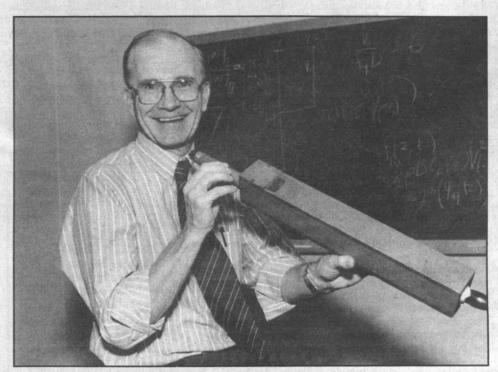
# MIT

# RCH VOLUME 44 . NUMBER 6





Professor Kim Vandiver, the new dean for undergraduate research, with a pipe from a pipe organ that he uses for a demonstration in his class on mechanical vibration.

Photo by Donna Coveney

## Vandiver discusses plans as dean for undergraduate research

■ By Denise Brehm. News Office

Professor J. Kim Vandiver, founding director of the Edgerton Center and former director of the Experimental Study Group, is once again paving a path in undergraduate education at the Institute. As of July 1, he became dean for undergraduate research, a new rendering of the former position of dean for undergraduate curriculum.

In the newly defined position—which reports to the dean for undergraduate education, Rosalind Williams—Professor Vandiver hopes to change the undergraduate academic experience at MIT as

recommended by the Task Force for Student Life and Learning. His goal is to incorporate more and earlier opportunities for students to get involved in real-life problem solving, engage in research, and perhaps most importantly, develop relationships with faculty mentors.

"The position of dean for undergraduate cur-

"The position of dean for undergraduate curriculum was constantly being redefined in response to changes at the Institute during the three years that Kip Hodges held the job," said Dean Williams. "When Kip decided to step down in July, it was really time for us to take stock.

"The Task Force specifically suggested tighter (continued on page 6)

## Work probes why habits are hard to make, break

■ By Deborah Halber News Office

An MIT researcher who studies an area deep within the brain has uncovered clues about why good habits are so hard to make and bad habits are so hard to break. Her work may also help those who suffer from extreme addictions and certain brain disorders.

"We all live mostly by habit," said Ann M. Graybiel, the Rosenblith Professor of Neuroscience. Habits—and automatic learned responses such as those used in driving and bike-riding—may serve to free up the "thinking" parts of the brain for more creative purposes.

As anyone who has ever tried to quit smoking or lose weight knows, habits do not come and go easily. And extreme habits, such as addictions or actions repeated uncontrollably, are the dark side of the brain's ability to relegate tasks to the basal ganglia, three large nuclei of nerve clusters buried below the cerebral hemispheres in the forebrain.

Professor Graybiel is tantalized by new evidence that there may be sensory tricks that break the destructive endless loops that seem to be tied to malfunctions of this brain region. If researchers could come up with a simple antidote to a seemingly unconquerable urge like the nicotine addict's craving for a cigarette, she says, it might help millions break free from the clutches of addictions.

Professor Graybiel hopes that her research will lead to cures or improved quality of life for those with motion control disorders such as Tourette's syndrome. She also is investigating the idea that the basal ganglia may be tied to conditions seen primarily as "thought" disorders, such as obsessive-compulsive disorder (which is like an out-of-control habit) or schizophrenia.

Working with Professor Graybiel are postdoctoral associates Yasuo Kubota and Naotaka Fujii of the Department of Brain and Cognitive Sciences; postdoctoral fellows Hu Dan, Pablo Blazquez, Juan Canales and Christine Capper-Loup; and graduate student Toshi Sakamoto.

#### **BURIED IN THE BRAIN**

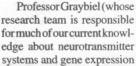
The basal ganglia's work falls somewhere in between that of the cortex—which is active in the "here and now" skills like talking, thinking and learning—and the brain stem, which controls automatic body functions like breathing and blinking.

For a long time, the function of the basal ganglia remained a mystery. It is known that they are involved in the control of movement.

Lesions in the basal ganglia occur in motor disorders such as Parkinson's disease and Huntington's chorea. Neurotransmitters in the striatum, an area deep within the basal ganglia, may also be involved in Tourette's syndrome, depression, attention deficit disorder and addiction.

Certain psychological disorders have physical components. In obsessive-compulsive disorder, for instance, the same useless movement might be

repeated over and over. Parksinson's patients seem unable to initiate a sequence of movements such as rising from a chair or walking from one place to another, but once the action is initiated, they have no trouble performing it.



in the basal ganglia) and her colleagues have uncovered evidence that the basal ganglia is tied to much more than motor control.

They see that its main inputs come from cognitive parts of the brain such as the frontal lobes, so Professor Graybiel is not surprised that the basal ganglia demonstrate a strong reaction to (continued on page 8)

## Award-winning invention cuts costs, boosts performance of automobile engines

■ By Elizabeth A. Thomson News Office

Whoever invited Alex Slocum to give a talk for Ford Motor Co. engineers two years ago deserves a raise.

The talk, which summarized ongoing research in Professor Slocum's mechanical engineering lab, sparked a collaboration that has led to an invention that could cut manufacturing costs for many automotive engines and is the grist for an MIT PhD thesis. The frosting on the cake: a 1999 R&D 100 Award, shared by Ford, MIT and Aesop, Inc., which the researchers will receive at a ceremony in Chicago on September 23.

Dr. Slocum, a MacVicar Faculty Fellow, has now won nine R&D 100 Awards, which honor the 100 most technologically significant new products of the year.

#### TO BUILD AN ENGINE

The current award-winning invention is a new way to align one or more components of automotive engines with extreme precision. Such an operation is critical to engine performance. In the production of an engine, the two main components are bolted together and a hole is machined lengthwise between the two. Then the two halves are taken apart again to put in the crankshaft and bearings that fit within the hole.

"When the halves are reassembled (with the crank-shaft and bearings in place), it's important that they are lined up to within five millionths of a meter of their original bolted position, or the engine will not work properly or possibly fail," said Martin L. Culpepper, the graduate student in mechanical engineering who is a cowinner of the R&D 100 Award with Professor Slocum; Robert Rines of Aesop, Inc.; and F. Zafar Shaikh, Joe Schim and Gary Vrsek of Ford. The inventors will also be presenting a paper on the work at a November meeting of the American Society of Mechanical Engineers.

Currently, engine manufacturers solve the alignment problem by machining eight holes into each of the main engine components, then fitting them together via dowel pins inserted in the holes. Among other drawbacks, "this design is costly to manufacture as it requires machining/gauging 16 precision holes and eight hollow dowel pins,"

(continued on page 2)



Graduate student Martin L. Culpepper is a co-winner of an R&D 100 Award for the Kinni-Mate Coupling for aligning and attaching engine components.

Shannon Culpepper/Shadow & Shape Studio

## Technique lets scientists 'see' minute ear-cell movements

Graybiel

■ By Rachel Bredemeier Electrical Engineering and Computer Science

(This article is reprinted with permission from the September 1999 issue of Electrical Engineering and Computer Science, the department's newsletter.)

The inner ear is sensitive to sounds that vibrate the eardrum by less than the radius of a hydrogen atom, though the mechanisms by which this happens are not fully understood. Now, Associate Professor Dennis M. Freeman and colleagues in the Research Laboratory of Electronics' Auditory Physiology Research group have devised methods to "see" the motions of inner ear cells that barely blur high-resolution images from an optical microscope.

The key to the approach is the marriage of the computer with video microscopy. To gain insight into the signal-processing functions of the ear, Professor Freeman has devised techniques to make slow-motion, three-dimensional movies of sensory cells and their neighbors during sound stimulation. The movies resolve not only the motions of cells but also individual motions of the 50 to 100 microscopic sensory hairs that protrude from each sensory cell.

By analyzing these movies with algorithms from machine vision, quantitative measurements, accurate to a billionth of a meter, are possible. These measurements allow direct tests of how the million moving parts in each of our ears cooperate to provide our remarkable sense of hearing.

Many factors contributed to Professor Freeman's investigations of auditory physiology. "My family has a history of hearing problems, and I have a slight hearing problem myself," said Dr. Freeman, the W.M. Keck Career Development Associate Professor in Biomedical Engineering in the Department of Electrical Engineering and Computer Science.

