, Rm 10-250. Admission: \$1.50, MIT/Wellesley ID required.

Without a Clue** - Lecture Series Committee Movie, Feb 18, 7 & 10pm, Rm 26-100. Admission: \$1.50, MIT/Wellesley ID required.

Crossing Delancey** – Lecture Series Committee Movie, Feb 24, 7 & 9:30pm, Rm 26:100. Admission: \$1.50, MIT/Wellesley ID required.

Coming to America** - Lecture Series Committee Movie, Feb 25, 7 & 10pm, Rm 26-100. Admission: \$1.50, MIT/Wellesley ID required.

Blue Velvet** - Lecture Series Committée Movie, Feb 26, 8pm, Rm 10-250. Admission: \$1.50, MIT/Wellesley ID required.

Gorillas in the Mist ** - Lecture Series Committee Movie March 3, 7 & 10pm, Rm 26-100. Admission: \$1.50, MIT/Wellesley ID required.

Alien Nation** - Lecture Series Committee Movie, March 4, 7 & 9:30pm, Rm 26-100. Admission: \$1.50, MIT/Wellesley ID

Diamonds are Forever** – Lecture Series Committee Movie, March 5, 8pm, Rm 10-250. Admission: \$1.50, MIT/Wellesley ID

Music

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

Thursday Chapel Concert* – Icelandic harpsichordist Helga Ingolfsdottir, Thurs, Feb 16, 12:05pm, Chapel. Works of Couperin, Forqueray, J.S. Bach and Thorarinsson.

Advanced Music Performance Recital* – Eun-Jung Park, '90 piano, Fri, Feb 17, 12:05pm, Killian Hall. Student of David Deveau performs Mozart, Schumann and Liszt.

Thursday Chapel Concert* - Donald Wilkinson, baritone and David Deschamps, harpsichord, Thurs, Feb 23, 12:05pm, Chapel. Songs and areas from Purcell's *The Tempest, The Indian Queen, The Fairy Queen* and others.

Advanced Music Performance Recital* – Kenneth Goodson baritone, Fri, Feb 24, 12:05pm, Killian Hall.

MIT Faculty Recital* - The Erdely Duo: Stephen Erdely, violin and Beatrice Erdely, piano, Fri, Feb 24, 8pm, Kresge Auditorium. Works of J.C. Bach, Mozart, Beethoven and

MIT Concert Band Winter Tour Finale* - John Corley, director, Sat, Feb 25, 8pm, Kresge Auditorium. Boston premieres of Concerto for Tuba and Wind Ensemble by John Bavicchi, Op. 101; Mazada by Ellen Spokane; Solo Promenance by Richard Cornell; Concerto Grosso for soprano and alto saxo-phones and wind ensemble by William Latham; and Variations on Veni Emanuel by John Guppy.

Affiliated Artist Concert* - Richard Given, trumpet and Karen Sauer, piano; assisted by the Cantabrigia Brass Quintet, Sun, Feb 26, 3pm, Killian Hall. Works of Telemann, Hindemith, Vivaldi, Purcell, Rieti, and Renwick.

Faculty Composers' Concert* – Sheila Waxman, piano; Karen Kaderavek, cello; Susan Larson, soprano, Wed, March 1, 8pm, Killian Hall. Thomas Oboe Lee Fireflies; Richard Cornell "Sonata for cello and piano;" Peter Child "Sonata;" David Ep-stein, "Piano Variations;" John Harbison "Mirabai Songs."

Thursday Chapel Concert* - Suzanne Stumpf, baroque flute; Kinny Earl, violin; Dan Ryan, baroque cello, Thurs, March 2, 12:05pm, Chapel. Duos, trios, solo and and trio sonatas of Vivaldi, Platti, Sammartini and Boccherini.

Advanced Music Performance Concert* – Eric Babson (G), oboe, Fri, March 3, 12:05pm, Killian Hall. Works by Hummel,

Affiliated Artist Concert* - Eleanor Perrone, piano, Fri, March 3, 8pm, Killian Hall. Works of Bach, Beethoven, Brahms

Affiliated Artist Series* - David Witten, piano, with the Longwood Symphony, Aaron Kula, conductor, Sat, March 4, 8pm, Kresge Auditorium. Tickets: \$8, \$6 students and seniors, \$3 MIT students. Bernstein's Slava, Shostakovich Symphony No. 5, Tchaikovsky's Piano Concerto

Guest Artist Concert* - The Lindsay String Quartet from England, Sun, March 5, 3pm, Kresge Auditorium. All-Beethoven program.

Theater

ahal* – Dramashop IAP Major Production of original work conceived and written by the Dramshop IAP Ensemble, Feb 16-18, 8pm, Kresge Little Theatre. Tickets: \$4, \$3 students & seniors. Reservations: x3-4720; Info: x3-2877.

The Imaginary Invalid* - MIT Community Players production, Feb 24-25, March 2-4, 8pm; Feb 26, 3pm, Kresge Little Theater. Classic comedy about the follies of man and medicine; performed with incidental music. Tickets: \$9, \$8/MIT ID, group rates available. Reservations: x3-2530.

MIT Community Players Seek Proposals for May Production - Original plays encouraged, but not necessary. Deadline: Feb 24. Info: 862-8268 or 981-5023.

Dance

MIT Ballroom Dance Club Workshops* - Sun, Feb 19: Milt Baliroom Dance Club Workshops* – Sun, Feb 19: Waltz I, 1-2pm, \$.50/members, \$.75/non-members; Mambo II, 2-3:30pm, \$.75/members, \$1/non-members; Tango IV, 4:30-5:30pm, \$3/members, \$4/non-members. Free general dancing, 3:30-4:30pm, Student Ctr Sala de Puerto Rico. No partner necessary. Sun, Feb 26: Samba I, 1-2pm, \$.50/members, \$.75/non-members; Waltz II, 2-3:30pm, \$.75/members, \$1/non-members; Waltz II, 2-3:30pm, \$.75/members, \$1/non-members, \$1/non-memb hecessary. Sun, Feb 25 Samoat, 1-25m, 4:30-finembers, \$1/non-members; Waltz II, 2-3:30pm, \$7.5/members, \$1/non-members; Mambo IV, 4:30-5:30pm, \$3/members, \$4/non-members. Free general dancing, 3:30-4:30pm, Student Ctr Sala de Puerto Rico. No partner necessary. Info: x8-6554.

