

**MINIATURE CRANES**—Professor David Gordon Wilson of mechanical engineering received these origami cranes from Professor Akira Naito of Nihon University in Japan. Professor Naito made them in appreciation for Professor Wilson's editing of one of his articles. The largest crane has a wingspan of about two inches; the smallest has a wingspan of just over half a millimeter. See story in Here & There on page 5.

Photo by Donna Coveney

### 6.5 PERCENT

## Tuition to Rise \$1,100

MIT announced Friday a \$1,100 tuition increase from \$16,900 this year to \$18,000 for the 1992-93 academic year. The 6.5 percent increase is the second lowest percentage increase in 20 years; the lowest was 5.9 percent in 1988.

In addition, there will be an average increase of 2.9 percent for housing and six percent for dining. Overall, tuition, room and board will rise from \$22,230 this year to \$23,565 in 1992-93, an increase of six percent.

The increases, approved by the MIT trustees at their March 6 meeting, were announced by President Charles M. Vest. He noted that tuition historically covers about half the cost of a student's education, with the remainder met by earnings from the endowment and by unrestricted gifts and grants.

While the increases are somewhat higher than the inflation rate, Dr. Vest said that the cost of running a major research university, and maintaining its excellence, is an "expensive proposition." He pointed to modern scientific instruments, computers, high costs of energy and utilities, and the need to

stay competitive on faculty salaries in order to attract and keep the best people.

Still, he said, the major issue in setting next year's tuition was to keep the increase as small as possible while supplying sufficient additional income to enable MIT to continue its "need-blind" policy of admitting students on the basis of merit, without regard to their financial circumstances.

He stressed that MIT will meet the full demonstrated financial need of all undergraduate students. About 59 percent of MIT's 4,325 undergraduates receive financial aid through a combination of scholarships, loans and term-time jobs. The average aid for a needy student this year—to help pay the \$22,230 cost of tuition, room and board—was \$16,600, for a total of \$42.2 million. Of that sum, scholarship aid amounted to \$28.1 million, with loans accounting for \$10.5 million and term-time work \$3.6 million.

The university's nominal self-help level—the amount students are expected to provide from loans and term-time work before receiving scholarship aid—amounted to \$3.6 million.

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### MICAR REPORT

## 'Openness' Needed in MIT Research

By Charles H. Ball  
News Office

An ad hoc committee that studied the "Military Impact on Campus Research" has concluded that a "policy of openness" should govern all research at MIT.

To that end, the committee has urged that programs, projects and research "be evaluated regularly by an external committee consisting of recognized experts reporting to the cognizant members of the administration."

Such an evaluation, the study group said, "should be in addition to the evaluation carried out by the program officers in the supporting agencies and by the corporation visiting committees."

"In a society such as ours in which support can come from several sources, scholars ideally can select their research interests and apply to one or more appropriate supporting agencies," the

committee said. "Unfortunately such plural support may be compromised by interagency agreements. One hopes that ethical considerations and the desire to improve the lot of humanity will influence what research is chosen and what sponsorship they accept."

As a corollary, it said, "MIT should reduce its dependence on sponsored research by developing resources which will permit scholars to pursue intellectually challenging projects which do not fit into the agendas of supporting agencies."

With respect to research specifically sponsored by the Department of Defense, the committee noted that there is no classified research on the Cambridge campus.

"However," it said, "student research at off-campus laboratories... needs to be monitored to avoid the possibility of classification before or when the research is completed."

It added: "The advisors and managers of the off-campus laboratories need to be regularly informed of MIT regulations. It should not be forgotten that all research can be classified by the government at any stage. Although rare, it has happened. One would expect it to be more likely when the research is sponsored by DOD."

The committee found that the fraction of MIT campus research sponsored by the DOD was 16 percent in 1983, 17.4 percent in 1988, and 16 percent in 1991.

The major fraction of the DOD-supported campus research—40 percent—was received by the School of Engineering, the committee said. It added that the Departments of Ocean Engineering, Civil Engineering and Electrical Engineering were the principal recipients, with 62 percent, 43 percent and 31 percent of their total research budgets respectively coming from the DOD in 1991.

Among the laboratories, the committee said, the Artificial Intelligence Laboratory, the Laboratory for Com-

(continued on page 5)

### ALMOST 'LIFELIKE'

## MIT Team Creates Mutating Molecule

In a step toward synthetic "life," Professor Julius Rebek and colleagues in chemistry have created molecules that can both reproduce themselves and mutate, or change their form in response to an environmental stress.

The work, reported in Science last month, "provides a model for evolution at the molecular level and brings synthetic life closer to reality," said Professor Rebek, the Camille Dreyfus Professor of Chemistry. His colleagues in the work, which is supported by the National Science Foundation, are postdoctoral associate Jong-In Hong, graduate student Qing Feng, and postdoctoral fellow Vincent Rotello.

The research was also reported in Chemical & Engineering News last month. C&EN said that "In the MIT experiments, two replicating molecules that are structurally very similar are allowed to compete for a limited amount of material from which they are both made." The molecules reproduce themselves, catalyzing their own replication and each other's.

Upon irradiation with ultraviolet light one of the molecules mutates to form a third type that is more effective than either of the two original molecules at gobbling up the chemicals it needs to reproduce.

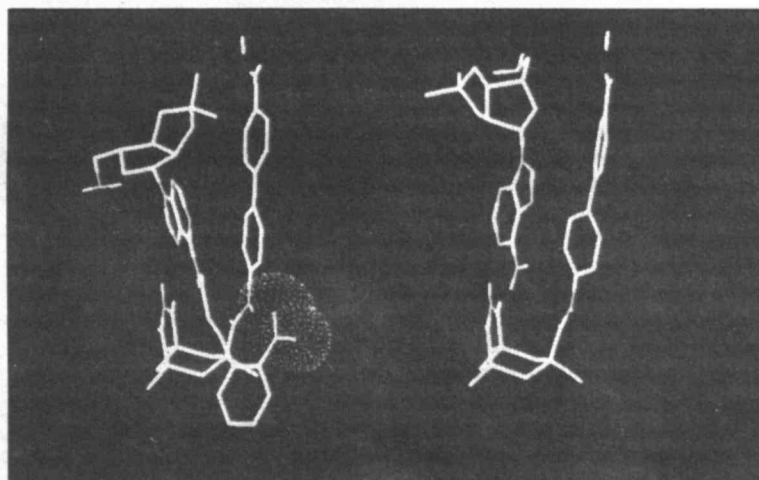
Specifically, the molecule that mutates contains a nitro group that is cleaved from the molecule when exposed to ultraviolet light.

Two years ago another group led by Professor Rebek created molecules capable of reproducing themselves. At the time, the next step was to create molecules that could both reproduce themselves and mutate—two of three criteria for Darwinian evolution and a goal achieved in the current work.

But to be considered truly "lifelike," the molecules must meet the third criterion of Darwinian evolution: natural selection, or competition among mutants resulting in a superior molecule that can pass on its characteristics to "offspring."

As noted in the C&EN article, however, natural selection requires at least two mutants, and the Rebek group has only one. As a result, they are currently working to create others.

The magazine concluded its story with a prediction from biochemist Gerald F. Joyce of the Scripps Research Institute: "By the end of this decade, someone—and the odds are good it will be Rebek—is going to make a self-sustained chemical system capable of undergoing Darwinian evolution."



**'LIFELIKE' MUTATIONS**—Professor Julius Rebek and colleagues have created synthetic molecules that have some of the characteristics of life. Two such molecules are shown here in a computer-generated image. Specifically, when irradiated by ultraviolet light the molecule at left "mutates" to form the molecule at right, which is much better than its predecessor at gobbling up the chemicals it needs to reproduce.

Photo by Morgan Conn

## IN BRIEF

### PAY CHANGES

New federal withholding tables that will affect many, but not all, employees have been issued by the Internal Revenue Service. The change in withholding is effective with the first payroll in March. The Payroll Department is preparing an explanation of the changes that will be circulated with paychecks later this month.

### NO TECH TALK

Tech Talk will not be published on March 25 because of the break for Spring Vacation. The Calendar in next week's issue will cover the period from March 18-April 5. The deadline for listings is noon Friday, March 13.

### PICTURES WANTED

The Communications Office is looking for two "companion" photographs—one black and white, one color—for the covers of the 1992-93 telephone directories. In keeping with this year's covers, which featured the Department of Earth, Atmospheric and Planetary Sciences, the theme of the photos submitted should focus on departmental activity at MIT.

The deadline for submission is Wednesday, April 15. Any photos or slides used will be returned to their owners. For more information, call the Communications Office, x3-1705, or stop by Rm 4-237.

### AARP CANCELLED

The March meeting of the MIT-Cambridge Chapter of AARP, scheduled for March 24, has been cancelled because it coincides with the annual meeting of the Quarter Century Club. The next AARP meeting will be Tuesday, April 28.



# Student Notices

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

## ANNOUNCEMENTS

**TCA/American Red Cross Blood Drive\***—Mar 11-13, Mar 16-17: Walk-ins welcome, but appointments appreciated. Mar 11-13: 12-5pm. Mar 16-17, 1-6pm. Kresge Auditorium. Call x3-4885.

**Hispanic Month\*\***—Mar 11: Hispanic Forum II, 5pm, BSU. Mar 12: The Politics of the North American Free Trade Agreement, Prof. Jonathan Fox, MIT, 5pm, Rm 4-163. Mar 13: Central America: Patterns of Culture, videos, 5pm, Rm 14E-310. Mar 14: Teach for America Presentation, 2pm, location TBA. Special Spanish Mass, 5pm, Chapel. Performance by the Association of Puerto Rican Students, 7pm, location TBA. Mar 15: The Clash of Civilization, Chuy Negrete Multimedia Performance, 3 & 7pm, location TBA. Mar 19: Local Hispanic Empowerment, 7pm, location TBA. Mar 19-22: Society of Hispanic Professional Engineers National Conference: Student Leadership, MIT Campus. For more information on any of these events contact Homer Perez x3-5010 or Teresa Hernandez x3-3278 (th@media.mit.edu).

**Lecture by Patricia Ireland, NOW President**—Mar 15: Sponsored by MIT Students for Choice and Reproductive Freedom, 8pm, Rm 26-100.

**Writers of Color Workshop\*\***—Mar 21: 3-5pm, Eastgate-Wolcott #205. Call Ayida Mthemba x3-4861.

**Career Services and Preprofessional Advising Recruitment Presentations\*\***—Mar 16: CGI, 6:30-8:30pm, Rm 4-149. Environ, 7-8pm, Rm 4-153. Mar 19: Peace Corps, 9am-3pm, Student Center 1st flr lobby; 4:30-6:30pm, Rm 4-149.

**Spring Vacation Libraries Hours\*\***—Mar 20-29: All libraries follow regular schedule with the exception of the following: **Aero & Astro:** Fri Mar 20, 9-5; Sat-Sun Mar 21-22 and Mar 28-29, closed; Mon-Fri Mar 23-27, 9-5. **Lindgren:** Fri Mar 20, 8:30-5; Sat-Sun Mar 21-22, closed; Mon-Fri Mar 23-27, 9-5; Sat Mar 28, 11-6; Sun Mar 29, 1-5. **Music:** Fri Mar 20, 9-5; Sat-Sun Mar 21-22, closed; Mon-Fri Mar 23-27, 9-5; Sat Mar 28, 11-6; Sun Mar 29, 1-11. **Reserve Book Room:** Fri Mar 20, 9-5; Sat Mar 21, 11-6; Sun Mar 22, 1-6; Mon-Fri Mar 23-27, 9-5; Sat Mar 28, 11-6;

Sun Mar 29, 1-11. **Rotch Visual Collections:** Fri Mar 20, 9-5; Sat-Sun Mar 21-22 and Mar 28-29, closed; Mon-Fri Mar 23-27, 9-5. **Schering-Plough:** Fri Mar 20, 9-5; Sat-Sun Mar 21-22 and Mar 28-29, closed; Mon-Fri Mar 23-27, 9-5.

**A Safe Ride\*\***—Call 253-2997 for a free ride within MIT boundaries. Service operates Sun-Wed 6pm-3am; Thurs-Sat 6pm-4am. Guide to shuttle stops available.

**Contact Line\*\***—A peer information and counseling hotline focusing on issues of sexuality. One male and one female staffer are available Sunday-Wednesday 8pm-12am to talk with you. We welcome people of all sexual orientations and we are open through Finals Week of Fall 1992. Our number is x3-6460. All calls are strictly confidential.

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

**MIT Student Furniture Exchange\*\***—If you have a great imagination, a sense of humor, very practical needs, a shoestring budget, a sense of adventure, the Furniture Exchange is the place for you. Great bargains, used furniture and more, Tues/Th, 10am-2pm, 25 Windsor St (MIT Museum Bldg, 1st fl). Donations welcome. x3-4293.

**Language Conversation Exchange\*\***—Internationals and Americans are invited to participate in this program which matches persons interested in practicing a language and getting to know someone from another country. Presently, there is a need for English partners to fill continued requests of internationals wanting to practice and improve their English. Sponsored by the Wives' Group, call x3-1614 for more information.

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

## RELIGIOUS ACTIVITIES

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

**Baptist Campus Ministry at MIT\*\***—Undergrads meet for supper on Tuesdays 5:15pm at 312 Memorial Drive, then move to Chapel across the street for worship at 6pm; graduates meet for brown bag lunch at noon on Wednesdays for Bible study and discussion at 312 Memorial Drive, 2nd flr. Call x3-2328.

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

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

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

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

**MIT Christian Impact\***—The weekly meeting for the ministry of Campus Crusade for Christ. Wind up the week: relax, snack, sing, laugh through skits and gain practical insight from God's Word. Meets Thursdays, 7:30pm, Student Ctr, 3rd flr. For more information contact Tom, 629-2494.

**Chinese Bible Fellowship (CBF)\*\***—Come join us for weekly Bible Study, fellowship, singing and prayer. We are a group of over 20 mostly English-speaking Chinese Americans who welcome both Christians and those who are seeking God. Wednesdays, 8-9:30pm, McCormick, East Penthouse.

**Chinese Christian Fellowship\*\***—Join us for Bible Study, singing, prayer and fun Wednesdays 7-9pm. All English-speaking undergraduate and graduate students are welcome (you don't have to be Chinese!). For location and more information contact Carl Lim, dorm x5-7533.