He started out working with Dr. Lou Braida, the Henry Ellis Warren Professor of Electrical Engineering, on making a better hearing aid. The signal (continued on page 8)

### InBRIEF

#### WOMEN INVITED

All women who are new to MIT are invited to a reception hosted by Mrs. Rebecca Vest and the MIT Women's League on Tuesday, Sept. 28 at the President's House from 4:30-6pm. At 5pm, brief presentations by some campus departments will be followed by a question-and-answer session. Anyone with questions may call x3-3656.

\* Open to public

\*\* Open to MIT community only

#### September 22-October 3

#### **ANNOUNCEMENTS**

Career Services and Preprofessional Advising Recruitment Presentations\*\*—Sept. 23: Citigroup/Citibank, 6pm, Rm 4-163. Kurt Salmon Associates, 6pm, Rm 4-237. Sept. 27: Exponent-Failure Analysis Associates, 7pm, Rm 4-145. Sept. 28: Barclays Capital, 6pm, Rm 4-145.

Perkins and Stafford loans: Have you signed your Perkins and/or Stafford loan notes yet? If not, come to the Student Services Center (Rm 11-120) before October 1 to avoid late charges.

#### **■ RELIGIOUS ACTIVITIES**

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

Baptist Campus Ministry\*\*—Weekly events: Sunday Nights at the RAC, 6pm, Main Dining Rm, Bldg W11. Home-cooked meal at 6pm (cost: by donation), followed by Bible Study. Tuesday Vespers, 6-6:30pm, chapel. A quiet time for reflection. More info: x3-2328.

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

Chi Alpha Christian Fellowship\*\*—Weekly Organizational Meeting, Tuesdays, 7:3-9pm, Private Dining Room 3 in Stratton Student Center. Christian worship and an examination of the Book of Revelation. Prayer and fasting each Thursday from 12-12:45pm in W11-063. More info: x3-2327, <cacf@mit.edu> <www.mit.edu/activities/xa/main/html>.

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

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

Graduate Christian Fellowship\*\*—Weekly meetings Fridays at 6pm. Also weekly Bible studies, prayer and volleyball. More info: <a href="http://web.mit.edu/mitgcf/">http://web.mit.edu/mitgcf/</a> or <mit-gcfinfo@mit.edu>.

Lincoln Laboratory Bible Study\*—Wednesdays, noon-1pm, weekly Bible study in the Division 7 conference room, D-430. More info: Sharon Frigon at 981-7751 or <frigon@ll.mit.edu>.

Lutheran-Episcopal Ministry at MIT\*—
Regular Wednesday worship 5:10pm, followed by either a brown bag supper or social activity in the Bldg W11 dining room. On the second Sunday of each month, LEM assists at Common Cathedral, a gathering of homeless people on the Boston Common, at 1pm. More info: x3-0108.

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

MIT Hillel\*\*—Tuesdays: 5:30pm Beginning Hebrew Class; 6:30pm Intermediate Hebrew Class. Wednesdays: noon Hebrew Conversation Table in Walker Cafeteria; 7pm Haftorah Class. Thursdays: noon Taste of Torah. Fridays: 6pm Egalitarian Chavurah Services and Orthodox Minyan Services; 7pm Shabbat dinner. Saturdays: 9am Orthodox Minyan Services; 12:45pm Shabbat lunch. More info x3-2982.

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

MIT Orthodox Christian Fellowship\*\*— Wednesdays at 5:30pm in Student Ctr DR 1 for dinner followed by Chapel Vespers. John Kymissis x5-7649 or Costa Sapuntzakis x5-

Protestant Eucharist/Holy Communion\*—
Wednesdays, 5:10pm in Building W11.
Sponsored by the Lutheran-Episcopal Ministry at MIT. More info: x3-2325 or </ri>

Taize Prayers\*—Fridays, noon-12:30pm in W11, the Board Room. All invited. Sponsored by students from the Protestant Ministry at MIT, Tech Catholics and the Lutheran-Episcopal Ministry. Taize Prayers, coming from the Taize community in France, are a form of Christian meditation based on singing and silence.

Tech Catholic Community\*\*—Sunday Masses 9:30am, 1pm and 5pm. Weekday Masses Tuesdays and Fridays 12:05pm when classes are in session. More info: x3-2981 or <catholic@mit.edu>.

United Christian Fellowship (UCF)\*\*—A member of INTERVARSITY Christian Fellowship. Weekly Large Group meetings Fridays at 7:15pm, 3rd floor of Student Center. Weekly dorm-based bible studies on campus. See web page <a href="https://web.mit.edu/ucf/">https://web.mit.edu/ucf/</a>. For more info: Sherry or Sara at 576-5157 or <a href="mailto:mit.edu">mit.edu</a>.

#### **STUDENT JOBS**

For other job listings and more information about the following listings, go to the Student Employment Office, Rm 11-120 or <a href="https://web.mit.edu/seo/">http://web.mit.edu/seo/</a>. The MIT Student Employment Office functions much like the classified section of a local newspaper, and does not screen potential employers or employees.

Off Campus, Technical. Krom, Inc., a hot new Interactive agency is looking for HTML, Javascript, CGI, UNIX programmers to build killer Web sites for Fortune 50 client roster. Sites require sophisticated functionality such as e-commerce and personalization. Must have sense of humor and fire in the belly to fit into this fun, fast startup culture. Call Tim Scully at 776-8832.

Off-campus, Non-Technical. Proctoring exams around greater Boston for a test preparation company. Must have a car and an accurate watch. Get paid while you study. Call Ted DesMaisons at 964-8378.

On Campus, Non-Technical. The Student Employment Office is seeking a student staff assistant to run the daily activities of the office. Duties include preprocessing student payroll; recording jobs on FileMaker Pro database, updating job boards; assisting with the Federal community service program; responding to questions from employers, students, and staff about work, payroll, and work-study; E19 runs, filing, alphabetizing, and lots of phone work. Must be detail oriented, organized, articulate, and service oriented. Call Jane Smith at x8-5614 or stop by Rm 11-120.

The following positions are for students with Federal Work Study eligibility.

Community Service. Assistant teachers needed in Cambridge preschool and afterschool programs. Hours are flexible between 8:30am-2:30pm and 2-6pm. Call Kelly Tyler at 349-6287.

Community Service. Youth Advocacy Organization seeks an assistant to the training director. Primary responsibilities include providing administrative assistance, event planning and programmatic support. Position requires computer skills, problem solving, organizational ability and a sense of humor. Call Michelle Quinn at 623-9900.

Community Service. MassRecycle is seeking an independent, organized individual to work in the MassRecycle office in downtown Boston. Duties include: providing general support to the membership coordinator and the executive director (including clerical tasks), assisting with public outreach events, report preparation, publication distribution and mass mailings. Should have an interest in environmental issues, recycling. Env. studies major preferred, not required. Must be reliable, able to work without supervision. Strong communication and writing skills necessary. Call Melissa Bernardin at 338-0244.

#### ■ VOLUNTEERS

The MIT Public Service Center (PSC) has compiled the following volunteer opportunities. Please contact the PSC for more information (Room W20-547, x3-0742).

#### ■ UROP

The UROP Office invites MIT and Wellesley students to join faculty members on research projects. For information on procedures, please contact the UROP Office, Rm 7-103 <a href="mailto:kurop@mit.edu">kurop@mit.edu</a> or x3-7306. Information and current listings available on-line at <a href="http://web.mit.edu/urop/www/">http://web.mit.edu/urop/www/>.

#### **■ CABLE**

For program information, contact Randy Winchester at x3-7431, Rm 9-050, <randy@mit.edu> or see the web site at <a href="http://web.mit.edu/org/m/mitcable/www/home.html">http://web.mit.edu/org/m/mitcable/www/home.html</a>.

## Mars conference slated for October

A stronauts, scientists and others interested in the human exploration of Mars will convene October 1-3 at MIT for "Mars Week," a student-run conference.

The conference, designed as an inspirational event that will educate and excite people about Mars exploration, will feature speakers representing an array of interests in Mars and space science.

Among those scheduled to speak are Apollo 11 astronaut Buzz Aldrin (ScD 1963); veteran space shuttle astronaut Franklin Chang-Diaz (ScD 1977); Professor Maria Zuber of earth, atmospheric and planetary sciences; and Robert Zubrin, Mars Society president and author of *The Case for Mars: The Plan to Settle the Red Planet*.