MIT Dance Workshop** - Beth Soll, director. Modern Dance Classes: Beginning, MW, 3:30-5pm, DuPont T-Club Lounge. In-termediate, T/Th, 5:30-7pm, Walker Rm 201.

MIT Folk Dance Club* - weekly dancing-Sun, International Dancing, 7:30pm, Student Ctr Sala de Puerto Rico; Tues, Balkan and Western European Dancing, 7:30pm, Student Ctr Rm 407; Wed, Israeli Dancing, 7:30pm, Student Ctr Sala de Puerto Rico. Info: x3-3655.

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

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

Exhibits

List Visual Arts Center

Felix Droese: House of Weaponlessness. This well-known German artist's first US exhibition recreates his installation of carved wood sculpture, monumental papercuttings, and found objects which constituted the West German entry to 1988 International Venice Biennale. Opening Reception — March 3. Kramer: In Residence. Mixed-media artist in residence to develop a room-sized documentary installation addressing issues of national defense, women and war, arms race economics, and peaceful applications of military research. Opening Reception - March 3, 5-7pm; the artist will attend. March 4 through April 23. Beverly Pepper: An Autobiography in Form. Part of an on-going series exploring 20th Century sculpture through the work of artists represented by a major work in the MIT Permanent Collection. March 4 through July 2. Hours: Weekdays, 12-6pm, Weekends, 1-5pm. Closed holidays.

THE MIT MUSEUM

MIT Museum Bldg (N52) - Korean Crafts and Paintings. Award winners of the 13th annual Korean Traditional Handi-

craft Competition and the Oriental ink paintings by contempo rary artist Chung-Shin Lee, internationally acclaimed artist. Korean Crafts through March 25; Chung Shin Lee through July 2. Getting to the Surface: Mathematics of Soap Film and Soap Bubbles. Dazzling computer-generated images representing the first discovery in more than 200 years of a new complete ing the first discovery in more than 200 years of a new complete minimal surface; includes 2 epoxy models and a videotaped in-terview with mathematician David Hoffman. Through March 26. Light Sculptures by Bill Parker, MIT '74. Changeable, touchable plasma sculptures by the artist who developed this medium, ongoing. Hours: Tues-Fri 9am-5pm. MIT Museum closed to the public on Mondays; Open 12-4pm Sat-Sun; \$2 dona-tion requested.

Compton Gallery - Richard Filipowski. Intricate, non representational sculptures and geometric paintings rooted in the Bauhaus philosophy executed by this recently retired MIT professor of visual design. Through March 20. Gallery hours: Weekdays 9am-5pm, closed Saturdays.

Ongoing exhibits: George Owen '94: Yacht Designer — Line drawings and half-models designed by one of the early professors of naval architecture at MIT. Half Models in Naval Architecture and Ship Building – Half-models, ship drawings and photographs illustrate how the half model has aided ship and yacht designers and builders.

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 - 1887: The Founding of the Lawrence Experiment Station. Second in a series of three exhibits in commemoration of the Lawrence Ex-periment Station's 100th anniversary. Jerome C. Hunsaker, Father of Aeronautics at MIT. Chronicles his founding of aeronautics at the Institute; his design and construction of Navy airships and NC-4, the first airplane to cross the Atlantic, and his role in leading the Dept of Aeronautical Engineering from 1939-51. Hall exhibit cases in 14N, 1st floor.

Wellesley Events

Jewett Arts Center* - Selections from the Wellesley College Museum Permanent Collection. Focusing on works from the Medieval collection, French and American 19th century landscape paintings, and a selection of old master paintings. Through March 19. Corridor Gallery - Renaissance and Baroque Prints. Selections from the Wellesley College Museum Permanent Collection. Through March 19.

Medicine and More* - K. Andra Larson, DO; Sarah Rbin, student, College of Osteopathic Medicine, University of New England, Career Ctr Panel Discussion, Feb 15, 5-6pm,

The Changing Role of Women in the USSR* - Prof Gail Lapidus, University of California, Berkeley, Dept of Political Science Davis Lecture, Feb 15, 8pm, 277 Science Ctr.

Impact of Employment and Training Programs on Latina AFDC Families* – Marian Darlington-Hop, research associate, Ctr for Research on Women Luncheon Seminar, Feb 16, 12:30-1:30pm, Cheever House, 828 Washington St.

Environmental Careers* - Cynthia Carlson Beckham, lecturer, Environmental Science Program U-Mass, Boston; Monica Sauermann Bushnell, research associate, Putnam, Hayes & Bartlett; Sarah Hokanson, consultant/project geologist, The Earth Technology Corp; Heidi Schultz, VP, publications/consultant, Eastern Research Group; Harlee Strauss, president/environmental consultant, H. Strauss Associates, Career Ctr Panel discussion, Feb 16, 7-9pm, Clapp

Freedom Rides-Mississippi, 1961: A View from the Suburbs* - Paul Breines, associate professor of history, Boston College, Dept of History Event Celebrating Black History Month, Feb 16, 7:30pm, 377 Science Ctr.

The Nuclear Age* - Peace Studies Program Discussion, Feb 20, 8pm, Pendleton East Rm 105.

Rebel With a Cause: Muhammed Ali as '60's Symbol* - Jeffrey Sammons, director, Afro-American Studies Program Rutgers University, Camden/author, Dept of History Black History Month Lecture, Feb 22, 7:30pm, 277 Science Ctr.

Why We Lost the ERA* - Prof Jane Mansbridge, Northwestern University/author, Dept of Political Science Secture, Feb 22, 7:30pm, Pendleton East Rm 105.

New Approaches to Women and Mathematics* - Suzanne Damarin, visiting research scholar, Ctr for Research on Women Seminar, Feb 23, 12:30-1:30pm, Cheever House, 828 Washington St.

