MIT TECH TALK
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Hodges is named dean for curriculum in UESA office

■ **By Kenneth D. Campbell**
News Office

Dean for Undergraduate Education and Student Affairs Rosalind H. Williams announced Monday the appointment of Kip V. Hodges, professor of earth, atmospheric and planetary sciences, as dean of undergraduate curriculum in charge of the Undergraduate Affairs Office, effective January 15. He succeeds Professor Travis Merritt, who retired at the end of the September.

"Kip has a deep love of science, an understanding of MIT students, a desire to make MIT education both lively and effective, a sense of humor, articulateness, an ability to work with the staff as well as faculty and students, and common sense combined with a commitment to change," Dean Williams said.

"He has taught geology to undergraduates and graduates including freshman advisor seminars and also field geology, and has done distinguished research in continental tectonics," Dean Williams continued." He has a hands-on active approach to education: doing science in an active and engaged way. In his department, Kip chaired the graduate education committee for four years and served on the graduate admissions committee for five years.

"In the Institute at large, he has chaired the Committee on the Writing Requirement, co-chaired the special subcommittee on writing of the Committee on the Undergraduate Program, and been a leader in bringing these proposals forward to faculty and students.

"In this long and quite complicated process, Kip has shown a remarkable ability to work patiently but persistently in attaining a consensus and in moving forward proposals that involve significant changes but that are also realistic.

"Kip is eager to catalyze educational reforms by working with departments to define what students need and what innovations will help make MIT education as effective and exciting as possible," Dean Williams continued. "We have had numerous conversations on the need for a proactive, collaborative approach in improving MIT education. Kip will be working closely with others in the larger dean's office to help establish a solid administrative framework, a team approach, for our new organization.

"He will continue his research in continental tectonics, serving the Dean's Office half-time. I feel it's important in this time of rapid change not to overstaff but to see how the office develops, and make additions later as necessary."

Dean Williams noted that Professor Hodges has been at MIT almost continuously since he finished his undergraduate degree at the University of North Carolina at Chapel Hill in 1978.

Professor Hodges, commenting on the appointment, said, "I believe that we at MIT should work toward a better synchronization of our undergraduate curriculum, so our students can see how the export of concepts from one field might influence new research directions in another.

"Many of the greatest breakthroughs in science and technology occurred because a few scientists and engineers saw the value of expanding their horizons to include the misty regions between established disciplines.

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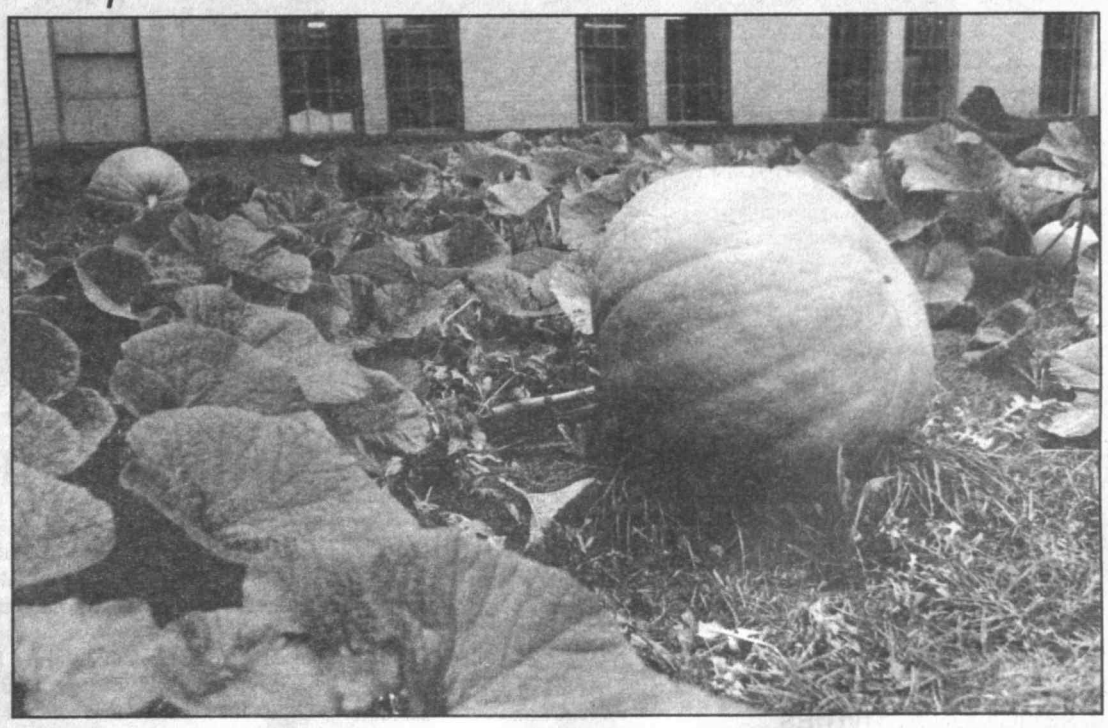
Pumpkin time



Nestled between Buildings 8, 6 and 4 is a pumpkin patch that produced some healthy-looking specimens this fall. Physical Plant gardener Kenny Manning planted the pumpkins, and groundspeople Neil Palmer, Michael Delprete and Alden McDonald helped care for them. The pumpkins are being donated to the Shriners' annual Haunted House.
Photo by Donna Coveney

Group maps a fifth of human genome

■ **By Seema Kumar**
Whitehead Institute

An international team of genome laboratories from North America, Europe and Japan has created a unified gene map that establishes the location of more than 16,000 human genes. The map represents the first edition of the quintessential goal of the Human Genome Project—a catalog of all the genes that make up a human being—and provides the location of one in five of all human genes.

"This gene map and its future editions will provide geneticists the biological equivalent of a chemists' periodic table—a systematic and universal frame of reference that will speed the discovery of genes underlying inherited human diseases," said Dr. Eric Lander, a member of this consortium and director of the Whitehead/MIT Center for Genome Research. "With such a map, searching for a disease gene should no longer take years of painstaking effort. Instead, geneticists will be able to simply scan the human genome for an inventory of all the genes, or candidates, in a suspected region and identify the culprit."

Gene maps will also become essential for searching the genetic basis of complex diseases, such as diabetes and cancer, that are caused by the interaction of several genes and the environment. The new gene map is described in the October 25 issue of Science by more than 100 authors representing the international consortium. The National Library of Medicine has also released a new Web site that incorporates this information in a consumer-friendly format. The URL is <http://www.ncbi.nlm.nih.gov/Science96>.

"A map like this has tremendous value for identifying disease genes and provides extraordinary opportunities for a new era of medicine. Given this, and the wealth of information we have collected so far on the human genome, it seemed a shame to wait until the entire genome is sequenced to put together a gene map," said Dr. Thomas Hudson, senior author on the paper and head of the Whitehead mapping team. "It made more sense to construct a series of increasingly comprehensive gene maps that geneticists around the world can put to good use."

FULL MAP IN NINE YEARS

The Human Genome Project has established a goal of completing the gene map and sequencing the 3 billion DNA building blocks by 2005. The unified gene map, put together in the past 18 months, attains one-fifth of this goal and ensures that researchers will be able to achieve the goal comfortably.

A major contribution to this effort came from the Whitehead Institute. Last year, Whitehead and Genethon announced a comprehensive map of more than 15,000 landmarks called sequence tagged sites or STSs that span 95 percent of the human genome. The integrated map provided researchers the framework for the gene map. Of the 16,000 human genes mapped in this paper, more than 9,000 were mapped at Whitehead.

The work reported in this paper greatly increases the number of mapped human genes. At the end of 1994 there were a little more than 5,000 mapped human genes according to the Genome Data Base. The number of mapped genes has tripled in the last 22 months since this project started.

This first-edition map also reveals some interesting, albiet preliminary, details about the distribution of human

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Researchers mold molecules to aid environment problems

■ **By Nancy Stauffer**
Energy Laboratory

MIT Energy Laboratory researchers are using the tools of molecular engineering to meet a range of environmental challenges, including the cleanup of industrial waste streams and aquifers.

One of today's leading environmental challenges is cleaning aqueous industrial waste streams laden with hydrocarbons and other organic contaminants. Conventional solvents can capture these contaminants, but there are drawbacks. For example, such solvents are usually oily; and while oil and water do not generally mix, a little of the solvent will go into solution, contaminating the water it is supposed to be cleaning.

For the past five years, T. Alan Hatton, the Ralph Landau Professor of Chemical Engineering Practice in the Department of Chemical Engineering, and coworkers have been examining ways to make and use solvents that would solve such problems. One focus of their work is micelles. These structures are made of long polymeric molecules whose two ends have differing properties: one end "hates" water and the other end "loves" it.

When this molecule is in water, the water-hating end wants to separate from the water, while the water-loving end wants to stay in solution. As a compromise, the water-hating ends of 30 or 40 molecules come together to form a core, leaving the water-loving ends dangling on the outside. The resulting structure—the micelle—serves as an excellent water-based solvent. The "corona" of water-loving ends surrounds the compact water-hating core and keeps the micelle in suspension. But the core is still accessible to organic contaminants in the water and will

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Open enrollment for benefits changes begins

Open enrollment for changes effective January 1, 1997, will be held from Tuesday, Oct. 29 through Sunday, Nov. 17. Personal Enrollment Guides that explain how to make changes are being distributed this week to eligible individuals.

During open enrollment, eligible employees may enroll in or change their health plan; change to individual or family, or cancel health or dental coverage; enroll in FRAP; or increase the level of life insurance coverage without evidence of insurability.

HEALTH RATES FOR 1997

The health plan rates for 1997 are shown in the table on page 10. Employees and MIT share in the cost of this coverage by each paying half of the weighted average increase or decrease in the cost of the plans.

There have been several changes to MIT's health coverages for 1997 and many of the plans have expanded their physician networks and enrollment areas. The most significant changes are the combining of Bay State Health Care and Blue Cross Option 2 into the Blue Choice plan and the expansion of Harvard Community Health Plan to Harvard Pilgrim Health Care.

The further expansion of Tufts, Blue Choice and Harvard Pilgrim offers broader choices to employees living in western Massachusetts, Rhode Island, Maine and New Hampshire. This growth also benefits employees living in eastern Massachusetts, since many physicians now participate with more than one physician network.

BLUE CROSS II/BAY STATE CHANGES

Blue Cross has decided not to offer Bay State Health Care for 1997. After discussions with Blue Cross, MIT has de-

(continued on page 10)

IN BRIEF

HALLOWEEN PARTY

The MIT Health Plans' annual children's party and art exhibition will take place on Sunday, Nov. 3 from 2-3:30 pm in the Medical Department atrium (Building E25). Open to all, the party features music, balloons, games and refreshments. Children are encouraged to come in costume.

RLE ANNIVERSARY

The Research Laboratory of Electronics is celebrating 50 years of history with a symposium and Compton Gallery display. See the special section in this issue starting on page 5.

STRATTON SERIES

MIT faculty and United Nations officials will discuss "Refugees, Immigrants and Urban Pressures: Whose Responsibilities, Whose Rights?" at a Catherine N. Stratton Series panel discussion tomorrow (October 31) in the Tang Center's Wong Auditorium (Building E51) at noon.

Student ■Notices

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

■ ANNOUNCEMENTS

Law School Meeting—Oct 30:** Janice Austin, Dean of Admissions, University of Pennsylvania School of Law, 11am-12pm, Rm 12-185 (Pre-Professional Office). For interested students to meet with school representatives. Sponsored by the Office of Career Services and Preprofessional Advising. More info: x3-4737.

Welcome Lunch for Postdocs at MIT—Nov 7:** Special guests: Dr. David Litster, VP and Dean of Science; Dr. Mary Rowe, Spec. Asst. to the President and Ombudsperson; Marianne Wisheart, Assoc. Dir., Career Services; Carolyn Hart, Family Resource Center. Sponsored by the MIT Association for Postdoctoral Women, 12-1:30pm, Whitehead Auditorium. Lunch will be provided. Open to all postdocs at MIT. More info: Valerie x3-7605 or Helen x3-5957.

Career Services and Preprofessional Advising Recruitment Presentations—Oct 30:** *Jefferies and Company, Inc.*, 6pm, Rm 8-105. *Lutron Electronics*, 6pm, Rm 4-149. *Lockheed Martin Company*, 7pm, Rm 2-190. *Digital Equipment Corporation*, 7pm, Rm 4-159. **Oct 31:** *Defense Nuclear Facilities Safety Board*, 7pm, Rm 4-149. **Nov 4:** *Bain - Asia*, 5pm, Rm 4-231. *Michelin Tire Corp*, 5:30pm, Rm 4-149. *Cornerstone Research*, 6pm, Rm 2-105. *Reuters - Information Technologies*, 6:30pm, Rm 4-153. *Raychem*, 7pm, Rm 4-145. *Rockwell*, 7pm, Rm 4-159. **Nov 5:** *Advanced Technology Labs*, 6pm, Rm 4-149. *Dean and Company*, 6:30pm, Rm 4-153. *Merck Company*, 6:30pm, Rm 4-159. *General Electric*, 7pm, Rm 4-231. *Sun Company*, 7pm, Rm 4-145.

■ RELIGIOUS ACTIVITIES

The Chapel is open for private meditation 7am-11pm daily. Regular Chapel services are:

Baptist Campus Ministry—**Weekly events: Tuesday night dinner at 5:15pm; Tuesday night bible study, 6pm; Monday graduate discussion, noon. Meets in Bldg W11.

Campus Crusade for Christ—**Weekly meeting on Wednesdays, 8pm, PDR 1 & 2, 3rd fl Student Center. Daily prayer, Rm W11-080 (CFL), 8am. More info: x2-1781 or <absfree@mit.edu>.

Tech Catholic Community—**Weekday Mass Tues & Thurs 5:05pm, Friday 12:05pm, Saturday 5pm, Sunday 9:30am & 5pm. Call x3-2981.

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

Communitas-Life Together—**Protestant Worship Sunday at 11am. Sponsored by: American Baptist Church, United Church of Christ, United Methodist Church, Presbyterian Church (USA). Chaplain John Wuestneck, x2-1780 or <chaplain@mit.edu>.

Lutheran-Episcopal Ministry at MIT*—Regular Wednesday worship, 5:10pm, followed by supper in the Bldg W11 dining room. Bible Studies, Sundays at 5pm, Bldg W11. More info: x3-0108.

Meditation and Discourse on the Bhagavad Gita*—With Swami Sarvagatananda, MIT Chaplain and Head, Ramakrishna Vedanta Society of Boston. Every Friday, 5:15-6:30pm, MIT Chapel. Sponsored by the MIT Vedanta Society. More info: 661-2011 or <mehta@jimmy.harvard.edu>.

MIT Orthodox Christian Fellowship—**Wednesdays at 5:30pm in Student Ctr DR 1 for dinner followed by Chapel Vespers. Mike Decerbo, Dorm x5-7569.

Other religious meetings:

Baptist Student Fellowship*—Weekly meetings on Tuesdays, include dinner followed by Bible Study. 5:30-7pm, Bldg W11, small dining room. Sponsored by Baptist Campus Ministry. More info: x3-2328.

Graduate Christian Fellowship—**Weekly meetings in Student Ctr, DR 1&2, Thursdays at 5:30pm. Also weekly Bible studies and Responsible Technology discussion group. Andrew Parris x3-2319 or <andrewp@mit.edu>.

Hillel*—More info: x3-2982.

Lincoln Laboratory Noon Bible Studies*—Wednesdays at noon, South Lab S2-410. Annie Lescard, Linc x2899.

MIT Muslim Students Association*—5 daily prayers, Bldg W11; also Friday congregation 1:10-1:45pm, Rm W11-110. Info: x8-9285.

■ OPPORTUNITIES

List Foundation Fellowship Program in the Arts. Awards up to $5000 will be given to support the work of students of color in the visual, performing, or literary arts. Applicants must be currently enrolled, full-time undergraduate or graduate students (freshmen are not eligible), US citizens or permanent residents, and African American, Asian American, Hispanic American, Native American, or Aleutian Islanders. To make an appointment and for guidelines and applications, contact Holly Kosisky, Office of the Arts, Rm E15-205, x3-8089, <holly@media.mit.edu>. Program is administered by Marueen Costello, Director of Special Programs, and cooperating faculty from the MIT community. Application deadline: **Oct 30.**

MIT Public Service Center Fellowships. This IAP, make a difference in a child's life and get paid for it. Fellowships of $1200 will be awarded to MIT students interested in working in Cambridge Public Schools over IAP. These grants, sponsored by the Lord Foundation and the Germeshausen Foundation, are intended to enable MIT undergraduates to work intensively with elementary, middle, and high school students in Science Curriculum Development or Educational Technology Support. Applicants must submit an application form and two letters of recommendation. Application forms and additional information are available from Tracy Purinton, Rm W20-311, x3-0742. Deadline: **Nov 1.**

■ STUDENT JOBS

There are more job listings available at the Student Employment Office, Rm 5-119, or on the Web at <http://tute.mit.edu/seo/wwwcl/seo.html> (student access only).

Off-Campus, Technical. Intern for computer database migration to Microsoft Access; comprehensive overhaul of Co. database. Also want to set up web site. Office located near North Station in Boston. Call Jeff Wallace at 742-7088 x105.

Off-Campus, Non-Technical. Babysitter needed. Looking for Chinese, Mandarin speaking babysitter for 5 year old girl, 3-8pm weekdays, preferably with a car. Call Dr. Reeves at 354-6321.

On-Campus, Non-Technical. Responsible for ensuring that the AV equipment in the Sloan classroom is cleaned and generally maintained on a regularly scheduled basis. Ensure that standard classroom equipment is in place, complete and functioning. Replace batteries in remote as needed, report any lost/damaged/incomplete equipment. Call Virginia Gifford at x3-3618.