The three-day event was planned by members of the "ThinkMars" initiative, a team of students from MIT, Harvard and other New England colleges, and is being presented in cooperation with the Mars Society, NASA Academy Alumni Association, National Space Society, and the Department of Aeronautics and Astronautics (aero/astro).

ThinkMars was created last year to participate in NASA's

"NASA Means Business" competition, and the student group was subsequently selected by the judges to develop a comprehensive business plan for a mission to Mars (MIT Tech Talk, March 31, 1999). That business plan went on to become a semifinalist in MIT's \$50K Business Plan Competition.

The team, which works via the Internet, is using NASA's technical mission plan (the NASA Design Reference Mission) as the basis for a business plan that focuses on the financial, political and logistical aspects of human exploration of Mars. Team members hope to launch the company that organizes the first mission.

"We weren't around for the first Moon walk, so this is our way of contributing to space exploration," said ThinkMars founder Justin Talbot-Stern, a graduate student in aero/ astro. "To us, it's not just a competition anymore, it's real life."

For more information about ThinkMars and a Mars Week schedule, see <a href="http://thinkmars.mit.edu">http://thinkmars.mit.edu</a>>.

**Denise Brehm** 

## Invention for automobile engines wins R&D 100

(continued from page 1)
Professor Slocum said.

"The pin-hole technique has been used for centuries to attain precision alignment," Mr. Culpepper said. "Our design could totally change this way of thinking."

#### **NEW APPROACH**

In the new patent-pending approach, which the researchers have dubbed the Kinni-Mate Coupling, the two major engine components are aligned via three spherical pegs that are pressed into one of the components (the pegs replace the traditional dowel pins). The pegs then "mate" with three corresponding conical holes in the other component. (These holes can be machined with grooves around the edges, which can improve the performance of the Kinni-Mate.)

Among the benefits: Kinni-Mate Coupling is one third cheaper than the

current method for aligning engine parts, in part because it employs fewer pieces (e.g., three pegs versus eight dowel pins). It can also be easily integrated into the existing manufacturing process because the inventors have developed a novel method for machining the new features with a modification of the old tooling.

Finally, it simply outperforms the standard pin-hole technique. The Kinni-Mate Coupling enables manufacturers to achieve five times better precision in aligning two parts.

Mr. Culpepper, who is writing his PhD thesis on the Kinni-Mate, noted that the concept has already seen limited use by Ford. "The company is currently taking the necessary steps to place it into full production," he said.

Mr. Culpepper and Professor Slocum have applied for two patents on the Kinni-Mate Coupling. The work was funded by Ford.

#### **Obituaries**

#### **ELIZABETH COURT**

Word has been received of the May 18 death of Elizabeth Court, 60, of Cambridge, a retired senior secretary in the Harvard-MIT Division of Health Sciences and Technology. She began working at MIT in 1984 and retired in 1998. Information on survivors was unavailable.

#### **PRISCILLA CREWE**

Priscilla Crewe, 64, of Dorchester, a lead diet aide in the Medical Department, died on July 31. She had worked at MIT since 1987.

Mrs. Crewe is survived by her husband, Harold J. Crewe; two daughters, Dorothy Rivera of Dorchester and Celine of Lynchburg, VA; two sons, Daniel of Randolph and Harold of Dorchester; 17 grandchildren and seven great-grandchildren.

#### Crimewatch

The following incidents were reported to the MIT Campus Police between August 21-30. This summary contains most incidents reported to Campus Police but does not include incidents such as medical shuttles, ambulance transfers, false alarms and general service calls.

August 21: Deacon St.: male assaulted and damage to victim's vehicle. Bexley: 2 underage students were intoxicated, one transported to MIT medical. Alcohol citation issued for possession of alcohol by person under 21 years of age. Bldg. E51: smoking complaint. Bldg. 10: suspicious person, checks out okay.

August 22: Bldg. E23: report of a sexual assault. Bldg. NW30: homeless person issued trespass warning. Student Ctr: 1) suspicious male, trespass warning issued; 2) check of vehicle, checks out okay. Bldg. 1: check on two individuals carrying computers, check out okay. Memorial Dr.: assist State Police with a car fire. Mass. Ave. at kiosk: check and inquiry of person. 519 Beacon Street: report of persons throwing items from roof at pedestrians.

August 23: Walker: report of students on roof. Bldg. 3: plaque stolen, \$82. Bldg. 56: cassette player and gym bag stolen, \$70. Fowler St.: Dodge Neon stolen, recovered in Boston, \$6,000. Bldg. E53: bike secured with a chain stolen, \$50. Bldg. NW30: homeless person assisted to shelter. Vassar St.: stolen vehicle recovered. Delta Kappa Epsilon: noise complaint. DuPont: dispute between students, same resolved. Tang: report of bird flying around apartment, opened window and assisted same towards fresh air.

August 24: Bldg. E40: report of 2 suspicious persons, unable to locate. Edgerton House: intoxicated 21-year-old student transported to medical. Bldg. NW62: malicious damage to windows. Bldg. W31: report of past sexual assault.

August 25: Delta Kappa Epsilon: report of a truck stealing a mattress. Vehicle and suspect gone upon CP's arrival. Bldg. E23: credit cards and blank checks stolen; credit cards used. Bldg. E52: bike secured with "U" lock stolen, \$200. Steinbrenner Stadium: wallet stolen, person attempted to use stolen credit card. \$0 cash also taken. Alpha Tau Omega: laptop computer stolen, \$3,500. Tech Square: Assist Cambridge Police with a person who was just robbed on Hampshire Street. Boat House: report of suspicious persons. Bldg. 7: report of suspicious person, gone upon CP's arrival. Phi Beta Epsilon: noise complaint, music turned down.

August 26: Bldg. E18: construction tools stolen, \$350. Bldg. E52: stamps and bathroom scale stolen, \$129. Bldg. 31: electronic organizer stolen, \$300. East Campus: wallet stolen, \$11 cash and credit cards. Bldg. 18: radio stolen, \$110. MacGregor: contact student to call home. Briggs Field: report of unauthorized persons using fields. Burton: emergency call hang-up, check of caller, accidental.

August 27: Bldg. E17: threatening phone calls. Bldg. 8: threatening graffiti. Memorial Dr. near Baker: assist State Police with a vehicle accident. Bldg. 4: suspicious activity. Kresge lot: erratic operation of a vehicle.

August 28: Bldg. 13: students in steam tunnel. Westgate: 1)harassing phone calls; 2)unwanted guest; 3)bike stolen, \$300. Bldg. 39: male arrested for attempted larceny of bike and other related charges. Sigma Alpha Epsilon, Boston: trash overflowing in dumpster causing a safety hazard. Bldg. E51: 2 suspicious individuals, trespass warning issued. MacGregor: fight between soccer players, simple assault. Chi Phi, Boston: fraternity problem. Random: report of a disturbance, call unfounded.

August 29: Boston: assist Boston University Police with a noise complaint of loud music. Mass. Ave. and Vassar St.: assist Cambridge Police with motor vehicle accident. Pi Lambda Phi, Boston: noise complaint. Tennis Courts: verbal assault. East Campus: noise complaint. Memorial Dr.: two males arrested for breaking into a vehicle and other related charges. Bldg. 7: report of a suspicious person, same checks out okay. Rear of Bldg. NW30: routine check and inquiry, trespass warning issued. Beta Theta Pi: noise complaint.

August 30: Sigma Chi, Boston: noise complaint. Bldg. E52: suspicious male, issued trespass warning. Bldg. 13: report of persons in elevator shaft. Bldg. 5 &14: report of persons on roof. Beta Theta Pi, Boston: noise complaint.

#### MIT TECH TALK (USPS 002157)

September 22, 1999 Volume 44, Number 6

Publisher KENNETH D. CAMPBELL

Editor ALICE C. WAUGH

Photojournalist
Donna Coveney

News Office

Director: Kenneth D. Campbell; Associate Director: Robert J. Sales; Assistant Directors: Donna Coveney, Elizabeth A. Thomson, Alice C. Waugh; Senior Writer: Sarah H. Wright; Science Writer: Deborah Halber; Assistant Editor of Tech Talk: Denise Brehm; Administrative Assistant: Myles Crowley; Design/Editorial Assistant: Lisa Damtoft; Administrative Secretary: Mary Anne Hansen; Senior Office Assistant: Patricia Foley.