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

**MIT Orthodox Christian Fellowship\*\***—Meets every Wednesday evening at 5:30pm in the Student Center, Rm 301, Private Dining Rm #1 in the Student Center for dinner/fellowship/discussion followed by Vespers (evening prayer) in the MIT Chapel. Open to all Orthodox Christians (Greek, Slavic, Arabic, etc.) and those interested in learning about the original Christian Faith. Information: Arlene Marge 625-3768.

**Church of Jesus Christ of Latter-day Saints Student Association at MIT\***—Sunday services, Cambridge University Ward, meets every Sunday 3-6pm at the Cambridge Chapel, corner of Brattle Street and Longfellow Park. Meetings are for students and young single adults.

**MIT Hillel\***—Mar 11: Israeli Folk Dancing, 7:30pm. Mar 11: Chug Ivrit Hebrew Table, 5-7pm, Walker Hall. Happy Birthday Study Break, 9pm, MacGregor. Mar 13: Torah & Chocolate, 12-1pm. Community Shabbat w/ guests from Generation program. Ashdown Hse DR. Shabbat Svcs, 5:30pm; Shabbat Dinner, 6:30pm; Shabbat Talk, 8:30pm. Mar 15: Project Mazon Food Collection. Bring food donations to Hillel, through 4/10. Mar 18: Megilla Reading, Shpiel & Refreshments, 7pm, Student Center Mezzanine Lounge. More info: x3-2982.

**MIT Korean Bible Study Group\***—Join our Friday night Bible study 7-9pm and Sunday Service 1-3pm at Berkland Baptist Church, Central Square. For more info, Chris Pak x3-9342 or 876-8594.

**Lutheran-Episcopal Ministry at MIT\*\***—Wednesday worship, 5:10pm, MIT Chapel, followed by supper and conversation across the street at 312 Memorial Drive. Contact Rev. Susan P. Thomas x3-2325 or Rev. Scott Paradise x3-2983.

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

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

**MIT Pagan Students' Group\***—Join us at our weekly dinner meeting for Pagans of all traditions. Discussions of religious and social issues of interest to Pagans on campus and in our community, general business, and upcoming events that our group is sponsoring. We meet in the north balcony of Lobdell every Monday evening at 6pm.

**United Christian Fellowship\*\***—Join us for a time of worship, prayer, and Biblical teachings. For more information call Adam Szabo x3-2401 or 576-3795 or Cathy Trotter x3-4944 or x5-6414.

**MIT Vedanta Society\*\***—Meditation and discourse on the Bhagavad Gita with Swami Sarvagatanaanda, MIT Religious Counselor. Sponsored by the MIT Vedanta Society and MIT Chaplaincy. Meets Fridays, 5:15pm, MIT Chapel.

## OPPORTUNITIES

**AKP Outreach and Research Grant Program\*\***—The Aga Khan Program for Islamic Architecture is introducing a grant program for outreach and research related to the Muslim world for assistant, associate, and full professors at MIT and Harvard University. Call x3-1400. Proposal submission deadline: Mar 16.

**Carroll L. Wilson Awards\*\***—The aim of the Wilson awards is to provide opportunities for MIT undergraduate and/or graduate students to explore a program of research and/or study of an important societal problem with international dimensions. For application material and more information contact Kimberly N. Bagni, Rm 3-209; Susan L. Kendall, Rm 20A-023, Caryn L. Tolpa, Rm E15-229, or the Undergraduate Education Office, Rm 20B-141. Application deadline: Mar 30.

**MIT Public Service Fellowships.** These grants are intended to enable MIT undergraduates in good academic standing, using scientific/tech-

nical background or not, to pursue intensive and specifically focused projects undertaken with and sanctioned by local public service organizations. For more information contact Virginia Sorenson, Rm 3-123, x3-0742. Deadline: Apr 6.

**The Writing Prizes\*\***—Cash prizes awarded in Fiction, Short Story, Poetry, Drama, Essay, Scientific and Engineering Writing, Science Writing for the Public. For applications and guidelines contact the Program in Writing and Humanistic Studies, Rm 14E-303. Deadline: Apr 9, 1992.

**I. Austin Kelly III Prize\*\***—Two prizes of \$500 each for the best scholarly or critical essays in any of the following fields or in some interdisciplinary combination of them: Literary Studies, History (including History of Science and Technology), Musicology, Archaeology, and Anthropology. Contact Ms. Joey Bennett, Rm E51-232, x3-0888. Entry submission deadline: Apr 23.

## INTERNATIONAL

**MIT Language Conversation Exchange\*\***—This service assists members of the MIT community to practice a language with a native speaker and get to know someone from another country. Call x3-1614 for more information.

**MIT-Japan Program.** A unique opportunity for MIT science, technology and management students to spend a year in Japan working at a major Japanese company or laboratory. Training, placement, travel and living expenses are covered by the Program. Call Patricia Gercik x3-3142, Rm E38-754.

**International Men's Group.** An opportunity for men from abroad to discuss issues relating to moving to a new country and adjusting to a new culture. The group will meet weekly throughout the year. For more information please call Dr. Paul Wood at x3-2916 or Dean Levak at x3-3795.

## STUDENT JOBS

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

**Off Campus, Non-Technical.** Editorial Staff Assistant needed for assisting the Information Services Department staff with routine duties and special projects. Duties will include general office assistance, faxing, copying, filing, mailings, errands, and special projects. Should have experience with Word, Excel, etc. Must have attention to detail and be able to deal with visitors in a professional manner. Person should work 12-15 hrs/wk for \$8/hr. Please contact Susan Centofanti (Senior Editor), Faxon Research Services, Inc., 238 Main Street, Suite 201, Cambridge MA 02142, phone 354-7112 or 661-1464 (fax).

**Off Campus, Non-Technical.** Someone is needed for a part-time position. Will photocopy articles at MIT Science and occasionally Harvard Medical School Countway Libraries. Person should work 10 hrs/wk for \$7/hr. Please contact Debra Burke, Alkermes, Inc., 26 Landsdowne St., Cambridge MA 02139, phone 494-0171.

**On Campus, Non-Technical.** The Campus Activities Complex seeks a sophomore for the position of Vendor Program Coordinator to be responsible for handling all bookings, contracts, promotions and monies under supervision for the CAC Vendor Program. Must be personable, assertive, outgoing, and professional. Course 14 or 15 majors preferred. Apply in room 500 of the Student Center. Expected to continue in position through senior year. Person should work 5 to 15 hrs/wk for \$7/hr. Please contact Grace Koo or Sandra Nett, x3-3913.

**Off Campus, Technical.** A voice processing company is looking for motivated people with good interpersonal communication skills or experience in languages. Must be able to work in a computer oriented environment. Job essentially is that of a 'lab technician' who will collect voice samples, etc. Hours are flexible and the salary is between \$8/hr and \$10/hr. Contact: Sally W. Kroeker, Elizabeth Corporation, 283 Cabot Street, Beverly MA 01915, phone (508) 922-0012 or (508) 922-1528(fax).

## UROF

*MIT and Wellesley students are invited to join with faculty members in pursuit of research projects of mutual appeal. For further information, please read details on procedures in the participation section of the UROF Directory and the Spring Guidelines. Direct UROF funding for Spring is now depleted; please consider alternative possibilities including academic credit.*

*Summer information are available now. Summer proposals for direct UROF funding will be accepted on a rolling basis starting April 1, 1992. Please watch for pertinent information on the UROF bulletin boards.*

*Faculty supervisors wishing to have projects listed may send brief project descriptions to 20B-140, or via e-mail at urop@athena, or call x3-7306. Listings are posted here, on the UROF bulletin boards in the infinite corridor by the Admissions Office, and in the UROF Office.*

**Solid Mixing in Fluidized Beds.** A student is needed for research work in solid mixing in Circulating Fluidized Beds (CFB's). A thermal tracer technique for solid mixing tests will be developed which will complement a technique based on magnetic permeability. Student will develop tests that will be performed in a room-temperature CFB in the Heat Transfer Lab. Student should have lab and/or shop experience; fluid mechanics and heat transfers also helpful. Faculty supervisor: Prof. Leon Glicksman, 3-433, x3-2233; contact: Detlef Westphalen, x3-7080.

**Eloranta Summer Research Fellowships.** The Eloranta Summer Research Fellowships were established as a memorial to Peter J. Eloranta '68. These fellowships are intended to encourage challenging intellectual activity during summer months. Area of study or research may be from any field. The activity must be student-originated or student-directed where originality is emphasized. The awards include a \$5,000 stipend that can be used to support materials, travel and living expenses. Information about Eloranta are at the UROF office, 20B-140. Contact: Norma McGavern, 20B-140, x3-7909.

**Numerical Experiments.** Looking for a student to devise and run numerical experiments for a promising new technique in a stochastic routing problem. Knowledge of probability (6.041 or equivalent) and C programming language very helpful. Hours and pay versus credit negotiable. Faculty supervisor: Prof. John N. Tsitsiklis, x3-6175, jnt@athena; contact: Bill Irving, x3-2832, wwirving@athena.

## VOLUNTEERS

**Chocolate Fools Day.** Chocolate Fools Day is a benefit supporting the Cambridge Performance Project Inc., sponsored by the Charles Hotel and WBOS. Feast on the spectacular chocolate creations of Cezanne Desert, Ritz Carlton, Sweet Enchantment, and many more in the ballroom of the Charles Hotel on Sunday, March 15 from 1-4 p.m. Tickets cost \$10 in advance, \$12 at the door, and \$8 for groups ordering in advance. Call 651-5865 for more information.

## CABLE

*Frequent schedule updates now appear on TechInfo. For more information about cable at MIT, call Randy Winchester at x3-7431, Room 9-050, e-mail: randy@mit.edu; tv-messages@mit.edu, x3-9383, E19-722E.*

**Mar 11: Channel 8:** 11am-12:30pm—Live coverage of the MIT Optics and Quantum Electronics Seminar.

**Mar 16: Channel 8:** 4-5pm—Live coverage of the MIT EECS colloquium: "System Decompositions and Modularity in the Game of Go," E. Berlekamp, UC Berkeley.

**Mar 17: Channel 8:** 4-5:30pm—Live coverage of the MIT VLSI Seminar: "Lessons from Japanese University Contamination Control Research," Michael Liehr, IBM Research Division.

**Mar 18: Channel 8:** 11am-12:30pm—Live coverage of the MIT Optics and Quantum Electronics Seminar.

**Mar 19: Channel 8:** 11am-5pm—Live coverage of the C.A.E.S. videoconference: "Automatic Speech Recognition and Understanding," Victor Zue. Channel 10: 1-2pm—Apple Education TV Series: "Macintosh Solutions for Math & Science."

## Crimewatch

*The following incidents were reported to the MIT Campus Police Department during February 28 - March 5:*

**Feb 28:** pocketbook left unattended, wallet missing, Bldg E39, value \$28; wallet left unattended in Killian Hall, value \$15; past attempted larceny of motor vehicle, East garage.

**Feb 29:** disturbance at Walker Memorial, all parties dispersed without further incidents; bag left unlocked and unattended found with radio and computer missing, Bldg E25, value \$300; annoying phone call, MacGregor.

**Mar 1:** malicious destruction of bulletin boards, infinite corridor.

**Mar 2:** lab kit left unlocked and unattended, stolen from Bldg 4, value \$500; vandalism to elevator, Bldg 14; hood ornament stolen from a car parked in East garage.

**Mar 3:** leather jacket, sunglasses and \$20 stolen, Athena cluster, Student Center.

**Mar 4:** suspicious activity, Student Center coffee shop; jacket stolen while attending a fraternity party, value \$115; two pocketbooks left in an unlocked and unattended room, victims were a few doors down the hall, 1) Bldg 20, value \$290; 2) Bldg N51, value \$120; wallet stolen from coat at Faculty Club, value \$11; obscene phone call, NW10.

**Mar 5:** while retuning from restroom, victim noticed person exiting from office in Bldg 24, discovered wallet missing, value \$79; another victim left office unlocked and unattended for 4 minutes, pocketbook removed from chair, Bldg 14, value \$80.

*Most of the above larcenies could have been averted—it only takes a minute for a theft to occur, it only takes a minute to lock it up and it saves a ton of aggravation. Crime Prevention is the anticipation, recognition and appraisal of a crime risk and the initiation of some action to remove or reduce it.*

## MIT TECH TALK (USPS 002157)

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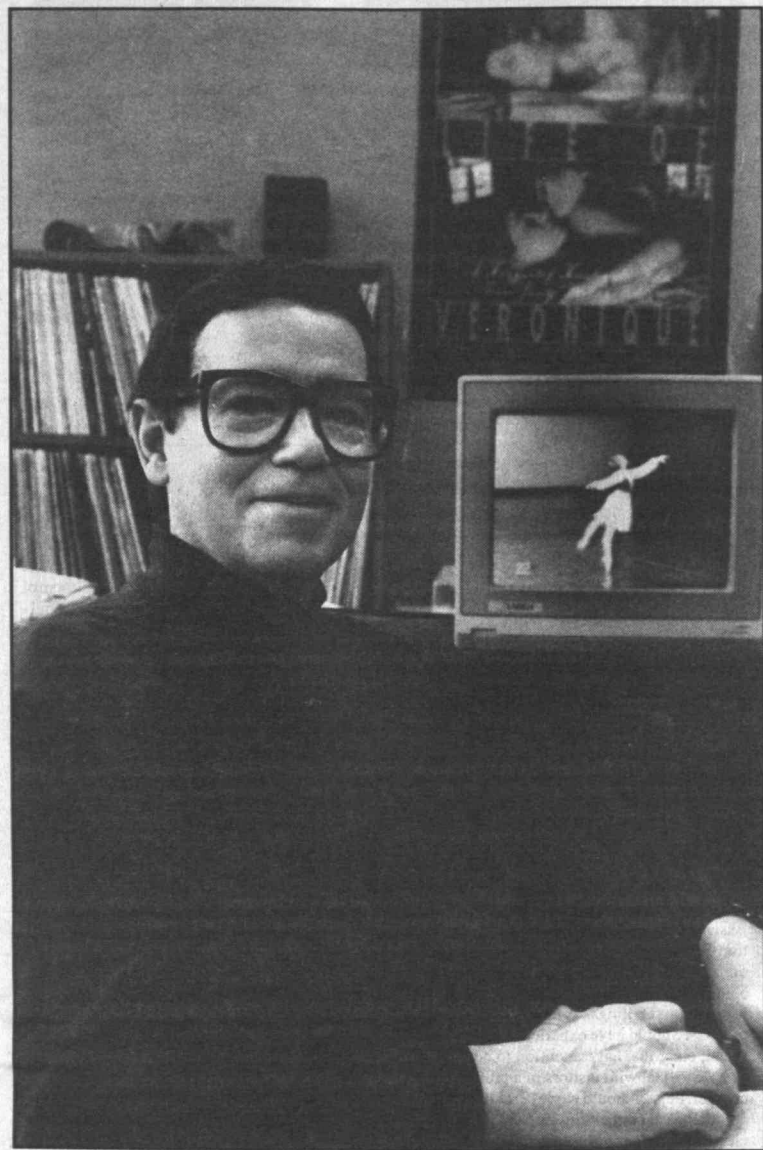


## COMING SOON TO A THEATER NEAR YOU

## Scientist/Screenwriter, Professor Leads a Double Life

To get a sense of the double life that materials science professor Keith H. Johnson is leading, consider two press releases: one from the MIT News Office and one from the Twin Eagle Entertainment Corporation.