For students with a Federal Work Study component in their aid package.

Editorial Mentor. Not a writing position. Work directly with teens on the teen editorial board as a mentor and a resource. Must participate in training workshop. Qualifications: editorial experience preferred but not necessary, experience working with at-risk teens helpful. Some office work required. All applicants must have at least a working knowledge of MS Word for Windows. Call Kristin Chase at 262-2434.

Program Coordinator. Coordinator to administer program activities for high school boys. Duties: assist in design of individual curriculums; track progress of each student; engage students in creative projects; plan functions, such as field trips and special events; help recruit and train volunteers. Junior, senior or grad student preferred. Please submit a resume and cover letter via fax to Ashok Pinto at fax 296-2280; candidates will be contacted for interviews.

Development Assistant. Intern will research foundations, write funding proposals, utilize on-line funding resources, and become familiar with Center projects and programs. Qualifications: Graduate student with strong organizational, research, and computer skills, excellent writing and communication skills, and experience writing proposals. Applicants should submit a 1-2 page statement describing their relevant background and skills, as well as a brief writing sample. Send statement and writing sample to Heather Simpson, 1493 Cambridge St., Cambridge, MA 02139.

Crimewatch

The following incidents were reported to the MIT Campus Police between Oct. 18-23:

Oct 18: *Bldg E51*, suspicious activity; *Bldg E55*, harassing phone calls; *Bldg 16*, malicious damage to vending machines; *Bldg 4*, $40 cash and credit card stolen; *Bldg 7*, wallet stolen, $4; *Ashdown*, $50 bike stolen.

Oct 19: *Bldg 7*, portable CD player stolen, $150; *Astro turf*, jacket stolen, $100; *Briggs field*, wallet stolen, $50; *Rear of NW14*, male arrested for outstanding warrant; New House, harassing phone calls.

Oct 20: *Amherst St. by Ashdown*, car broken into and wallet stolen $50; *Bldg E25*, coat stolen, $100; *Bldg 7*, various items stolen, $600; *Tang*, bike stolen, $350; *Bldg 2*, obscene e-mail; *Bldg 66*, various items stolen, $300.

Oct 21: *Briggs Field*, wallet stolen, $50; *Johnson indoor track*, wallet stolen, $10.

Oct 22: *Bldg 16*, malicious damage to vending machines; *Bldg NW21 alley*, male arrested for outstanding warrant; *500 Memorial Dr.*, 1) bike stolen, $260; 2) bike stolen, $300; *Student Ctr.*, suspicious person; *Hayden Library*, wallet stolen, $20.

Oct 23: *Bldg 39*, jacket stolen, $150; *Student Ctr.*, male taken into custody on an outstanding warrant; *Sailing Pavilion*, wallet stolen, $30.

MIT students Ron Cao (second from left) and Jake Seid (far right) spent five weeks last summer working with Professor Neng Wong of East China Normal University (left), six students from the Number 2 Secondary School Attached to East China Normal University, including Charley Huang (second from right), and others to develop China's first high school Web server.

Students link China high school to Web

■ By Kathleen Rowe
News Office

Instantaneous worldwide communication comes more slowly to some places than others. An Internet link between a Shanghai secondary school and the rest of the world has just been forged by two MIT students who traveled to China last summer to set up that country's first high school Web server.

Ron Cao and Jake Seid, graduate students in electrical engineering, went to Shanghai to teach students from the Number 2 Secondary School Attached to East China Normal University about e-mail and the Internet, to train them how to make home pages using HTML, and show them how to set up and maintain a Web server.

Their project, the "Computer Educational Development Initiative in Shanghai, China," had three goals:

- To enable students to use their technical understanding to advance computer-aided education in China.
- To build multicultural understanding and awareness between younger-generation Chinese and Americans.
- To offer MIT undergraduates the chance to form a lasting relationship with students and teachers at a Chinese high school.

"Not only will e-mail facilitate communication between East and West, but as other Chinese high schools follow the model set by the Number 2 School, e-mail will facilitate communication among the younger generation of China's many provinces," Mr. Cao said.

The two MIT students helped the school set up e-mail accounts for both students and teachers to allow communication between MIT and the high school. After five weeks, the high school students had created China's first student home pages, first Internet educational program (where students can do math, physics and chemistry problems on the Web in Chinese), and first on-line Chinese HTML primer.

"This is one of the most exciting projects we've started," said Professor Suzanne Berger, head of the MIT International Science and Technology Initiative (MISTI), which along with the Eloranta Fellowship funded the student project.

"One of the most striking lessons I learned was the importance of being able to see issues from a non-American point of view," Mr. Seid commented. "In order to understand the needs and concerns of another culture, you can't assume that the 'American way' of doing things will always be correct. This experience will make me more sensitive to differences in perspectives that exist across cultures." He is studying the future of the information technology industry as part of MIT's Made By Hong Kong project.

CONTINUATION PROPOSED

Mr. Cao and Mr. Seid proposed a continuation of their project, the MIT-China Educational Technology Initiative (MIT-CETI), to MISTI. Under this program, two MIT students will go to Shanghai next summer to help the Number 2 Secondary School further advance its computer-aided education program—possibly setting up a local-area network, teaching C or Java, or expanding on this year's HTML work.

MISTI, through funds from the Dr. Ge Y. Chu Fund and the Freeman Foundation Grant, has just announced that it will support a second year of the program, and organizers are now seeking two more MIT students who are interested in going to China.

"These are opportunities for our students to establish partnerships with Chinese students and researchers that we hope will continue for their whole lives," Professor Berger said.

China is an emerging center for innovation and industry, she added. "With this program there are long-term mutual benefits for China and the U.S.—many American firms are extremely interested in not only selling to China, but being close to the innovation there."

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■ CABLE

Frequent schedule updates now appear on TechInfo. For more information about cable at MIT, call Randy Winchester at x3-7431, Rm 9-050, e-mail: <randy@mit.edu>. World Wide Web: <http://web.mit.edu/org/m/mitcable/www/home.html>.

Oct 30: *Channel 8:* 11am-12:30pm—Live coverage of the EECS/RLE Optics and Quantum Electronics Seminar: "Trends in Ferroelectric Optical Devices," William Burns, Naval Research Laboratory. *Channel 9:* 5pm-2am—Repeat of above lecture (Burns).

Oct 31: *Channel 10:* 4pm—Physics 8.01 Review Assignment #9 with Prof. Walter Lewin. This program will repeat every hour on the hour until 4pm, 11/7.

Nov 4: *Channel 8:* 4-5pm—Live coverage of the MIT-EECS Colloquium: "Approaching the Channel Capacity of Bandlimited Channels," David Forney, Vice-President, Motorola, Inc. *Channel 11:* 9am—Chemistry 5.11 Exam Review #2. This program will repeat until 9am, 11/5.

Nov 5: *Channel 8:* 4-5:30pm—Live coverage of the MIT MTL VLSI Seminar: "Chemical Mechanical Polishing: Meeting Planarization Requirements in ULSI Manufacturing," Dale Hetherington, Sandia National Laboratories. *Channel 9:* 5:30-2am—Repeat of above lecture (Hetherington).

Nov 6: *Channel 8:* 11am-12:30pm—Live coverage of the EECS/RLE Optics and Quantum Electronics Seminar: "Photolithography and Its Limits (?)" Mordechai Rothschild, MIT Lincoln Laboratory. *Channel 9:* 5pm-2am—Repeat of above lecture (Rothschild).

Nov 7: *Channel 10:* 4pm—Physics 8.01 Review Assignment #10 with Prof. Walter Lewin. This program will repeat every hour on the hour until 4pm, 11/14.

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Student-services offices plan to forge closer ties

■ By Carla Lane
FAST Communications

This month, more than 100 members of the MIT community came together for an unusual event. Representing a number of different offices that serve students, they convened over four half-days to begin planning a new organization that will better integrate the services now provided by the offices of Student Financial Aid, the Bursar, the Registrar and the Student Information System.

Reengineering

The need to reorganize the way these services are offered has been recognized for a number of years. "MIT was spending a lot of money and a lot of good people were working hard, but our students were still unhappy," said Shirley Picardi, a director in Information Systems who served as bursar from 1985-95. Called the Learning Forum, the sessions were sponsored by the Financial and Academic Services Transition team (FAST) of Student Services Reengineering (SSR). The Forum's goal was to bring together the people who provide these services—the people who know both their virtues and their problems—to explore ideas for redesigning them.

Most of the participants were members of the offices being reorganized. Because their functions are now separate, however, they rarely work together. The meetings gave them the opportunity to interact directly and share their ideas and concerns. They were joined by people from other offices that serve students, including Residence and Campus Activities, Undergraduate Academic Affairs, and laboratories and departments around the Institute. A few faculty and students also took part. "None of us works in a vacuum," said Stephen Immerman, director of administration and operations in the Office of the Dean for Undergraduate Education and Student Affairs. "We need input from everyone for this reorganization to be successful."

In the new alignment, the four offices being reorganized, as well as the Admissions Office, the Department of Athletics and Physical Education, the Campus Activities Complex, the Office of Career Services and Preprofessional Advising, and Housing and Food Services will be part of one integrated organization reporting to Dean Rosalind Williams. Dean Williams is the overall sponsor of Student Services Reengineering.

Each of the first three Learning Forums contained the same parallel sessions, each organized around a topic critical to the redesign. Because people could select which session they would attend on which day, the groups were quite diversified. The FAST human resources team organized the discussions around information they gathered from focus groups with staff, interviews with students and faculty conducted last spring by the SSR Assessment and Redesign teams, and research on other academic institutions provided by the FAST best practices team.

In one session, participants discussed what students, faculty, staff, parents, alumni/ae, and even the public want in student services, and what conflicts exist in the MIT culture that might interfere with their delivery. Explained Melinda Cerny, a member of FAST: "For example, students want easy and direct access to their records by having as much information and as many transactions as possible online. But this expectation could conflict with the desire of faculty and staff to maintain meaningful personal contact with students. We discussed ways to accommodate both wishes."

LOOKING CLOSELY AT OFFICES

In another session, participants considered the responsibilities of each office and ways the offices could be reorganized to do the work better. In the third session, they explored the concepts behind the process-centered organization, a new practice of organizing a large-scale enterprise around its goals rather than around the tasks necessary to achieve them. Once the group became familiar with the principles, they met in smaller groups to discuss the goals of MIT's financial and academic student services and to propose better ways to accomplish them.

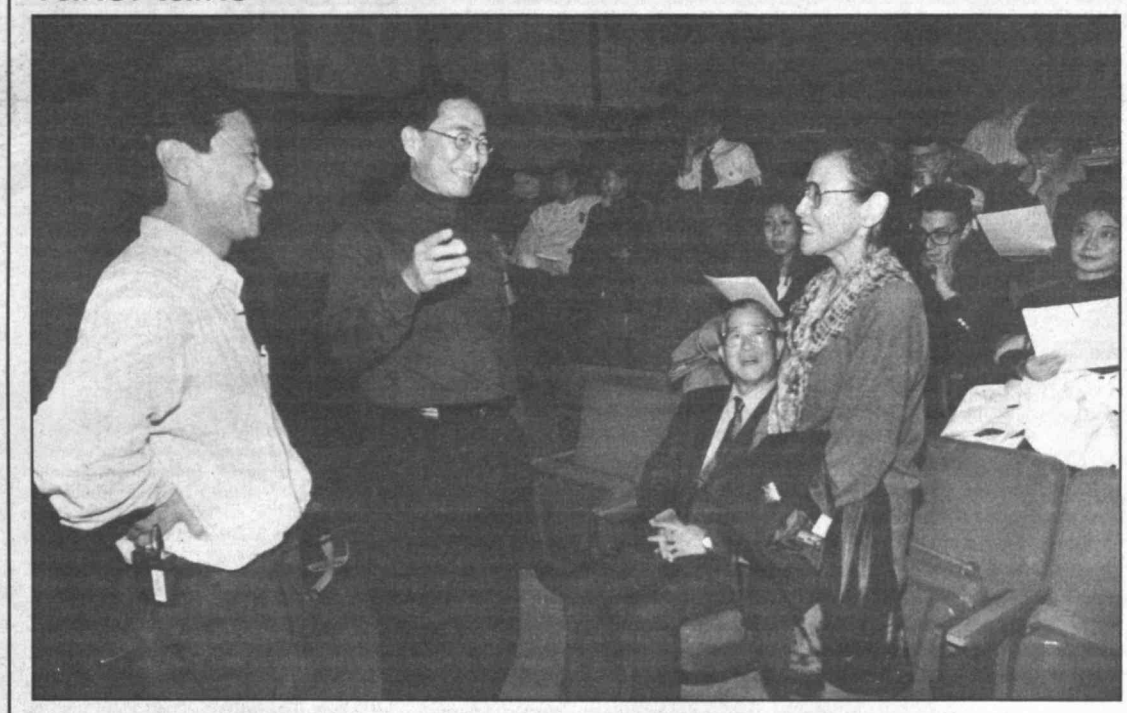
Records of the issues raised in all sessions on these first three days were put on posters, so that in the fourth session all participants could see all the ideas the groups considered. People reviewed the suggestions and concerns, and identified the themes and trends that were most important.

Arnold Henderson, associate dean of counseling and support services, was one of the staff members who came from outside the four offices being reorganized. "We rely heavily on the people in these offices, so to be effective, we need to be able to understand their functions," he said. "I was also glad to be able to share my own perspective on working with students."

The ideas developed in the Learning Forum will become the basis for the Design Forum to be held Thursday and Friday, Oct. 31 and Nov. 1, where

(continued on page 9)

Takei talks



Professor Shigeru Miyagawa of foreign languages and literatures (far left), who was born in Japan and lived there until age 10 when his family moved to the United States, has made an interactive CD-ROM called "Star Festival" of material from his personal trek to rediscover his Japanese roots. Actor George Takei (center), who played Lt. Sulu on the original Star Trek, is providing narration on the CD-ROM as Professor Miyagawa. Mr. Takei was an artist-in-residence at MIT last week, working in classrooms and presenting some of the soon-to-be-released "Star Festival" to an audience which included Professor Miyagawa's parents, Ichiro Miyagawa (seated in front) and Mitsuko Miyagawa (far right). **Photo by Donna Coveney**

Perspectives lectures start Friday

The Perspectives series, in which Media Lab researchers speak about their current work and about changes and new developments in their respective fields, resumes on Friday, Nov. 1 with a talk by Seymour Papert, LEGO Professor of Learning Research, entitled "Why Can't You Learn Chinese in a Day?" All talks are from 5-6pm in Bartos Theater (Building E15).

Professor Papert will offer speculations on whether computers have helped us understand or extend the limits of learning, and answer criticism by skeptics including Institute Professor Noam Chomsky of linguistics. Other talks are as follows:

November 19—Marvin Minsky, Toshiba Professor of Media Arts and Sciences, "Computers, Emotions, and Common Sense." Many people still believe that the human mind has qualities that no machine can match, such as motivation, feelings and "consciousness." Professor Minsky argues that these differences come not from the nature of our machines, but rather from constraints we imposed on them in our earliest methods of programming. Now that computers have grown in power, he suggests it is time to begin to remove those restrictions and make computers more "human."

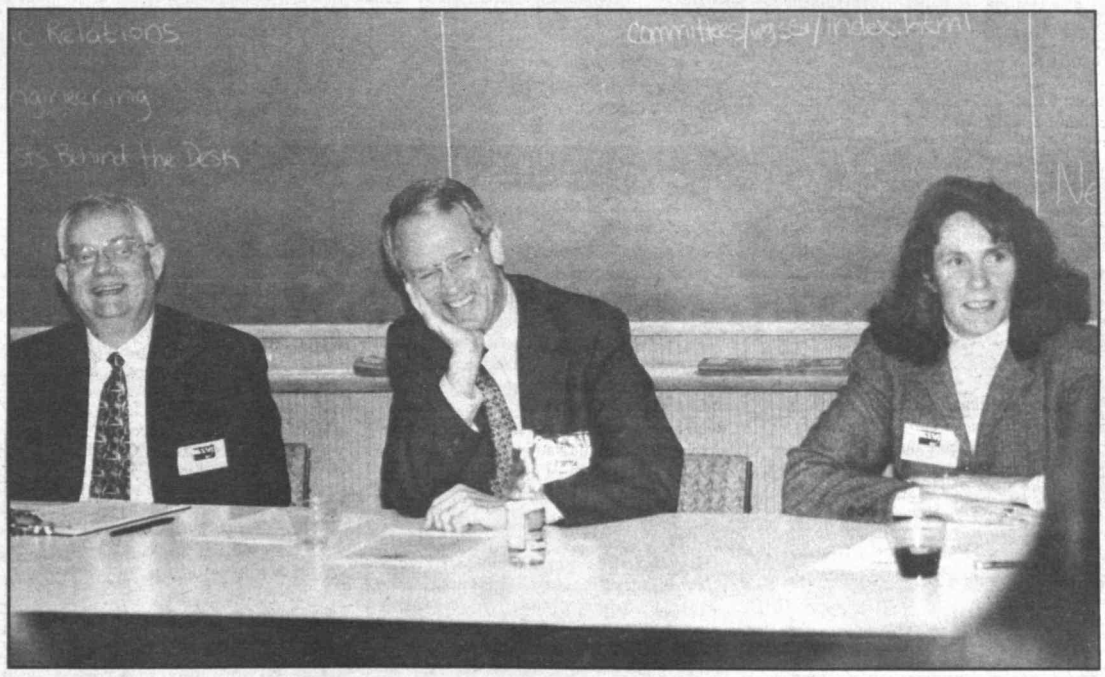
February 25—Professor Hiroshi Ishii, "Tangible Bits: Towards Seamless Interfaces Between People, Bits and Atoms." Professor Ishii will explore attempts to bridge the gap between our physical environment and cyberspace by developing ways to make digital information accessible through physical surfaces, everyday objects, and ambient media such as light, sound, and air. The goal of this work is to move away from the current model of human-computer interaction that uses a monitor display, keyboard and mouse, and create a new set of "tangible interfaces."