The Arts page is produced by the Office of the Arts, Room E15-205, (617) 253-4003.Director of Arts Communication: Mary Haller; Administrative Staff Assistant: Lynn

News Office e-mail: newsoffice@mit.edu News Office URL: ttp://web.mit.edu/newsoffice/www Office of the Arts URL:

Tech Talk is published weekly except for most Monday-holiday weeks by the News Office, Room 5-111, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, Massachusetts 02139-4307. Tele-

http://web.mit.edu/arts

phone: 617-253-2700.

Postmaster: Send address changes to Mail Services, Building WW15, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, Massachusetts 02139-4307. Subscribers may call (617) 252-

1550 or sende-mail to <mailsvc@mit.edu>-Tech Talk is distributed free to faculty and staff offices and residence halls. It is also available free in the News Office and

the Information Center.

Domestic mail subscriptions are \$25 per year, non-refundable. Checks should be made payable to MIT and mailed to Business Manager, Room 5-111, MIT, 77 Massachusetts Avenue, Cambridge, MA 02139-4307.

Periodical postage paid at Boston, MA.

Permission is granted to excerpt or reprint any material originated in Tech Talk. Selected articles that originated here are

also available online

(see web URL above).



Printed on Recycled Pape



The 1999-2000 Knight Science Journalism Fellowships program. Back row, left to right: Martha Henry (program coorindator), Ganapati Mudur, Andreas Schriber, Peter Spotts, David Chandler, David Talbot, DongHo Shin. Front row, left to right: Wayt Gibbs, Susan Lewis, Boyce Rensberger (program director), Karen Hopkin, Melissa **Photo by Graham Ramsay** 

## Ten journalists are Knight Fellows

For the 17th year, MIT's lecture halls and laboratories are being infiltrated by science journalists.

Ten newspaper and magazine writers and television producers-all selected by the Knight Science Journalism Fellowships program—are on campus, spending a sabbatical year away from their regular jobs and working to gain deeper familiarity with science and technology. Seven are Americans and one each is from India, Switzer-

The 1999-2000 class of Knight Fellows will be introduced to the MIT community at a reception Wednesday, Sept. 22 from 4-6pm in the Bush Room (10-110). President Charles M. Vest will speak at the reception, which is sponsored jointly by the MIT News

Office and Technology Review maga-

This year's Knight Fellows are: · David Chandler, who has covered

physical sciences for the Boston Globe for 15 years . W. Wayt Gibbs, a senior writer for

Scientific American, who says he has covered 23 disciplines in science and engineering for the magazine. • Karen Hopkin, a freelancer who has

a PhD in biochemistry and writes for various magazines and web sites. Susan K. Lewis, a writer, director and

producer for WGBH's long-running Nova science series

· Ganapati S. Mudur, who covers science and medicine for the Telegraph, a

leading Calcutta daily newspaper. Melissa Schorr, who covered health issues for the Las Vegas Sun and writes about women's health for various magazines

 Andreas Schriber, a producer and editor of science and environmental programs for Swiss Television DRS.

· DongHo Shin, chief science writer for the Hankyoreh, a major daily newspaper in Seoul. Shin became a Knight Fellow last January and will continue through the fall semester.

• Peter N. Spotts, who covers science and technology for the Christian Science Monitor.

 David Talbot, a reporter for the Boston Herald who specializes in investigative stories that focus on environmental hazards

Knight Fellowships, funded chiefly by an endowment from the John S. and James L. Knight Foundation, are designed to improve the quality of science journalism in the mass media by offering experienced reporters the opportunity to take courses at MIT for a full academic year.

"When science reporters are doing their regular jobs, they rarely have time to learn more than the minimum needed to write the story of the moment," says Boyce Rensberger, the program's director. "So they often miss the background, the context, the process of science that's needed to give perspective. That's what these fellowships provide. The vast majority of the 162 science writers who have been in the program since it began have told us that the year made a huge difference in the quality of their work.

Mr. Rensberger, who was a fulltime science journalist for 32 years, mainly at the Washington Post and the New York Times, took over the Knight directorship last year upon the retirement of Victor K. McElheny, who created the program in 1983. Martha Henry is the program coordinator.

## More faculty named to professorships

Four more faculty members have been appointed to named profes-

Professor of Biology Nancy H. Hopkins has been appointed to the Amgen, Inc. Professorship for a fiveyear term. The chair is intended to encourage education and research in biological and chemical sciences, biotechnology and other areas related to the life sciences

After receiving the BS from Radcliffe College (1964) and the PhD from Harvard University's Department of Molecular Biology and Biochemistry (1971), Professor Hopkins was a postdoctoral fellow of James D. Watson

at Harvard and at the Cold Spring Harbor Laboratory, where she worked on DNA tumor viruses. She joined the MIT faculty as an assistant professor in 1973 in the Center for Cancer Research and worked on RNA



tumor viruses that cause leukemia in mice. She was promoted to professor of biology in 1982. In 1995, she was named chair of the first Committee on Women Faculty in the School of Science at MIT.

Nine years ago, Professor Hopkins switched fields to work in developmental biology. Her lab developed techniques for making transgenic zebrafish, including a technique called insertional mutagenesis. Using this technique, her lab is now engaged in a large experiment to isolate genes required for the normal development of the zebrafish embryo. This research is believed to be important to the eventual understanding and possible treatment of human diseases including cancer and birth

Associate Professor Earl Miller is the newest recipient of the Class of 1956 Career Development Professorship for a three-year term, established by the class at its 25th reunion.

Professor Miller received the BA in psychology from Kent State Univer-

sity in 1985, and the MA (1987) and PhD (1990) in psychology and neuroscience from Princeton University. He was a postdoctoral fellow at the National Institute of Mental Health from 1990-95.



Miller was appointed an assistant professor in MIT's Center for Learning and Memory and the Department of Brain and Cognitive Sciences in 1995 and was promoted to associate professor with tenure on July 1, 1999. He has received several academic awards including a Pew Scholar Award (1996), a McKnight Scholar

Award (1996), a Sloan Research Fel-

Scholar Award (1998)

Professor Miller's work focuses on the neural basis of high-level cognitive functions, including the mechanisms of attention, learning and memory needed for intelligent behavior. He studies the activity of neurons in the prefrontal cortex, the brain region most highly developed in primates and most closely associated with complex

Professor Wanda J. Orlikowski of the Sloan School of Management has been selected to hold the Eaton-Peabody Professorship of Communication Sciences for a five-year term.

Professor Orlikowski joined the MIT faculty as an assistant professor of information technologies in 1989, was promoted to associate professor in 1994. and received tenure in 1996. She received the BComm in 1977 and the MComm in 1982 from the University of Witwatersrand, and the MPhil (1986) and PhD (1988), both from New York University.

Professor Orlikowski's research interests focus on the dynamic interaction between organizations and information technology, with particular emphasis on the role of organizing structures, cultures and work practices



Orlikowski

in technology change. She has conducted multiple studies of collaborative technologies such as electronic mail, web tools and groupware, and examined their ongoing use in organizational communication, coor-

dination and distributed work. She is currently investigating the patterns, meanings and experiences of working virtually, and exploring the social and technological implications of such new ways of organizing.

Assistant Professor Sanjay E. Sarma of mechanical engineering is the next holder of the Cecil and Ida Green Career Development Professorship for a three-year term. The chair was created by the Greens to recognize excellence in teaching.

Dr. Sarma received the BTech from the Indian Institute of Technology in 1989, the ME from Carnegie Mellon University in 1992 and the PhD from the University of California at Berkeley in 1995. He was named an assistant professor at MIT in January 1996.

Professor Sarma's research is in the areas of computer-aided design (CAD), computer-aided manufacturing (CAM), solid modeling, computational geometry, and machine tool design and automation. He wrote his thesis on a methodology for integrating CAD and CAM in milling and has patent applications pending for three things: a haptic device for CAD/CAM, a technique for fiveaxis toolpath generation and an apparatus for reference-free part enlowship (1996) and a John Merck capsulation.

### Foundation grants another \$2.2M to Knight program he Knight Science Journalism Fel-

The Knight Science Journal Lowships program has been low the John S. awarded \$2.2 million by the John S. and James L. Knight Foundation.

Of that grant, \$2 million-plus another \$1 million in matching funds to be raised by the program—is to build the endowment, and \$200,000 is to enable the program immediately to increase the number of stipends it can award fellows while the new money is phased in over four years.