The MIT release carried a San Diego dateline, where Professor Johnson



Professor Johnson in his office with a promotion of his film showing the ballerina who is the star. Photo by Donna Coveney

## APRIL EVENT

## International Knowledge Symposium Scheduled

Business and government leaders will join MIT faculty members in a symposium at MIT on Thursday, April 9, on the topic, "Knowledge Without Borders: National vs. International Roles of the Research University."

The all-day conference, at Kresge Auditorium and open to all members of the MIT community, will illuminate and debate the issues raised in the May 1991 report titled, "The International Relationships of MIT in a Technologically Competitive World."

That report, which expressed the views of a representative group of the MIT faculty, concluded that the Institute's broad and open links with the international science and technology community are crucial to its ability to serve American society. The study recommended that MIT continue these diverse links while strengthening and expanding its research and educational programs in support of American industry.

The April conference, according to its organizers, "is designed to bring to the surface other perspectives from industry, government, and from abroad, on the same set of issues, and to provide a format in which these views can be expressed and debated."

"The immediate audience will be the MIT community, but it is hoped the discussions will reach a larger audience through other participants, the media and through contributions to a volume on this subject to be published by the Consortium on Financing Higher

Education next fall." The chairman of the earlier faculty study group, political science professor Eugene Skolnikoff, former director of the MIT Center for International Studies, will be co-chairman of the April conference with MIT President Charles M. Vest.

Invited participants, who will take part in four separate panels, include: From government—Rep. Joseph P. Kennedy II (D-Mass.), and Robert White, US Department of Commerce undersecretary for technology.

From industry—John McTague, vice president-research, Ford Motor Company, and Dr. John Armstrong, vice president, IBM Corporation. From abroad—Dr. Wataru Mori, member of the Council for Science and Technology, Japan, and Dr. Jean-Claude Derian, Jean-Claude Derian Associates, France.

From universities: MIT Provost Mark S. Wright, Institute Professor and former provost John M. Deutch, Professor Richard K. Lester, director of the MIT Industrial Performance Center, Associate Provost Sheila E. Widnall and Dr. Robert M. Rosenzweig, president of the Association of American Universities.

The organizers of the event, besides Professor Skolnikoff, are Professor Lester, Professor Claude R. Canizares, director of the Center for Space Research; and Eric C. Johnson, director of corporate relations.

addressed the International Superconductor Applications Convention, describing a recently developed theory about the mechanism of high-temperature superconductivity (MIT Tech Talk, Feb. 12). This followed a paper published in the journal *Physica C* (Superconductivity) with coauthors D.P.

Clougherty and M.E. McHenry.

The other press release, distributed from New York City in August, begins this way:

"The tanks were rumbling out of Moscow when Keith Johnson was finally able to get his call out of Leningrad to Twin Eagle's New York office."

Twin Eagle, it turns out, is the sole agent in the United States for co-production and service deals with Leningrad's Lenfilm Studios. And Professor Johnson's call to Twin Eagle president George Capsis was to confirm the signing of the first "post-coup" Soviet-American co-production deal.

And just how does Professor Johnson fit in to all of this?

Well, the deal is between Lenfilm and the professor for the production of his original screenplay, "Natalya's Decision." As described by the Twin Eagle release, the movie "examines the conflict of a young Soviet ballerina who must choose between leaving the Soviet Union for the United States and the pursuit of her personal goals, or staying in her homeland to help restore artistic freedom to the country she loves."

The story is set in the spring/summer of 1991 amid the background of the abortive coup and revolutionary political changes that led to the breakup of the Soviet Union.

Backing up a bit, Professor Johnson first went to Russia in June as a technical advisor to Batterymarch Financial Management, a Boston-based investment and management company. As a personal favor to his friend, Batterymarch chief executive officer Dean LeBaron, he was helping to identify Soviet military technology that could be converted to possible commercial ventures in the West.

"We were caught up in what was happening and I thought it might be interesting to write a screenplay in terms of someone trying to decide whether to remain in the Soviet Union or seek a more stable life elsewhere," Professor Johnson said.

Such choices were presenting themselves to many creative people, both artistic types and scientists, and it was after attending performances of the Bolshoi and Kirov ballet companies that Professor Johnson decided to frame

his screenplay in terms of a ballet dancer, believing this would have the most commercial appeal.

Professor Johnson wrote a "treatment," an extended outline of the plot and characters he planned to use, and showed it to some friends. One of them passed it on to an acquaintance at a Hollywood studio, which immediately expressed interest and contacted Professor Johnson.

What followed was essentially a serendipitous situation in which a first-time author—Professor Johnson had never written anything except scientific papers—found someone eager to use his brainchild.

The production company Noble Entertainment Group, in the same building that houses the Hollywood studio, heard about the story. The company already had been contacted by Lenfilm Studios for possible joint ventures, and Professor Johnson's proposed movie seemed a perfect vehicle. He had a contract within a few days to write the screenplay.

"I was in the right place at the right time," he said.

When Professor Johnson returned to Russia in August, for additional consulting for Batterymarch and also to sign the production deal with Lenfilm, the Soviet Union's most prestigious filmmaker, he stepped right into the historic events of last summer.

"I was visiting a rocket plant when the tanks rolled into Moscow," he recalled. Later, in Leningrad, soon to revert to its original name of St. Petersburg, he stood in Revolutionary Square as the city's mayor defied the coup leaders.

The turmoil, and the dissolution of the Soviet Union, required Professor Johnson to modify his original story line. In fact, he is still keeping a wary eye on events in Russia in case still more revisions are needed.

"I was rewriting even as the coup was occurring," he said.

When he was asked to do the screenplay for the movie, he studied and read some old scripts to get a sense of the form. "It felt very natural, and I love movies," he said, "but you have to work at it. There's a certain form that you learn—I guess you could compare

it to learning how to do computer programming."

The Twin Eagle news release makes the point—perhaps unnecessarily—that Professor Johnson "is a unique individual, splitting his time between the development of screenplays and his career as a quantum physicist at MIT."

The San Diego Union, covering the superconductivity convention there, referred to the MIT professor "as something of a Renaissance man." Both descriptions certainly seem to fit.

Professor Johnson, a Cambridge resident and a member of the MIT faculty for 25 years, makes the point that he is first and foremost a scientist. "I don't want people to get the wrong idea about that," he said.

"It's a left brain, right brain kind of thing," he commented.

But he has found the filmwriting project a welcome change from five years of intense superconductivity research. In fact, he is already working on another screenplay at the request of Noble Entertainment.

While he hopes "Natalya's Decision" will be a commercial success ("It's a good, romantic story"), he also thinks it can serve to depict the former Soviet Union and its people in a positive way and to point out the dilemma the situation there has produced for creative people and for the nations of the former Soviet Union.

"If all of them leave, they'll be left with nothing," he said.

In the meantime, Professor Johnson's film is in preproduction in Hollywood. About 70 percent of it will be shot at Lenfilm Studios in St. Petersburg and the remainder in Hollywood, where Natalya goes before the attempted coup. Ballerina/actress Katherine Healy, a principal dancer with the Vienna State Opera who made her screen debut at the age of 12 with Dudley Moore in the 1982 movie, "Six Weeks," has been chosen for the role of Natalya. Casting is being completed and shooting begins this summer.

Does Natalya stay in Hollywood after her country comes apart?

"I don't think I ought to give away the ending," Professor Johnson replies.

Charles H. Ball

## AT SLOAN

## Bailyn, Huang Named to Chairs

Lotte Bailyn, professor of organizational psychology and management and a member of the Sloan faculty since 1969, has been named to the newly endowed T Wilson (1953) Chair in Management. Mr. Wilson, retired chairman of The Boeing Company, endowed the chair in honor of his year at MIT as a member of the Sloan Fellows Class of 1953 and his continuing association with the Institute since that time. Professor Bailyn is the first woman to hold a chair at Sloan.

Chi-Fu Huang, a member of the finance faculty at Sloan since 1983, has been named J.C. Penney Professor of Management. The chair had been vacant since its first and only incumbent, Robert C. Merton, left to join the faculty of Harvard Business School in 1988.

Professor Bailyn has focused much of her work on the study of the relationship between work/career and family, starting with a major MIT alumni/ae survey and following up with research on men and women in various technical careers. She found a greater diversity of technical careers in the engineering than had previously been observed, and she found that patterns

of autonomy needs in research labs were different from what the prevalent managerial assumptions often were.

Among her many contributions in the work/family area is the concept of "accommodation" in spouses as a determinant of career success, the identification of the multiple patterns of work/family relationships that can be successful, and the differential impact of work/family stresses on men and women.

Her recent effort to examine how human resource policies and organizational cultures inhibit needed patterns of accommodation such as work at home, part-time work, sabbaticals, and slower career trajectories has received attention from policy makers and promises to be a critical area of future work, especially as the diversity of the work force and organizational structures increases.

Professor Bailyn received her PhD degree in social psychology from Radcliffe College, Harvard University, and her BA degree in mathematics from Swarthmore College.

Professor Huang has made major contributions to the theory of financial economics, and has written on dynamic general equilibrium theory, intertemporal utility theory, and the theory of individual consumption and portfolio decisions.

His most extensive work has been in dynamic general equilibrium theory.

Here he has developed two main themes. The first theme concerns the relations between the revelation of new information to the agents in an economy

and the characteristics of asset prices in an economy. His results justified some key assumptions underlying much of the modern work on asset pricing.

The second main theme concerns the critical

allocational role of securities markets. Previous research suggested that an efficient allocation of resources would require markets for far more securities than actually exist. Huang's work shifted the focus of discussion from the number of markets to the nature of dynamic trading opportunities. He showed that an efficient allocation of resources could in fact be obtained with relatively few securities as long as these securities could be traded continuously.

Professor Huang received his PhD degree in finance and his MA degree in economics from Stanford University. He also holds an MBA degree from Virginia Polytechnic Institute, and a BA degree in economics from National Taiwan University.



Bailyn



Huang



# Classified Ads

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

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

Deadline is noon Friday before publication.

## ■ FOR SALE

Scandinavian Design stereo bench, teak finish, 42"Wx25"Hx17"D, \$100. Bruce or Johanna, Draper x8-3288 or 506-443-0067 eves.

Wing chair, blue cut-velvet, perf cond, stretcher base, elegant style, \$150. Call 484-0802 betw 1-9pm.

Almst nw Packard Bell VGA color monitor, \$160; Magnavox 14" VGA PW monitor, \$100; Panasonic 1124 pmtr, \$200; 14" Samsung flat wh monitor, \$100 or \$115 w/card. Call 241-0991.

Schwinn Airdyne Total Body Ergometer w/self-calibrating performance monitor, mint cond, \$399. Marie, Linc x7028.

3-pc LR set, navy blue, incl couch, love seat & chair, \$300 or bst. Susan x3-0240 or 396-5209 aftr 7pm.

Amiga 500 video sys: computer, monitor, ext dr, B&W video camera, copy stand/lts, Okimate color printer w/adaptor, video, paint, w/psftwr, worth \$2200+, bst offer. Call x3-9311.

3 wood louvered doors, unpainted, unfinished, 2 w/hinges & passage sets, 29"x76"; 32"x78"; 36"x81". Can be cut down in height. \$35 each, all 3 for \$90. Joe, Draper x8-2292.

Girl's ice skates, size 13 & size 1, white, gd cond, \$10 ea. Pat, Linc x7450 or 284-9311.

Hewlett Packard IIP envelope tray, used once, \$80 new, will sell for \$50; Westbend humidifier, \$15. Beth, x3-8291 or 527-9228.

Mahog drop leaf tbl w/drawers on both ends (rare), emp pedestal style, 42"L, 26.5"H, 21"W w/lvs down, 54"W w/lvs ext, exc cond, \$399, off-white cotton armchr, \$110. Kathy x3-8403.

IBM PS/w Model 50 w/84 MB fast SCSI HD & contr + orig 20MB HD; 80286/12 MHz, 80287 Math copr, 1MB, VGA mono display, Windows 2.0, extras, complete sys, \$1000. Michael 876-0682.

8 Tech Dinghies for sale by Sailing Pavilion, gd cond, ready to sail, \$1200 ea. Call x3-4884.

Ski boots: Salomon SX-70, rear entry, sz 360 (fits M's 11-12), \$45. Paul x8-6086 or 731-2657 lv mssg.

## ■ VEHICLES

1981 Yamaha Maxama, 8,497 orig miles, detach AM/FM/cass, detachable fairing, deluxe touring seat, always garaged, \$550 or bst. Call x3-1863 or 387-3892 or 389-3939.

1987 Honda Accord LX, 4 dr, auto, a/c, all power, cruise control, AM/FM/cass, 59K, v gd cond, \$8000. Call Seppo at x3-0320 or 547-0444.

1989 Toyota Camry DLX, 4-dr, auto, a/c, pw & pl, AM/FM/cass, cruise & more, exceptionally clean, \$8700. Call x3-8014.

1990 Honda CRX-HF, 55 mpg, 5 spd, AM/FM stereo, white, exc cond, \$6490. Dick x3-4643.

## ■ HOUSING

Bedford: beaut studio apt in single fam hse in town ctr, nr Linc Lab, v sunny w/skylt, big yd, patio, prkg, bus to Cambridge. Call 275-8384.