March 18—Professor Joseph Jacobson, "Electronic Books and Electronic Paper." This talk will focus on the current status, future directions and implications of work on new display technologies that underlie the development of the "one-book" library. With such technology, a user could press a button and read "Jane Eyre" on real paper—then close the book, press the button again and read today's newspaper on those same pages.

April 29—Professor Bruce Blumberg, "Building Things with Behavior and Character." By combining ideas from the study of animal behavior and classical animation, we can learn how to build interactive characters that not only display the rich level of behavior found in animals, but also convey what they are "feeling" and what they are likely to do next. Applications for this work include interactive characters and companions used for immersive storytelling environments and as the basis for "smart" avatars for Web-based environments.

The talks are free; members of the MIT community and the public are invited to attend on a first-come, first-served basis.

Lending support



Edward A. Jacobson, President Charles M. Vest and Cheryl M. Thornton share a relaxed moment at the October 16 meeting of the Working Group on Support Staff Issues, of which Mr. Jacobson and Ms. Thornton are co-convenors. Dr. Vest attended the meeting for an open discussion "to get to know what's on the minds of support staff at MIT," she said. **Photo by Donna Coveney**

■ Awards & Honors

■ Students, postdoctoral associates and friends have endowed a new award in honor of Professor **Klaus Biemann** of the Department of Chemistry, who recently accepted MIT's early-retirement offer. The Biemann Medal and a cash award will be presented annually to an individual early in his or her career who has made a significant achievement in basic or applied mass spectrometry.

The medal honors Professor Biemann, whose "lasting legacy is the training of students and postdoctoral associates over a 40-year period at MIT." Said Dr. Ronald A. Hites, who received the PhD with Professor Biemann and was on the MIT faculty from 1972-79: "I'm always telling my graduate students things that Klaus told me. From him, we learned how to organize our thinking, and we learned how to give a scientific talk that was also an interesting story. He tells a fine story, and we all learned that one way or another." Dr. Hites is now a professor at Indiana University.

The first award (which has been funded from contributions by many of Professor Biemann's approximately 250 former doctoral students and postdocs) will be given at the 1997 meeting of the American Society for Mass Spectrometry.

■ Professor **Daniel Kemp** of the Department of Chemistry has been chosen as a recipient of the 1997 Arthur C. Cope Scholar Award from the American Chemical Society. The Cope Scholar Awards program was established in 1984 to recognize and encourage excellence in organic chemistry. Professor Kemp will deliver a lecture at the Arthur C. Cope Symposium, organized by the ACS Division of Organic Chemistry, next September in Las Vegas.

■ The Alpha Theta chapter of **Sigma Chi** at MIT was presented with the Peterson Significant Chapter Award at the fraternity's 49th annual leadership training workshop in August in Bowling Green, OH. Award criteria include scholarship, pledge and member retention, financial stability, campus activities and leadership, campus and community service, faculty and alumni relations, publications, initiation and pledge programs.

The Sigma Chi Foundation sponsors the award (the highest bestowed on an undergraduate chapter) and presents winning chapters with a cash contribution for its university's counseling or tutoring program. There are 229 undergraduate chapters in North America; 44 received the 1995-96 award.

Institute Calendar

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

October 30 - November 10

■ SPECIAL INTEREST

Research Laboratory for Electronics 50th Anniversary Celebration*—Nov 1-2: See insert in this issue and schedule on page 8.

President Vest on National Policy and MIT—Nov 6:** Sponsored by the MIT Women's Forum, 12-1pm, Rm 14W-111 (Killian Hall). More info: <rks@mit.edu>.

■ SEMINARS & LECTURES

WEDNESDAY, OCTOBER 30

Trends in Ferroelectric Optical Devices*—William Burns, Naval Research Laboratory. EECS/RLE Seminar Series on Optics and Quantum Electronics, 11am-12pm, Rm 34-401B (Grier Room B). More info: x3-8504.

US Policies Toward 'Rogue States'*—Robert Litwak, Director, International Studies, Woodrow Wilson Center, Smithsonian Institution. Defense and Arms Control Studies Program Seminar, 12-1:30pm, Rm E38-615. Bring a bag lunch, refreshments provided.

Time Series Analysis of Climate Data*—Dr. David J. Thomson, Bell Laboratories. The Houghton Lectures, sponsored by the Center for Meteorology and Physical Oceanography. 7th of 8 lectures: Statistical Properties of Climate and Solar Proxy Series. Lectures will be held Wednesdays and Fridays, 2-3:30pm, Rm 54-325.

Recent Advances in the Theory of Proteins and Heteropolymeric Gels: Kinetics*—Prof. Alexander Grossberg, MIT. Polymer Seminar sponsored by the Program in Polymer Science and Technology, 3:30pm, Rm 37-252. Refreshements. More info: <rutledge@mit.edu>.

Computer Simulations of the Earth's Magnetic Field and Inner Core Rotation*—Dr. Gary Glatzmaier, Los Alamos National Laboratory. Sponsored by the Dept. of Earth, Atmospheric and Planetary Science, 4pm, Rm 54-915. Refreshments, 3:30pm, Ida Green Lounge.

PAHs at a Coal Tar Site*—Allison Mackay, G. Environmental/Aquatic Sciences Seminar, MIT Parsons Laboratory, 4pm, Rm 48-316. More info: Jannie x8-5554 or <janiscka@mit.edu>.

THURSDAY, OCTOBER 31

Refugees, Immigrants, and Urban Pressures: Whose Responsibilities, Whose Rights?*—Moderator: Bishwapriya Sanyal, MIT. Panelists: Myron Weiner, MIT; Janice Perlman, US delegate at the 1996 UN Habitat II Conference. Speaker: Wally N'Dow, secretary general of Habitat II. Catherine N. Stratton Series sponsored by the Women's League, 12pm, Wong Auditorium, Tang Center (2 Amherst St.).

Production Entry Strategies in Developing Countries: The Special Case of China*—Ann Gray, Harvard Business School. Operations Research Center Seminar, 4-5pm, Rm E40-298. Refreshments follow, Rm E40-106 More info: see <http://web.mit.edu/orc/www> or call x3-6185.

Changing Media and the Presidential Election*—Henry Jenkins, MIT. MIT Communications Forum, 4-6pm, Rm E15-070 (Bartos Theater).

High Tc Superconductors: A New Paradigm in the Theory of Solids*—Samuel Ting, MIT. MIT Physics Colloquium, 4:15pm, Rm 10-250. Refreshments, 3:45pm, Rm 26-110.

FRIDAY, NOVEMBER 1

Research Laboratory for Electronics 50th Anniversary Celebration*—See insert in this issue and schedule on page 8.

Lecture by Thomas Downs, President and CEO, Amtrak. Center for Transporation Studies "Chief Executive Viewpoints" Luncheon Seminar, 12-12:45pm lunch, 12:45-2pm lecture, Rm 10-205. Lunch is available for a modest fee.

Infrared and Raman Spectroscopy Techniques*—Rick Hapanowicz, Rich Carl, Nicolet Instrument Corp. Sponsored by the Center for Material Science and Engineering, 1pm, Rm 13-2137.

Time Series Analysis of Climate Data*—Dr. David J. Thomson, Bell Laboratories. The Houghton Lectures, sponsored by the Center for Meteorology and Physical Oceanography. Last of 8 lectures: Persistence in Temperature Series. Lectures will be held Wednesdays and Fridays, 2-3:30pm, Rm 54-325.

Model for the Period and Amplitude of Sawteeth: Open Problems*—Dr. Franco Porcelli, Poytecnico of Turin. Plasma Fusion Center Seminar, 4pm, Rm NW17-218.

Yellowstone and the Western US: Plate Tectonics and non-Plate Tectonics*—Dr. Eugene Humphreys, Univ. of OR. Sponsored by the Dept. of Earth, Atmospheric and Planetary Sciences, 4pm, Rm 54-915. Refreshments, 3:30pm, Ida Green Lounge.

Why Can't You Learn Chinese in a Day?*—Seymour Papert, MIT. Perspectives Series lecture sponsored by the MIT Media Laboratory, 5pm, Rm E15-070 (Bartos Theater).

SATURDAY, NOVEMBER 2

Building Your Team: Formulas for Success*—MIT Enterprise Forum's Fall Workshop, 7:15am-6pm, Kresge Auditorium. Registration: $175/forum members, $195/non-members. More info: 1-800-221-2333.

Research Laboratory for Electronics 50th Anniversary Celebration*—See insert in this issue and schedule on page 8.

MONDAY, NOVEMBER 4

Fuel Performance Issues*—Mr. John E. Rivera, Yankee Atomic Electric Co. Department of Nuclear Engineering/American Nuclear Society Student Chapter Seminar, 3:30pm, Rm NW12-222. Refreshments, 3pm.

Approaching the Channel Capacity of Bandlimited Channels*—David Forney, Vice-President, Motorola, Inc. MIT-EECS Colloquium, 4-5pm, Rm 34-101. Refreshments, 3:45pm.

The Motion of a Sphere in a Viscoelastic Fluid*—Dr. Mark T. Arigo, Stokes Lab, Harvard Univ. Mechanical Engineering Fluid Mechanics Seminar Series, 4-5pm, Rm 5-234. More info x3-5365.

Bioremediation of Petroleum Contaminated Soils: Ex Situ Vented Biopile Case Study*—Dr. Michael Miller, CDM. Dept of Civil and Environmental Engineering Water Resources & Environmental Engineering Seminar, 4pm, Rm 48-316. More info: Janni x8-5554.

Barotropic and Baroclinic Tides in the Western North Atlantic Determined from Long-Range Reciprocal Acoustic Transmissions*—Brian Dushaw, Univ. of WA. Quasi-Biweekly Seminar sponsored by the Center for Meteorology and Physical Oceanography, 4pm, Rm 54-915.

Superfluid Vortex Interactions*—Prof. Joel Koplik, Levich Institute, City College of New York. Applied Mathematics Colloquium, 4:15pm, Rm 4-163. Refreshments, 3:45pm, Rm 2-349. More info: <http://web.mit.edu/mathdept/www/AppliedMathColloq/fall96> or x3-7770.

TUESDAY, NOVEMBER 5

Stalinist Technological Style: the Roots of Russia's Ongoing Environmental Crisis*—Paul Josephson, Independent Scholar. Dibner Institute Tuesday Lunchtime Colloquium, 12-2pm, Rm E56-100. If you plan to attend, please call x3-6989 or contact <dibner@mit.edu>.

The 1996 Draper/MIT/Boston University Autonomous Helicopter System*—Eric Johnson, Draper Labs. Autonomous Underwater Vehicles Seminar Series sponsored by MIT Sea Grant, Draper Labs and MIT Dept of Ocean Engineering, 12pm, Rm E38-300. More info: x3-9310 or <bales@mit.edu>.

The 1996 Draper, MIT and Boston University Autonomous Helicopter System*—Eric Johnson, Draper Labs. Autonomous Underwater Vehicles Seminar sponsored by MIT Sea Grant, Draper Lab and MIT Dept of Ocean Engineering, 12pm, Rm E38-300. More info: x3-9310.

Chemical Mechanical Polishing: Meeting Planarization Requirements in ULSI Manufacturing*—Dale L. Hetherington, Sandia National Laboratories, Albuquerque, NM. MTL VLSI Seminar Series, 4pm, Rm 34-101. Refreshments, 3:30pm. More info: x3-4799.

Multidisciplinary Research on Environmental Aspects of Semiconductor Manufacturing: Challenges and Opportunities*—Prof. Farhang Shadman, Univ. of AZ, Director of the Environmental Research Center. Part of a series of seminars, transmitted live via compressed video, entitled "Environmentally Benign Semiconductor Manufacturing." Seminars will take place about twice a month through April 1. Presented by Microsystems Technology Laboratories, 4pm, Rm 26-100.

Campus and Works for Carnegie Mellon University*—Michael Dennis, MIT. Sponsored by the Dept of Architecture, 6:30pm, Rm 10-250. More info: x3-7791.

WEDNESDAY, NOVEMBER 6

Photolithography and Its Limits(?)*—Mordechai Rothschild, MIT Lincoln Laboratory. EECS/RLE Seminar Series on Optics and Quantum Electronics, 11am-12pm, Rm 34-401B (Grier Room B). More info: x3-8504.

The Challenger Disaster*—Dianne Vaughan, Boston University. Defense and Arms Control Studies Program Seminar, 12-1:30pm, Rm E38-615. Bring a bag lunch, refreshments provided.

President Vest on National Policy and MIT—**See Special Interest, above.

Modeling the Interfacial Behavior of Polymeric Systems*—Prof. Anna Balazs, Univ. of Pittsburg. Polymer Seminar sponsored by the Program in Polymer Science and Technology, 3:30pm, Rm 37-252. Refreshements. More info: <rutledge@mit.edu>.

Algal Photosynthetic Physiology*—Claire Ting, Visiting Scientist. Environmental/Aquatic Sciences Seminar, MIT Parsons Laboratory, 4pm, Rm 48-316. More info: Jannie x8-5554 or <janiscka@mit.edu>.

The Earth's Spinning Core*—Dr. Xiaodong Song, Lamont-Doherty Observatory of Columbia University. Sponsored by the Dept. of Earth, Atmospheric and Planetary Sciences, 4pm, Rm 54-915. Refreshments, 3:30pm, Ida Green Lounge.

Observing the Ocean*—Dr. James G. Bellingham, MIT Sea Grant. The Fourteenth Robert Bruce Wallace Lecture, Dept of Ocean Engineering, 4pm, Rm 9-150. Reception immediately following.

THURSDAY, NOVEMBER 7

Space Museums*—Jeff Foust, G. Sponsored by Students for the Exploration and Development of Space, 7:30pm, Rm NE43-800. More info: x8-2828 or <bam@draper.com>. Refreshments.

FRIDAY, NOVEMBER 8

Railroad Classification Yard Performance*—Carl Martland, MIT. Center for Transporation Studies Research Seminar, 12-1:30pm, Rm 1-236 (Spofford Room).

The Coupling of Plate Motion and Orogenic Events—or How the Alps Helped Make the Andes*—Dr. Paul Silver, Carnegie Institution of Washington, DTM. Sponsored by the Dept. of Earth, Atmospheric and Planetary Sciences, 4pm, Rm 54-915. Refreshments, 3:30pm, Ida Green Lounge.

SATURDAY, NOVEMBER 9

Bukhara: The Sources, the Myth, the Architecture and the Urban Fabric*—Conference sponsored by the Aga Khan Program for Islamic Architecture at Harvard University and MIT. To RSVP or for more info: Attilio Petruccioli, MIT Rm 10-390, phone x3-1400, fax x8-8172, <minas@mit.edu>. Continued on Nov 10.

SUNDAY, NOVEMBER 10

Bukhara: The Sources, the Myth, the Architecture and the Urban Fabrid—See listing for November 9.

■ COMMUNITY CALENDAR

CPR Course—Nov 9:** Section B, 9am-3pm. $50, limited enrollment, preregistration required. Sponsored by the Medical Dept. More info: x3-1316.

Health Education Free Friday Workshops—Nov 1:** Advanced Applications of Biofeedback in Behavioral Medicine, 12-1pm, Rm E23-297. Sponsored by the Medical Dept. More info: x3-1316.

Health Education Stress Reducers—Oct 31-Dec 12:** Manage Your Stress!, 6 sessions, 6-7:30pm Thursdays, $50 (MIT Health Plans, students, and retirees $45). **Nov 8-Dec 20:** Friday Noon Cool-Down: The Feldenkrais Method, 6 sessions, 12-1pm Fridays, $50 (MIT Health Plans, students, and retirees $45). Preregistration required. Sponsored by the MIT Medical Dept. More info: x3-1316.

Health Education Workshops for Parents and Parents-To-Be—Oct 30:** Babies are Smarter Than You Think. **Nov 6:** Making Playtime More Fun for You. All sessions 12-1pm, Rm E23-297. Children welcome, no preregistration necessary, sessions are free. Sponsored by the MIT Medical Dept.. More info: x3-1316.

Informal Needlework Group—**Sponsored by the MIT Women's League, 10:30am-1:30pm, Rm 10-340 (Emma Rogers Room). Upcoming meetings: **Nov 6, 20, Dec 4, 18, Jan 15, Feb 5, 19, Mar 5, 19, Apr 2, 16, May 7, 21, June 4.**

MIT Pistol & Rifle Club, Basic Pistol Marksmanship Course*—Starts **Nov 6,** 4 nights: **Nov 6, 7, 14, 15,** 6-9pm. 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 $50, $10 deposit. Info/registration: Valerie Lowe, Draper x8-4769 or <vlowe@draper.com>.

Repetitive Strain Injuries (RSI) Series—**Free, no preregistration necessary, 12-1pm, Rm E25-111. **Nov 1:** Occupational Therapy and RSI: Prevention and Treatment. **Nov 8:** A Discussion of Appropriate Adaptive Equipment and Workers' Compensation. Sponsored by the MIT Medical Dept. More info: x3-1316.

Wives' Group—Oct 30:** "Getting Around Boston—Sightseeing Highlights In and Around Cambridge and Boston," Tunie Hamlen, Tour Director, New England Sights. **Nov 6:** Puppet Show and Finger Puppet Making, with Margaret Moody, Wives' Group member and puppeteer with the Galapagos Puppet Troupe. Puppet show for 3-7 year olds, puppet-making for all. Meetings are from 3-4:45pm, Rm 400 Student Ctr. Babysitting available in Rm 491. **Nov 8:** Harvard Tour and coffee hour. Meet at the Harvard Square Information Kiosk (call x3-1614 for meeting time). Tourguide: Peggy Teek, Southern Baptist Chaplaincy. All members of the MIT community are welcome. Info: x3-1614.