The new grant, announced earlier this week at the foundation's headquarters in Miami, raises the organization's investment in the MIT fellowships program to \$7 million. The Institute itself has contributed \$2.5 million to the endowment. The program, which is wholly supported by the newspapers.

endowment, allows working journalists to spend a full academic year studying at MIT.

The enlarged endowment also ensures long-term support for the program's new series of one-week minifellowships that bring journalists to MIT for intensive courses in specific fields. The first of these, "Genes and Cells: Boot Camp for the Genetic Revolution," is to be staged in early Decem-

The Knight Foundation makes national grants in journalism, education and the arts. Its fourth program, community initiatives, is concentrated in 26 towns where the Knight brothers published newspapers, but the foundation is wholly independent of those

## Schools of Engineering, Humanities make appointments

Dick K.P. Yue, professor of hydrodynamic and ocean engineering, has been named as associate dean of the School of Engineering.

Professor Yue received all his degrees from MIT (SB 1974, SM 1976, ScD 1980) and has been a faculty member in the Department of Ocean

Engineering since 1983. His main research contributions

are in theoretical and computational hydrodynamics. He is internationally recognized for his expertise on ocean and coastal wave dynamics, and for his extensive work in nonlinear wavewave and wave-bottom interactions, and large-amplitude motions and loads on

marine structures. He has also made fundamental contributions to the understanding of the hydrodynamics of fish swimming and the application of these principles to the design of underwater vehicles, and the study of vortical and turbulent flows in the air-sea interface, and their effects on surface waves and interface processes.

Professor Yue directs the Vortical Flow Research Laboratory and is associate director of the MIT Testing Tank Facility. Since 1985, he has served as chair of the Ocean Engineering Undergraduate Program. He has been active in the Education Committee of the School of Engineering, and at the Institute level, he has served on the Committee on Student Affairs, and the Committee on Undergraduate Admissions and Financial

#### **HUMANITIES APPOINTMENT**

Josey Twombly has joined the School of Humanities and Social Science as assistant dean for development. Before coming to MIT, she was director of major gifts at Harvard

Twombly

Ms. Twombley holds a bachelor's degree from Skidmore College (1970) and a master's degree from Russell Sage College (1976). From 1986-90, she worked at Ketchum, Inc., directing capital campaigns and feasibility and planning studies for a variety of nonprofit clients. She has also worked for Williams Colcial gifts during the college's Third Century Campaign, and as associate director of capital giving

lege from 1992-96 as regional director of spe-

#### Throwing it away?

Post it on the "reuse" e-mail list, where everything from old computers to kittens can be given away. For more information, send e-mail to:

<reuse-request@mit.edu>



## Calendar

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

(For arts-related listings, see page 7.)

INSTRUCTIONS: Seminars & Lectures listings must be submitted to the online TechCalendar at <a href="http://tech-calendar.mit.edu">http://tech-calendar.mit.edu</a>. If you have questions about that procedure, please contact <a href="http://tech-calendar.mit.edu">help@tech-calendar.mit.edu</a>.

Listings for Community Calendar and Student Notices should be submitted using the web form at <a href="http://web.mit.edu/newsoffice/tt/calform>. If you have questions, please contact <a href="https://truedocs.org/res/tt/calendar@mit.edu">tt/calform>. It you have questions and you have

Events must be MIT sponsored and take place on the MIT campus or at an MIT affiliate (Draper Labs, Lincoln Laboratory, etc.).

Next deadline for all types of listings is noon Friday, September 24, covering events from Wednesday, September 29 through Sunday, October 10.

#### September 22-October 3

#### **■ SEMINARS & LECTURES**

(Listings compiled by TechCalendar, courtesy of The Tech.)

#### WEDNESDAY, SEPTEMBER 22

- NATO Expansion: Increases or Diminishes Western Security?\*—Prof. George Grayson, College of William and Mary. Security Studies Program Seminar Series. 12-1:30pm, Rm E38-615. Bag lunch, refreshments will be provided. More info: x3-0133, <|levine@mit.edu> or <|http://web.mit.edu/ssp/>.

#### THURSDAY, SEPTEMBER 23

- Parenting Children with Special Needs\*— Barbara Popper, M.Ed., Federation for Children with Special Needs. Sponsored by Family Resource Center. 12-1:30pm, Rm 16-151. More info: x3-1592, <frc@mit.edu> or <http://web.mit.edu/personnel/www/frc/ >.
- Experiences in Interactive Expression\*—Don Ritter, Prof. of Computer Graphics & Interactive Media, Pratt Inst., Brooklyn. Experiences in Interactive Expression (part of "Special Topics at the CAVS" MAS 879). 3-5pm, MIT Museum Bldg, 390. More info: <a href="http://cavs.mit.edu/seminar/mas879/interact.html">http://cavs.mit.edu/seminar/mas879/interact.html</a>>.
- A Novel Snowmaking Process: Theory and Potential Applications\*—Moshe Alamaro, MIT. Sponsored by MIT Atmospheric Science Seminars. 4pm, Rm 54-915. More info: x3-0136, <ddlucas@mit.edu> or <www-paoc.mit.edu/MASSseries.html>.
- Applications of Revenue Management in Manufacturing\*—Dr. Mitchell H. Burman, Analytics Consulting. Sponsored by Operations Research Center. 4-5pm, Rm E40-298. Followed by refreshments in Rm E40-106. More info: x3-7412, <danibon@mit.edu>or</hr>
- The Ice Ages, Global Climate, and the Asteroid Event\*—Prof. Richard A. Muller, Univ. of California, Berkeley. Physics Colloquium. 4:15pm, Rm 10-250. Refreshments in Rm 4-339 at 3:45pm. More info: x3-4801, <physhdq@mit.edu> or <a href="http://web.mit.edu/physics/www/Colloquium/current.htm">http://web.mit.edu/physics/www/Colloquium/current.htm</a>.
- The Power of Images in Communicating Science and Technology\*—Felice Frankel, Artist-in-Residence at MIT. Sponsored by Office of the Arts with Media in Trausition Project. 5-7pm, Bartos Theater. Boyce Rensberger, director of the Knight Science Journalism Fellowships program, will serve as respondent. Media in Transition Forum. More info: <a href="mailto:knight-science-franked-new-media-in-transition.mit.edu">knight-science-franked-new-media-in-transition.mit.edu</a> or <a href="https://www.night-science-franked-new-media-in-transition.mit.edu">knight-science-franked-new-media-in-transition.mit.edu</a>.

#### FRIDAY, SEPTEMBER 24

- Production System Design\*\*—Prof. David S. Cochran, MIT. Sponsored by ME Seminar Series. 3-4pm, Rm 3-270. Refreshments in Rm 1-114 to follow. More info: x8-5807 or <a href="mailto:bhenson@mit.edu">bhenson@mit.edu</a>>.
- Level-restricted Generalized Kostka Polynomials\*—Anne Schilling, Department of Mathematics, MIT. Sponsored by Combinatorics Seminar with Department of Mathematics. 4:15-5:15pm, Rm 2-338. Refreshments at 3:30pm in Rm 2-349. More info: x3-6544, <sara@math.mit.edu> or <http://www-math.mit.edu/~combin>.

#### MONDAY, SEPTEMBER 27

- Computing Molecular Structure and Function\*—Prof. Thomas Lozano-Perez, MIT., EECS, AI Lab. MIT-EECS 1999 Fall Semester Colloquium Series. 4pm, Rm 34-Edgerton Hall. Refreshments at 3:30pm. More info: x3-4193 or <elias@theory. lcs.mit.edu>.