Was Plato a Feminist?* - Gregory Vlastos, emeritus professor of philosophy, University of California, Berkeley, Dept of Philosophy Lecture in conjunction with 11th Annual Boston Area Colloquium on Ancient Philosophy, Feb 23, 8pm, Clapp Library Lecture Rm.

Women on Stage* - Cross-cultural collage of scenes, sponsored by Wellesley College Theater, Feb 24-26, 8pm, Alumnae

Faculty Recital* - Joel Moerschel, cello and Jean Alderman piano perform Richard Strauss, Beethoven and others, Feb 26, 8pm. Jewett Auditorium

The Nuclear Age on PBS* - Peace Studies Program Discussion on current episodes of this PBS series, Feb 27, 8pm, Pendleton East Rm 105.

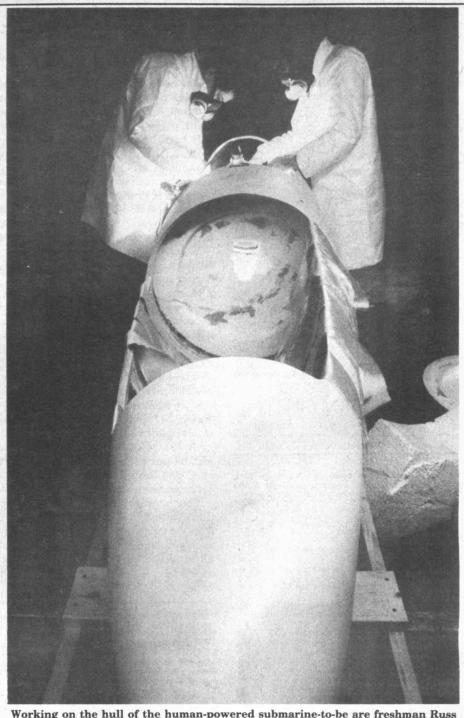
Tropical Forests in Three Dimensions: Ecolotical Interactons in Rain Forest Tree Canopies* - Narlini Nadkarni, asst professor of biological sicneces, University of California, Santa Barbara, Douglas Lecture, Feb 27, 5pm, 277 Science Ctr. Reception, 4:30pm, Science Ctr Lounge

Research in Cognitive Science* - Dr. Michael Turvey, prof of psychology, University of Connecticut, Dept of Psychology Lecture, Feb 28, 4:15pm, Clapp Library Lecture Rm.

MIT Cable Listings - Submit announcement in writing to Rm MIT Cable Listings – Submit announcement in writing to Rim 9-050. We prefer a day's warning, but faster action may be possible. Useful also for correcting errors, notifying about cancellations, and dealing with emergencies. If you have met the Tech Talk deadline, your announcement is automatically put on cable (except for exhibits and some multi-meetings

We are now accepting requests via e-mail. Announcements are shown on MIT Cable channel 12, which is displayed on the receivers in Lobbies 7 and 10. Announcements should be of in-terest to the general MIT community. Classified ad type messages will not be accepted. Messages should include: date, title of event, speaker or sponsor, time and location. MIT Cable reserves the right to edit your message to fit the screen. Include your MIT phone number. E-mail your announcements to: tv-@telecom.mit.edu. Messages will usually be posted within 24 hours of their receipt.

Send notices for Wednesday, March 1 through Sunday, March 12 to Calendar Editor Rm 5-111, before 12noon Friday, February 24.



Cohn, left and graduate student Anthony Joseph. The sub is being built to participate in a race next summer.

-Photo by Donna Coveney

Biological Chemistry symposium planned

A special symposium entitled, "Biological Chemistry: Chemistry's Connection to Life," will examine MIT's and industry's recent research accomplishments in various disciplines of biological chemistry.

Two all-day programs, sponsored by the Industrial Liaison Program and the Department of Chemistry, will be held at Kresge Auditorium on Thursday and Friday, February 16-17. Registration begins at 8am on Thursday; the program starts at 9am on both days.

The symposium will host academic, government and industrial leaders to provide a forum for discussion of the research opportunities and promises of biological chemistry. The program will feature speakers from MIT's Departments of Chemistry and Biology, as well as the Whitaker College of Health Sciences, Technology and Manage-

Industry will be represented by speakers from E. I. Du Pont de Nemours, Hoffman-LaRoche, Pfizer, BioTechnica, Igen, Ciba-Geigy, G.D. Searle, Merck, Sharp & Dohme, Eastman Kodak, ICI Pharmaceuticals, and American Cyanamid. The agenda will offer lectures, poster sessions and informal group discussions

The symposium is open to the MIT community. Preference for luncheon seating will be given to preregistrants.

Federal Express official to speak

Ever wonder how Federal Express does it? There will be an opportunity to find out Friday, Feb. 24, when Michael Fisher, operations research advisor to the company, speaks at a seminar at 12:45pm in the Spofford Room (1-236).

As a major delivery service handling a million pieces of cargo per night, Federal Express continually revises its distribution system. One recent change was the opening of a second hub in Indianapolis (the first is located in Memphis). The problems involved in making such changes will be the topic of Dr. Fisher's talk.

Dr. Fisher, who received the PhD degree from the Flight Transportation Laboratory, has been associated with Federal Express for 11 years.

The seminar is sponsored by the Center for Transportation Studies. An optional luncheon will be offered at noon, \$2 for students, \$4 for others. For further information, call Scott Campbell, x3-5380, or Terri Lehane, x3-5321.

Weight control program returns

A spring Weight Control Program will be offered by the Medical Department's Health Education Service beginning Monday, Feb. 27, 1-2pm in the second floor conference room (E23-297). The introductory session will include a slide/tape presentation.

The program is based on principles of behavior modification to assist in encouraging positive lifestyle changes. There are no prescribed diets. Participants will set their own goals with guidance from the group leader, Connie Roberts, RD, of the Brigham and Women's Hospital.

Open to all members of the community, the program is \$70 for students and MIT Health Plan members and \$85 for others. Advance registration is required. For further information and registration, call the Health Education Service, x3-1316.

Tax tip

Here are pointers the IRS offers to speed up your tax refund:

-Use the peel-off label and pre-addressed return envelope.