■ SENIOR FOCUS

The Singapore Connection: Soft Landing for Businesses in China—Nov 4:** Speaker: Mr. Kheng-Hwa Ko, Deputy Managing Director, Singapore Economic Development Board. Sponsored by the MIT Club of Boston, 5:30-9pm, MIT Faculty Club. $30 for dinner & lecture, call Kathleen Fitzgerald at x3-5168.

■ MITAC

The MIT Activities Office (MITAC) is a non-profit employee service that serves the cultural and recreational needs of the MIT community (including MIT's retirement community), their families, and friends. Two locations: (1) Room 20A-023, 18 Vassar St, Cambridge, 9:30am-3:30pm, Monday, Wednesday, Thursday, and Friday (closed Tuesday and all Institute holidays); (2) Room LLA-218, x6130, Lincoln Lab., Lexington, 1:15-4pm, Thursday and Friday only. Call x3-7990 at 20A-023 or e-mail <julieh@mit.edu> for further information. Please note that MITAC accepts only cash or a personal check (with a valid MIT ID) made payable to MIT. (Include MIT ID#, room number, and extension on checks.) Credit cards not accepted.

New England International Auto Show (Bayside Expo Center)—Nov 2 - Nov 11:** tickets $5.50 (reg. $8).

"Nutcracker" Ballet (Wang Center, Boston)—Nov 30:** 2pm, tickets $45 (reg $59). Must be purchased by 11/8.

Handel's "Messiah" (Symphony Hall, Boston)—Dec 7:** 3pm, tickets $22 (reg $25). Must be purchased by 11/15.

"A Christmas Carol" (North Shore Music Theatre, Beverly)—Dec. 14:** 2pm, adults $26, children $15. Must be purchased by 11/22.

Ski Weekend at The Mountain Club on Loon (Lincoln, NH)—Dec 13-14:** $124pp double, $96pp triple, $82pp quad. Seats still available but must be purchased by 11/14.

Museum Passes—**Children's Museum, $4 (reg $6-7); Museum of Science, $4 (reg $5.50-$7.50).

Nick's Comedy Stop—** Tickets $5.50 ($5 + 50¢ svc charge), admits 2 people.

Discount Movie Tickets—**Sony Theatres, Showcase Cinemas, General Cinemas $5 ($4.50 plus 50¢ svc chrg); General Cinemas, children $3 ($2.75 + 25¢ svc chrg); Kendall Square Cinema tickets, $5.50 ($5 plus 50¢ svc chrg).

■ MOVIES

Admission to below Lecture Series Committe Movies is $2.00, and MIT or Wellesley identification is required. For the latest Lecture Series Committee movie and lecture information, call the LSC Movieline, x8-8881, or check TechInfo or the Web.

Nov 1: The Phantom, 7 & 10pm, Rm 26-100. Mr. Smith Goes to Washington, 7:30pm, Rm 10-250. **Nov 2:** Muppet Treasure Island, 3, 7, 10pm, Rm 26-100. **Nov 8:** Multiplicity, 7 & 10pm, Rm 26-100. If....(1968), 7:30pm, Rm 10-250. **Nov 9:** The Nutty Professor, 7 & 10pm, Rm 26-100.

Next deadline for listings: **12 noon Friday, November 1.** Covers events from Wednesday, November 3 through Sunday, November 17. Listings for the Institute Calendar and Student Notices may be e-mailed to <tticalendar@mit.edu> or mailed to Calendar Editor, Rm 5-111. Faxes are not accepted. Early submissions encouraged.

Institute Arts

For more arts-related information call the 24-hour hotline at 253-ARTS or consult the World Wide Web at <http://web.mit.edu/arts/www/>. ***See November Arts on page 11.***

■ MUSIC

MIT Chamber Chorus*—Nov 7: William Cutter, director. Music of England and New England by Purcell and Britten, Billings, Ives, and Fine. 8pm, Killian Hall. x3-2906

MITCAN: Music of Africa Performance Class.** Directed/taught by Prof. James Makubuya. Ensemble class offers hands-on practice and performance experience on various traditional African musical instruments. This class is not for credit this semester. No previous experience required. The class meets from 7-10pm, on the following Thursdays: In Kresge Reh Rm A or B—Oct. 24; Nov. 14, 21, & 28; Dec. 5 & 12. In Rm 4-160—Nov. 7 & 14. x3-4964 or <makubuya@mit.edu>.

MIT Guild of Bell Ringers*—Change ringing on hand bells. Beginners always welcome. Will also ring for occasions. Meets Mondays, 6:30pm, 2nd floor balcony of Lobby 7. Ken, 784-6114

■ DANCE

MIT Folkdance Club*—*Sun*—International Dancing: Early teaching for beginners–7-8pm; Teaching & requests–8-11pm, Sala de Puerto Rico or Lobby 13. *Tues*—Advanced Balkan Dancing: Regular teaching & requests, 8-11pm, Student Center 4th floor. *Weds*—Israeli Dancing: Early teaching for beginners–7-8pm; Teaching & requests–8-11pm, Sala de Puerto Rico or Lobby 13. MIT/Wellesley students free, 25¢ others. Call x3-FOLK or email <fdc-request@mit.edu> for locations on a given week.

■ OTHER

RUNE Submission Deadline—Nov 1:** Send artwork, poetry, essays, anecdotes, plays, etc for MIT's journal of arts and letters. For more info on where to submit (<rune@mit.edu> is a good place to start, but they also have a box on the fourth floor of the Student Center) e-mail either <pnkfelix@mit.edu> or <rune@mit.edu>.

Applications for Wiesner Student Art Gallery—**All students welcome to apply to put up an exhibit. Information: Ted Johnson, Campus Activities Complex, Rm W20-500, x3-3913.

Program funds foreign study

The Center for International Studies has announced the International Predissertation Fellowship Program for doctoral students in the Departments of Political Science, Economics, and Urban Studies and Planning.

The program is for students in the early stages of doctoral training who wish to obtain supplementary area and language training to study Africa, China, Latin America, the Caribbean, the Middle East and South or Southeast Asia. It is sponsored by the Social Science Research Council (SSRC).

The award provides support during 12 months of full-time study. It includes tuition and fees for overseas or domestic language training, and for area-studies course work at the home university or at a university in the region of interest.

Contact Liz Leeds, CIS executive director, Rm E38-652, x3-9861, <eleeds@mit.edu> for application packets and further information. The deadline for submitting applications to CIS is December 2. Applications are due at the SSRC by January 10, 1997.

Financial aid booklet available

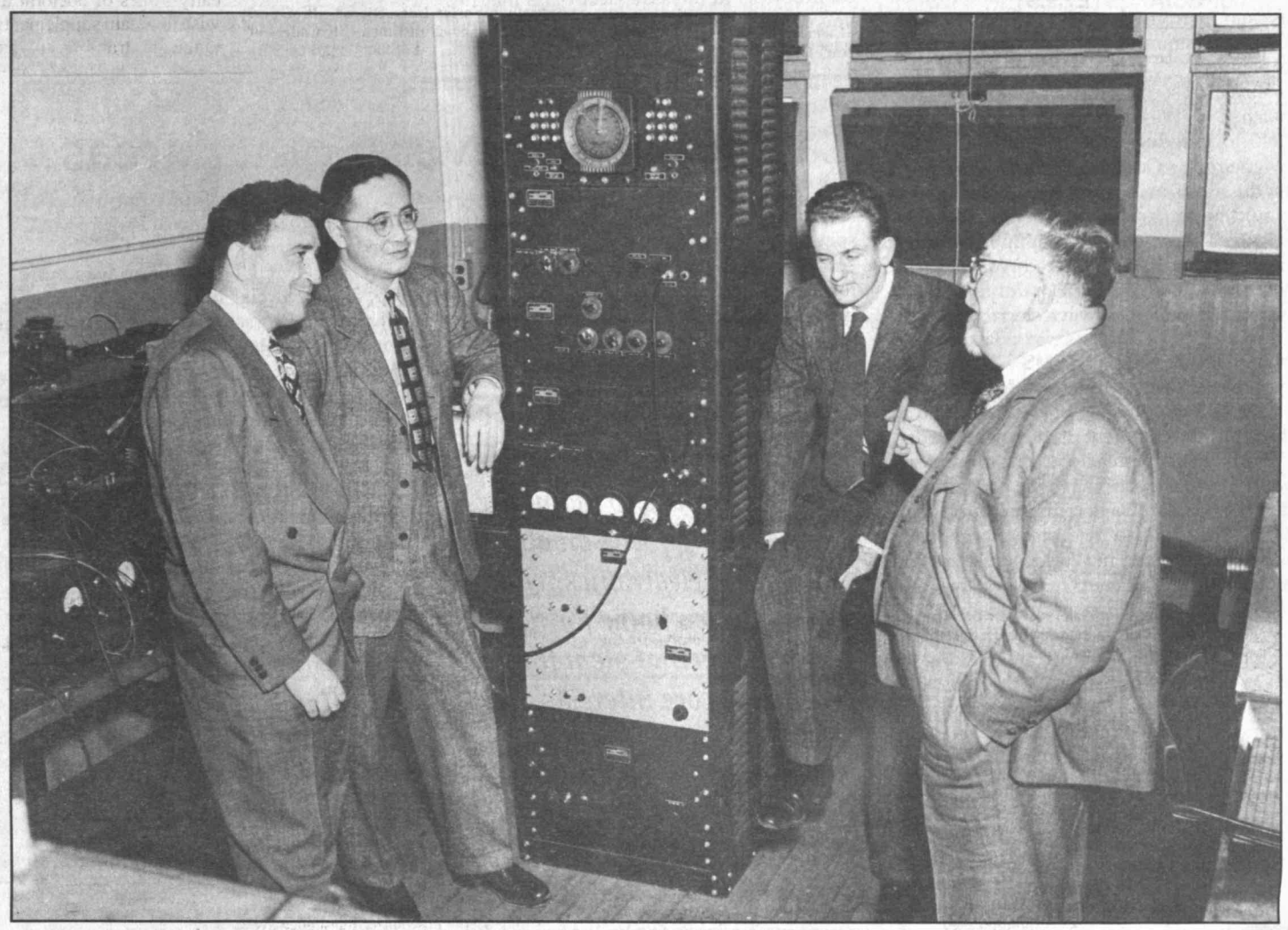
A free handbook is available for prospective and present college students that explains how to find out if they are eligible to receive federal, state and college-supported financial aid, where to get the application forms they will need, when to apply and where to get more information.

The 40-page 1996-97 Handbook on Admissions and Financial Aid at Independent Colleges in Massachusetts is available by calling 531-1154 and leaving voice mail. Published annually by the Association of Independent Colleges and Universities in Massachusetts (AICUM), the booklet also includes statistical information on 55 independent institutions in Massachusetts.

RLE Celebrating 50 Years 1946-1996 OF IMPACT & INNOVATION

Research Laboratory of Electronics marks 50th anniversary

RLE is marking the occasion of its 50th anniversary with a symposium on November 1-2, an exhibit in the Compton Gallery, and this collection of photographs and articles written by RLE staff in recent years to record important historical milestones. See page 8 for details about the symposium schedule and gallery exhibit.



Professor and future MIT president Jerome Wiesner and his RLE colleagues Yuk Wing Lee, doctoral student Thomas Cheatham and Professor Norbert Wiener with Cheatham's electronic analog correlator, circa 1948.

Work broadens, spinning off new labs and centers

From its inception, RLE's openness to new directions has led to an increasingly broad range of research. As this diversity grew and the success of the laboratory's interdisciplinary structure became evident, it was natural for some of its ideas and people to coalesce into new activities, within which there was (at least initially) a tighter focus than the set of interests evident in RLE's early years.

Given RLE's origins in MIT's wartime Radiation Laboratory, there was a continuing interest in military electronics from its inception, and members of the laboratory carried out many studies, often in the form of summer projects. In the first years of the Korean conflict, some of these results were applied in the areas of secure communications, tropospheric and ionospheric scattering, correlation and new radar techniques. From these studies, Lincoln Laboratory evolved and took on the role of an applied military laboratory in 1951. As these interests moved from RLE to Lincoln Laboratory, RLE turned completely to unclassified civilian projects without direct military applications.

Through its interaction with MIT's Acoustic Laboratory, several speech conferences were organized that led to the formation of RLE's Linguistics Group in 1950. An initial

(continued on page 6)

James R. Killian, Jr., and Harold E. Edgerton prepare to bury a time capsule when RLE moved into new quarters in Building 26 in 1957.

Venerable Building 20: 'A Building With Soul'

("A Building with Soul" by Alex Beam originally appeared in The Boston Globe, June 29, 1988. It is reprinted with permission of The Boston Globe.)

I am sitting inside MIT's legendary Building 20 with three great minds, one of them encased in plaster.

Institute Professor of Linguistics Morris Halle and neurophysiologist Jerome Lettvin—seated on opposite sides of a bust of German naturalist and explorer Alexander von Humboldt—are rhapsodizing about the rickety wooden barracks that is their professional home.

"Building 20 is an admixture of all the interesting things at MIT," says Lettvin, a jovial mountain of shivering cerebra who is admired inside Building 20 not for his genius but as a man who first uttered a profanity on television, during a 1961 debate with Timothy Leary ("It made the front page of Variety," Lettvin insists. "You can look it up.")

What's so special about Building 20? Even the MIT Museum had trouble answering that question in 1980, when it organized an exhibit dedicated to the ramshackle "Plywood Palace," the least descript of all the Institute's studiously nondescript structures. "Why do we celebrate a building so modest, so meek and indeed so homely in its demeanor?" asked the introduction to the exhibit catalogue.

First off, we celebrate its history. One of several temporary structures thrown up on campus during World War II—it took less than an afternoon to design—Building 20 is the only one still standing. Many of MIT's greatest projects, including the wartime radar project and its first interdisciplinary labs started in Building 20, along with many of the Institute's leading professors.

Secondly, the building is the kind of aca-

(continued on page 7)

The view from Building 20 in the 1940s, when the Parsons Lab across Vassar Street was under construction.

RadLab evolves into modern RLE

Radar, an acronym for radio detection and ranging, was patented by British scientist Sir Robert Watson-Watt for meteorological applications in 1935. Since practical applications for airborne microwave radar had not been developed before World War II, the government of England requested assistance from the US National Defense Research Committee (NDRC) to develop this capability.

Britain's secret Tizard Mission was dispatched to Washington, DC in September 1940 to introduce the 10-centimeter cavity magnetron. In October 1940, MIT was chosen for the site of an independent laboratory that would be staffed by civilian and academic scientists from every discipline. Fourteen months before the US entered World War II, MIT's new Radiation Laboratory began its investigation of microwave electronics.

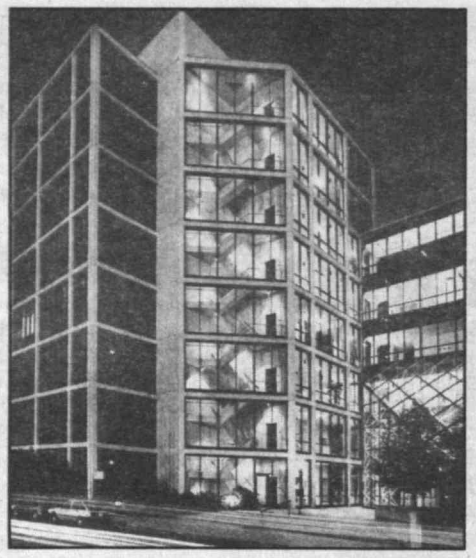
MORE THAN 100 SYSTEMS

During World War II, large-scale research at the Radiation Laboratory was devoted to the rapid development of microwave radar. Projects included physical electronics, microwave physics, electromagnetic properties of matter and microwave communication principles. The "RadLab" designed almost half of the radar deployed in World War II, created more than 100 different radar systems, and constructed $1.5 billion worth of radar.

At the height of its activities, the RadLab employed nearly 4,000 people working on several continents. What began as a British-American effort to make microwave radar work evolved into a centralized laboratory committed to understanding the theories behind experimental radar while solving its engineering problems.

The RadLab formally closed on December 31, 1945, and its staff members resumed their peacetime activities. In its wake remained tons of surplus equipment and the concept for a basic research center that was to continue in MIT's Research Laboratory of Electronics.

On January 1, 1946, under the sponsorship of the US Office of Scientific Research and Development, RadLab's Basic Research Division continued work at MIT as a transitional organization. Under the leadership of Director Julius A. Stratton and Associate Director Albert G. Hill (who passed away on October 21—see obituary on page 9 in this issue of Tech Talk), it continued investigation on problems in physical electronics that involved cathodes, electronic emission, and gaseous conduction. In microwave physics, the electromagnetic properties of matter at microwave frequencies were studied. Modern techniques were applied to both physics and engineering research, and in microwave communications, engineering applications were emphasized. On July 1, 1946, the Basic Research Division was finally incorporated into the new Research Laboratory of Electronics at MIT.



In 1973, the RLE moved into its present quarters (above), the Fairchild Building, just up Vassar Street from the old RadLab home in Building 20. Former RLE Director and MIT President Julius A. Stratton (below) speaks at the dedication.

Lab spins off several other areas

(continued from page 5)

emphasis on the engineering aspects of speech communication grew to cover the entire field of linguistics, and eventually formed the linguistics section of MIT's Department of Modern Languages in 1961. In 1979, these interests joined with others in psychology, philosophy, and vision to form MIT's Cognitive Science Center.