#### **TUESDAY, SEPTEMBER 28**

- F.C. Bartlett and the Origins of Social Constructionism in 1930's Cambridge\*—
  David Bloor, University of Edinburgh,
  Scotland. Dibner Institute Lunchtime Colloquia. 12-2pm, Rm E56-100. Please call if
  you plan to attend x3-6989 <dibner
  @mit.edu>.
- Formation of Gas Hydrates in the Deep Seafloor\*—Dr. Bruce Buffett, University of British Columbia. Sponsored by 10.978 Seminar. 12:30-2pm, Rm E40-496. Lunch will be provided. More info: x3-3401 or <gkiley@mit.edu>.
- Deviations from Scaling in Geomorphology and Deviant Scaling in Biology\*—Peter Dodds, Dept of Mathematics, MIT. Sponsored by Physical Mathematics Seminar with Department of Mathematics. 2:30-3:30pm, Rm 2-338. Refreshments at 3:30pm in Rm 2-349. More info: x3-4387, <bush@math.mit.edu>.
- An Overview of Transistor Technologies for Microwave/Millimeter-Wave Power Amplification\*—Phillip Smith, Sanders, a Lockheed Martin Company. Sponsored by MTL VLSI Seminar. 4-5pm, Rm 34-101. Refreshments in Rm 34-101 at 3:30pm. More info: x3-5264, <debb@mtl.mit.edu> or <a href="http://www-mtl.mit.edu">http://www-mtl.mit.edu></a>.
- Conflict and Displacement in Colombia: The Case of the Magdalena Medio Region\*—
  Jenifer Otsea, Executive Assistant and Policy Advisor, Americas Bureau, UNHCR. Sponsored by Center for International Studies. 4:30pm, Rm E38-714. More info: x3-3121 or <a href="mailto:aurics@mit.edu">aurics@mit.edu</a>>.
- Elections 1999: Israel's First Post-Zionist Government?\*—Dr. Bernard Avishai, International Director of Intellectual Capital, KPMG LLP. Sponsored by Center for International Studies. 4:30pm, Rm E51-095. A presentation of The Emile Bustani Middle East Seminar. More info: x3-8961 or <stilwell@mit.edu>.
- Something for Nothing\*—Sylvia Kolbowski, New York. Sponsored by Office of the Arts with Dept of Architecture. 6:30pm, Rm 10-250. More info: x3-7791.

#### WEDNESDAY, SEPTEMBER 29

The War in Kosovo\*—Professor Steven Burg, Politics Department, Brandeis Univ. Security Studies Program Seminar Series. 12-1:30pm, Rm E38-615. Bag lunch, refreshments provided. More info: x3-0133, <|levine @mit.edu>, <a href="http://web.mit.edu/ssp/">http://web.mit.edu/ssp/>.

#### THURSDAY, SEPTEMBER 30

- Helping Children with Separation and Divorce\*—Judy Osborne, Stepfamily Associates. Sponsored by Family Resource Center. 12-1:30pm, Rm 16-151. More info: 3-1592, <frc@mit.edu> or <a href="http://web.mit.edu/personnel/www/frc/">http://web.mit.edu/personnel/www/frc/>.
- Experiences in Interactive Expression\*—
  George Fifield, curator, Decordova, Boston Cyberarts Festival). Part of "Special Topics at the CAVS" MAS 879. 3-5pm, MIT Museum. More info: <a href="http://cavs.mit.edu/seminar/mas879/interact.html">http://cavs.mit.edu/seminar/mas879/interact.html</a>.
- Network Algorithms for Exact Statistical Inference in Contingency Tables\*—Nitin R. Patel, Cytel Software Corp, and Sloan School of Mgmt. Sponsored by ORC. 4-5pm, Rm E40-298. Followed by refreshments in RmE40-106. More info: x3-7412, <amacost@mit.edu> or <a href="http://web.mit.edu/orc/www>">http://web.mit.edu/orc/www></a>.

#### FRIDAY, OCTOBER 1

- Private Financing of Mars Missions & Base\*— John Carter McKnight, pres., Red Planet Research, and Bruce Mackenzie, former exe. dir., Mars Society.12:30-1:30pm, Rm W20-445. Sponsored by the MIT Mars Society and MIT SEDS. Bring lunch. More info: <br/>
  - bmackenzie@alum.mit.edu>.
- Hairy Little Legs: Feeding, Smelling, and Swimming at Low and Intermediate Reynolds Numbers\*\*— M.A.R. Koehl, Dept. of Integrative Biology, Univ of California, Berkeley. Sponsored by ME Seminar Series. 3-4pm, Rm 3-270. Refreshments in Rm 1-114 to follow. More info: x8-5807 or <a href="https://doi.org/10.1001/journal.org/10.10

- Electron Cyclotron Heating in Overdense Plasmas\*—Abhay Ram, MIT Plasma Science ence and Fusion Center. Plasma Science and Fusion Center Seminar Series. 4-5pm, Rm NW17-218. Refreshments at 3:45pm. More info: x3-810, <rivenberg@psfc. mit.edu> or <a href="http://www.pfc.mit.edu/">http://www.pfc.mit.edu/</a>.
- Mobius Inversion in Coding Theory\*—Stefan Schmidt, MIT. Sponsored by Combinatorics Seminar with Department of Mathematics. 4:15-5:15pm, Rm 2-338. Refreshments at 3:30pm in Rm 2-349. More info: x3-6544, <sara@math.mit.edu> or <a href="http://wwwmath.mit.edu/~combin>.">http://wwwmath.mit.edu/~combin>.</a>

#### **■ COMMUNITY CALENDAR**

Moonlight Sails & BBQ's\*—Friday, Sept. 24, 6pm, Sailing Pavilion. Sponsored by MIT Nautical Association. Glide along the river after dark, sailing in a Rhodes-19. Bring a

- flashlight and something for the BBQ on the dock afterwards. You should have a current MIT Sailing Card for this event. More info: x3-4884, <meking@mit.edu> or <a href="mailto:siributed">http://web.mit.edu/mit-sailing/www/>.</a>
- Wives Group\*\*—Sept. 22: Boston by Slide. Sept. 29: Freedom Trail Tour, \$4 per person, meet at 2:45pm in front of the MIT Coop in Kendall Square. Meetings from 3-5pm in Rm W20-400. A support network for the partners and spouses of MIT students, staff and faculty. More info: x3-1614.

#### **■ MITAC**

The MIT Activities Office (MITAC) has two locations: (1) Walker Memorial Rm 005, 9:30am 3:30pm, Wednesday-Friday (2) Room LLA-218, x6130, Lincoln Lab, 1:15-4pm, Thursday and Friday only. More info: x3-7990 or <a href="mailto:square">square</a>

- Ringling Bros. & Barnum & Bailey (FleetCenter, Boston)\*\*—Fri., Oct. 22, 7pm. Ticket: \$21 club seating (reg. \$25).
- Boston Bruins vs. Tampa Bay Lightning (FleetCenter, Boston)\*\*—Thurs., Oct. 28, 7pm. Ticket: \$25.50 (reg. \$47).
- Annie (Lowell Memorial Auditorium, Lowell)\*\*—Thurs., Nov. 4, 7pm. Ticket: \$37 (reg. \$39.50).
- Sound of Music (Colonial Theatre, Boston)\*\*—Sun., Nov. 7, 2pm. Ticket: \$70 orchestra seating. Purchase by 9/24.
- Flying Karamazov Brothers (Symphony Hall, Boston)\*\*—Sun., Nov. 7, 3pm. Ticket: \$30 (reg. \$35).
- Engelbert Humperdinck (Lowell Memorial Auditorium, Lowell)\*\*—Thurs., Nov. 18, 8pm. Ticket: \$37 (reg. \$39.50).

## **X----**

#### **Ongoing Community Meetings**

#### ■ COMMUNITY

- MIT Ballroom Dance Club\*—For schedule, call x8-6554 or see <a href="http://web.mit.edu/mitbdt/">http://web.mit.edu/mitbdt/>.</a>
- MIT Folkdance Club\*—Sundays: International Dancing 7:30-11pm. Wednesdays: Israeli Dancing 7:30-11pm. MIT/Wellesley students free, \$1 others. For location, see <a href="http://www.mit.edu/activities/fdc/home.html">http://www.mit.edu/activities/fdc/home.html</a>>.
- The Furniture Exchange at MIT\*\*