# Sports at MIT

## GYMNASTICS

Gymnast Lisa Arel recently returned from the National Collegiate Gymnastics Association (NCGA) Division III Championships with her seventh All-America honor. Arel placed fifth on the balance beam to earn the All-America recognition. The senior from Lee's Summit, Mo., was also named the NCGA Outstanding Senior Gymnast, and was named to the NCGA All-Academic team. Joining Arel on the All-Academic team was fellow senior Kortney Leabourne of Ballston Lake, N.Y. Julie Lyren, a junior from Greenwich, Ct., finished ninth in the all-around.

## SWIMMING

The MIT men's swimming freestyle relay teams made a huge splash at last weekend's New England Division III Championships at Wesleyan University. Despite never before winning a relay title at the meet, the Engineers captured all three freestyle relays. The team of Brian Meade of Fairport, N.Y., Bob Rockwell of Alexandria, Va., Jim Bandy of Altamonte Springs, Fla., and Chad Gunnaugsson of Sturgeon Bay, Wis., won both the 800 and 400 yard events. The four MIT juniors set a New England Division III record in the 800. Gunnaugsson, Mead, and seniors Mike Doane of Ashbridge, Ct., and Saul Nuccitelli from Springfield, Mo., brought home the championship in that event. The Engineers finished fourth in the meet, which ties the team's best finish ever, and head coach John Benedick was named New England Division III Men's Swimming Coach of the Year. It is the second time Benedick has won the award, and he is also only the second coach in New England Division III history to be named Coach of the Year for both men's and women's teams. The meet also produced several individual qualifiers for the NCAA Division III championship. Bandy and Rockwell qualified in the 500 free and Meade qualified in the 100 free. The 200 free relay team swam a consideration time as did sophomore Vijay Lathi of Weston in the 200 individual medley and junior David Ferguson in the 400 individual medley. Consideration times will be acted upon for qualification on Friday, March 12. In women's swimming, Jennifer Chan's consideration time in the 200 yard breaststroke has qualified her for this weekend's Division III national championships at Ithaca College. Chan is a senior from Lexington, Ky. MIT women's diving coach Brad Snodgrass has also recently been named Coach of the Year.

## TRACK

The MIT indoor track team finished in a tie for third place in last weekend's ECAC Division III Championship at Bates College. Individual champions for the Engineers were senior Tom Washington in the high jump with an Institute record 6'9 1/2", and Matt Robinson, a sophomore from Olympia Fields, Ill., in the pole vault. Washington is from Fort Washington, Md. Junior Rob Flemming from Arlington Heights, N.J., placed second in the 35 lbs. weight throw, while third places were earned by sophomore David Moyle in the 3000 meters and freshman Ethan Crain in the 5000 meters. Moyle is from Voorhees, N.J., while Crain hails from Windham, Maine.

A group of former MIT track athletes recently competed in the Stanford University Bay Area Relays. Led by Bill Singhose '90, the four athletes called themselves the "Has Beens." Singhose, a graduate student at Stanford, won the pole vault at a height of 15' 6", and ran a leg on the mile relay team that took third place with a time of 3:26.1. Singhose was joined by Mark Dunzo '91, Kevin Scannell '91 and Garret Moose on the relay.

Roger Crosley

Cambridge: townhse, 3BR, 2+b, garage, wood stove, hwdw flrs, \$179,000. Neil 492-8113.

Cancun, lux week-long (May 2-9) accom in resort: 2BR, 2b, ktchn, LR, \$800; 1BR, 1b, ktchn, LR, \$600; 1 hotel-like double, \$400. Daine, Linc x2118.

Chester, VT: close to downhill & x-c skiing, avail for rent, only \$150/wknd or \$300/wk. Bob, Lincoln x2826 or 863-1041.

Jamaica Plain: beaut 7-rm 3BR turn-of-cent Vict condo, 1325 s.f., sunny, hwdw flrs, w/d, lrg ktchn w/exp brick, safe nbrhd, nr Stony Brk T, low fees, red to \$122,000 by ownr. Call x3-1916.

Lexington: 4BR, 2b, fully furn 8-rm sabbatical house, on 1 acre, gar, no pets, avail now, \$1500 incl utils. Call 617-861-6674 or 603-643-5627.

Loon Mt/Lincoln NH: ski downhill & xc, reasonable rates, wkdy/wknd, 2BR, 2b, riverfront condo, slps 6, clubhse & ski shuttlebus on premises. Art x3-8395 or 472-8551.

Mashpee, MA: Townhouse slps 4, indr/outdr pool, tennis, sauna, access to beach, Aug 14-21, \$500. Launa x3-7271.

Medford: lrg 2BR apt, LR, DR, eat-in ktchn, hwdw flrs, porch nr T bus line, off-st prkg, quiet safe nbrhd, \$725+ negot. Roger x3-7144 or 776-6871 eves.

Puerto Banus, Spain: nr Marbella, Mar 28-Apr 25, eleg apt, 2BR, 2b, LR, full ktchn, d/w, washer, marble flrs, terrace, gardens, pools, garage, \$400/wk. Jean, Linc x4516 or 508-369-7782.

Waltham: 2BR apt, lrg ktchn, LR, DR, hwdw flrs, 2-car prkg, full attic, yd, no pets, avail 5/1. Call 449-3556.

## ■ WANTED

Spring book drive, unwanted children's books needed for new Cambridgeport public school. Call x3-9759 or 492-4510 for pickup.

Any type of ROBOT w/a programmable movements & arm control, like the old Healtkit (Hero ROBOT). Claude, Linc x2905.

Patch of ground to park my 21' motorhome on, Mon-Fri starting in Apr till summer, must be accessible to T or be able to join carpool to campus, willing to pay \$100/mo. Bob x3-8657.

Eldercare wanted for recent widow, Wakefield, nr train, own room. Elaine 617-599-9151 aftr 6pm.

Wanted: old necklaces, beads, etc. that you do not wear anymore, for use in art projects, cannot afford to pay, so please only stuff you want to give away. David x5-6664.

## ■ ROOMMATES

Belmont: Waverly Sq, 1M to shr 2BR apt w/M grad student, nice nbrhd, off-st prkg, 1/2 block from T #73 bus, \$412.50/mo. Mike x3-2364 or 489-2614.

Cambridge: F/M, 30+, grad student OK, shr 2BR nr Hvd & MIT, avail 4/1, no pets/smkg, \$312.50+. Call 547-4023.

Cambridge: shr 3BR 2brent-cont condo betw Hvd & Porter Sq w/2M grad students, huge windows, balc, fpic, d/w, w/d, free ht & hw, prkg, avail 4/16, \$291.67. Call x3-0771 or reza@ai.mit.edu.

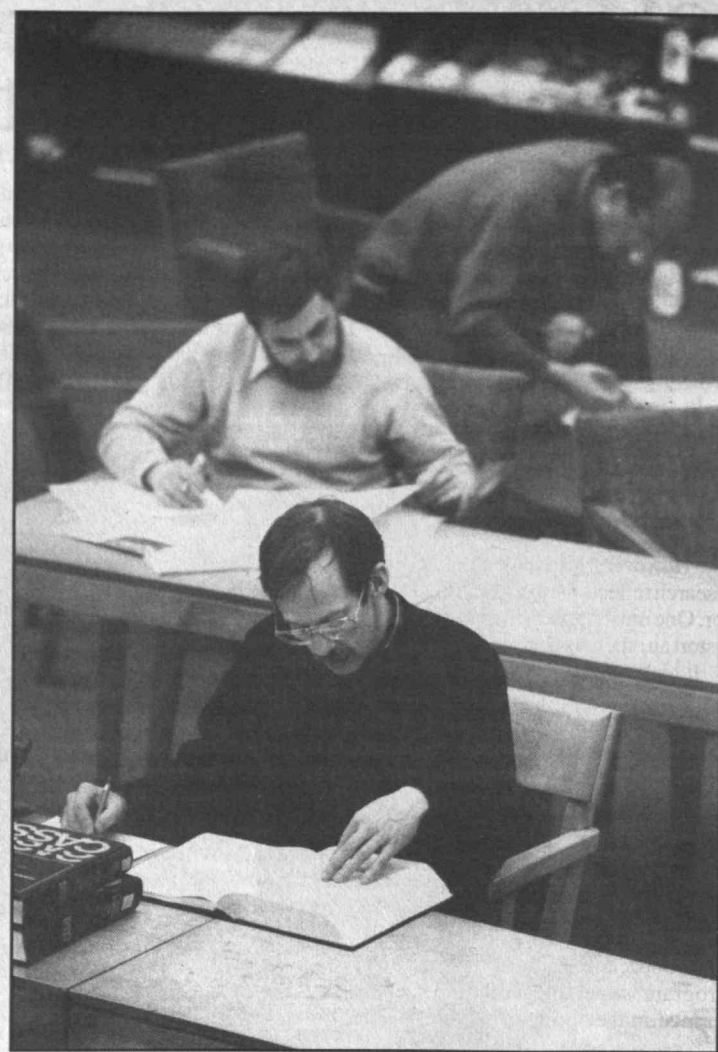
## ■ CHILD CARE

*Child Care Providers: If you wish to advertise your availability to care for children in your home, we are required by law to publish your family day care license number in your ad. This applies to all child care ads unless you specify that you will take care of the child in his or her home.*

Loving, responsible person/couple to care for 2-yr-old girl aftns & housework, live-in own apt, English native language, non-smkr, exp/ref required, driver's lic. Ronit x3-2268.

## ■ MISCELLANEOUS

Steve who bought WordPerfect 5.1 manual from me: I have a simple but urgent thing to check with you, pls call Jin 508-970-0803.



**HITTING THE BOOKS**—Photojournalist Donna Coveney caught these three in the Science Library, hard at work.

## \$1.25 MILLION

# Toda Makes Grant in Architecture School

MIT will receive a \$1.25 million endowment over the next five years from the Toda Corporation of Japan, one of Japan's top general contractors. The first installment of \$250,000 will be used for research at the discretion of MIT, the rest will be invested as an interest-producing endowment.

The funds will create opportunities for international contact between the people of MIT and Toda through joint research and mutual visits.

According to Michael Joroff, director of research and development in the School of Architecture, an initial allocation of some of the Toda funds will go to the MIT Program in Innovative Housing Construction, a major research program aimed at improving the performance and production of housing. Income from the endowment may further be used to create Toda Fellowships for graduate students and/or faculty members every year who are interested in pursuing research in this area.

Some of the funds may also be used for a central research facility to house

MIT's Building Technology Program, a program closely aligned with Toda's interests in the field and designed to develop a new breed of professional known as the building technologist. The building technologist will not actually design or build buildings, but will instead develop new techniques and materials for those tasks, as well as for the proper operation of the building.

The Toda Corporation offers integrated services in planning, development, design, construction, maintenance and finance. Established in 1881, it has been involved in many overseas projects, beginning with the construction of a pavilion for the Anglo-Japanese Fair held in London in 1910. It has long-established subsidiaries in the US and Brazil, a new subsidiary in China, and a representative office in London, which will serve as a base to deal with the upcoming unified EC market.

MIT Chairman Paul E. Gray paid a visit to Toda in November, and last March Mr. Joroff was the featured speaker at a Toda seminar in Tokyo.

## UASO Becomes UAAO

The programs and activities of the Undergraduate Education Office have been merged with those of the Office of the Dean for Student Affairs. To reflect the broader mission, the Undergraduate Academic Support Office has been renamed the Under-

graduate Academic Affairs Office, as a colorful bulletin board proclaims in the main corridor.

The UAAO, headed by Associate Dean Travis R. Merritt, has assumed responsibility for UROP, the Writing Requirement, ROTC, teaching development, curricular support and educational studies research. All of the staff members in those programs and activities remain the same, Professor Merritt said.

The activities complement the existing programs of the office which include R/O Week, IAP, Undergraduate Seminars, the Institute Colloquium, academic advising and study skills, and the Wellesley Exchange. Professor Merritt noted that the merged operation will enhance natural linkages such as those between UROP, IAP and the seminars.

## Tuition to Increase

(continued from page 1)

ship assistance—was raised \$500 to \$6,600, an 8.2 percent increase. MIT reduces the self-help requirements for students from families of very low income by as much as \$3,500.

Because students from wealthier families who fail to qualify for financial aid still receive scholarships from outside the financial aid system, it is estimated that only about 20 percent of students and/or their parents pay the full amount.



# 'Openness' Needed in MIT Research

(continued from page 1)

puter Science, the Laboratory for Information and Decision Systems and the Materials Processing Center obtained 81 percent, 59 percent, 84 percent and 50 percent of their support respectively from DOD in 1991.

"This dependence on DOD support makes these departments and laboratories vulnerable to changes in DOD support," the committee noted.

In fiscal 1991, the Department of Defense was the third largest sponsor of campus research, providing \$49.1 million. The committee said it believed that DOD-supported research "is of MIT quality."

"However," it added, "all sponsored research reflects the agenda of the sponsor. One must not permit that agenda to distort an otherwise balanced program."

It continued: "DOD-sponsored research has an additional concern. Accepting DOD support may imply support of DOD national policies, some of which are controversial."

As one example, it mentioned the government's Strategic Defense Initiative for intercepting and destroying ballistic missiles in space, also known as the "Star Wars" program.

The committee, in fact, was asked to give special consideration to the SDI program when the committee was formed in the spring of 1986 by then

President Paul E. Gray.

It found that "a minor fraction of MIT campus research is sponsored by the SDI," adding that "a major fraction of the Lincoln Laboratory program is sponsored by the SDI." Lincoln reports that about 25 percent of its current program comes from SDI funds.

In its general summary and conclusions, the committee said it concurred with the conclusions of the Pounds Commission of the Special Laboratories of 1969 that MIT's goals as an institution "include not only education, research and scholarship, but also improving the human condition."

The committee said a project "is appropriate when it takes advantage of educationally useful and intellectually important scientific and technical opportunities."

Noting that the Pounds Commission also emphasized "the existence of an MIT community whose contribution to MIT policies is essential to their formulation and execution," the committee commented:

"Such participation, if it is to be constructive, requires a well-informed community and therefore a policy of openness. We believe that this policy should apply to all sponsored research."

It offered a series of recommendations in this regard—that:

—The support picture for each de-

partment and laboratory and for the institution as a whole, and in what way that picture is compatible with the goals of the department, should be readily available and circulated to the MIT faculty, staff and students.

—There should be departmental and school seminars on their research support and its implications.

—Each graduate research assistant, graduate research fellow, post-doctoral fellow, etc., should be informed by a statement in their appointment letter at the time of his or her appointment of the nature of their support, the supporting agency and the goals of the supported research.