Computation was a part of RLE from the start, and several of the early, important computers were set up and used in the laboratory (including the TX-0 and PDP-1). Many contributions were made through RLE's interaction with the MIT Computer Center, including the invention of the LISP programming language by Professor John McCarthy in 1958. There were also many experiments in time-sharing on the PDP-1 in RLE, as well as in the Computer Center, but a desire to pull these interests together around a common computational focus led to the formation of Project MAC in 1963.

RLE continues to maintain its strong focus on all aspects of electronics while providing a home for new directions that stem from these core interests.

The large MULTICS system was built there, and artificial intelligence, in turn, split off from Project MAC to form its own laboratory in 1969, thus demonstrating the continuing nature of new laboratory formation. In 1976, Project MAC took its current name, the Laboratory for Computer Science.

PLASMA FUSION CENTER IS BORN

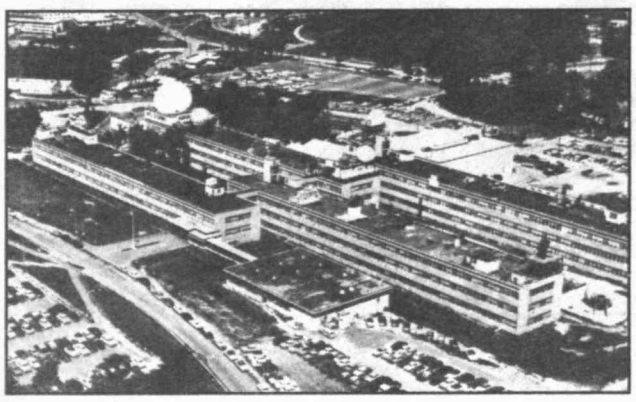
Early work on gaseous discharge tubes led to RLE's increased research activity in high-density plasmas, and in an interest in the use of plasmas for thermonuclear fusion to provide electrical energy. This vision led to the need to perform large mission-oriented experiments on both the tokamak and mirror machines. In 1976, the MIT Plasma Fusion Center was formed to support these efforts. Thus, a major part of RLE's effort in plasmas was moved to the Plasma Fusion Center, but a continuing emphasis on basic plasma theory and experiments has remained in RLE.

From these examples, one can see the occasional formation of new groups from RLE's parent body, and these activities, seeking their own identity, continue to grow as a biological process. Through it all, however, RLE continues to maintain its strong focus on all aspects of electronics while providing a home for new directions that stem from these core interests.

An RLE timeline

1945—At the August 14 V-J convocation of MIT's wartime Radiation Laboratory, Director Lee Dubridge officially announces the lab's closing slated for December 31.

1948—Doctoral student Thomas Cheatham Jr. builds the first electronic analog correlator (see photo on page 5), paving the way for Henry Singleton's digital correlator in 1949.



1950—J.C.R. Licklider joins RLE from Harvard's Psycho-acoustic Lab and stimulates communications biophysics research at RLE; Walter Rosenblith will follow in 1953.

1951—RLE research in continental air defense, associated with MIT's Project Charles, spawns Lincoln Laboratory (left).

1952—Jerrold Zacharias, James Yates, and R.D. Haun produce the first practical atomic clock, based on atomic beam frequency standards developed by Zacharias.

1955—Norbert Wiener (seated), John Barlow and Walter Rosenblith observe the auto-correlation function of brain waves, promoting the application of statistical communication techniques to communication biophysics.

1957—RLE moves into the Compton Laboratories (Building 26) with the Lab for Nuclear Science and MIT's Computation Center (see photo, page 5)

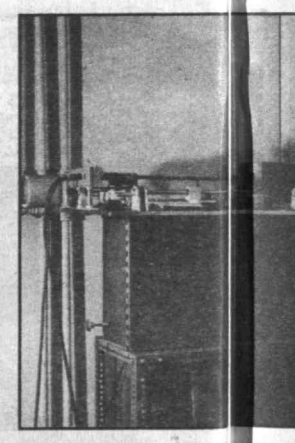
1958—John McCarthy develops the LISP programming language that can manipulate symbolic expressions as well as code and debug major subroutines.

1959—Jerome Lettvin and Walter Pitts (below) publish their landmark neurophysiological research in the paper *What the Frog's Eye Tells the Frog's Brain.*

1962—Project "Luna See," conducted by Louis Smullin and George Fiocco, demonstrates high-power optical maser technology by bouncing a laser beam off the moon's surface. It was the first time space had been spanned by laser light.

1965

1967—RLE's first ading blind is the first af dable reader (above, wit Kenne the PDP-1 comput t co system that could n text



1968—Thomas Huang us an optical scanner to perfor Fourier transform codin and introduces the conce of coding in blocks small than the original image.

1969—Louis Braida nd his laborators begin a l dmark ries of articles in the rnal o *Acoustical Society of A erica* o ditory intensity perc tion.

Five RLE directors join in a cake-cutting at the Lab's 40th anniversary in 1986. From left: Albert Hill, Jerome Wiesner, Jonathan Allen, Julius Stratton and Henry Zimmermann.

Lab's funding stemmed from postwar government contract

As World War II drew to a close, a major concern of researchers was the suspension of activity by the Office of Scientific Research and Development (OSRD), which the government had created to oversee defense and medical research. But in March 1946, the government executed a contract with MIT under the sponsorship of a tri-service committee, which consisted of the Army Signal Corps, the Office of Naval Research and the Air Materiel Command. The contract awarded RLE its first research funding in addition to surplus Radiation Laboratory equipment. This Joint Services Electronics Program (JSEP) was essential in maintaining the momentum created by the Radiation Laboratory.

Much of RLE's first research funded by JSEP carried over from the Radiation Laboratory. The initial emphases were on microwave and physical electronics coupled with the basic study of microwave physics, and communication science and information theory. Today, JSEP in RLE focuses on fundamental studies of electronical and optical processes. An important emphasis is not only the development of scientific understanding, but also the construction of novel theoretical and experimental tools to produce and observe the phenomena under study.

The results under JSEP complement achievements in industry, the Department of Defense, and other JSEP-funded academic laboratories. JSEP at RLE has continued since 1946, making it the oldest sponsored research program at MIT as well as the federal government's oldest university-based sponsored research program.

RLE has its beginnings as RadLab in Building 20, "A Building With Soul"

(continued from page 5)

demic melting pot that gives university presidents indigestion. Famed linguist and antiwar activist Noam Chomsky works just a few doors away from MIT's ROTC offices, which have decorated one whole wall with a colorful mural of an F-16 fighter.

The music department's piano repair facility—a "computer-free zone," according to a sign on the wall—shares a floor with the nuclear science lab's shop room. The model railroad club, which houses the most sophisticated toy train in the world, is just a stone's throw away from the chemical engineering department's cell culture lab, where a bulletin board message inquires plaintively: "Did anybody use toxic substances in the small Corning spinner flasks? About half of my cultures died without apparent reason."

After the war, many of the heavyweight research projects moved into their own buildings, and Building 20, with its creaky floors and poor ventilation, attracted researchers who couldn't find space elsewhere at MIT. Once they settled in, they fell in love with the place. "It turned out to be absolutely perfect for research," explains Halle, an ebullient bearded scholar who has made Building 20 his home for 37 years. "You can knock down a wall, you can punch out a ceiling, and you could get space. In academics, space is everything."

"You can knock down a wall, you can punch out a ceiling, and you could get space. In academics, space is everything."

—Institute Professor Morris Halle

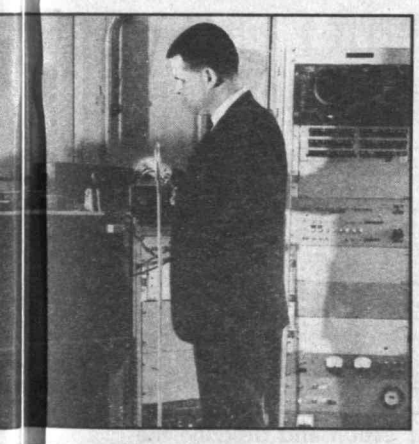
In the interests of space, Halle's lab launched an "expansionist" raid against the model railroad club's huge two-room suite. The land grab failed because the club argued that its computerized, 200-switch track layout could not be easily moved. Indeed, a move against the club might have set off a revolt among the building's older tenants, who fondly remember the five-cent Cokes dispensed from the club's specially programmed soft drink machine.

Not surprisingly, Building 20 has its own myths.

"I know someone who can tell you some hair-raising stories about the early days of microwave," Lettvin says, shoving aside piles of unopened mail to dial his phone. Unfortunately, his contact isn't in.

"Remember the phantom?" Lettvin asks. Indeed, Halle does remember the mysterious, homeless botanist who camped out in a Building 20 storeroom and haunted the building's corridors during the 1960s and '70s. No one knows how he supported himself, or who his family was. "He turned down a job at the Field Museum in Chicago in order to remain a phantom in Building 20," Lettvin says.

The professors say MIT tried to evict the squatter and lost their case in a Cambridge court. The phantom hung on until 1980, only to drift into oblivion—and into the history of Building 20.



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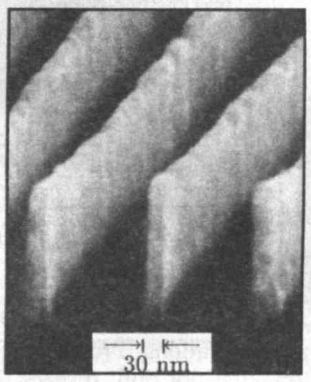
1978—Henry Smith establishes RLE's Submicron Structures Laboratory, now the NanoStructures Laboratory. Among its results is a scanning electron micrograph (right) of an X-ray nanolithograph of polymethyl methacrylate.



1973—RLE moves into the new Sherman Fairchild Complex on Vassar Street (see photo on page 6).

1986-87—RLE's Radio Astronomy group demonstrates the Tracking and Data Relay Satellite Very Long Baseline Interferometer (VLBI) and produces the world's first astronomical space-ground VLBI observations.

1975

1985

1995

1972—Bruno Coppi (below, with a steel plate from Alcator A) designs and constructs the first high-field toroidal plasma machine, the Alcator A tokamak.

1983—RLE's Advanced Television Research Program is established, with William Schreiber as director.

1995—Bose-Einstein condensation (BEC, below) is achieved by Wolfgang Ketterle. His work improves on the first achievement of BEC by RLE alumnus Eric Cornell at the University of Colorado earlier in the year.

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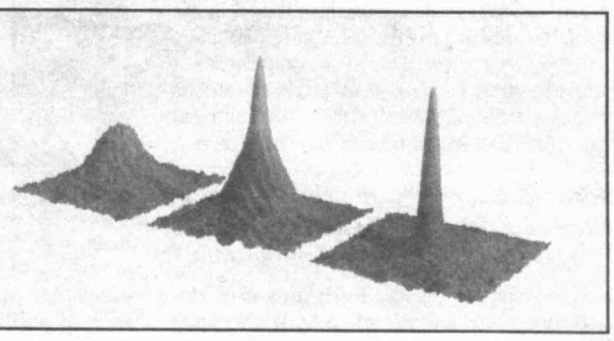


RLE Celebrating 50 Years 1946-1996 OF IMPACT & INNOVATION

Schedule of Events

FRIDAY, NOVEMBER 1

POSTER SESSION

- 1-5pm
- The Grier Room (Rm 34-401)

RLE's students will present the latest in the laboratory's broad range of research. We hope you can join us for this kick-off event of RLE's 50th anniversary celebration.

LABORATORY TOURS/OPEN HOUSE

- 1-5pm
- Tours start from the Grier Room (Rm 34-401)

In connection with the poster session event, RLE invites you to tour its unique scientific facilities. You will have the opportunity to meet with faculty, students, and staff, and discuss their latest research results.

COMPTON GALLERY EXHIBIT AND OPENING RECEPTION

- 5:30-8pm
- Lobby of Building 13—Compton Gallery

A reception will accompany the opening of RLE's exhibit in the Compton Gallery. This new exhibit will not only feature artifacts and photographs from RLE's first 50 years, but it will also highlight some of the exciting research currently being undertaken in the lab. On Saturday, November 2, the gallery will also be open from 9am to 5pm in order to accommodate RLE's 50th anniversary visitors.

SATURDAY, NOVEMBER 2

REUNION BREAKFAST

- 8-9:30am
- MIT Faculty Club (Building E52, 6th floor)

All students, faculty, and staff who have been part of RLE since the laboratory's founding in 1946 are invited to attend RLE's reunion breakfast at the MIT Faculty Club. Professor Emeritus Jerome Y. Lettvin will be this morning's speaker. Tickets are limited, so register today.


Lettvin

Professor Lettvin has been affiliated with RLE since 1951. Since that time, he has conducted research on the bio-electrical processes involved in cognition and sensory perception in living systems. He is widely recognized for his work on vision and pattern recognition published in the 1959 landmark paper, "What the Frog's Eye Tells the Frog's Brain."

TECHNICAL SYMPOSIUM

- Tang Hall (Building E51)
- Registration starting at 8am
- Presentations from 10am-1pm
- Lunch will be provided for all symposium registrants from 1:15-2:15pm.

Talks will be presented by six RLE investigators on some of the laboratory's latest research:

10-10:30am
"Watching Hearing: Measuring Nanometer Motions of the Inner Ear With a Light Microscope"

Professor **Dennis M. Freeman** will present an overview of his investigations into the physiology of the inner ear, which seek to characterize the signal processing properties of the peripheral auditory system. Professor Freeman and his colleagues in RLE have introduced novel microscopic photodetection methods and high-resolution imaging techniques to measure the motions and physical properties of inner ear structures. The focus of their studies includes sensory receptor cells and other structures in the inner ear that comprise a complex hydromechanical system. Professor Freeman will demonstrate a video system that has been developed in his group to measure the mechanical properties of these structures. The system includes a computer that records and analyzes video images, so that both basic three-dimensional structures and motions can be visualized.


Freeman

10:30-11am
"Biomedical Imaging and Diagnostics Using Optical Coherence Tomography"

Professor James G. Fujimoto will describe his group's work on optical coherence tomography (OCT), a new imaging technology that can obtain higher resolution biomedical images. Professor Fujimoto and his colleagues at RLE have helped to develop this new medical technology, which can perform noninvasive imaging of structures within the eye, retinal tumors, arterial plaque, and other biological structures. Applications for OCT include the diagnosis of several retinal diseases, including macular degeneration, and may hold promise for glaucoma treatment as well. Professor Fujimoto's group also develops new femtosecond laser generation and measurement techniques, and investigates ultrafast phenomena in electronic and optoelectronic materials.


Fujimoto

11-11:30am
"Predicting the Behavior of Materials"

Professor John D. Joannopoulos will describe his theoretical studies in condensed matter physics that have provided many of the first calculations for the electronic and geometric structures of solids. He and his colleagues in RLE have predicted semiconductor surfaces, including the atomic configuration of several surface reconstructions, the sites and mechanisms for molecular chemisorption and diffusion, and the nature of surface phase transitions as a function of temperature. By developing techniques that predict atomic- level surface structure and use minimum energy calculations, Professor Joannopoulos's research not only reveals new surface states, but it also provides increased understanding of the semiconductor growth process at a detailed atomic level, thus exploiting the best performance modern supercomputers can offer.


Joannopoulos

11:45am-12:15pm
"The Single-Electron Transistor and Other Devices of the Future"

Professor Marc A. Kastner and his colleagues in RLE's Quantum-Effect Devices Group have pioneered a single-electron transistor device which turns on and off once for every electron that is added to it. In addition to their technological potential, such devices provide new insight into the behavior of electrons that are confined to regions with small dimensions. Professor Kastner will provide an overview of the single-electron transistor's technological applications, and how the transistor will further understanding of very small semiconductor devices. He will also address the possible role of self-assembled nanostructures in devices of the future.


Kastner

12:15-12:45pm
"Bose-Einstein Condensates: A New Form of Quantum Matter"

Professor Wolfgang Ketterle will discuss his research in basic atomic physics, where phenomena involving collisions, light scattering, and quantum statistics are studied. Professor Ketterle has been recognized for his emerging leadership in developing several new techniques used to extract energy from ultra-cold neutral atoms. His group's recent observation of the mysterious Bose-Einstein condensate (BEC) has permitted the study of ultracold matter in an entirely new regime. In the BEC state, matter is coherent and exhibits "laser-like" properties. While Professor Ketterle seeks to understand BEC properties, his longer range plans are to use coherent atoms for vast improvements in precision measurements and atom optics.


Ketterle

12:45-1:15pm
"Signal Processing for Next-Generation Wireless Communications"

Professor **Gregory W. Wornell** will provide insight into the increasingly important role the field of signal processing is playing in the development of future wireless communication systems. Professor Wornell and his group in RLE explore multiuser wireless and broadband communications, and have developed a variety of new signal processing techniques for next-generation systems. Future applications for this research include code-division multiple-access and packet-switched mobile radio networks, indoor spread-spectrum personal wireless systems, and digital audio and television broadcast systems.


Wornell

TECHNICAL SYMPOSIUM—PLENARY TALKS

- Wong Auditorium in Tang Hall (Building E51).


Vest

2:30-3:30pm

MIT President **Charles M. Vest** will speak on science policy in America, the role of research universities in society, and how RLE can contribute to the solution of important societal needs. Dr. Vest's article, "Measuring the Return on Investment in University-Based Research," appears in the fall 1996 issue of RLE currents.


Burke

4-5pm

Award-winning television host and author **James Burke** will detail the history of communication and describe the role that RLE has played. Mr. Burke's television series and books include: Connections, The Day the Universe Changed, After the Warming, Masters of Illusion, Connections2 and The Axemaker's Gift.