-Double-check your math.

-Use the correct tax table.

-Sign and date your return.

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

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

ed equipment may be dis-posed of through the

Deadline is noon Friday before publication.

For Sale

64K Coco cmptr, \$200; StarSG10 pentr, \$245; dual disk drv, \$225; Radioshack moded, \$99; Bot progrms (game & util), \$1,000; "Rainbow" mags, \$250; 1600 progrms total cost \$2,019, all for \$400. Art Berg, 326-3038.

on SX 81 ski boots, sz 9 (340), usd 2 wks, \$70 or bst. Bill, x3-6249.

4 rad trs. sz 185/70SR13 M&S. nvr usd. \$99. Nori. x3-0469

Compaq pribl persol coptr, fully IBM coptbl, 640 RAM, 20 Meg (60ms) hrd disk, 1200 baud int Hayes compatibl modm, Epson LX-80 prntr, math co-process, \$1,650. Jack, x5-7542 dorm or x3-0469.

HP 41CV Scientific calculatr, magnete card rdr, therml prntr, math modules, I nw ovr \$600, complt sys, \$185. Dave, x3867 Linc or

3-drwr dosk, \$35; Vac-u-Vin (for saving opn wine 3 wks), nvr opend, nw \$20, \$10. Richard, x5-8476 dorm or 868-4184.

Dwn jackt, v wrm, gd cond, \$30; 10" b&w tv, \$30. Frank, 547-1949.

Pum: sm desk & drssr, \$25 ea; reclining chr, \$35; swivl chr, \$25, mst be pickd up frm Andover. Cathy, x3-5648.

wboard, 145cm, \$105. Jack, x5-7330 dorm, Baker 330.

Electrolux vac w/pwr nozzl, \$100; Electrolux shampooer, \$15; ktchn, DR, desk & ez chrs, \$10-35; pink AT&T Slimline phone, \$25; xtra solid typing tbl, \$25; teak stereo cbnt, \$50; oak crir tbl, \$45; misc lamps, \$15-45; console tbl, nw, \$55; elec bebrd htr, \$10. Call 332-

Immac Elna sewing mach, qlty Swiss metl constrctn, zig-zag, buttnhole free arm, \$450 or bst. Call x3-9676, lv msag.

Microwv ovn cart, walnt colr, ahlvs for cookbooks, etc, castrs, 28x30x18", \$30. Bob, x3-2941 or 924-1210.

Dk rm eqpmnt, nvr usd, enlrgr, \$200; Gralab elec timr, \$48; enlrging easl, \$15; safelight, \$11; film develping tank, \$7.50; develping trays, 3/\$6; chemicl buls, 3/\$3.80; thermomtr, \$3.50; all for \$275. Linda, x3-

Lange Z-Pro ski boots, sz 9, gd cond, \$75 or bst. Armando, x5-7331

Nw stereo equint won in raffle, full warr, Acoustic System spkrs, 150W, 80W fully digitl Nikko recvr, Sherwood tratbl, mst sell, airdy have a stereo sys. Malcolm, 266-2824, 3-8pm.

Toshiba VCR, V-78MS, can play bth US & foreign formattd tapes, \$500; JVC 21" colr tv, egppd to recv US & foreign tv signls, \$500; bth 2 wks old. Nicholas, x3-5106 or 661-3951.

Ski boots, buckl, w/pull-out insulatr bladder, sz 9-1/2, lt gr (Alpina) colr; sz 10 black, exc cond, \$35 ea. Ron, x8-1628 Draper

80 blank audio cass, normi bias, 90 min; 20 blank chrome 60 min tapes, es, askg \$1.25 ea or all for \$100. Andy, x3-7746 anytin

2 Skicard int'l passes, nw/not usd, gd for most ski alopes in US, discount 25-50% on lifts, lodging, meals, \$50 or bst. Hoa, x3-6185 or 508-520-0209.

18' canoe, exc cond, oars inc, for fitness, fishing, & loads of fun, \$400. Roz, x3-1752.

Compaq Deskpro #286/20 w/NEC Multi II mntr, nw nvr usd, \$2,500 firm. Jan Blair, x8-2843 Draper.

Vehicles

'66 Dodge Coronet, 2-dr, rns grt, less thn 50K on sint 6 eng, no rst, I 3 cars & cam't store this 1, call & it's yours. Rob, x3-2037 or 876-

74 Mercedes Benz 280 sdn, 4-dr auto, lthr int, buckt seats, a/c, AM/FM, pwr wndws, nw trs & rims, exc cond, no rst, 2-tone bl, \$3,000 or bst. Barbara, x8-3515 Draper.

76 VW RAbbit, only 67K, rns gd, 4-spd, gd trs, askg \$500 or bst. Grog, x3-6504 or 494-8890.

79 VW Rabbit, 2-dr, exc cond, v lttl rst, a/c, AM/FM, 148K, 6 trs, mny nw parts, well-maint, \$600. Susan, x7070 Linc.

'81 Toyota Tercel, 4-dr, auto, AM/FM, exc cond, no rat, \$1,000 or but

'81 Subaru DL wgn, 5-spd, 4-dr, 61K, gd cond, some rst, nw exh & batt, \$1,350. Antonio, 225-0629.

'85 Honda 250 Rebel mtrcycl, mint cond, xtnded warr, \$900. Katherine, x3-3279 or 891-3842, lv mmg.

'86 Chevy Sprint, only 34K, 5-spd, AM/FM/cass, rcnt tune-up, 50+mpg, exc cond, mst sell, \$2,300. Todd, x8-3896 Draper.

'87 Dodge Shelby Charger, 34K, 2.2L turbo, 5-spd, sunrf, louvrs, nd, nvr drivn in snow, mving, \$9,000 or bst renbl

offr. Jim, x3540 Linc.

Housing

2BR condo on T, 8 mi to MIT, in Winthrop, crnr unt, prkg, pool, tennis, sec, ownr financing avlbl, \$110,000. Pat, 846-6777.

'A Place to Go' sets spring agenda

The new program, A Place to Go, organized last term by the Office of the Dean for Student Affairs and the Medical Department, plans a series of more focused meetings beginning February 27.