—Information regarding the careers of MIT graduates should be readily available through recommended regular surveys of recently employed graduates to find out what they are doing and under what sponsorship.

The report of the committee was submitted by its chairman, Institute Professor Emeritus Herman Feshbach. Previous chairs included Professors William F. Brace and Arthur C. Smith.

The other members of the committee were: Professors Stephan L. Chorover, James L. Kirtley, Jr., Vera Kistiakowski, J. David Litster, James R. Melcher (deceased), Walter E. Morrow, Myron Weiner and two graduate students, Steven A. Farber and Reza A. Ghanbari.

## Here & There

■ A professor at Nihon University in Japan, Akira Naito, found an unusual way of expressing his appreciation for the rewriting of his article on human-powered helicopters in the journal *Human Power*, edited by mechanical engineering professor David Gordon Wilson.

Professor Naito is best-known in this country, in fact, for his leadership of student groups at Nihon University in the development of increasingly sophisticated human-powered helicopters. They are vying with groups in the US for a prize offered by the American Helicopter Society.

He is also the world champion in the art of making miniature origami—artifacts produced by paper-folding (see photo, page 1).

To thank Professor Wilson, he sent an origami display called "Parade of Cranes." In it, 11 cranes are shown coming in to land. The largest has a wingspan of close to 50 mm (about 2"). Each succeeding crane is reduced by about a third in size. The last two are invisible to the naked eye, mounted on the tips of sewing needles. The smallest has a wingspan of just over half a millimeter—about 30 thousandths of an inch—and can be seen to be a complete bird through a strong magnifying glass.

Anne LaVin in Academic Computing Services has studied origami for more than 20 years and taught a course on the art during IAP. She showed the class the Parade of Cranes and an accompanying videotape of Professor Naito making micro-origami under a microscope. "We were privileged to be allowed to see such craftsmanship," she said, "and the students were really inspired by it."

The display will be offered to the MIT Museum, Professor Wilson said.

■ A recent graduate student at the Ralph M. Parsons Laboratory in the Department of Civil Engineering has a newly published book that seems far afield from her studies in environmental engineering—but really isn't.

The book by Susan Murcott, *The First Buddhist Women: Translations and Commentaries on the*

*Therigatha* (Parallax Press), is described by the publisher as a contemporary translation of and commentary on the enlightenment verses of the first female disciples of Buddha:

"The book explores Buddhism's relatively liberal attitude towards women since its founding nearly 2,600 years ago, through the study of the *Therigatha*, the earliest known collection of women's religious poetry."

Ms. Murcott was drawn to Buddhism as a peace activist in Boston during the late 1960s. She traveled to Japan, Australia and Hawaii to study Zen and Buddhist philosophy, and spent more than 10 years researching and translating the text of her book. She was a co-founder and editor of *Kahawai: Journal and Women of Zen*, and she teaches meditation at Wellesley College.

Ms. Murcott completed her master's degree studies in January and now is working on a portion of the final report, due in September, of the National Research Council's Committee on Waste Water Management in Coastal Urban Areas. She began working for the committee as an intern, under the auspices of her faculty advisor, Professor Donald R.F. Harleman.

Her career work really does tie in to her interest in Buddhism because both take root from a love of nature, she said. In her own case, she has been an Outward Bound instructor and has hiked the Appalachian Trail from end to end, a distance of some 2,000 miles.

■ An MIT alumnus is running for president as the candidate of the Libertarian Party. He is Andre Marrou (SB chemistry, 1962), now a Scarsdale, N.Y., realtor who served two years in Alaska's House of Representatives.

Asked about his party's goals by a Maine newspaper, he replied: "Democrats and Republicans want government to control the people. We want government to control government."

■ The Australian National University recently held a workshop on Signal Processing and Control Research in an Industrial World to inaugurate its Cooperative Research Center for Robust and Adaptive Systems. Pro-

fessor Alan Willsky of electrical engineering was a featured speaker, discussing "Research Initiatives, Challenges and Opportunities: Who's in Control?"

### CLIPS AND QUOTES:

"That has been their tactic at every step. They try to inflict as much economic pain as possible on their opponents to get them to abandon the field."—Michael W. Golay, professor of nuclear energy, on nuclear critics who use economics as an argument against relicensing of plants, in a Boston Globe story on the planned shutdown of the Yankee Rowe plant.

"Middle management is very afraid of change. There will be no change without a commitment from top management. . . It's hard to acknowledge that somebody may be better than you, especially when it's the Japanese. That still haunts Detroit."—Professor Daniel Roos, director of the Center for Technology, Policy and Industrial Development, in an Automotive News story on the slow transition of the US auto industry from mass production to lean production techniques described by Dr. Roos and his coauthors in *The Machine That Changed the World*.

"I'm 56 years old and I feel like when I was 16 and going off to college for the first time. I'm looking forward to this new adventure. I know I'm going to learn a great deal and I'll bring that experience back to MIT."—Laurence R. Young, professor of aeronautics and astronautics, in the Newton Graphic, on being selected by NASA as one of three payload specialists to train for the 1993 Spacelab flight.

"The greatest cause for concern is the leveling off in the private sector. This is exactly the wrong time for this to happen."—Professor Richard K. Lester, director of MIT's Industrial Performance Center, in a Boston Globe story on anticipated reductions in defense and other research spending.

Charlie Ball



IN THE BUSH ROOM—Some of the 454 students who participated in this year's Alumni Fund Student Volunteer Telethon ham it up for photographer J.D. Sloan.

### 300 PIZZAS

## Telethon Raises \$217K

To a casual passer-by the evening scene in the Bush Room during February may look like a circus. And why not? Balloons hang above seats, students whiz around on roller blades, cheers continually rise up. A challenge gets called out: "O.K. The next \$100 upgrade gets tickets to the Omni!" And from a corner, a group shouts back: "Over here! Just got one!" A poster facing the door says, "Calling makes cents."

The festivities are actually the Annual Alumni Fund Student Volunteer Telethon, where this year energetic student callers fueled themselves on more than 300 pizzas, 25 cases of soda and 45 deli cakes. They talked to nearly 6,500 alumni and alumnae around the country, of whom 3,700 pledged donations, and they raised the largest telethon total since the beginning of the capital campaign: \$217,640.

This afternoon from 4-6pm in the Bush Room (10-105) the Alumni Association will host the students at the Telethon Awards Reception. Top living group and individual callers will be announced and receive the top prizes: a weekend on the Cape at the Chatham Bars Inn and Bose Speakers. Points are given to callers based on the number of gifts, dollar totals, and number of first-time gifts.

Joseph S. Collins, director of the Alumni Fund, said "In contrast to our peer institutions, MIT has the delightful distinction of having the best student volunteer telethon solicitation. This year alone we engaged more than 10 percent of the undergraduates as volunteer callers."

The challenge to bring out busy students to make calls belongs to Emily

Berkowitz, coordinator of student programs in the Alumni Association. This year she recruited 454 students, 30 more than last year. "I try to find what motivates each person. I also try to make it easier for them. I cheer them on. I give them prizes. I also capitalize on their competitiveness."

She is not above encouraging rivalries between living groups. One night she staged the Sorority Showdown and on another, the Dorm Duke-Out. One fraternity returned for a second night of calling when they slipped from the lead.

Traditionally staff from throughout the Alumni Association take part in the telethon. For instance, Mr. Collins, Vice President William J. Hecht and Associate Director Diana Strange ran training sessions. Program directors and support staff worked together encouraging students, collecting donor cards, passing out prizes and totaling up numbers.

Top callers for each evening got prizes from among the \$4,000 worth of gifts from area and alumni businesses and MIT offices. Among prizes from area businesses, students won dinner at Redbones, ice cream from Toscanini's, certificates from Brines Sporting and the Charles Hotel, and cakes from S&S Deli. The MIT Museum Shop donated a gift certificate, the Microcomputer Center gave software and computer accessories, and the MIT Press Book Store gave T-shirts and gift certificates. Bose Corporation and Kurzweil, both alumni businesses, made a difference with their contributions of audio equipment.

Maryglenn Vincens,  
Alumni Association

## MIT Wins SSC Grant

MIT has received \$50,000 for research related to the development of the Superconducting Super Collider in Texas.

The grant is part of a \$100 million research and development program funded by the Texas National Research Laboratory Commission, the Texas agency for the SSC.

The money awarded to MIT, the lead institution of a consortium that includes Columbia University and the University of Washington, will be used to develop and test liquid and solid xenon and krypton detectors, using both scintillation and ionization signals. The principal investigator is Dr. Min Chen, professor of physics.



# Institute Calendar

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

March 11-22

## SEMINARS & LECTURES

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

WEDNESDAY, MARCH 11

**Femtosecond Optical Pulse Generation from Semiconductor Travelling Wave Amplifiers\*\***—Peter Delfyett, Bellcore. EECS/RLE Seminar Series on Optics and Quantum Electronics, 11am-12pm, Rm 34-401B (Grier Rm).

**Verifying Production Bans on Chemical Weapons\*\***—Benoit Morel, Carnegie Mellon Univ. DACS Technology, Defense and Arms Control Seminar Series, 12-2pm, Rm E38-615.

**Open-Ocean Deep Convection\*\***—Helen Hill, MIT/Imperial College, London. Oceanography Sack Lunch Seminars, 12:10pm, Rm 54-915.

**Sloshing Frequencies\***—A.M.J. Davis. Sponsored by the Dept. of Ocean Engineering, 3:30pm, Rm 5-314.

**Combustion Chemical Kinetics: Validating Comprehensive Mechanisms\***—Prof. Simone Hochgreb, MIT. Thermal Science Seminar sponsored by the Dept. of Mechanical Engineering, 4pm, Rm 5-234. Refreshments, 3:45pm.

**Nationalism\***—Liah Greenfield, Harvard Univ. The Political Uses of History, CIS, 4-6pm, Rm E38-714.

**Perspectives on Peace in the Middle East: What Next?\***—His Excellency Nabil El-Araby, Egyptian Ambassador to the UN. Workshop on Reconstruction in the Middle East, CIS, 4-6pm, Rm E38-615.

**Rank M Wavelets and Regularity Conditions\*\***—Dr. Peter Heller, AWARE, Inc. Wavelet Seminar, sponsored by the Dept. of Mathematics, 4:05pm, Rm 4-163.

**Enterprise Forum\***—Case Presentation: Instant Information, Inc, 6pm, Rm 10-250. Registration 5:30pm. Spotlight Series presented by Steve Bailey, Business Editor, Boston Globe., 7:40pm, Rm 10-250.

THURSDAY, MARCH 12

**Viscous Flow Around Marine Propellers Using Boundary Layer Strip Theory\*\***—Gary Hufford, Draper Lab, MIT. Hydrofoil and Propeller Seminar, Dept. of Ocean Engineering, 12-1pm, Rm 5-314. Bring lunch, coffee provided.

**A Prescription for a National Affordable Housing Strategy\*\***—Richard Baron, McCormack, Baron & Associates, St. Louis. Rose Lunchbox Series, sponsored by the Center for Real Estate Development, 1pm, Rm W31-301.

**Applying Total Quality Management Principles in the University\***—Jill Maser, Quality Coordinator, Univ. of Penn. Sponsored by Working Group on TQM, 2pm, Rm 10-105 (Bush Rm). More info: Robert Weatherall x3-4733.

**Source and Amplification of Noise in Burners; Simulation and Experimental Results\***—Prof. Ahmed Ghoniem, MIT. Sloan Automotive/Reacting Gas Dynamics Laboratories Seminar Series, 4-5pm, Rm 37-232.

**Digital Television in the Home and Workplace\***—Panel: Edward Horowitz, Sr. VP, Viacom Intl; Robert Hubbard, VP, Hubbard Broadcasting; IBM representative TBA. Moderator: Andrew Lippman, MIT. Communications Forum, 4-6pm, Bartos Theater.

**Old Cities and New Towns: Searching for the Infrastructure of Tomorrow\***—Andrew C. Lemer, National Research Council, Washington, DC. Brunel Lecture sponsored by the Macro-Engineering Research Group, 4pm, Rm E51-317.

**The Kalman Filter for Two-Dimensional Stable and Unstable Atmospheres\*\***—Ricardo Todling, UCLA. Quasi-Biweekly Seminar Series sponsored by the Center for Meteorology and Physical Oceanography, 4pm, Rm 54-915.

**Ultra High Energy-Gamma Ray Astronomy or How to Stand Under a Shower and Not Get**

**Wet\*\***—Dr. Cyrus Hoffman, Los Alamos National Laboratory. Physics Colloquium, 4:15pm, Rm 10-250. Refreshments, 3:45pm, Rm 26-110 (Compton Rm).

FRIDAY, MARCH 13

**Mechanisms for Lattice and Grain Boundary Diffusion in Magnesium Oxide\*\***—Bernhardt J. Wuensch, MIT. Sponsored by the Center for Materials Science and Engineering, 2pm, Rm 13-2137.

**Non-Faradaic Electro-Chemical Modification of Catalytic Activity\*\***—Dr. Costas G. Vayenas, Yale. Sponsored by the Chemical Engineering Dept, 3pm, Rm 66-110.

**Controls on the Stratigraphy of Foreland Basins Derived from Computer Simulations and Field Studies in the North Slope, Alaska\***—Dr. Peter Flemings, MIT. Crosby Lecture, sponsored by the Dept. of Earth, Atmospheric, and Planetary Sciences, 4pm, Rm 54-915. Refreshments, 3:30pm, Ida Green Lounge.

MONDAY, MARCH 16

**Current Issues in Job Training\*\***—Jay Ostrower, Boston Community Development, and Jeanne Strain, Economic Development Consultant. Community Economic Speaker Series sponsored by the Dept. of Urban Studies and Planning, 12:15-1:45pm, Rm 7-335.

**Transmutation of Nuclear Waste\*\***—Dr. Edward Arthur, Los Alamos National Laboratory. Sponsored by the American Nuclear Society and the Nuclear Engineering Dept, 3:30pm, Rm NW12-222. Refreshments, 3pm.

**Three-Dimensional Turbulent Boundary Layers: New Experiments on Old Problems\*\***—Prof. James P. Johnston, Stanford. Fluid Mechanics Seminar Series, 4-5pm, Rm 5-234.

**System Decompositions and Modularity in the Game of Go\*\***—E. Berlekamp, UC Berkeley. EECS Colloquium, 4-5pm, Rm 34-101 (Edgerton Hall). Refreshments, 3:30pm.