JUBILEE DINNER PARTY

- 6:30-10pm
- Morss Hall, Walker Memorial (Building 50)

To cap off the two-day celebration, we invite you to join us for this final, spectacular event of RLE's 50th anniversary, which will include cocktails, dinner and dancing. Tickets are limited, so register today.

On-site registration

On-site registration will take place on:

- Friday, November 1, from 1-6pm in the lobby of Building 36 (50 Vassar St.)
- Saturday, November 2, starting at 8am in the lobby of Tang Hall (Building E51).

Individuals interested in attending only the Saturday symposium (morning technical talks and afternoon plenary talks) are not required to register. However, seating preference will be given to paid registrants. Registered individuals will be entitled to lunch at the symposium and a guaranteed seat in the Wong Auditorium for all talks Since a good-sized audience is anticipated, particularly for the plenary talks, video hookups will be provided to the adjacent classrooms in Tang Hall to accommodate all who wish to attend.

The standard event registration fee for non-MIT faculty and staff is $100. This includes registration for all events and meals on Saturday. MIT faculty and staff registration is $35. Student registration is $20.

Albert Hill, developer of radar and air defenses, dies at 86

■ **By Kenneth D. Campbell**
News Office

Professor Emeritus Albert G. Hill, 86, a key leader in the development of World War II radar, director of the MIT Lincoln Laboratory development of the electronic Distant Early Warning and SAGE continental air defense systems, and first chairman of The Charles Stark Draper Laboratory, died October 21 at his home in Needham of pulmonary disease.

Dr. Hill, director of Lincoln Lab from 1952-1955, waged "an evangelical campaign to gain acceptance of the idea of early warning as a defense against Soviet bomber attack," wrote James R. Killian Jr., the late president of MIT, in his 1985 autobiography, *The Education of a College President.* Professor Hill won approval when he appeared before the National Security Council "at a meeting presided over by President Truman, to advocate the building of a Distant Early Warning line" of radar, a $2 billion project, Dr. Killian said. Professors Hill and Killian also advocated the DEW line in an article they wrote for the November 1953 *Atlantic Monthly* entitled "For a Continental Defense," citing "the new and awful urgency created by the Soviets' achievement of a nuclear explosion."

Dr. Paul E. Gray, chairman of the MIT Corporation, paid tribute to Dr. Hill, who served MIT for 41 years as a technical leader in the MIT Radiation Lab (which developed radar into a useful military tool), a professor of physics, director of the Research Laboratory of Electronics (1949-52), director of Lincoln Lab, deputy chairman of the Physics Department from 1967-73, MIT vice president for research (1970-75), and director of the Plasma Fusion Center (1976-78), as well as the leader in the 1970s of the transformation of the MIT Instrumentation Laboratory into the independent Draper Laboratory. Dr. Hill also was chairman of an advisory group that started MIT's Energy Laboratory.


Hill

Dr. Gray recalled Dr. Hill's distinguished career as an MIT administrator, which included being "a strong but generally unrecognized early advocate for equal opportunity and affirmative action." Dr. Hill personally recruited African-American graduate students and faculty for the physics department, putting it in the vanguard of these efforts at MIT. Additionally, he chaired the committee which proposed and organized the Office of Minority Education. Dr. Gray also recalled that "Al often described himself as being like a roasted marshmallow—hard and crusty on the outside but soft and gooey on the inside."

"For many years, Al Hill quietly contributed to the national security by his advice to the Joint Chiefs of Staff when the Weapons Systems Advisory Group and the Institute of Defense Analysis were being formed" in the Cold War era of the late 1950s, said Robert A. Duffy, retired president and CEO of Draper Lab, where Hill served as chairman from 1970 through 1982.

Dr. Hill was born in St. Louis on Jan. 11, 1910. He received the BS in mechanical engineering (1930) from Washington University in St. Louis and, after serving two years with Bell Telephone Laboratories, the MS in physics (1934). He received the PhD in physics from the University of Rochester in 1937.

He was an instructor in physics at MIT from 1937 to 1941, when he became a staff member of the Radiation Laboratory at MIT, known as the "RadLab," which was developing radar for use in World War II. Hill headed the Radio Frequency Group in the Transmitter Components division and at the end of the war was chief of the 800-person division. The head of the RadLab, Lee DuBridge, summarized the laboratory's achievement "by remarking that radar won the war; the atom bomb ended it," Dr. Killian wrote.

After the war, Dr. Hill became an associate professor of physics. In July 1946, MIT formed the Research Laboratory of Electronics (RLE) as the natural continuation of the Radiation Laboratory's basic research division. Dr. Hill was named associate director, and became professor of physics in 1947. In 1949, Dr. Killian appointed Hill as the director of RLE.

Lincoln Lab was formed in 1951 at the request of the government, and Dr. Hill became its second director, leading the development of the computerized SAGE (Semi-Automatic Ground Environment) air defense system and the DEW line of radar sets stretching from northern Alaska to Greenland. He helped establish in 1955 the SHAPE (Supreme Headquarters, Allied Powers Europe) Technical Center in The Hague and the NATO Communications Line, extending from northern Norway to eastern Turkey.

In 1956, Dr. Hill was called to Washington to serve as director for the Weapons Systems Evaluation Group and vice president and director of research for the Institute for Defense Analyses. He returned to MIT in 1959 and resumed teaching physics. In 1965, he also became a lecturer in the Department of Political Science.

In 1970, he was appointed to the new position of vice president for research, supervising research administration on campus and the special laboratories (Lincoln Lab and the Instrumentation Lab). In May 1970, MIT formally divested itself of the Instrumentation Lab, which under the direction of Charles Stark Draper had developed the gyroscope and the inertial guidance system and had guided Apollo XI to the moon in July 1969. Dr. Hill, still vice president of research, became the chairman of the independent board of directors of the laboratory, renamed the Charles Stark Draper Laboratory in honor of its founder. Draper Lab remained a division of MIT for three years and became independent in 1973.

"My association with the laboratory came at a politically disquieting time," Dr. Hill said in an interview in the Draper Lab newsletter, D-Notes, upon his retirement in 1982. "The public resistance to the Vietnam War affected MIT, and Stark Draper's laboratory knew that it was going to be separated from MIT. The morale was low." In the end, however, only eight out of 2,000 people chose not to stay at the lab. In 1984, the Draper Laboratory dedicated the Albert G. Hill Building at One Hampshire Street in Cambridge.

Hill received many honors, including the Presidential Certificate of Merit in 1948, the Air Force Distinguished Civilian Service Medal in 1955, the Secretary of Defense Distinguished Civilian Service Medal in 1959, and the Washington University Distinguished Alumni Citation in 1955.

A memorial service is planned at MIT at a time to be announced. Hill had no children. His first marriage, to Ethel Sampson, ended in divorce. He and his second wife, Ruth Parker, were married in 1960; she died in 1990. Hill is survived by three nieces and a nephew: Carol Hill Timson of St. Louis and Salem, MO; Lexie Hill Schoen, The Hague, Holland; Marcella Louise Hill Taylor, Apple Valley, CA; and Jesse Landis Boogher Hill, Aptos, CA, and by Lexie Timson Long of St. Louis and nine other grandnieces and grandnephews. Donations may be made in his name to the American Lung Association, 1505 Commonwealth Ave., Brighton, MA 02135-3605.

Hose there?

President Charles Vest drinks from a "fire hose" (an experience often compared to that of acquiring an MIT education) at an exhibit on hacking at the MIT Museum. He came to celebrate the recent release of the new book entitled Is This The Way To Baker House? A Compendium of MIT Hacking Lore. *Awaiting their turns at the fire hose are recently retired MIT Museum Director Warren Seamans (center) and MIT alumnus Andrew Silver, who is making a film about hacking at MIT.* **Photo by Donna Coveney**

Other obituaries

HAROLD M. ARMITSTEAD

Harold M. Armitstead, 90, of Topsfield died on September 27. He began working at Draper Labs in 1955 and was a supervisor at the time of his retirement in 1971. He leaves his wife, Helen; two daughters, Margaret Sedler of Topsfield and Virginia Luci of Nashua, NH; a son, James of West Greenwich, RI, a brother, Stanley of Atkinson, NH; a sister, Hilda Glover of Connecticut, 12 grandchildren and many great-grandchildren.

ERIC W. EDMAN

Eric Edman, 76, of Dorchester, died on September 3. He was hired in 1958 and was a service staff member at Lincoln Lab when he retired in 1982. Survivors include his wife, Lottie Edman; his son, Eric T. of Milton, and two grandchildren.

JOSEPH E. LEAHY

A funeral Mass was said on September 24 at St. Mary's Church in Quincy for Joseph E. Leahy, 74, of Quincy, who died on September 20. He was hired at MIT in 1964 and was an industrial hygiene engineer in the Medical Department when he retired in 1983.

Mr. Leahy leaves his wife, Barbara Corcoran; three daughters, Ann M. Fitton of New York, Maureen L. Watson of Hanson and Patricia L. Snow of East Bridgewater; a son, Timothy J. of Abington; three brothers, two sisters and five grandchildren.

PETER ROSSINI

A funeral Mass was said at St. Andrew's Church in Billerica on September 30 for Peter Rossini, 64, of Billerica, who died on September 26. He was an engineer at Lincoln Lab who was hired in 1955 and retired in 1994.

Mr. Rossini, a Korean War Air Force veteran, leaves his wife, Barbara; a son, Peter R. of Chelmsford; two daughters, Donna Malaga of Washington state and Kathleen Schiffler of New York, and three grandchildren.

ELIZABETH H. SALIGA

A funeral Mass was said in St. Michael's Church in Bedford on September 25 for Elizabeth H. Saliga, 89, of Bedford, who died on September 22 at the Westridge Health Center in Marlborough after a long illness. She was a support staff member at Lincoln Lab from 1954 until her retirement in 1973.

Mrs. Saliga leaves four sons, Robert J. of Marlborough, Richard P. of Bedford, Donald F. of Hudson and Thomas E. of Centerville, a sister-in-law, a cousin, a niece, 18 grandchildren, 36 great-grandchildren and two great-great-grandchildren.

CHARLES J. STRUMSKI

A funeral Mass was said in St. Catherine's Church in Norwood on September 10 for Charles J. Strumski, 81, of 201 Prospect St. in Norwood, who died on September 6. He came to MIT in 1949 and was a sponsored research technical staff member in the Laboratory for Nuclear Science when he retired in 1980.

Mr. Strumski leaves his wife, Margaret F. (Curley) Strumski; a son, Charles A. of Walpole; two daughters, Margaret A. Strumski of Hollywood, FL and RoseMarie Henderson of Bingham, ME; four brothers, Leo, Walter and John of Canton and Joseph of Cape Cod; a sister, Helen Kessler of Canton, and two grandchildren. He was buried in Highland Cemetery in Norwood.

ROMEO M. THEROUX

Romeo M. Theroux, 82, of 4 Glen Road, Hudson, died on September 13. He began working at MIT in 1964 and was a service worker in Physical Plant when he retired in 1979.

Recycling program continues expansion

MIT's recycling program has further expanded, with new containers placed in the lobbies of several buildings on campus. Fall telephone book recycling has also begun.

The following buildings now have containers for placing newspapers to be recycled: E10, E40, E56-270,12, 20, 34, 36 and 38. Commingled materials (glass bottles, metal and tin cans, and plastic containers labeled #1 and #2) can be placed in containers in these locations: E10, E15, E40, E51 (third floor), E56-240, 12, 20, 33, 34, 36-113, 37, 38 and 39.

When dropping off newspapers, advertising inserts may be included. Papers should be deposited individually, or bundled with string or put in a paper bag (plastic bags or magazines are unacceptable).

These new locations are in addition to the newspaper and commingled-material containers in the lobbies of Buildings 2, 5, 7, 8, 9, 10, 13, 14, 16, 18, 26, 54, 56, 66, 68, E15, E17, E18, E19, E23, E25, E51, E52, and E53. Newspaper recycling is also available in the northwest campus area at the Building NW14 and NW21 loading areas. The loading docks at Buildings 48 and E38 are now equipped with newspaper and commingled-material containers as well. Cardboard may also be recycled in Buildings 20, 50, E19 and E52, but boxes must be flattened.

PHONE BOOKS

Red dumpsters for telephone books, paperbacks, magazines, glossy paper and manila folders have been placed in the following four locations: the Sloan lot, the Building E19 lot, the Building 56/66 loading area and between Buildings 11 and 13. They will remain through the fall.

Anyone who needs a white paper recycling basket or who has recycling questions or comments may contact Jennifer Combs, recycling coordinator, at x3-7671 or <jcombs@mit.edu>. Questions about the Housing Office's recycling program should be addressed to that office.

Offices forging closer ties

(continued from page 3)

some of the participants will regather to recommend an organization that will reflect these ideas. "From these four days, those of us providing these services were able to evaluate what is important to us and the people we serve, what are the challenges, where are the problems," Mr. Immerman said. "Now we can build an organization around this understanding."

For Martin Schlecht, professor of electrical engineering and computer science and FAST team sponsor, one of the most exciting parts of the Learning Forum was seeing all of these people working together. "A hundred people from a wide range of offices were working with great enthusiasm and collegiality to design their future work environment," he said.

Open enrollment begins this week; Benefits details changes

(continued from page 1)

cided to combine Bay State and Blue Cross Option II to form the Blue Cross product called Blue Choice Plan 2 (Plan 2 indicates a self-insured plan). Current Option II and Bay State members will automatically be enrolled in Blue Choice during open enrollment unless they elect to enroll in another of MIT's health plans.

The Blue Choice offering combines the best of both plans. Former members of Option II will get a significant reduction in rates and an opportunity to participate in a managed care product as well as maintaining the freedom of choice they currently enjoy. Former members of Bay State will be able to use their same primary care physicians through the Blue Choice Plan.

In Blue Choice, members may visit their physician (in-network) and pay a $5 copayment or they may choose to go outside the network to seek medical care. Those who seek care outside the network will pay a deductible and a portion of the covered expenses. In addition, the plan covers dependents until age 25 without regard to their student status.

For more information about Blue Choice primary care physicians, consult the Benefits Office Web site at <http://web.mit.edu/benefits/www/>. To request a complete physician directory in print and a Blue Choice brochure, send e-mail to the Benefits Office at <benefits-www@mit.edu>.

HARVARD NETWORK

Beginning in January, MIT will offer a new integrated HMO product made possible by the recent merger of Harvard Community Health Plan (HCHP) and Pilgrim Health Care. The new Harvard Pilgrim Health Care plan will include all the current HCHP health centers in addition to all the independent physician and multispeciality group practices that are currently part of the Pilgrim Health Care plan. The enrollment area for the expanded network now extends well into western Massachusetts and Rhode Island. Southern New Hampshire and portions of Connecticut, New York and Vermont are also included. For more information, contact the plan directly at (888) 333-4742.

Other Harvard Pilgrim announcements for 1997 include:

- Emergency room copayment will be $30 (currently it is $25). This copayment is waived if the patient is admitted to the hospital.
- The prescription drug benefit will be $5 copayment for Formulary (medications commonly prescribed for certain medical conditions), $10 copayment for non-formulary prescriptions at any HPHC designated pharmacy. Currently the benefit is $5 per prescription.
- There are new fitness options including YMCA, Fitness Network and some alternative fitness choices.
- There is a new eyewear discount program of 20-40 percent depending on the provider and service selected.

TUFTS PLAN

The Tufts Associated Health Plan (TAHP) has expanded to include most of Massachusetts including the Cape and Nantucket, a significant portion of both New Hampshire and Maine, and parts of Vermont and Connecticut. If you have questions, call the plan directly at 466-1000.

COVERAGE FOR DEPENDENTS

All of MIT's health plans, except for Central Massachusetts Health Care (CMHC), now offer coverage for dependent children until age 25 regardless of student status. CMHC provides coverage to full-time students beyond age 19 to age 26.

BENEFIT MEETINGS AND FAIRS

The Benefits Office will sponsor Information Sessions, Benefit Fairs and Information Tables to assist members of the community in making decisions about their benefit choices. Representatives from the health, dental and life insurance plans as well as members of the Benefits Office staff will be available to help answer questions at these events. Representatives from the Benefits Office will also be on hand at Information Sessions and Tables.

Sessions on **Blue Choice/HPHC** will be held at the following times:
—Wednesday, Oct. 30—Harvard Pilgrim Health Care, 12:15-1:15pm, Student Center Rm 407
—Wednesday, Oct. 30—Blue Choice, 3-4 pm, Student Center Rm 407.
—Thursday, Oct. 31—Blue Choice, 12:30-1:30pm and 3-4pm, Lincoln Lab South Auditorium
—Wednesday, Nov. 13—Blue Choice, 12:15-1:15pm, Killian Hall (Building 14W)
—Wednesday, Nov. 13—Harvard Pilgrim Health Care, 1:30-2:30pm, Killian Hall

There will be four **Benefit Fairs** on:
—Monday, Nov. 4—10am-3 pm, Bush Room (10-105)
—Wednesday, Nov. 6—10am-4 pm, Lincoln Lab East Atrium
—Thursday, Nov. 7—10-11am, Haystack Observatory Conference Room A
—Thursday, Nov. 7—2-3pm, Bates Linear Accelerator Cafeteria

Information Tables will be set up on:
—Friday, Nov. 1—10am-noon, Lobby 10
—Tuesday, Nov. 5—1:30-3:30pm, Building E25 atrium
—Tuesday, Nov. 12—noon-2 pm, Lobby 10
—Thursday, Nov. 14—noon-2 pm, Building E25 atrium

Health Plan Rates As Of January 1, 1997

Plan	Level of Coverage	Faculty/Staff Monthly Rate	Support/Service Weekly Rate
Blue Choice	Individual Family	$109.65 $277.30	$23.07 $58.25
Blue Cross/ Blue Shield Option 2 (out-of-state)	Individual Family	$152.22 $390.92	$32.90 $84.47
Traditional MIT Health Plan	Individual Family	$36.82 $134.47	$6.27 $25.58
Flexible MIT Health Plan	Individual Family	$131.82 $350.47	$28.19 $75.13
Harvard Pilgrim Health Care	Individual Family	$35.71 $135.59	$6.01 $25.55
Tufts Associated Health Plan	Individual Family	$48.19 $166.28	$8.89 $32.63
Central Massachusetts Health Care	Individual Family	$34.08 $110.56	$5.64 $19.77

FRAP

The Flexible Reimbursement Account Plan (FRAP) is comprised of two spending accounts; eligible employees may enroll in either or both. These accounts offer a way to set aside before-tax dollars to pay for medical expenses not covered by health and dental plans and for the care of a dependent family member. The medical/dental account offers a yearly maximum of $3,000, while the dependent care account offers a yearly maximum of $5,000. Remember that the dependent care account maximum is $5,000 per household and that employees must re-enroll in the FRAP program each year.