'I Can't Get No Satisfaction" (or How to Make it at MIT) is the theme of the four meetings, each of which will be devoted to a narrower problem area. The schedule is:

February 27-Pressures, from family. friends, lovers, academics, or whatever people find puts pressure on them at MIT.

March 6-Relationships, with academic advisors, friends, roommates, girl/boyfriends and ex-girl/boyfriends.

March 13-What Happens When it All Gets to You, depression, eating and sleeping problems and feeling unmotivated.

March 20—Getting Back on Track: Some Strategies for Coping will provide a hopeful wrapup to the series.

"The idea for the series came from the need for an informal place where students can get together to share ideas and experiences," Dr. Margaret Ross, one of the facilitators, said.

"It can be difficult to get work done at MIT if there are personal issues distracting one," she continued, "and MIT itself can cause some emotional troubles.'

The counselors in ODSA (Jackie Simonis) and the Medical Department (Dr. Ross) came up with A Place to Go to address such problems. The spring series is open to all students who may attend any or all meetings. No advance registration is necessary.

New Naples, FL condo for mt, avlbl yr-md, \$600/wk, \$2,000/mo Dec thru March, 3BR, 2b, DR, ktchn, patio, all appliance & amenities, outdr htd pool, 15 min wlk to Gulf Beach, less to shps & restaurnts, mins to public glf courses, tennis, etc. John, x3541 Linc or 862-4809 eves.

Lynn, 4 rm apt, w-w carreting, back prch, Indry hook-up, nr public trasprtn, platy of dryway prkg, exc cond, \$650/mo inc all utils. Call 846-1656 aftr 5pm.

a for mt 4/8-15, beachfrnt villa in nw 5-star lux resort, 2BR, 2 full baths, full ktchn, sleeps 6, video avibl for preview, \$750. Call

So ME, 3BR oceanfrnt has for mt, 9 mi frm Kennebunkport, quiet, fully furn, wtr views on all sides, priv beach, avlbl 1st 2 wks in July, last 2 wks in Aug, \$725/wk. Kathy, 497-5525.

Orleans Cape Cod, Cape salt box, sleeps 8, 1,000' to Pleasant Bay, 2-1/2 acres, deck, W/D, dahwahr, grill, linens, before 7/1 \$650/wk, 7/1-Labor Day, \$900/wk, aftr Labor Day, \$650/wk. Call 216-991-4105.

Doerfield Beach, FL, lux 3-lvl twnhse, wlk to beach, 2BR, 2-1/2b, fully furn, \$700/wk, \$2,400/mo. Call x3-3087 or 508-887-9942.

Animals

My gerbils were evicted: 2 cute blck, frndly, w/cage, H2O, food, perf for chidrn of all ages, free. Rachel, x3-8803 or 489-5422, ly mssg.

Wanted

SLR camra, no expensive frills, gd cond. Sanjeev, x3-5009 or 492-

Wntd to buy, agl fmly hae in Watertown, Waltham, Arlington, Belmont, up to \$180,000. Call x3-0457 or 924-6294.

Boy's or M's hoky padding (elbows, givs, etc) to fit 2 med/sm built W. Kathryn, x3-1775 or 891-0780 eves.

Backpack, nd int frame type, lrgr thn 4500 c.i. Bruce, x5-9858 dorm

Rd nded to MIT frm Peabody, reg wrkng hrs. Carol, x3-6733.

Roommates

F wratd to shr mod 2BR Winchester condo, a/c, w-w, off-st prkg, pool, party rm, gardn & duck pnd, lndry in bldg, \$412 inc all utils. Julie, x3-

W Newton, F writd to shr 1st fir 2-fmly hae, furn xcept BR, off-st prkg, barmit, yrd, nice area, svibl now, \$575 inc utils. Mary, x3-7527 or 969-5297 eves.

Miscellaneous

Exp'd typst avibl, tech/non-tech, nw to MIT but sevri yrs exp in ry. Kathleen, x8-8407 or 489-1192 mssg.

Wrdprcssng, typng, 3 yrs MIT exp. Call 497-6319.

Surplus Property

The Property Office has this excess MIT equipment for transfer within the Institute. Unless noted, items are at the Equipment Exchange, 224 Albany St, x3-5611, open Tues & Thurs Ilam-3pm. After 30 days, items are sold to

Case 2524—Transfer of funds required: 4 DECMate II, PC 278 systems w/word processing software; 2 LQP prntrs; 1 LA450 dot matrix prntr. To inspect, call Tricia Kellison, x3-5312.

Case 2513: 10 library ladder.

Case 2501: 2 DECMate II computer systems; 1 DEC LQP02 prntr; DEC

Important reminder: capacitors, transformers and other equipment that may contain PCB's cannot be transferred or accepted in transfer either within the Institute or outside. If you have not had the opportunity to read Bob Alberry's memorandum on the hasards of PCB's and would like to read it, or if you have a PCB problem, call John Fresina, director, Institute Safety Office, x3-4736.

Faculty to resume consideration of undergraduate education

(continued from page 1)

tributed the two new faculty committee reports, and a third prepared by a student group, to faculty members.

In a letter accompanying the reports, she said they would serve as the springboard for faculty discussions this semester.

At upcoming faculty meetings, she continued, the Committee on the Undergraduate Program will introduce motions deriving from the work of the ad hoc faculty

"After a period of Institute discussion," the letter states, "CUP hopes that the faculty will feel ready to vote on proposals with respect to the first-year academic program at the April 19th faculty meeting." And, probably, at the same meeting, Dean MacVicar said, the CUP also wishes to ask for a "sense of the faculty" with respect to key features of the science requirementrelated ideas. Formal voting on specific science requirement proposals is not expected for 12 to 18 months, she said.