  Used furniture needed in good condition, to be sold to MIT/Harvard students. Donations are tax-deductible and receipted; profits go to MIT scholarships. Call x3-4293 or see <a href="http://web.mit.edu/medical/wivesgroup/resource.htm#anchor545694">http://web.mit.edu/medical/wivesgroup/resource.htm#anchor545694</a>>.
- GABLES (Gay, Bisexual, and Lesbian Employees and Supporters) at MIT\*\*—Monthly lunch-time get togethers held on and off campus on the last business day of the month. Info line x2-1014. Staff lesbigay email list sign-up: <gables-request@mit.edu>.
- Graduate Student Council Grocery
  Shuttle\*—The GSC offers a grocery
  shuttle from MIT to the University
  Park Star Market on Saturday mornings every half-hour from 8-11:30am
  from Eastgate. Free to all members
  of the MIT community. For schedule and stops, see <a href="http://www.mit.edu/activities/gsc/Committees/HCA/Grocery/grocery.html">http://www.mit.edu/activities/gsc/Committees/HCA/Grocery/grocery.html></a>.
- Hands Club\*—Sign Language lunches every Monday at noon in the back of Walker (on odd days) and second floor of Lobdell (even days). More info: <askwersk@mit.edu>.
- Tech Squares\*—MIT's Square and Round dance club, meets on Thursdays, with caller Ted Lizotte. For more info, see <a href="http://www.mit.edu/activities/tech-squares/">http://www.mit.edu/activities/tech-squares/</a> or e-mail <squares@mit.edu>.
- MIT Toastmasters\*\*—An organization that helps people improve and practice their public speaking and presentation skills. Meets second and fourth Friday of each month, 12:05-1pm, Rm E19-220. For schedule, see <a href="https://www.mit.edu/personnel/toastmasters/">https://www.mit.edu/personnel/toastmasters/</a>».
- MIT Working Group on Support Staff
  Issues\*\*—The MIT Working Group
  on Support Staff Issues is made up of
  staff and administrators working together to address issues of concern to
  support staff at MIT. The group organizes task groups which report findings to the membership for action and
  implementation. If you would like to
  attend one of the monthly working
  lunch meetings, contact Heather
  Mitchell at <mheather@mit.edu> or
  x3-9474.

#### ■ FAMILY

Family Resource Center\*\*—In addition to parenting workshops and programs, the Family Resource Center also offers support and training programs for child care providers, workshops at your request, a lending library, and individual consultations concerning parenting, schools, child care options, and work/family issues.See <a href="https://www.frc/">https://www.frc/</a>, call x3-1592 or e-mail <a href="free">free</a> mit.edu>.

- Family On-Line Services\*\*—A computer workstation is available in the Family Resource Center reception area for those who would like to access child care databases and on-line parenting resources. Also, the FRC maintains a list of those members of the MIT community who would like to be on an e-mail list to receive news, program updates, etc. To be added to the subscriber list, e-mail <frc@ mit.edu> or call x3-1592.
- Fathers Group\*\*—Peer-led, informal discussions of the challenges and joys of father-hood. No fee. Cosponsored by the Family Resource Center and the Health Education Resource Center. Open to MIT, Draper and Whitehead communities. Call or e-mail for meeting place and time, x3-1592 or <mit-dads@mit.edu>.
- Mothers Group\*\*—Professionally led group, meets Wed. 12:30-1:30pm, Rm E23-297. No fee or preregistration required. Cosponsored by the Family Resource Center and the Health Education Resource Center. For schedule and information, call x3-1316.
- Off-Campus Playgroups\*\*—The MIT Wives Group, with the cosponsorship of the Family Resource Center, provides ongoing support for establishing and maintaining informal parent-child playgroups. For more info contact Wives Group, Rm E23-376, x3-1614.
- Parents Forum\*\*—Peer-led discussions for parents. No fee. Info: Chris Bates, x3-4084 or <cbates@mit.edu>.
- Parenting discussions\*\*—Wed, 11:30am-12:30pm in Rm E23-297. Sponsored by Health Education. More info: x3-1316.
- Toddlers' Group\*\*—Wed, 10:30-11:30am, Rm E23-297. For mothers of toddler age children. Sponsored by Health Education. More info: x3-1316. Toddlers and infants are welcome; fun toys are provided.
- Wives Group\*\*—A support network for the partners and spouses and MIT students, staff and faculty. Meetings held every Wednesday at 3pm in W20-400. More info: Jennifer at x3-1614 or <a href="http://web.mit.edu/medical/wivesgroup">http://web.mit.edu/medical/wivesgroup</a>.

#### ■ HEALTH

- Al-Anon\*\*—Meetings every Friday, 12-1pm Rm E25-101. More info: 781-843-5300.
- Alcoholics Anonymous (AA)\*—Meetings every Tues, 12-1pm; Thurs, 12-1p; Womens AA meets Mon 6-7pm., Rm E23-376. Info: Denise x3-4911.
- Alcohol Support Group\*\*—Meetings every Wednesday, 7:30-9am. Info: Denise, x3-4911.
- Cancer Support Group\*\*—Meets last Tuesday of the month, 12:15-2pm. For those with acute and chronic forms of cancer. Sponsored by the MIT Medical Dept. Info: Dawn Metcalf, x3-4911.
- Co-Dependents Anonymous (CoDA)\*—Thursdays, 6:30-8pm, Rm 66-168. Info:Alise, x3-4911.
- Early Pregnancy, Prepared Childbirth and Childbirth Review\*\*—Classes are offered to patients of the Medical Department's Obstetrics Service. Call x3-1316.
- Falun Gong Classes\*—Falun Gong is an ancient way of self-improvement in body and mind, an advanced Qigong system of the Buddhas' School. Good for all ages. Everyone is welcome. No fees or donations. Tuesdays, 6:30-7:30pm, Rm. 1-134. Contact Leonard at x3-0720 or see <a href="http://falun.mit.edu">http://falun.mit.edu</a>.

- Health Education Resource Center\*\*— Books, free video loan program and brochures on diet, exercise, wellness, childbirth, parenting, aging and much more. Rm E23-205; open weekdays 9-5pm. Call x3-1316.
- Nursing Mothers Room\*\*—A comfortable, private place to nurse babies or express milk. Cosponsored by the Family Resource Center and the Medical Dept. Located within the Women's Lounge in Rm 10-384 and Rm E19-6th floor, accessible 24 hrs/day. Make arrangements with Margery Wilson, Rm E23-407, x3-2466.
- Nursing Mothers' Group\*\*—For pregnant and nursing women. Babies and toddlers welcome. No fee or registration. Sponsored by the Medical Dept. Info: x3-2466.
- RSI Alert!\*\*—RSI Alert! is a group of MIT employees and students dedicated to creating an awareness of Repetitive Strain Injury, educating to prevent RSI, and facilitating treatment and accommodations for those who have RSI. To receive notices about events and meetings, subscribe to our listserv mailing list by sending e-mail to clistserv@mitvma.mit.edu> with the following message: [SUBSCRIBE RSIALERT YourLastname YourFirstname]. Info:
- Weight Watchers at Work\*\*—Thursdays, 1-2pm, Rm 8-219, 12-week program. More info: <overlan@mit.edu>.

#### ■ INTERNATIONAL

x8-9328.

- Guide for Foreign National Spouses Seeking Work\*\*—Information on topics such as American resumes, job interviews, volunteer work, employment agencies, salary negotiation, visa issues and more. Reference binders may be used in Rm 12-170; ask for Beth Anderson.
- Hosts to International Students Program\*—Offer assistance, encouragement and occasional hospitality to our students from around the world. Not a home-stay program. Faculty, staff and alumni/ae (singles, couples or families) are encouraged to participate. Kate Baty, x3-4862 or <a href="https://doi.org/10.1007/journal.com/">https://doi.org/10.1007/journal.com/</a>
- Japanese Lunch Table\*— Japanese and non-Japanese students meet every Wednesday from noon-2pm (beg. Sept. 15) for language and cultural exchange. E38-7th floor. Bring your own lunch. Info: <japanprogram@mit.edu>.
- MIT Japan Program\*\*—Students: Go to Japan with the MIT Japan Program and do cutting-edge research in your field in a Japanese corporate, government or academic organization. All expenses paid. Info: x8-8208 or <japanprogram@mit.edu>.
- MIT Job Support Group for international spouses. Meet people in the same situation you are. We can help you find information and prepare for your job search and interviews. Info: Jennifer, x3-1614.
- MIT Language Conversation Exchange\*\*—We find conversation partners for those interested in practicing a language with a native speaker. Info: x3-1614.
- Stammtisch/German Table\*—Join us for lunch auf deutsch, Mondays at 1pm in Walker. All are welcome. Info: <sberka@ mit.edu>.

MIT TECH TALK SEPTEMBER 22, 1999

## Facilities offices ready to move this Friday

■ By Ruth T. Davis **Facilities Communications** 

The administrative offices in the Department of Facilities are moving out of their Building E18 locations on Friday, September 24. Those areas include the Director's Office, the I/T Group and the finance and accounting

Their new location will be right across Main Street at Three Cambridge Center above the MIT Coop. Although MIT will lease the space for three to four years, the offices are considered on-campus and will have the MIT address of Rm NE20-277.