LIFE INSURANCE

MIT offers fully paid basic life insurance in the amount of $50,000 for full-time employees as well as employee-paid supplemental life coverage. Supplemental coverage is available in multiples of an employee's annual salary up to five times his or her annual pay.

Open enrollment is the time to increase your supplemental life insurance coverage without evidence of good health. Employees may increase coverage by one multiple of pay as long as that amount does not exceed three times the annual salary or $200,000, whichever is the greater. Increases larger than this, as well as amounts of coverage applied for outside of open enrollment, will be subject to medical evidence of insurability.

(continued on page 12)

Classified Ads

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

INSTRUCTIONS: Ads are limited to one (of about 30 words) per issue and may not be repeated in successive issues. Ads may be resubmitted after skipping a week. Ads/renewals are not accepted via telephone or fax. All must be accompanied by full name and extension (or proof of MIT affiliation).

- **E-mail address (return address must be mit.edu): <ttads@mit.edu>**
- **Interdepartmental/Walk-in address: Calendar Editor, Rm 5-111.**

Please note that all Tech Talk ads are provided to TechInfo on the date of publication, which makes them accessible world-wide via the Internet.

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

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

Deadline is noon Friday before publication.

■ FOR SALE

Boston Bruins tickets, Loge seats to many games at below box office price of $60/ea, call for available dates. Jim x3-7774 or <hanlon@mitvma.mit.edu>.

Toshiba Sub-Notebook, T3400 CT, Protege active matrix screen, 33 megahertz: 4MG RAM, ext dr: 250MG, hard dr 14:4, modem card, softwr, $1200. Jan Blair, Draper x8-2843 or 617-576-5125.

Apline Flexstep stairmaster, digital counter (steps, time), very sturdy, gd cond, $150 new, $75 or bst. Call 225-9564 (h) or e-mail <tchin@mit.edu>.

White Q-sz platform bed w/mattress, $200 or bst; white 3 x 5.5' desk/table, $50. contemp sofa, $900. Call 862-1935 (Lexington).

Ladies Raleigh bike, 28", 10-sp, yellow, gd cond, priced to sell, $45. Cheryl 252-1122 or 438-1908.

Collectible Baseball Replay Games, complete boxed games for most seasons betw 1928-1990; unboxed card sets betw 1930-1980, exc cond, make offer. Emily 396-8550 or <emilym@ll.mit.edu>.

Classical records, several hundred in mint condition, many classic performances, $1/ea; also selling dual turntable. Roger x3-7144 or 776-6871 (eves) or <rkolb@mit.edu>.

100 lb weight set, $25; walnut stereo cabinet 19d x30h x40w, $50; Weslo stationary exercise bike, $50; 7-speed 26" boy's bike, $25. Draper x8-3841 or x8-2282.

Kitchen curtains: 3 pairs white cotton blend w/ print ruffle and matching top (swag), bottom curtain 54W x 35L, top 77W x 33L, like new, $10 for all. Rosalie 776-3748.

Pentium 100, 16MB-RAM, 1.08GB HD, 3.5" disk, 8x CD, SoundBlaster, speakers, 28.8 Modem, 15" digital monitor, 1MB, brand-new, $1,800. E-mail <sobrinho@mit.edu>.

■ ANIMALS

Good home wanted for 2 cats, preferably together, father 1-1/2 yrs, son 7 mos, bl, d sh n all shots. Call x8-7872.

■ VEHICLES

1989 Toyota Celica ST, 84K, lt blue, lojack, manual transm, AM/FM/cass stereo, sl. sunroof, 1 ownr, gd cond, askg $5000. Call 275-5816 lv mssg.

1991 BMW 318IS, 1 ownr, service records, moon roof, immaculate, family expanding, nd sta wagon, $9,250 or bst. E-mail <annam@pfc.mit.edu>.

1994 Ford Explorer XLT, hunter green, 26K, 4-dr auto, a/c, pw, cc, stereo cass, security sys, kill switch, roof rack, askg $19,990. Call 396-1112 aftr 6pm.

■ HOUSING

Land, 62+ wooded acres in North Central Mass., frontage both sides of road, isolated spring, cleared portion was 19th-century homesite, $65,000. Steve, Lincoln x4170.

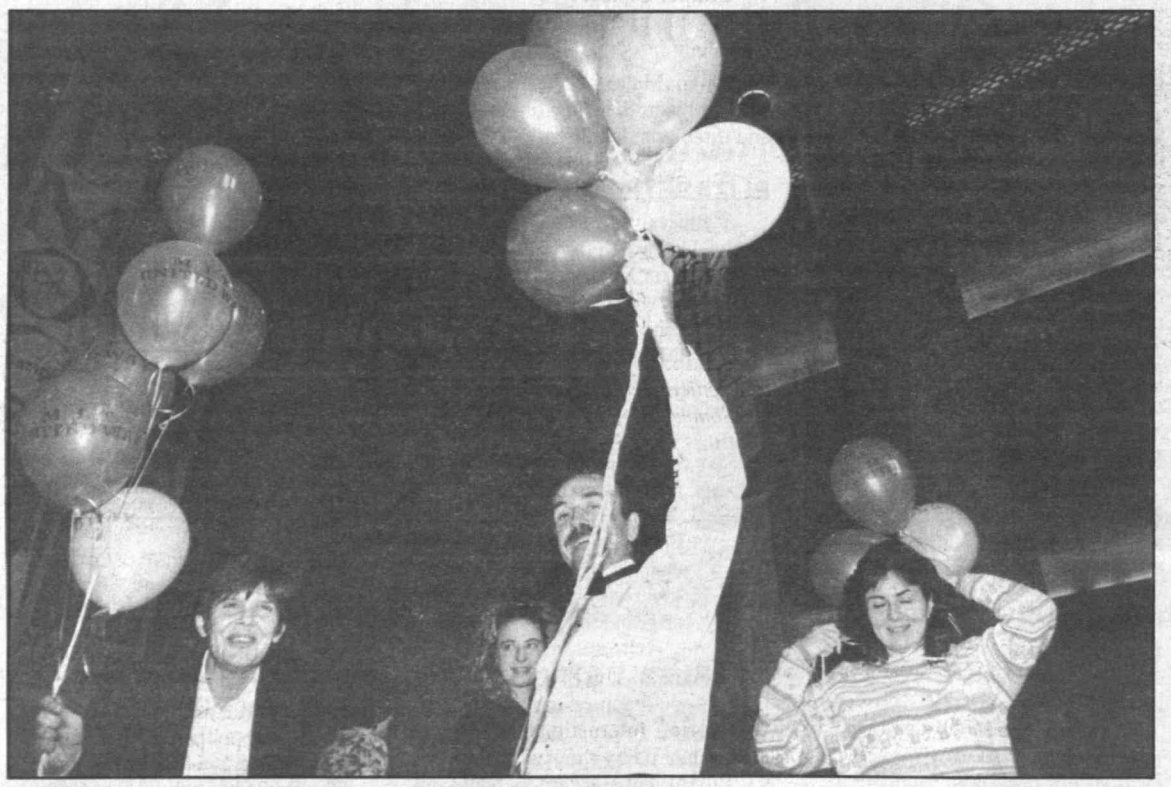
Naples, FL: lux condo, 3BR, 2b, furn, lanai, htd pool, walk to beach, 30 mins to Red Sox spring training, avail Jan-Mar, $2500/mo. John, Linc x3541 or 617-862-4809, or email:<southie@ll.mit.edu>.

■ WANTED

Looking for: 87-91 Camry, 4dr, a/c, auto, pw, <80K mi; 91-93 Taurus wagon, a/c, auto, pw, <70K mi. Contact <heiman@slipknot.mit.edu> or x3-0806 or 965-3919.

Housesitter wanted for period 1/20 - 2/24, spacious house, care of cat and plants, safe, quiet nbrhd, 10 min from bus to Harvard Sq. Alfred 646-8618.

United Way honors MIT; drive begins



At the Lobby 7 event marking the start of United Way season at MIT are (left to right) Meg Westlund, operations manager for the Center for Engineering Study; Kelly Edmonston of United Way; Robert Preston of catering, and Debra Fair, senior staff in the Office of Special Community Services. **Photo by Donna Coveney**

MIT was honored last week for its past United Way contributions at a Boston ceremony, even as this year's fund drive kicked off in Lobby 7.

MIT and other major donors to the United Way of Massachusetts Bay were recognized in a "Leading the Way" installation at UWMB's headquarters on Summer Street. The collage of photographs, quotes, faces and names lists individuals who last year gave more than $100,000 and corporations whose combined employee and corporate giving exceeded that amount.

MIT was one of 13 organizations that donated between $250,000 and $499,999 last year (Harvard was the only other university to contribute this much). Thirteen companies were honored for donating $500,000 to $999,999; six contributed $1-million to $2 million and three gave more than $2 million.

United Way contributions fund thousands of human-services programs administered by 191 local agencies. Starting next week, chief solicitors in various areas of the Institute will distribute donor packets to employees, who will have several options for how their money is used. They can contribute to the entire United Way network, to one or more eight categories (children six and under, children 7-18 years old, the elderly, the hungry and homeless, prevention and treatment of HIV/AIDS and of substance abuse; abused women and children, and the disabled), to a specific network agency, to a non-United Way health and human services agency in Massachusetts, or to the local United Way in their city or town outside the UWMB service area.

The Institute's goal this year is to raise $300,000 by December 31. Last year, members of the MIT community contributed approximately $260,000. Sixty-four donors were Leadership Givers who donated at least $1,000 apiece.

Again this year, the campaign will feature a bake sale (scheduled for November 21 at 11am in Lobby 7), a clothing drive from December 9-20 and an end-of-campaign raffle for all who made donations. For more information, contact Debra Fair in the Office of Special Community Services, Rm 20A-023, x3-7914, <debbief@mit.edu>.

TheArts

End-Oct/Nov Arts

30 Weds

Ghoulish Music
MIT Concert Band Halloween Concert. John Corley, director. Costumed musicians perform music chosen for its sound-effect potential. 6pm, Lobby 7.

List Foundation Deadline
The List Foundation Fellowship Program annually awards up to $5,000 to one undergraduate and one graduate student of color who are citizens or permanent residents of the US, to support a year's work on a project in the performing, visual or literary arts. Maureen Costello, 253-4004 or email: costello@media.mit.edu

31 Thurs

Sax in Chapel
Boston Saxophone Quartet. 12noon, Chapel.

31-1 Thurs/Fri

***Anything Goes* Closes**
Musical Theatre Guild production of the Cole Porter classic. $9; $8 MIT faculty and staff, sr citizens, other students; $6 MIT/Wellesley students. 8pm, Student Ctr Sala de Puerto Rico. 253-6294

31-2 Thurs/Sat

Two Gentleman of Verona
Shakespeare Ensemble set in the wild west. $7, $5 students/srs, $1 off/ticket for groups of 10 or more. 8pm, Kresge Little Theater. 253-2903

1 Fri

Roadkill Buffet
MIT's improv comedy troupe presents *Kangaroo on BBQ*. 7pm, Rm 6-120. Tom Louie, 816-4446 or email: rkb@mit.edu

Festival
Celebrating 5 years of collaboration between the Office of the Arts and IBA/ETC's Cafe Teatro Series. Quetzal combines old and new Latin American instruments, rhythms and musical influences; Boston premiere of NYC's William Cepeda and 16 singers, dancers and instrumentalists of The Boricua Ensemble, perform a fusion of bomba, plena, danza and jibaro rhythms. $10, $8 MIT students & srs: available at TicketMaster (931-2000), at The Source (Student Ctr first floor, M-F 8-5pm) or at the door. 8pm, Kresge Aud. 927-1731

Compton Exhibit Opens
Research Lab for Electronics 50th Anniversary Exhibition.
MIT Museum's Compton Gallery. Weekdays: 9-5pm. 253-4444

3 Sun

Jerry Gorovoy on Bourgeois
In conjunction with *Louise Bourgeois: Drawings* at the List Ctr (see right), Louise Bourgeois' assistant discusses her life and art. 3pm, Bartos Theater (E15). 253-4400

Opening/Halloween Party
Staying Healthy.Drawings by the youngest members of the MIT Health Plans. Costume Party Opening: 2-3:30pm, E23 Atrium

4 Mon

Film Talks
Where Cinephilia Went: The Art of Contemporary Cinema. Opener of four lectures led by Associate Prof Henry Jenkins, director, Film and Media Studies Program. "What's All the Fuss About Quentin Tarantino?" and "From Vulgar Modernism to the American New Wave, 1950-1965." 7-9pm, Bartos Theater. 253-4680

5 Tues

Architecture Lecture
"Campus and Work for Carnegie Mellon University." Prof Michael Dennis. 6:30pm, Rm 10-250. 253-7791

7 Thurs

Chapel Concert
Et Cetera performs "The Road to Redemption... and Stops Along the Way." songs by Purcell and Campra. 12noon, Chapel.

Poetry at MIT
August Kleinzaler and W.S. DiPiero. 7:30pm, Bartos Theater. 253-7894

8 Fri

Exhibit Closes
Venice, San Francisco and Somerville: Mary Kocol. Night-time color photographs. The Dean's Gallery, Sloan School of Management, E52-466. Weekdays: 9-5pm. 253-9455

9-10 Sat/Sun

Architecture Conference
"Bukhara: The Myth, the Source, the Architecture and the Urban Fabric." International conference sponsored by the Aga Khan Program at Harvard and MIT; Attilio Petruccioli, MIT, organizer. 9am-5:30pm, Rm 6-120. 253-4418

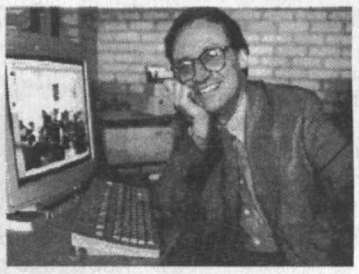
10 Sun

Ritual Architecture Exhibit
The Ephemeral, The Transient, The Static: Ritual Architecture and Urbanity, The living traditions of ritual architecture in India.Opening Reception: 5-7pm. Wolk Gallery (Bldg 7, 3rd floor). 258-9106

Band for Dancing
VinoVana Chorus and Orchestra performs for weekly MIT Folk Dance Club International Dancing. MIT/Wellesley students free, $.25 others. Early teaching for beginners; 7-8pm, Teaching & requests; 8-11pm, Lobby 13. 253-FOLK or email: fdc-request@mit.edu

12 Tues

authors@mit.edu Reading Series
William Mitchell, Dean of the School of Architecture and Planning discusses *City of Bits: Space, Place and the Infobahn.* Copies of his book, will be available for sale and autographing. 5:30-7:30pm, Rm 6-120. 253-5249



13-17 Weds/Sun

Artist in Residence
Joseph Grigely, in residence with his ongoing interactive installation, *Ordinary Conversations*. (See List Ctr information right.)

14 Thurs

Soprano & Harpsichord
Elizabeth Taylor Ghirin, lyric soprano; Yukiko Takagi, harpsichord. Bach, Monteverdi, Bernstein, Wolf and American Folk Songs. 12noon, Chapel.

14-16 Thurs/Sat

A Night of One-Acts
Dramashop's student-written, student-directed one-act plays. 8pm, Kresge Little Theater. 253-2908

15 Sat

Amernet String Quartet
Haydn's Quartet in B-Flat Major, Op. 76, No. 4; Bartok's Quartet No. 1, Op. 7; Brahms' Quartet No. 1 in C Minor, Op. 51. 8pm, Kresge Aud.

Techy Show/Tell
Bring slides, video, poetry, something to read, show, perform, and/or consume. 9pm, Rm 20B-119. email: robot@mit.edu

16 Sun

Toons Fall Concert
Coed a cappella group of MIT and Wellesley Students. Two guest groups TBA. 7:30pm, Rm 6-120. Rich, 647-3401 or email: toons-request@mit.edu

Gamelan Galak Tika
Traditional music and dance from Bali featuring the first Boston area appearance of masked dancer, I Nyoman Cerita, his 14-year old daughter and his 10-year old son. $5, free to MIT community and children under 12. 8pm, Kresge Aud. 253-2826 or 253-9822 or email: galak-tika@mit.edu

18 Mon

Dean's Gallery Opening
Madge Slavin: *Picking up the Pieces*. Figurative and landscape images in mixed media on paper. **Opening Reception—Nov 20**, 4:30-5:30pm. The Dean's Gallery, Sloan School of Management, E52-466. Weekdays 9-5pm. 253-9455

Film Lectures Continue
See 4 Mon left. "The 'Movie Brats' and Their Legacy" and "The Roger Corman School: Gender and Genre in Popular Cinema." 7pm, Bartos Theater. 253-4680

19 Tues

4th Pietro Belluschi Lecture
Michael McKinnell, architect, Boston; MIT Adjunct Professor. 6:30pm, Rm 10-250. 253-7791

21 Thurs

Violin in Chapel
Alexey Shabalin, formerly of the "Moscow Soloists" chamber orchestra, in a program of solo Bach. 12noon, Chapel.