In its presentation at today's faculty meeting, she said, the CUP will ask that discussions be scheduled in departmental and living group settings to consider findings of the reports, preparatory to the introduction of formal motions by the CUP next

"We wish this deliberative process to enable unhurried and thorough discussion in departments and schools, and across the wider MIT academic community," she said. Her letter listed these highlights of

"possible considerations" ahead: -to include biology and materials as

part of the science core: -to revise the content of the physics

component of the science core to include some material in quantum and atomic physics;

-to reformulate the current science distribution requirement;

-to improve the quality of science core recitation teaching:

-to increase opportunities for "handson" experiences for students in the science

-to give encouragement for more students to spread the science core out beyond the freshman year;

-to enhance the attractiveness of subject alternatives for first semester fresh-

-to change the second semester freshman year from pass/no record for all subjects taken to pass/no record for one subject

-to permit upperclass students to designate one subject pass/no record each se-

-to permit students, beginning with second term freshman year, to designate HASS requirement, science requirement and departmental requirement subjects as pass/no record in limited number;

-to set "C" as the grade level proficiency for the pass grade beginning with the second semester of the freshman year.

Professor MacVicar noted that the CUP will "warmly welcome" advice and comment during discussions of these matters.

Professors Thomas J. Greytak (physics) and Philip S. Khoury (history) make up the CUP subcommittee developing the science requirement proposals; Professors Jack L. Kerrebrock (engineering) and Anthony P. French (physics) are the subcommittee developing the "first year" proposals.

The two ad hoc committee reports distributed by the CUP are the "Report of the Science-Engineering Working Group," cochaired by Professors Robert J. Silbey (chemistry) and David N. Wormley (mechanical engineering), and the "Report of the Committee on the First-Year Program," chaired by Professor Kenneth R. Manning (history and The Writing Program). The former report builds from the previous work of the School of Science Education Committee and the Commission on Engineering Undergraduate Education.

The third report related to deliberations by the faculty is the "Report of the Ad Hoc Committee on the First Year," prepared by the Undergraduate Student Association's Student Committee on Educational Policy.

Outage caused little damage

(continued from page 1)

under contract to MIT responded immediately and moved the stuck elevators using backup power and mechanical means.

The Athena operations crew, under the supervision of Jeffrey I. Schiller, worked around the clock all weekend to get the machines back up, Professor Murman said. As of Monday morning, he said, the system was largely restored from the user's point of view. Some file servers and work clusters remained out, but those were expected to be back in service by the end of Monday.

The impact on campus was exacerbated because MIT's emergency 1,000 kw generator, which serves the central part of the campus, was out of service for repairs and maintenance. It had been shut down the previous week, the first time in 10 years the backup system was off line, said Paul F. Barrett, director of Physical Plant. The emergency generator would have come on automatically, providing lights and other critical services.

Physical Plant had placed a temporary back-up generator at Building N9 when the main emergency generator was taken off line. The smaller backup unit was started when the municipal power was lost. Physical Plant personnel went to work cutting off sections of the Institute from the backup unit so power could be restored gradually. However, Mr. Barrett said they soon had to be diverted to cutting off sections of the university from the city power grid to enable the utility to restore power sooner to a large geographic area.

In addition, 24 small generators came on automatically to provide emergency electric service to outlying buildings on the east, west and north campus. Two other small generators were delayed by mechanical problems, Mr. Barrett said.

Day Camp to return

MIT's Summer Day Camp will open its 24th season Monday, June 26, and run through August 18 in four, two-week quarters. The program is open to children ages 6 to 14 (those born between January 1, 1975 and December 31, 1982).

For further information and registration material, call the Day Camp office, x3-2913.

Tsongas

(continued from page 1)

facing a descent into second-class economic status. The only way out of it is education.' Mr. Tsongas, who turns 48 this month,

served in the US Senate from 1978 to 1984. He announced he would not seek reelection to a second term after discovering he had lymph cancer. He has since undergone successful treatment for the cancer.

Mr. Tsongas, a Lowell, Mass., native, received a bachelor's degree at Dartmouth College and a law degree at Yale University. A former Peace Corps volunteer, he served as a Lowell city councilor, Middlesex County commissioner and Congressman before winning election to the Senate.

-Charles H. Ball

Deficit-control

(continued from page 8)

measures should be successful in bringing the budget into balance within three years. The specific budget control steps will be evaluated each year in order to take into account emerging needs and overall circumstances.

Vice President Culliton said that the budget control measures currently being undertaken by offices and departments throughout the Institute may well result in a lower deficit than had originally been projected for this year.

THE ARTS

Brody's first big play

Students improvise to create AHA!

Playwright Alan Brody has directed his first major production at MIT, *Aha!*, a theatrical piece created by students to explore and express some of the ways they feel about love.

The performance, which plays about 90 minutes without intermission, arose out of Dramashop's IAP program. "The idea was to help the students find out as a group what they really cared about. It turned out to be love," Professor Brody said.

The actors told stories, brought in well-loved scenes or monologues, and developed improvisations. From that Aaron McPherson '89 wrote the script. Ahal's subjects are as diverse as schoolyard romance, the love of God, the effect of advertising, the first kiss, a Jackie Collins scenario — even the love of physics, McPherson said.

Over three weeks the seven performers learned through an exercise called a "river" how to follow the single feeling that made each story important. In the river, McPherson said, "you fix a single feeling, or intention, in your mind. You begin to move and make sound. Through the river you become free to express what it is

about the story that is important to you. The object is to follow natural impulses, without the censoring influence of cautious thought," he said.

At a certain point the play is opened up so the actors can improvise from stories of love told by audience members.

The last three performances begin tomorrow, Feb. 16-18, in Kresge Little Theater (3-2877).

In drama students here, Professor Brody said, "I've found a raw energy and a brilliance. I want to create a structure in which they can clarify their own goals and find their own voices. I want to support and encourage as many thoughts about theater as I can," he said.

Following are other thoughts from Professor Brody, beginning with comments on challenges inherent in his new position as director of theater arts at MIT. "For the first time I have been given an opportunity to build a program in the context of science and technology. If I can figure out where theater belongs in this context — and in the particular microcosm that is MIT — it seems to me I can figure out where it belongs in America. . .

"What happened here in the past has been splendid. Through the work of (Dramashop Director) Bob Scanlan, there has been a true nurturing: of theater literature, of a way to respect the traditions of theater and a way to develop a genuinely fine critical sense among the students.