**Analytic Modeling of Dispersion of Suspensions Near the Sea Bed Under Waves or Tides\*\***—Dr. Chiang C. Mei, MIT. Sponsored by the Parsons Laboratory, 4-5pm, Rm 48-316.

**On Circuit Complexity\*\***—Prof. Alexander Razborov, Steklov Mathematics Institute. Applied Mathematics Colloquium, 4:15pm, Rm 2-105. Coffee or tea, 3:45pm, Rm 2-349.

TUESDAY, MARCH 17

**Quantum Mechanics of Trapped Wave Packets\*\***—Roy J. Glauber, Harvard Univ. Seminar on Modern Optics and Spectroscopy, sponsored by Harrison Spectroscopy Laboratory, Research Laboratory of Electronics, Schools of Science and Engineering, Plasma Fusion Center, and Industrial Liaison Program. 11am-12pm, Rm 37-252 (Marlar Lounge). Refreshments following seminar.

**WordPerfect User Group\*\***—Coordinated by Information Systems, 12-1:30pm, Rm 9-150. Topic: How To Get Help. Info: Gail Garfield Neuman x3-0878.

**Lessons from Japanese University Contamination Control Research\***—Michael Liehr, IBM Research Division. Microsystems Technology Laboratories VLSI Seminar Series, 4pm, Rm 34-101. Refreshments, 3:30pm.

**Functional Details of the new Access Mobility System\*\***—Tony Castagna, CEO, Quest Technologies. Highly automated powered stair-climbing wheelchair. Seminar on Product Design for People with Disabilities, 4-5:30pm, Rm 3-133.

**Powered Stair-Climbing Wheelchair\*\***—Tony Castagna, Quest Technologies—Lecture and demonstration on functional details of the new Access Mobility System, sponsored by the Seminar on Product Design for People with Disabilities, 4-5:30pm, Rm 3-133.

**Macroeconomic Aspects of Zimbabwe's Transition from Socialism\*\***—Prof. Rob Davies, Univ. of Zimbabwe; Visiting Professor, Swarthmore. Institutional Perspectives on Third World Development, CIS, 4-6pm, Rm E38-714.

**Response of an Airfoil Encountering a Density Discontinuity\***—Prof. F.E. Marble, CalTech. Sponsored by the Gas Turbine Laboratory, Dept. of Aeronautics and Astronautics, 4:15pm, Rm 3-270. Refreshments, 4pm.

**CERN Heavy Ion Experiments\*\***—Dr. Barbara Jacak, Los Alamos National Laboratory. LNS Colloquium, 4:15pm, Rm 6-120. Refreshments, 3:45pm, Rm 26-414 (Kolker Rm).

**The Present and Future of Japanese-American Security Relations\*\***—Ikuro Anzai, Ritsumeikan Univ., Kyoto. With guest chairperson, Prof. Hayward Alker, MIT. Sponsored by the MIT Japan Program, 5:30-6:30pm, Rm E38-6th fl. conf. rm.

**Section: Architectural Models of the 16th-18th Centuries\***—Henry Millon, MIT. Department of Architecture Lecture, 6:30pm, Rm 9-150.

**Occidentalism as a Counter Discourse: A Case Study of the Television Series He Shang in Post-Mao China\***—Prof. Xiao-Mei Chen,

Ohio State Univ. Sponsored by Foreign Languages and Literature, 7pm, Rm 4-153.

WEDNESDAY, MARCH 18

**Integrated Optics Grows Up\*\***—Rod Alferness, AT&T Bell Laboratories. EECS/RLE Seminar Series on Optics and Quantum Electronics, 11am-12pm, Rm 34-401B (Grier Rm).

**Germany in the New World Order\*\***—Catherine M. Kelleher, The Brookings Institution. DACS Technology, Defense and Arms Control Seminar Series, CIS, 12-2pm, Rm E38-615.

**Microsoft Word (for the Macintosh) User Group\*\***—Coordinated by Information Systems, 12-1pm, Rm 9-150. Topic: Word 5.0. Info: Phyllis Crierie x3-0736.

**An Acoustical View of the Gulf Stream Southern Recirculation Gyre\*\***—David Chester, MIT/WHO. Oceanography Sack Lunch Seminars, 12:10pm, Rm 54-915.

**The Forward Speed Diffraction Problem in the Domain\***—Greg Osborne. Sponsored by the Dept. of Ocean Engineering, 3:30pm, Rm 5-236.

**Who Was Shakespeare\***—Charles Vere, Lord Burford. Questions concerning the identity of the author of the Shakespearean canon will be discussed. Sponsored by Prof. Michael Rubner, 4pm, Rm 26-100.

**The Modern Keurbooms River Estuary and its Neocomian Counterpart, the Robberg Formation, at Plettenberg Bay, South Africa\*\***—Prof. Izak C. Rust, Univ. of Port Elizabeth. Crosby Lecture, sponsored by the Dept. of Earth, Atmospheric, and Planetary Sciences, 4pm, Rm 54-915. Refreshments, 3:30pm, Ida Green Lounge.

**Time-Frequency Localization Operators\*\***—Dr. Pankaj Topiwala, MITRE Corporation. Wavelet Seminar, sponsored by the Dept. of Mathematics, 4:05pm, Rm 4-163.

**Who are the Luë Revisited: Ethnic Identity in China, Laos and Thailand\***—Charles Keyes, Univ. of Washington. Peoples and States: Ethnic Identity and Struggle, sponsored by Anthropology/Archaeology Program and CIS, 4:30-6:15pm, Rm E38-714. Refreshments.

**Pacts of Reconciliation: Ending Internal Wars and the Associated Political Consequences\*\***—Panel discussion, sponsored by the Harvard-MIT Joint Seminar on Political Development, 5:30pm, MIT Faculty Club. Open to members only.

**Saddam Husain's Monument: An Exercise in Thinking About Cultural Relativism\***—Kanan Makiya, author of *Republic of Fear*. Sponsored by the Aga Khan Program for Islamic Architecture at Harvard and MIT, 5:30pm, Rm 6-321.

THURSDAY, MARCH 19

**The Transformation of Santa Fe Pacific\*\***—Vernon Schwartz, Catellus Development Corp., San Francisco. Rose Lunchbox Series, sponsored by the Center for Real Estate Development, 1pm, Rm W31-301.

**The Role of Surface Tension in the Reduction of Top Ring Friction in a Reciprocating Engine\***—James Azzola, MIT. Sloan Automotive/Reacting Gas Dynamics Laboratories Seminar Series, 4-5pm, Rm 37-232.

**Towards a Dynamical Understanding of Plantetary-Scale Flow Regimes\*\***—Franco Molteni, European Centre for Medium Range Weather Forecasts. Quasi-Biweekly Seminar Series sponsored by the Center for Meteorology and Physical Oceanography, 4pm, Rm 54-915.

**Quantum Mechanics in the Light of Quantum Cosmology\*\***—Prof. James Hartle, Univ. of California. Physics Colloquium, 4:15pm, Rm 10-250. Refreshments, 3:45pm, Rm 26-110.

**A Theory for the Structure of Architecture—Rifat Chadirji, Iraqi architect and writer.** Aga Khan Program Study Group, 7-9pm, Rm 5-216. Interested participants must sign up by Mar 16, call x3-1400. Continued on Mar 26.

FRIDAY, MARCH 20

**Moving Toward Pollution Prevention: Environmental Considerations and Transportation Planning\*\***—Julie Belaga, Regional Administrator, EPA. Center for Transportation Studies Luncheon Seminar Series, 12:45-2pm, Rm 10-105. Luncheon optional: 12-12:45pm, fee: \$2/students, \$5/non-students.

**Solitary Waves in Stratified Flow\*\***—Prof. Triantaphyllos R. Akylas, MIT. Fluid Dynamics Seminar, sponsored by the Dept. of Aeronautics & Astronautics, 12-1pm, Rm 33-206.

**Natural Selection in a Propagating Reaction Front\*\***—John Yin, Univ. of California, Berkeley. Sponsored by the Chemical Engineering Dept, 3pm, Rm 66-110.

**Environmental Effects of the Gulf War\***—Prof. Farouk El-Baz, Boston Univ. Department Lecture Series sponsored by the Dept. of Earth, Atmospheric, and Planetary Sciences, 4pm, Rm 54-915. Refreshments, 3:30pm, Ida Green Lounge.

## FILMS & VIDEO

**Video News Tapes on India\***—Mar 12: Showing in a series of video tapes, covering events during February, from Newstrack, an independent news agency in New Delhi. Sponsored by the Center for International Studies, 4:30pm, Rm E38-615.

## COMMUNITY INTEREST

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

**AA Women's 12-Step Meeting\*\***—Meetings every Sunday, 5:30-7pm, Rm E23-297. For info call Alice x3-4911 or Betty x3-5714.

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

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

**Cancer Support Group\*\***—Meetings every Thursday, 12-2pm, Bldg E51. For those with acute and chronic forms of cancer. Sponsored by the MIT Medical Dept. For information about weekly luncheon meeting, call Dawn Metcalf, Social Work Service, x3-4911.

**Children's Art Classes\*\***—For children 5 years and older, Thursdays, 3:30-5pm, Westgate Function Room. Sponsored by the MIT Child Care Office and Technology Community Women. Fee is \$10/mo plus one-time TCW \$5 membership fee.

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

**Drop-In Playgroup\*\***—Ongoing, daily, Mon-Fri, 9:30-11:30am, Westgate Function Room. Sponsored by the MIT Child Care Office.

**Family Day Care Provider Support Group\*\***—Monthly meetings. Contact Susan Bennett, Eastgate, 621-1592. Sponsored by the MIT Child Care Office.

**Infant-Toddler Child Care Briefing\*\***—Mar 11: Introductory discussion, 12-1:30pm, Rm 4-144, preregistration required, call x3-1592. Sponsored by the MIT Child Care Office.

**Informal Embroidery Group\*\***—MIT Women's League, 10:30am-1:30pm. Upcoming dates are: Mar 18, Apr 1, 15, May 6, 20, June 3, 17. Meets in Rm 10-340, the Emma Rogers Room. Info: x3-3656.

**Job Search Support Group\*\***—For wives and spouses of MIT employees and students. Sponsored by the MIT Wives' Group. Info: Mieke 628-0721 eves or Susan x3-1614.

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

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

**Parents Anonymous\***—Wednesdays, 12-1pm, sponsored by Parents Anonymous and MIT Child Care Office. Call 1-800-882-1250 for more information.

**Parenting Workshops\***—Mar 11: Good-bye Diapers: Toilet Training Without Tears, 12-1pm, Rm E23-297. All workshops sponsored by the MIT Child Care Office and/or the MIT Medical Department. More info: x3-1592 or x3-1316.

**Summer Camp Briefing\*\***—Mar 18: Information on area day camps, overnight camps, more, 12-1pm, Rm 4-144. Preregistration required, call x3-1592. Sponsored by the MIT Child Care Office.

**Wives' Group\*\***—Mar 11: "Women's Personal and Social Identity in Different Cultures," Jean Jackson, Professor of Anthropology, MIT. Mar 18: "Are You Looking for a Job, Too?" Mieke Burggraaf, Wives' Group Member. Meetings are from 3-4:45pm, Rm 491 Student Ctr. Babysitting in Rm 407. All women in MIT community welcome. Info: x3-1614.

**Working Parents Support Group\*\***—Meets Tuesdays, 12:30-1:30pm. Preregistration required; call x3-4911. Sponsored by the MIT Child Care Office and the MIT Medical Dept.

**Workshop on Job Search Strategies\*\***—For international women. First meeting: March 16, 2pm. Pre-registration free before Mar 13. Info: Mieke 628-0721 eves or Susan x3-1614.

## HEALTH EDUCATION

**Healthy Lifestyles\*\***—Mar 17-Apr 21: Five hands-on sessions in stress management led by a specialist from the Mind/Body Medical Institute, sponsored by the MIT Medical Dept. Tuesdays, 4-5:30pm. Fee: \$45. Call x3-1316 for more information.

**Health After 50 Workshops\*\***—Mar 17: Start Walking!, 12-1pm, Stratton Student Center, Mezzanine Lounge. Sponsored by the MIT Medical Department. More info: x3-1316.

**Nursing Mothers' Support Group\*\***—Pregnant and breastfeeding women at MIT meet to gain confidence and share info and practical tips. First Tues of each month, 10-11:30am and third Wed of each month, 4-5:30pm, Rm E23-297. Babies welcome. Info: Margery Wilson 868-7218; call x3-1316 for schedule.

**Working Mothers Support Group\*\***—An ongoing support group that meets to discuss parenting-related issues in a casual atmosphere. Meets first Thursday of each month, 12-1:30pm (drop in anytime), Rm 18-591. Info: Debbie Levey x3-7112 (mornings only).

**Childbirth Preparation\*\***—Early Pregnancy, Lamaze Childbirth Preparation, and Lamaze Review classes are offered to patients of the MIT Medical Department's Obstetrics Service. Call x3-1316 for details.

**Tape Time for Health\*\***—A new, free video loan program. Topics include birth, parenting, baby care, smoking cessation, etc. Visit the Health Resources Center to borrow a tape or call x3-1316 for a list of titles available.

## MITAC

**Ticket locations and hours:** Tickets may be purchased at the MITAC Office, Rm 20A-023 (x3-7990), 10am-3pm Monday-Friday (except the third Monday of each month when MITAC is closed for inventory. Lincoln Lab sales in Rm A-218, 1-2pm Tues and Wednesday, and 1-4pm Thursday and Friday. Further details on events are included in MITAC's monthly flyer. To avoid disappointment, make reservations and purchase tickets early. Because MITAC is nonprofit, refunds are not available.

**Note:** Friday lobby sales in Lobby 10 and E19 have been suspended. Also, MITAC will be closed for inventory on the third Monday of each month (no ticket sales, but browsers are welcome).

**MITAC**, the MIT Activities Committee, offers discount movie tickets for General Cinema and Loews Cinemas, both are \$4/ea (Loews tickets are not valid the first 2 weeks a movie is released). Tickets are good 7 days a week, any performance. Due to popular demand, Showcase discount tickets have returned—tickets are \$4.25 ea, valid Mon-Thurs only.

**Norumbega Harmony\*\***—Mar 15: "Early Boston Composers: Choral Music of Billings, Holden, and Their Circle," at the Old South Meeting House, 3pm. Tkts: \$5/ea; purchase by 3/12. Call 569-0021.