Evening with Gregor von Rezzori
Gregor von Rezzori, Writer-in-Residence Nov 16-Dec 1. Born in the Bujkovina (now part of Romania) in 1914, Rezzori became known to American readers in 1981 with the publication of his novel *Memoirs of an Anti-Semite*. 8pm, Rm 6-120. 253-7894

21-23 Thurs/Sat

H.M.S. Pinafore
MIT Gilbert & Sullivan Players. Tickets: $7-10. Nov 21-23— 8pm, Nov 23—2pm, Sala de Puerto Rico. 253-0190 email: savoyards-request@mit.edu

22 Fri

MIT Festival Jazz Ensemble
James O'Dell, director. $2 at the door. 8pm, Kresge Aud.

22-24 Fri/Sun

Dance Troupe Fall Concert
Student-choreographed pieces. Nov 22-23— 8pm, Nov 24—2pm, Kresge Little Theater. Ticket prices TBA. Carol Cheung, 225-8744 or Christina Schofield, 225-8398

23 Sat

MIT Concert Band
John Corley, director. 8pm, Kresge Aud.

24 Sun

Wampler Show Closes
Open Strings for e: Search on the Journey. Collage by Prof Jan Wampler explores influences on the architectural process. (See right for MIT Museum info)

25 Mon

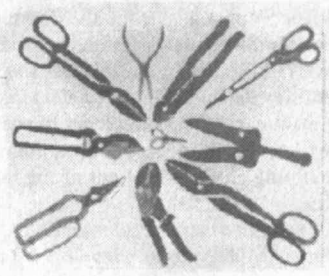
Another Film Lecture
See 4 Mon above. "High Concept and the MTV Style" and "Modernism Made Accessible: The New American Independents." 7pm, Bartos Theater. 253-4680

29 Fri

***Staying Healthy* Ends**
See 3 Sun above.

All Month

List Center
Louise Bourgeois: Drawings. Over 100 works on paper spanning the entire career of 84 year old Bourgeois, Also *Spider* (1996), a massive steel sculpture.

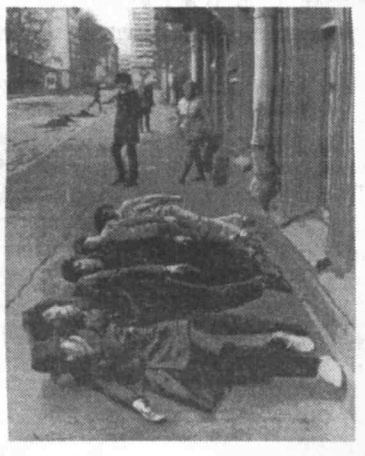


Ordinary Conversations. Ongoing interactive installation by artist-in-residence Joseph Grigely, who will be at the List Ctr Nov 13-17.

List Visual Arts Ctr (E15). Hours: Tues-Th & Weekends 12-6pm; Fri 12-8pm; closed holidays. Office Hours: Meet the curatorial staff for informal discussions; Weds, 12:30-1:30pm. 253-4680

MIT Museum
Lightforest: The Holographic Rainforest. An interactive large-scale holographic installation of landscape holography by Betsy Connors.

Maps from the Age of Atlases. Rare maps from the MIT Museum's Hart Nautical Collections.



Renewal and Metamorphosis. Russian photography from the late Soviet era to the 1990s organized by the Navigator Foundation. Through Dec 15.
Ongoing Exhibits: *Holography: Artists and Inventors*; *The MIT Hall of Hacks*; *Light Sculptures by Bill Parker*; *Math in 3D: Geometric Sculptures by Morton G. Bradley, Jr.*; *MathSpace*.

MIT Museum, 265 Mass Ave. Hours: T-F 10-5, Weekends 12-5. Admission $3; $1 students, srs & children 12 &under; free for members of the MIT community with valid ID. 253-4444

Hart Nautical Gallery
Ships for Victory: American Shipbuilding's Finest Hour and *Permanent Exhibition of Ship Models*. 55 Mass Ave. Daily 9-8pm. 253-5942

Aga Khan Archtecture
Seven winning architectural Projects from the last award cycle of 1992-1995. The Rotch Visual Collections, Rm 7-304. 253-2955

All events are free unless prices are noted.
All concerts: 253-9800 unless otherwise noted.
MIT Arts Hotline: 253-ARTS.
MIT Arts Web: http//web.mit.edu/arts/www/
Month-at-a-Glance is produced by the MIT Office of the Arts (253-4003) and ARTSNET.
Design and production: MIT Design Services.

MIT researchers engineer molecules to aid environment

(continued from page 1)

readily absorb large amounts of them.

Using micelles for cleaning is not a new idea. Common household detergents contain micelles, which dramatically increase the capacity of the washwater to pick up organic contaminants. Micelles could likewise be used to remove organic contaminants from industrial waste streams.

But there is a problem. If the micellar solution and the waste stream come into direct contact, they will mix. How does one then separate the "loaded" micelles from the mixture so as to remove the contaminant and regenerate the micelles? Filtering is feasible but inefficient as it removes the bulk solvent (water) from the dilute contaminant. (One researcher likens the process of filtering out the micelles to going fishing by emptying all the water out of the lake and then picking up the fish.)

As an alternative, Professor Hatton and Patricia Hurter (MIT PhD '92) developed a technique in which the fresh micellar solution is pushed through hollow tubes whose walls are made of membranes that serve as ultrafine filters. Similar hollow-fiber units are used for kidney dialysis.

In the MIT technique, the contaminated stream flows in the opposite direction in the space surrounding the hollow fibers. The relatively large micelles cannot flow through the walls of the tubes, but the organic contaminants can—and will—to join the cores of the micelles. The result is a clean stream of treated water and a highly concentrated solution of contaminant-bearing micelles. Experiments have confirmed that the contaminants will move through the walls of the tubes and into the micelles. In one series of tests, a 2 percent micelle solution removed 80 percent of the contaminant toluene from the feed stream.

Professor Hatton and graduate students Gerard Prioleau and Randi Mosler of chemical engineering are performing further experiments on the technique as well as fundamental studies on the structure and behavior of micelles. They are also looking at options for cleaning up and recycling the micelles. For example, they are working with a micelle made of a new class of polymers that responds to pH. By manipulating the pH of the loaded micellar solution, the researchers can disrupt the structure of the micelle so that it can no longer accommodate the contaminant, which falls out of solution. By then adjusting the pH back to its original value, they can reform the micelles for reuse.

The initial work was supported by the MIT Sea Grant College Program and the US Department of Energy. The work on the pH-sensitive micelles is being funded by the National Science Foundation.

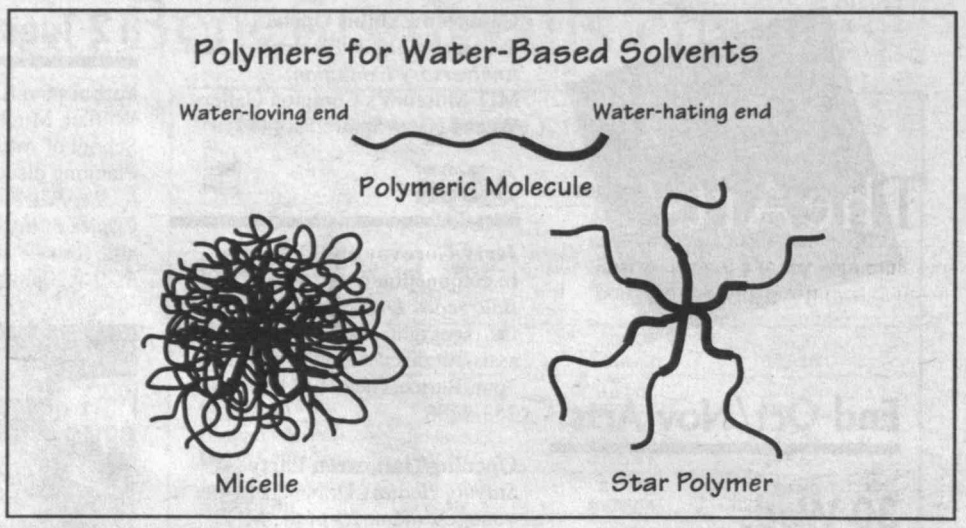
CLEANING GROUNDWATER

Another aqueous stream that often requires cleaning is groundwater. In polluted aquifers, contaminants are present both in the water and on the soil or permeable rock through which the water flows. One cleanup method involves injecting clean water down a well, forcing it through the aquifer to wash the contaminants off the soil, and then bringing the contaminant-bearing water back up via a second well.

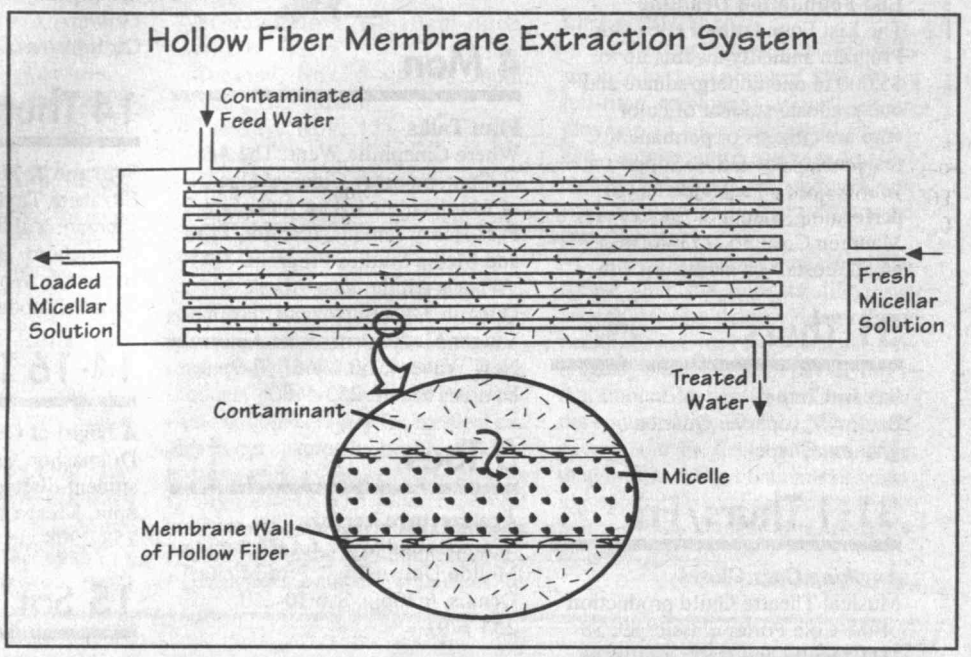
This process, however, typically requires large quantities of water because the contaminants tend to cling to the soil. The process would be more efficient if the contaminants came off the soil more quickly—a change that could be achieved by adding micelles to the cleanup water. But there are several problems with this. For example, while a micelle's overall structure is generally stable, individual molecules are constantly moving into and out of the structure. Once in the aquifer, those individual molecules will be drawn by their oil-like tails to adsorb on the soil, adding to the contamination problem rather than alleviating it. Also, if the micellar solution becomes too dilute, the micelles will simply break apart.

Professor Hatton, St. Laurent Professor of Chemical Engineering Robert E. Cohen and Dr. Colleen A. Vandevoorde (MIT PhD '96) are therefore looking at a new type of molecule. The "star polymer" consists of a central core from which "arms" radiate. Certain parts of each arm are water-hating while other parts are water-loving. Like the micelle, the star polymer will both stay in solution and pick up contaminants. But unlike the micelle, the star polymer will not fall apart because it is a single molecule, with its arms chemically bound.

The MIT team found that one type of star polymer, the sulfonated polystyrene star, is easily synthesized and has a high capacity for taking up contaminants such as toluene and naphthalene. Work must continue on characterizing the nature and behavior of these stars and examining the economics of their use. The research was supported by the Charles E. Reed Initiatives Fund, the Emissions Reduction Research Center and the Northeast Hazardous Substances Research Center.



MIT researchers are engineering long polymeric molecules for environmental cleanups. Above: the object on the left is a micelle, formed when the "water-hating" ends of several molecules come together, leaving the "water-loving" ends dangling on the outside. The water-loving ends keep the micelle suspended in the aqueous stream, while the water-hating core captures organic contaminants. The object on the right is a "star" polymer, an individual molecule whose structure produces the same behavior.



In this device, a solution containing molecules called micelles is pushed through hollow tubes, while the contaminated waste stream moves in the opposite direction in the space surrounding the tubes. Contaminants are small enough to move through the walls of the tubes to join the micelles, but the micelles are too large to escape. The result is a clean stream of water and a highly concentrated solution of contaminant-bearing micelles.

One-fifth of genome mapped

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genes among the 23 chromosomes. The researchers observed, for example, that chromosomes 1, 17 and 19 were gene-rich and that chromosomes 4, 13, 18, 21, and X were gene poor—a finding consistent with those in the earlier Whitehead map.

One of the foremost applications of the gene map will be in positional cloning—a method commonly used for searching disease genes. In this time-consuming method, researchers study a number of affected families to narrow the location of the disease gene to a specific region on a given chromosome. They then use the several pieces of overlapping DNA clones within the suspected region to identify genes contained in the region. These genes are then scrutinized for the presence of sequence mutations in affected individuals.

"By providing an inventory of all candidate genes within that region, gene maps will make positional cloning more efficient," said Dr. Lander. But the value of gene maps will extend beyond facilitating gene searches. They will shed light on genome organization, provide information about clustering of related genes, and tell us more about conservation of gene order among species.

Editor's note: See the next issue of Tech Talk for a preview of the "post-genome world" based on a Science policy article by Dr. Eric Lander.

Hodges to be dean in UESA office

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"I would also like to encourage our faculty to explore new, non-traditional teaching methods. We should be world leaders in the perfection of electronic classrooms, in the development of shared learning protocols in technical fields, and in the use of off-campus or 'field' courses to enhance the education of our students.

"I have been, and will continue to be, active in the development of a new communications requirement for our undergraduates that will ensure that they leave MIT prepared to engage in the important debates that will shape the future of our world.

"My goal is the same as that of our faculty as a whole: to prepare our students as best we can to ascend to national and international leadership roles in the next century.

"The demands of my own profession provide an important perspective on the value of holistic education. My research specialty, the evolution of mountain ranges, is an extremely integrative topic, requiring me to obtain and synthesize data from numerous subdisciplines within the earth sciences and beyond. It requires a broad foundation in the basic sciences and (more importantly) understanding how they can be combined and focused on research problems. I spend about as much time in the field, in places like Nepal, Tibet and Greenland, as I do in the laboratory working with mass spectrometers and lasers."

Professor Kip Hodges in the field.

Dr. Hodges, 39, received the PhD in geology from MIT in 1982 and spent a year as an assistant professor at the University of Wyoming. He returned to MIT in 1983 as an assistant professor, was named associate professor in 1987 and was granted tenure in 1990. He was appointed a professor in 1993.

He is associate editor of the Geological Society of America Bulletin, and he serves on the editorial boards of Geology and of Contributions to Mineralogy and Petrology. He served in 1991 as a member of the peer review panel of the Department of Energy's early site-suitability evaluation for the potential high-level nuclear waste repository at Yucca Mountain, NV, and also served the National Science Foundation from 1990 to 1992 as a member of the Tectonics Review Panel.

"This appointment concludes the search for a successor to Travis Merritt, who announced his plans to retire last spring. I discussed the process with administrators, staff and students; everyone agreed that we should be looking for an MIT faculty member," Dean Williams said, adding that she was grateful to all who have participated in the search process.

The internal search had three components, she added. All faculty in August were sent a letter, soliciting self-nominations and nominations of others. She interviewed all those who responded. She discussed the position with about a dozen people on the Undergraduate Academic Affairs Staff, and she also met all the associate deans both individually and as a group.

Students leaders were contacted over the summer by e-mail and invited to comment on the search and after the beginning of the term, four open meetings were held to get student input.

MIT students put China school online

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Mr. Cao and Mr. Seid noted that working in China allowed them to understand Chinese people and culture at a much deeper level than they could have otherwise. Through MIT-CETI, they want more MIT students to be able to gain the same invaluable experience.

"Being a student at MIT, it's easy to get caught up in technology for technology's sake and not see its greater role in society," Mr. Seid said. "For MIT students, affecting society with technology means taking a global perspective, and hopefully, our new program will help give students that understanding."

The high school Web site URL is <http://202.120.80.2>. According to Mr. Cao, there is only one 128K line connecting the Internet in America and China, so it is sometimes very difficult to reach the main site. The mirror site can be seen from the MIT-CETI home page at <http://www.mit.edu/ people/ jjseid/mitceti.htm>.

Benefits open enrollment period begins

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DENTAL INSURANCE

The eligibility for dental coverage has been revised. Employees must have a minimum one-year appointment in order to be eligible to enroll in the Delta Dental Plan. This revision was effective on January 1, 1996 and replaced the previous requirement of at least a three-month appointment. The eligibility criteria were changed to protect long-term employees whose premiums are adversely affected by the claims experience of short-term employees who terminate employment after less than a year.

Anyone with questions about open enrollment or benefits may contact the Benefits Office at x3-0500, Rm E19-411, <benefits-www@mit.edu>. At Lincoln Lab, the location is Rm A-125, x7060. To order plan brochures, call BenTalk at x3-5000.

Further information on open enrollment, links to health plan Web pages (including access to physician listings) and other benefits news can be found on the Web at <http://web.mit.edu/benefits/www/>.