"With all of that in place already I hope we will develop the kind of academic program that will make it possible for students to be able to minor in theater soon. . .

"There are so many misconceptions about the theater. People often go for status or because they think it might be good for them. The theater has served society as a diversion — which is mostly passive — or an entertainment — which is more active. But it can also be a conscience, a spiritual source, a source of wonder — even a new way of thinking, a new way of understanding,"

— China Altman

Alan Brody, below. Cast members of Aha!, counterclockwise, are: George Madrid '91, Derek Clark '89, Ian Dowell '86, Kelly Marold '91, and A.J. Babineau '90. Photos by Donna Coveney





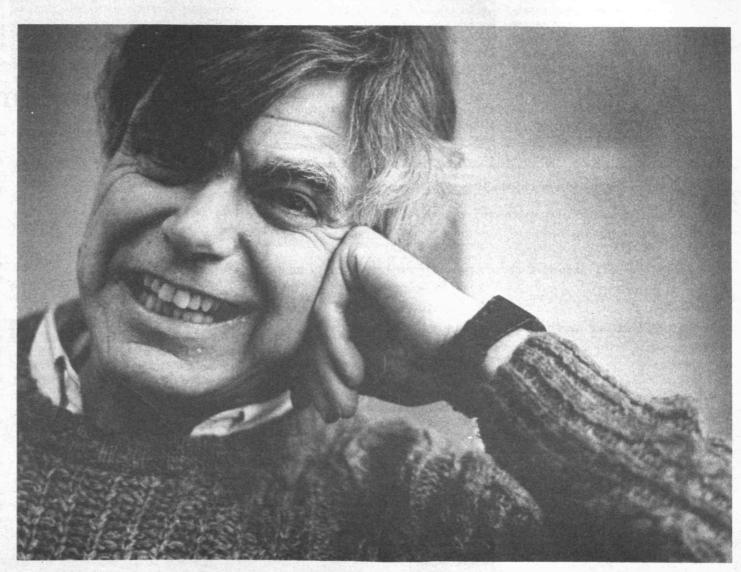




The artist has a vision of what it's like to be alive and an impulse to share that...

The theater can serve as a conscience, a spiritual source, a source of wonder — even a new way of thinking, a new way of understanding.

—Ålan Brody



Paul E. Gray President

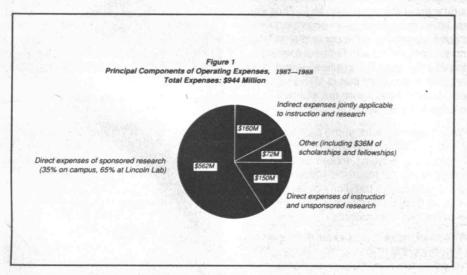
This memorandum describes the finantrating these matters are for the 1987-1988 academic year, which is described in full fi- tion, as reflected by tuition charges. nancial detail in the most recently published Report of the Treasurer. While these numbers are, in some sense, out of date, they illustrate the essential features of the relation between educational costs, tuition, and financial aid.

The Institute has a dual missioneducation and research—the expenses of which are illustrated in Figure 1, which displays the principal components of the operating expenses for 1987-1988.

With this caution about the coupled charcial elements at MIT that bear on tuition acter of education and research in mind, it and affect financial aid. The numbers illus- is possible to estimate the cost of education at MIT and relate it to the price of educa-

THE COST OF EDUCATION

In addition to the \$150 million in direct costs for education and unsponsored research, there are \$160 million in indirect expenses for services that support both instruction and research. This \$160-million total includes the costs of plant operation and maintenance, fiscal, personnel, and other Institute-wide services, administration, general expenses, the libraries, medi-



The direct expenses of instruction and unsponsored research (\$150 million) are comprised principally of the appropriate fractions of salaries and benefits of faculty, other academic staff, teaching assistants, and support and service staff directly engazed in the educational programs of the Institute. Also included are the costs of equipment, materials, and supplies, used in the educational programs. Similarly, the direct expenses of sponsored research reflect the costs of faculty, research staff, research administrative staff, and others directly engaged in programs of sponsored research, as well as the associated costs of equipment and operations.

While a division of expenses in these categories is necessary for management purposes (and for establishment of the total cost of sponsored research for reimbursement by the sponsors), this categorization is somewhat artificial in that it does not reflect the integrated and synergistic nature of the academic enterprise, particularly on the campus. Both undergraduate and graduate education are dependent on the research programs conducted on the campus, and these research programs benefit from the participation of students. For the faculty, the activities of education and research are interwoven and inseparable.

cal services, and student services. About \$65 million of these indirect expenses can be attributed to instruction, and \$95 million to research. This apportionment is the result of detailed negotiation with the federal audit agency, which represents the financial interests of federal research spon-

A third element in the cost of education is the amount spent on scholarships and fellowships for undergraduate and graduate students. A total of \$36 million was spent for these purposes in 1987-88, \$26 million in funds generated by endowment or received from outside sources, and about \$10 million in unrestricted Institute funds.

THE PRICE OF EDUCATION

During the 1987-1988 year, the tuition rate was \$12,500, and the total tuition and related income was \$125 million. Thus, tuition charges covered about 55 percent of educational costs at MIT in 1987-1988. This relationship has held true here formany years. From 1930 (which is as far back as the analysis has been pushed) to the present, tuition charges have covered from 45 percent to 65 percent of educational costs at the Institute. The circumstances at other private research universities are similar.

On the basis of this analysis, the cost of education at MIT is approximated as follows:

\$150 million Direct expenses of instruction and unsponsored research

\$65 million Allocable indirect costs

Unrestricted funds used in support of scholarships and fellowships \$10 million

\$225 million Total

During the 1987-1988 year, there were 9,100 full-time graduate and undergraduate students enrolled. Consequently, that year the cost of education per full-time student was about \$24,000.*

* This per-student estimate takes no account of summer session enrollment or of the fact that some portion of the \$225 million of educational expenses is incurred in the summer. One may also argue that the \$225-million total overstates the cost of education at MIT because it includes some faculty effort devoted to unsponsored research rather than to instruction and because no allowance has been made for the portion of the shared indirect costs, which, in fact, supports other MIT activities, including the Association of MIT Alumni and Alumnæ, the MIT Press, the housing system, and Dining Services. While precise estimates of these offsets are difficult to establish, the associated reduction in the cost of the education figure is, in my judgment, certainly less than 10 percent. When these factors are taken into account, the cost of education drops to about \$203 million, and the per-student cost drops to about \$22,000.