**Boston Classical Orchestra\*\***—Mar 25: Includes Handel's Water Music Suite; Mozart's Concerto for Trombone and Orchestra (Ronald Barron, soloist); Copland's Quiet City; and Haydn's Symphony No. 100 (Military). At the historic Old South Meeting House, 8pm, tickets \$9/ea (reg \$13/ea); must be purchased by Mar 11.

**Kittery, Maine Outlet Late Winter Shopping Spree\*\***—Mar 28: Bus leaves MIT's Hayward Lot 8:30am; and returns approx. 6pm. \$14.50/pp incl. round-trip bus and bus tip.

**Harlem Globetrotters\*\***—Mar 29: At the Boston Garden, 2pm, tickets \$15.50/ea (reg \$18.50/ea).

**Spring Weekend in Montreal\*\***—Apr 3-5: \$128/pp/dbl. occup. includes round trip bus, bus tip, 2 nights' lodging at the Shangrila in downtown Montreal and 2 continental breakfasts. Bus leaves Hayward Lot Fri at 7am, returns approx. 7pm, Sun. Ticket sales begin Feb. 11th, 10am in 20A-023; 1pm at Lincoln Lab in Rm. A-218. First come; first served; reserve early.

**Museum of Fine Arts**—The Council for the Arts has 10 passes employees may borrow for free admission. Call the Office of the Arts at x3-4003 for availability. At Lincoln Lab, MFA passes are available in A-150.

## SOCIAL ACTIVITIES

**MIT Singles, 35 Plus\*\***—Meets Fridays 5:30-7pm for coffee and conversation, MIT Faculty Club Bar Lounge, cash bar. For information call Judy x3-9792 or Mary Anne x3-3293.

**La Table Française.** Meets every Thursday in Walker Dining Hall, 1-2pm (schedule permitting). Open to the entire MIT community, all levels welcome. Native speakers eagerly awaited! For more info call x3-9777.

**German Lunch Table.** Campus & Lincoln Lab: Tuesdays 1-2pm, Walker Memorial Dining Hall. Wednesdays 12-1pm, Lincoln Lab Schoolhouse, P-101. Information: Campus, Sabina Homann-Grabbe, x3-4771. Sponsored by Foreign Languages and Literature. Lincoln: Paul Williams x3981 or Fred Beihold x5343.

**Japanese Lunch Table.** Meets Tuesdays at 1pm, through May 5 (except 3/24 and 4/21) in Rm 407 in the Student Center. Bring a lunch and talk with native Japanese speakers. Free babysitting. Beginning Japanese speakers are especially welcome. Call Susan Sherwood x3-8095.

(continued on page 8)



# The Arts

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

## Get a Laugh

MIT students with a current ID can pick up free tickets for the April 4 performance of "Out for Laughs! A Wild Night of Women's Comedy." The tickets are being distributed through Friday, March 13 in Lobby 10 and are provided by a grant from the Council for the Arts at MIT and the Peter DeFlores Fund for Humor.



The performers are Karen Williams, (below) who "turns her act into a party," (*Bay Area Reporter*); Janice 'Gal' Perry, who returns from her critically acclaimed European tour of "World Power Sex Control"; and MIT's own Betsy Salkind SB '86, SM '86 of the Sloan School of Management (above).

This festival of comedienne is presented by the MIT Women's Studies Program and Sojourner. The show will be ASL interpreted.



General admission tickets are \$13.50 in advance, \$15 at the door, and are available at New Words Bookstore (Cambridge), Crone's Harvest (Jamaica Plain), Wood & Strings (Arlington). Credit card orders through Wood & Strings, 641-2131. Other information: Women's Studies, 253-8844 or Sojourner, 524-0415.

## Reading of the Minutes and More

Boston poet Larry Leier will present a public reading of original work during a regularly scheduled meeting of the MIT Space Engineering Research Center (SERC) at 3:45pm on Friday, March 13 in Rm 33-419. Information: 253-8809.

This unusual blend of poetry with department business was organized "to allow science and engineering students an opportunity to extend their appreciation for the arts." Mr. Leier is managing editor of *Holdout* magazine and continues to write both poetry and prose while working part-time as an editorial assistant at SERC.

This event has been funded by the Council for the Arts at MIT.

## Poetry at the Media Lab

Ed Barrett, senior lecturer in the MIT Program in Writing and Humanistic Studies will appear in the "Poetry at the Media Lab" series on Thursday, March 12 at 7:30pm in the Bartos Theater (Wiesner Building E15). Information: 253-7368

Mr. Barrett is the author of two collections of poems, *7x3* and *Theory of Transportation*, a verse translation of *Antigone*, and "Coyote," the libretto of an opera based on Navajo texts produced by the Manhattan Opera Company. He has also published three books on hypertext and hypermedia with the MIT Press.

The series is funded by the Council for the Arts at MIT.

## 25 YEARS

# 'No Dogs Allowed' Celebrates Anniversary

No Dogs Allowed, a wind trio composed of MIT alumni, will celebrate the group's 25th anniversary tomorrow (March 12) with an 8pm concert in Killian Hall.



Clarinetist Steve Umans '70, principal research engineer in MIT's Laboratory for Electromagnetic and Electronic Systems joins Ray Jackendoff G '69, clarinet, and Tom Stephenson '70, bassoon in a concert of Mozart and Poulenc and a suite of pieces from the "Glogauer Liederbuch" of 1460. In special recognition of the anniversary, the group will premiere two new pieces by Yehudi Wyner and John McDonald, commissioned for the event. Pianist Elise Jackendoff, former co-chair of the piano department at the Longy School of Music will join the trio for McDonald's piece, *Partita da Chimera*.

The trio was formed in 1966 when the three musicians were MIT students and made their debut in a Chapel Concert in May 1967. As individuals, the members of No Dogs Allowed are active performers in the Boston area while maintaining careers in science and technology.

**Panel Discussion**  
An open panel discussion entitled "Is There Musical Life After MIT? Balancing Music-Making with Another Career" featuring the members of the trio and MIT Associate Provost Jay

Keyser will precede the concert at 4pm. Other panelists include Harry Gatos, professor emeritus, MIT Department of Materials Science and Engineering; and two MIT scholarship students at the New England Conservatory: violinist George Ogata '92, concert master, MIT Symphony, and John Ito '93, violist. Elise Jackendoff will moderate. A similar discussion and a short performance will be presented at Belmont High School on April 15.

A concert is also scheduled at Brandeis University on Saturday, April 4 at 8pm. Excerpts from the program will be broadcast on WGBH radio during March and April.

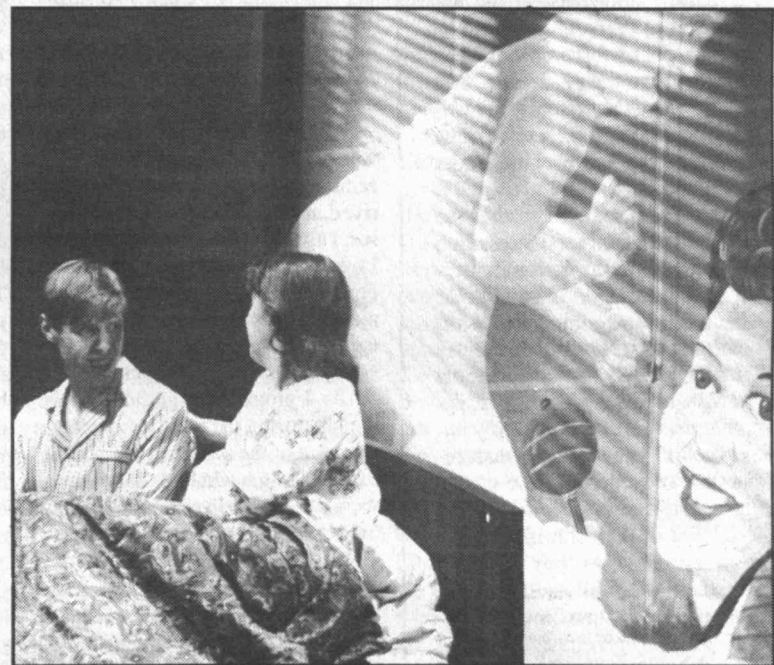
These programs have been funded by grants from the Council for the Arts at MIT and the Massachusetts Arts Lottery Council as administered by the Belmont Arts Lottery Council.

Information: 253-7351.



MIT Affiliated Artist Marek Zebrowski, piano, performs a concert of Mozart, Mendelssohn, Rachmaninoff, and Ravel on March 15 at 8pm in Kresge Auditorium. Mr. Zebrowski has been an affiliated artist at MIT for the past 15 years and has developed a substantial performing career both in the United States and abroad. Information: 253-2826.

photo by Donna Coveney



John (Derek Clark '89) and 'Nanny' (Betty Whyte) remain in bed after wife Helen (Andrea McGimsey '87, not pictured) has stalked off in a jealous snit. The MIT Community Players' production of Christopher Durang's vicious comedy *Baby with the Bathwater* continues March 13-14 at 8pm in Kresge Little Theater. Tickets: \$6, \$5 MIT community/seniors, \$4 MIT students. Information/reservations, 253-2530.

—Photo by Jack Nickerson, Plasma Fusion Center staff



**USE YOUR NOODLE**—The MIT Japan Program will screen Juzo Itami's 'Ramen Western' film, *Tampopo* on Tuesday, March 17 at 7:30pm in Rm 10-250. The film is in Japanese with English subtitles. \$3 donation at the door. Information: 253-8095.

## Ziporyn in Concert

Composer/clarinetist Evan Ziporyn (below), a member of the MIT music faculty, will perform a concert of new music for bass clarinet on Monday, March 16 in Killian Hall at 8pm. The program will include the premiere of works by Ziporyn, David Lang, Martin Bresnick, Michael Tenzer and John Halle. For more information, call 253-2826.

Professor Ziporyn holds degrees from Yale and University of California-Berkeley. In 1981 he made the first of several extended trips to Bali to study 'gender wayang' and gamelan and performed, taught and studied through Southeast Asia and Africa. In 1984 he



moved to Berkeley, California, where he joined Gamelan Sekar Jaya, eventually becoming the ensemble's musical director. In 1987 he received a Fulbright Fellowship for his studies in Balinese music.

A review in *Die Burger* called Professor Ziporyn's music "a sophisticated combination of jazz phrases and rhythmic patterns ... integrated into a single musical voice. His brilliant and original phrasing make for an extremely unique style ... pure joy."

## MUSIC

For recorded information on upcoming concerts call the MIT Music and Theater Arts Concert Line, 253-9800. Updated weekly

**MIT Chapel Series**—March 12: Barbara Winchester, soprano; Robert Ward, guitar. Elizabethan, Spanish, and American songs. March 19: Musica Romanza: Susan Ward, voice, recorder and Janna Frelich, voice, harp. 12noon, Chapel.

**Advanced Music Performance (AMP)**—March 13: Michael Valdez G. Tunes by Cole Porter, Vince Guaraldi, Michael Valdez, Mark Messier, Eric Ostling '88, Bill Evans, and Chick Corea. March 20: Eran Egozy '93, clarinet. 12noon, Killian Hall

**Noon Piano Recital**—March 11: Leslie Amper. Bach, Liszt, Debussy. 12:15pm, Killian Hall.

**Winter Jazz Festival**—March 12: MIT Festival Jazz Ensemble, Jamshied Sharifi, director; MIT Concert Jazz Band, Everett Longstreth, director. Special guests, Harvard University Jazz Ensemble (directed by Tom Everett). Tickets available the week before for free; \$1 at the door. 8:15pm, Kresge Auditorium.

**MIT Chamber Orchestra**—March 14: Steven McDonald, director. 8pm, Kresge Auditorium.

**Noon Piano Recital**—March 18: Leslie Amper, piano. Beethoven's Sonata Op. 23 No. 2 in A Major. 12:15pm, Killian Hall.

**MIT Brass Ensemble**—March 18: Larry Isaacson, director; Eleanor Perrone, piano. Paul Hindemith, Peter Schickele, world premiere of a work by Culver. 8pm, Kresge Auditorium.

**MIT Musicians Wanted**—MIT Symphony Orchestra has openings for musicians from the MIT community. Dalia Atlas, guest conductor. Rehearsals Tues/Thurs. 7:30-10pm, Kresge Auditorium. May 2 concert. Info: 253-2826

## THEATER

Call the Theater & Dance Performance Hot-Line, 253-4720 for complete up-to-date information.

**Hamlet**—March 12-15, March 19-21: MIT Shakespeare Ensemble, directed by Kim Mancuso. \$7, \$5 MIT/Wellesley student. 8pm, Sala de Puerto Rico. 253-2903

**Dramashop Auditions**—March 16-18: For student-written one-act plays. 7:30-11pm, Kresge Little Theater. 253-2877

## EXHIBITS

**List Visual Arts Center (E15)**—*Science Fictions*. Two-person exhibition examines the fugitive nature of various scientific systems. *Cannibal Eyes*. Group exhibition of artist/photographers who incorporate existing photos into their own work. *Our Bodice, Our Selves: An Installation by Deborah Small*. Explores the restricted notions of gender and race relations by examining the "captivity narrative" developed by the European settlers of America. Through April 18. Weekdays 12-6, weekends 1-5. 24-hr Hotline, 253-4680.

**MIT Museum Bldg (N52)**—*Information Art: Diagramming Microchips*, through April 5. *Thinking the City: 12 Views from MIT*. Exhibit about design in Boston by 12 members of MIT's Dept of Architecture studio design faculty. Through June 30.

Ongoing: *Crazy After Calculus: Humor at MIT; Doc Edgerton's Stopping Time; Holography: Types and Applications; Lawrence B. Anderson '30; Light Sculptures by Bill Parker; Math-in-3D: Geometric Sculptures by Morton C. Bradley, Jr.; MathSpace*. Tues-Fri 9-5, Weekends 1-4. 253-4444

**Compton Gallery**—*No Apartheid Anywhere: Works by Valerie Maynard*. Sixty works on paper and sculptures by the Maine-based printmaker, sculptor, painter and collage artist. Through March 20. 253-4444

## HISPANIC MONTH

Information for all events: 253-5010 (mornings) or 253-3278

**The Clash of Civilization**—March 15: Dr. Chuy Nigrete presents a trilingual (English, Spanish, Aztec native language) multi-media performance on the history of Mexican American people in the US. 3 & 7pm, Killian Hall.