MAKING UP THE DIFFERENCE

What sources of revenues are used, year after year, to make up the difference (about \$100 million in 1987-1988) between tuition revenues and the cost of education? There are only three such sources: a portion of the income derived from the Institute's endowment, short-term investment income earned on a portion of working capital, and a portion of the annual flow of gifts, grants, and bequests. In each of the three sources, only that portion of the income not specifically designated for other purposes may be used.

If these sources of revenue are insufficient to make up the gap and cover the costs of education, the Institute must either draw on nonrecurring capital resources to balance the budget (as we did in 1987-1988 in the amount of \$3 million) or run a deficit (as we are likely to do in the present year). which requires a similar drawdown of nonrecurring capital funds (e.g., endowment principal or reserves) to close the books at vear end.

Our objective in financial planning and budgeting is to achieve balance without using nonrecurring capital resources to meet recurring expenses. This objective has been achieved in seven of the past ten years. The cumulative net surplus in these ten years was approximately \$6 million, which was added to the principal of endowment or otherwise used for capital purposes, such as the purchase of property for academic purposes. In addition, during that ten-year interval, \$26 million of unrestricted bequests were added to the endowment.

WHAT DRIVES TUITION?

The tuition rate increases from year to year, as the cost of education at the Institute increases. About 74 percent of this cost reflects salaries and benefits. About 80 percent of faculty payroll costs appear as educational costs. These costs have increased strongly in the past five years, both because of the need to restore, to some degree, purchasing power lost by individuals in the high-inflation years of 1975 to 1981 and because of the overriding need to preserve salary competitiveness in the context of other front-rank research universi-

The most rapidly growing element of educational costs is the demand for unrestricted funds in support of undergraduate scholarships. About 60 percent of MIT undergraduates are needy and receive aid. This year the average need is about \$13,000, which is about two-thirds of this year's typical student budget. The average needy student assumes a self-help burden (loan and/or term-time employment) of \$4,900 and receives a grant or scholarship of about \$8,000 to cover the balance. In 1987-1988 scholarship aid to undergraduates totaled \$18 million, of which \$4.5 million came from outside sources, \$6.5 million from MIT graduate students alike.

sources restricted for scholarships, and \$7 million from unrestricted or general

This latter amount, \$7 million, has increased by a factor of 4.5 since the 1980-1981 academic year. This increase is primarily a reflection of changing federal priorities toward student aid. While the aggregate need for student aid has risen steadily, federal scholarship programs have remained essentially flat in real-dollar terms-loans have made up the difference.

Finally, in recent years, we have intentionally decreased enrollments by almost 300. This was done to reduce crowding in the undergraduate houses and to relieve pressures on graduate student thesis supervisors in several departments, particularly those in the School of Engineering. This reduction has placed additional pressure on the tuition rate, since there have been no directly offsetting reductions in educational expenses.

TUITION AND SELF-HELP FOR **NEXT YEAR**

While the process of budget making for the 1989-1990 academic year will not be complete until mid-spring, the principal features of that budget are now reasonably clear-albeit, not fixed. The considerations described above, together with this year's budget imbalance, which must be corrected within two years' time, will require a tuition increase of about 8 percent, which is larger than any during the last five years.

Considerations of undergraduate student aid are closely coupled to tuition setting. The self-help level has been held at \$4,900 for four years, and all of the annual increases in aggregate need have been met by increases in scholarship awards, much of which has been supported by general funds. Next year the self-help level will increase, probably by \$400, and afterwards is likely to follow a pattern of annual increases, in which increases in need are shared between the individual needy student (in the form of increased self-help) and the Institute (in the form of general funds in support of scholarships).

This is not to say that the Institute is relying solely on tuition increases to reduce the projected budget imbalance. Other measures to increase revenues and cut costs are being taken. These include such measures as: moderating projected salary increases for faculty and staff, deferring new program initiatives, unless their costs can be offset by reductions in ongoing programs, considering a modest increase in enrollment, and raising endowed funds for faculty and student support. These measures, taken together, should keep MIT on a sound financial footing, which, in turn, supports the Institute's ability to provide the best possible education for undergraduate and

Deficit-control measures set

By KENNETH D. CAMPBELL

Staff Writer

Since last fall, a group of senior officers and staff, led by Provost John M. Deutch, have worked with the academic deans and vice presidents to develop a plan to bring the Institute's budget into balance within

The budget problem appeared last year, and it appeared that in fiscal year 1989 there would be a \$6 million deficit on an operating budget of about \$1 billion. At the beginning of the fall term, President Paul E. Gray asked the provost to convene a group to consider various ways to eliminate the deficit. In addition to Professor Deutch, this budget advisory group consists of Kenneth A. Smith, Associate Provost and Vice President for Research, William R. Dickson, Senior Vice President, James J. Culliton, Vice President for Financial Operations, Doreen Morris, Assistant to the Provost and the Senior Vice President, and John A. Currie, Director of Finance.

Among the major factors placing pressure

on the budget are: slower than anticipated growth

in research support, pressure to keep salaries (particularly for faculty) competitive with

other research universities,

- desire to keep increases in tuition and self-help rates as modest as possible,
- commitment to maintaining the policy of need-blind admissions, and
- development of new initiatives in education and research.

The budget advisory group, working with the Academic Council, has developed a three-year budget control program. Among the steps being proposed are:

- moderating anticipated salary increases,
- increasing tuition and self-help at somewhat higher rates than in previous years (self help is the amount a student is expected to provide from term-time work and/or loans before receiving scholarship aid),
- modestly increasing student enrollments,
- holding program budgets level or offsetting increases by decreases in other areas,
- using income generated by the Campaign for the future, particularly income from funds raised for faculty support.

Professor Deutch said that these (continued on page 6)