**Inca Son**—March 16: South American musicians perform the music of South and Central America. 5pm, TBA.

**Frida**—March 18: Film based on the life of Mexican artist, Frida Kahlo. In Spanish, French, and German, with subtitles. 7pm, Rm 66-110.

**Video screenings**—March 19: *Art of Central America and Panama*, and *The World of a Primitive Painter*, works of the Honduran primitive painter J.A. Velasquez, in his village of San Antonio and Tegucigalpa. 5pm, Rm 66-110.



# 'Indirect' Costs Are Real Costs at MIT

■ By James J. Culliton  
Vice President, Financial Operations

MIT numbers among the research universities that have been mentioned in press coverage of indirect cost accounting practices. Although some of the federal procedures for calculating indirect costs can be improved, on closer examination of the books at MIT, for example, there is justification for billing the government for its share of the real cost of doing research.

In fiscal 1990, grants and contracts accounted for \$292 million of MIT's \$1064-million overall budget revenues. About \$203 million was paid out from federal sources for direct costs incurred at the project level and \$89 million for indirect costs (Table 1, A and C). That is, 30 cents out of each award dollar went to indirect costs. Although MIT also receives contract support for off-campus research, only on-campus research is used to compare universities.

The Defense Contract Auditing Agency audits indirect cost expense allocations, and the Office of Naval Research (ONR) negotiates and approves the indirect cost rate. The \$89 million appropriated for indirect costs in fiscal 1990 represents the aggregate amount allocated to on-campus research out of a total \$230 million charged to seven different indirect cost pools (Table 1B). The pools jointly support instruction and research, whose various allocations are made according to federal cost principles and any special negotiations (Table 1C).

For example, physical plant operations and maintenance cost \$53 million. Fifty-eight percent of that amount, or \$31 million, which is calculated on the basis of square footage of campus buildings used for research, was allocated to research indirect costs. Similarly, to cover the depreciation or use allowances for buildings (over a 50 year life) and MIT-owned equipment (over a 7 to 15 year life) used in sponsored research, the federal formula allocated \$20 million to research from a second cost pool of \$34 million.

General and administrative expenses, largely the salaries of full-time staffs involved in functions such as accounting, purchasing, personnel and medical services, safety, and environ-

mental and radiation protection, were \$79 million. Of this, \$19 million was allocated to the support of research based on studies of how the services were used.

Out of a \$32-million pool, an indirect cost of \$10 million was charged for research support contributed from departmental administration, which includes department heads, deans, and other senior administrators.

Research administration, however, covers only those functions devoted entirely to research, such as the MIT Office of Sponsored Programs, patent activities, and those responsible for monitoring the use of human subjects, animal care and biohazards. From a total pool of \$5 million, \$3 million was allocated to research conducted on campus and the balance to off-campus research.

Out of a sixth cost pool of \$11 million for library costs, \$4 million was allocated to research. This breakdown was based on a study of what percentage of the MIT library costs was incurred on behalf of research, the results of which ONR accepted in a memorandum of understanding.

The final cost pool, covering student services, totals \$16 million and includes offices such as the dean of student affairs, the admissions office, the registrar, and financial aid. In 1990, \$2 million of this pool was allocated to research based on the ratio of student hours devoted to research to total student hours.

To determine the on-campus indirect cost rate, the total \$89 million allocated to on-campus research from the seven cost pools is expressed as a percentage of the modified total direct cost (MTDC) base. The MTDC base, mandated by the Office of Management and Budget (OMB) in its Circular A-21 or accounting guidelines for educational institutions, consists of the \$203 million in direct costs of research less equipment purchases, subcontracts, and certain other items. For fiscal 1990 the on-campus MTDC base was \$145 million.

To generate \$89 million in indirect costs required that MIT apply an indirect cost rate of 62 percent to the \$145-million MTDC cost base. Articles in the popular press imply that 62 cents of each research grant dollar goes to indi-

rect costs but that number is actually 30 cents. Suggestions that universities should "return" some of the overhead to the departments or faculty for their use can also be misleading. Because the overhead pays real costs, there is nothing to return.

A great deal of attention is now being given to improving the indirect cost system. Steps have already been taken to clarify the allowability of certain costs and this will eliminate some of the areas most vulnerable to differing interpretations. The use of caps or fixed rates, particularly with respect to administrative costs, has received widespread consideration. Unless thresholds, ceilings and caps on indirect cost components are imposed with great care, they may unfairly deny reimbursements to some institutions and may provide windfalls to others. For example, MIT has waived a "windfall" reimbursement of \$2 million annually since 1988, to which it would have been entitled under the 3.6 percent ceiling imposed by OMB on faculty salaries charged to departmental administration. Institutions receiving state funds might be put in the same position.

A far more desirable approach would be to establish a threshold rate for administrative costs with the option to establish a higher rate with increased documentation requirements. This option recognizes that the government continues to make new regulations requiring increased administrative expense in connection with human research subjects, laboratory animals, drug-free work place and work force, changing audit standards and procedures, safety in the work environment, biohazards, hazardous waste disposal, procurement certifications and assurances, among others. For instance, the indirect costs of environmental medical services on the MIT campus have grown from \$974,000 in 1985 to \$1.5 million in 1990, an increase of more than 50 percent. Proliferating federal regulations not only add to the costs of central administration, but increasingly divert faculty investigators from their research to satisfy the administrative and record-keeping requirements associated with a range of regulatory compliance programs.

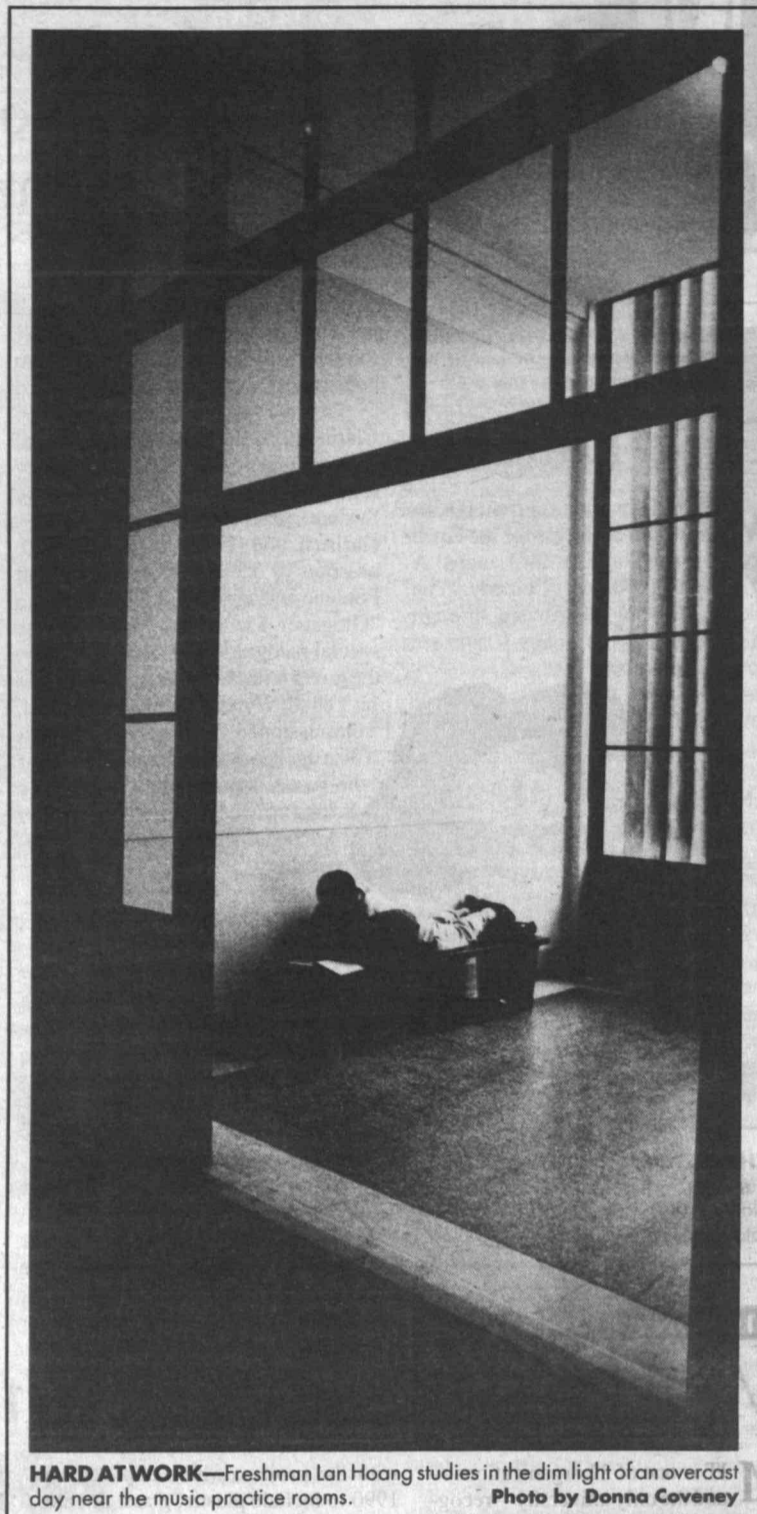
It is also time to take a more realistic view of the useful lifetimes of buildings and equipment acquired with non-federal funds and used in research and to reflect this in indirect costs for depreciation.

There are no magic bullets which will solve the indirect cost problem, and these are only a few starting points. Before any progress can be made, however, there must be a shared vision between Congress, the administration, and the university community as to how and why the federal government should support research and training at universities.

Along with federal support for the infrastructure of American universities, the basic relation between the universities and the federal government for the support of research has been eroding for more than a decade. The underpinnings of the system—investigator-initiated research, peer review, and full funding—have come under increasing attack.

If the view is reaffirmed that the federal funding of university research is an investment in the national interest, then the needed revision to A-21 can effectively be accomplished without changing the founding principles of A-21. If A-21 is rebuilt to reflect the view, whether by design or default, that universities are simply another type of vendor, and that research should be done in the places that have the lowest overhead, the highest level of cost sharing, or the greatest access to other funding sources, then A-21 will itself contribute to altering and curtailing the federal government-university relations and the capacity of the university community to respond to national needs.

(This article was published in *Science* magazine Feb. 14, 1992 and is reprinted here with permission. © Science, 1992)



**HARD AT WORK**—Freshman Lan Hoang studies in the dim light of an overcast day near the music practice rooms. Photo by Donna Coveney

**Table 1.** A breakdown of MIT's fiscal year 1990 operating expenses, detailing on-campus research allocations. Figures are in millions.

A 1990 Operating expenses* \$1100	B Joint expenses of instruction and research \$230	C Joint expenses allocated to research \$117
Joint expenses of instruction and research \$230	Instruction: \$113 Research: \$117	Off-campus: \$28 On-campus: \$89
Direct cost of on-campus sponsored research \$203	Detail of joint expenses:* \$230	Detail of on-campus allocation to research: \$89
Direct cost of off-campus sponsored research \$414	Plant operations and maintenance \$53	\$31
Instruction and unsponsored research \$127	Equipment depreciation and building use \$34	\$20
Scholarships \$45	General administration and expenses fiscal, personnel, medical, and other \$79	\$19
Auxiliary activities \$37	Department administration \$32	\$10
	Research administration \$5	\$3
	Library costs \$11	\$4
	Student services \$16	\$2

\*MIT treasurer's report.

(continued from page 6)

## MOVIES

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

LSC Movies\*\*—Mar 13: *Little Man Tate*, 7 & 10pm, Rm 26-100. *All About Eve*, 7:30pm, Rm 10-250. Mar 14: *Rambling Rose*, 7 & 10pm, Rm 26-100. Mar 15: *Star Wars*, 7 & 10pm, Rm 10-250. Mar 20: *Nasty Girl*, 7 & 10pm, Rm 26-100. Mar 21: *The Muppet Movie*, 7 & 10pm, Rm 10-250.

Send notices for Wednesday, March 18 through Sunday, April 5, 1992 to Calendar Editor Rm 5-111, before 12 noon Friday, March 13.

# A Cautionary Tale From the Past

■ By K. Barry Sharpless

The following essay was written some time ago, but continues to pop up on laboratory doors around MIT, most recently at the Ceramics Processing Research Laboratory where it was read by a Tech Talk reporter. It is reprinted here with Dr. Sharpless' permission in an effort to reach everyone in the MIT community. Dr. Sharpless was a long-time member of the MIT faculty, last holding the Arthur C. Cope Professorship in Chemistry. He is now at the Scripps Research Institute in California.

Many of you may know that I was blinded in one eye during a lab accident in 1970, shortly after I arrived at MIT as an assistant professor. I always wore glasses whenever I was at my bench, and while I felt I conscientiously observed safety measures, my experience proves one can't be too cautious about wearing safety glasses.

As I prepared to go home from the lab during the early hours of the morning of the accident, I looked in the bays to see what my co-workers were doing, and then returned to my own bench, removed my safety glasses, and put on my parka. As I was walking to the door, I passed the bench where a first-year graduate student was flame-sealing an NMR tube. I asked how it was going, and he replied, "Good, I've got it sealed."

He was sealing off the tube at atmospheric pressure under a flow of nitrogen gas while cooling the tube in a liquid nitrogen bath, a technique

neither of us had performed before. Nor, I regret to say, had we looked up the procedure, which we subsequently discovered to be incorrect.

I stopped by his bench, picked up the tube from the bath, and held it to the light. The tube immediately frosted over, and, as I wiped it to better see the contents, I noticed that the solvent level was exceedingly high. Suddenly the solvent level dropped several inches. Though I instantly realized condensed oxygen had been sealed in the NMR tube, I was quite literally unable to move a muscle before it exploded. Glass fragments shredded my cornea, penetrated the iris, and caused the partial collapse of one eye. My only other injuries were superficial face cuts.

My first two weeks at Mass Eye & Ear were spent totally immobilized and with both eyes bandaged. The pain was terrific, but my fear was even greater: I had been warned that when my eyes were uncovered there was a small chance I might be blind in both eyes due to "sympathetic ophthalmia." Because eyes are walled off from the rest of the body in utero, eye protein driven into the blood stream can raise an immune response that leads to the "killing" of the uninjured eye. My disappointment at having no functional vision in my injured eye was, needless to say, surpassed by my joy at retaining full vision in my good eye.

The lesson to be learned from my experience is straightforward: there's simply never an adequate excuse for not wearing safety glasses in the laboratory at all times.