"MIT is a research university, so we must move to accommodate that research," said Victoria V. Sirianni, director of Facilities. The Center for Learning and Memory led by Professor Susumu Tonegawa will occupy the Building E18 space that has housed Facilities for more than 35 years.

However, not all of the staff in Rm E18-207 will relocate to Building NE20. In October, Design and Construction (DCS) and the Capital Projects Group will move to Building 45, where they will join other Facilities staff who have been there for several months already. Building 45 serves as the central office for the Stata Center project and is undergoing renovations to accommodate the additional Facilities

DCS and the Capital Projects Group will share resources of staff, technology and other office support during the upcoming capital development.

"As MIT enters a period of increased construction activity, we want to ensure that we coordinate and enhance communication with the MIT community," said David Myers, manager of Design and Construction. "Housing DCS and the Capital Projects Group in the same location will allow for a collaboration of activities that will enable

Although the Facilities staff on the second floor of Building E18 are moving, the areas housed on the first floor are not. The Operations Center as well as Repair and Maintenance will remain on the first floor of Buildings E18 and E19 for now. Last month the Key Issuance area was also moved from the second floor to Rm E18-172 to accommodate the incoming research labs.

'Our department has kept pace with technological advances, so we will be able to serve the MIT community even though we will be in decentralized locations," said Ms. Sirianni. "Of course, our ideal situation is to be in a space that accommodates all of our areas.' Therefore, over the next few months the department will study its business processes and present a space proposal for one location to the Executive Vice President John Curry

The telephone and fax numbers for the Rm NE20 staff will be the same as they were in Building E18. The DCS staff will retain their phone numbers but will have a different fax number at their new location that will be announced at a later date.

The architectural firm of Perry and Radford, who also designed the renovation of Building N42 two years ago, was hired to configure the necessary space changes for Rm NE20-277. Renovations to the space were kept to a minimum and include alterations to accommodate two people to an office and one person cubicle spaces with three-quarter-height partitions.

Although the MIT community may encounter some disruption of communication to the Director's Office and the finance and accounting area during the days surrounding the move, Repair and Maintenance will operate business as usual, as will Custodial and Mail Services. Information Systems and the Facilities I/T Group will work over the weekend to ensure that phones and computers in Rm NE20-277 are ready to go on Monday morning.

Facilities will join several other MIT departments housed in Building NE20 including the MIT Sea Grant College Program, the Center for Transportation Studies, and the Department of Brain and Cognitive Sciences.

The building, managed by Boston Properties, also contains businesses not affiliated with MIT. A private security guard is posted in the lobby and requires identification before allowing anyone to enter the building. Therefore, MIT employees visiting Building NE20 should have their ID with them when coming to do business with the Facilities staff.



Cambridge animal control officer Mark McCabe returns a goose rescued from Rm 10-250 to its home on the Charles River near the Hyatt Hotel on Memorial Drive. **Photo by Donna Coveney** 

## 'Goose-napper' leaves animal in 10-250

white goose, probably one of a A small group of birds that lives between the BU bridge and the Hyatt Hotel on Memorial Drive, was placed sometime over the weekend in Rm 10-250. It was removed Monday and returned to its flock by a Cambridge animal control officer.

The adult bird "wasn't harmed, but it was put in a situation it didn't want to be in," said Mark McCabe, director of animal control for the City of Cambridge, who took the bird out of the building. He said the unusual flock of 15-20 white geese lives year-round in the area because they are fed by someone at the pumping station at Magazine Beach.

The identity of the goose-napper is not known. Mr. McCabe noted that there is a cruelty to animals statute in Massachusetts under which an offender could be fined \$500 and imprisoned for up to one year. In this case, he said, because the bird was not harmed, he probably would have been more interested in educating rather than prosecuting the

"The animal was put in a situation where it was stressed. It was not in its natural habitat, that's for sure, he said.

## Bates to hold open house, symposium

The MIT Bates Linear Accelerator Center will host an open house on Sunday, October 3 from noon-4 pm. Everyone (including family members) is welcome.

Bates is a world-class scientific facility that carries out frontier research in the field of nuclear physics. Many of the 85 scientific and technical personnel will be on hand to greet visitors and show them around the facility. Visitors can explore the huge detectors, OOPS (Out-of-Plane Spectrometer) and BLAST (Bates Large Acceptance Toroid), in the South Experimental Hall; see the control room; and try their hands at a scientific demonstration like Newton's Folly or figure out how we can get an object to roll

The central research focus at Bates is the study of the fundamental properties of the proton, including its magnetism and shape. A new major detector is under construction that will probe

the fundamental origin of magne-

The Bates Laboratory is supported by the US Department of Energy and operated by MIT as a national facility. The lab is located off Route 62 (west) on 21 Manning Road. For directions and a virtual tour of the facility, go to <a href="http://www-lns.mit.edu/~eluc/">http://www-lns.mit.edu/~eluc/</a> whats\_new/openhouse.html>.

#### **BATES25 SYMPOSIUM**

To celebrate its 25th anniversary, Bates is planning the "Bates 25" scientific symposium on the MIT campus from November 3-5. The event will include talks on electromagnetic nuclear physics, where the field is going and where Bates is today. Cochairs for the event, which has two dozen confirmed speakers, are Dr. William Turchinetz, former Bates associate director, and Dr. William T. Donnelly, a senior research scientist in the Department of Physics.

The cost of the event, including a dinner dance, is \$125. For more information and updates, see <a href="http://">http:// mitbates.mit.edu/bates25/>.

## Science library offers database training

This fall, the Science Library is presenting a series of workshops on the most commonly used online databases for scientists and engineers. The titles, dates and times are listed below. For updates and more information, see <a href="http://libraries.mit.edu/science/">http://libraries.mit.edu/science/>.</a>

• Electronic Resources Workshop (no pre-registration required). September 23, 4-5pm, Rm 14-0645 October 27, noon-1pm, Rm 1-115

• Web of Science Workshop—citation databases in science, technology, social science, arts and humanities. Preregistration is required; contact

<pli><pli>@mit.edu> or x3-9321 October 6, 4-5pm, Rm 1-115

November 8, noon-1pm, Rm 1-115 INSPEC workshop—physics, computers and control, electrical engineering. Pre-registration is required; contact <gcsherra@mit.edu> or x3-5648. October 14, 6:30-8pm, Rm 14-0637 November 16, 3:30-5pm, Rm 1-115

• Introduction to Beilstein CrossFire and SciFinder Scholar-chemistry. Preregistration is required; contact <kajosalo@mit.edu>. Walk-ins may attend if space available.

October 22, 2-4pm, Rm 14-0645

· Everything You Want to Know about Patents (no pre-registration required) November 30, 3-5pm, location to be announced.

 Uncover Table of Contents Service (no pre-registration required) November 17, noon-1pm, Rm E53-

## Technology and Culture Forum to feature Deutch

On Monday, September 27, Insti-tute Professor John Deutch, former provost and former CIA director, will speak at a Technology and Culture Forum. The title of his program is "Beyond Science & Engineering: Re-Inventing Education for the 21st Century.'

The forum will take place at 7pm

in Rm 6-120 and will include a panel of respondents representing various MIT perspectives: John-Paul Clarke (SM 1991, SM, ScD), the Charles Stark Draper Assistant Professor of Aeronautics and Astronautics; Zojeila Flores, a senior in biology; and Kevin Shea, a graduate student in chemistry.

### Retirees Directory reminder

The deadline for inclusion in the 1999-2000 Retirees Directory is rapidly approaching. Members of the Retirees Association should return their membership form (and \$10 membership fee check) as soon as possible to the Association of MIT Retirees, MIT Rm 50-005, 77 Massachusetts Ave., Cambridge, MA 02139-4307.

Retirees who would like to be included in and receive a copy of the directory should send name, address, telephone number, e-mail address and a check for \$5 for Directory-Only membership. Those who elect this level of membership will receive no other mailings from the Association.

#### **MIT** experts guides available

uides to MIT experts on medi-Jeally related research and on the environment are available through the MIT News Office.

The 1997-98 MIT Media Guide to Experts on Medicine, Physiology and Health features research descriptions and contact information for almost 200 MIT faculty and scientists.

The MIT Media Guide to Experts on the Environment, published in 1995, features researchers working in fields ranging from air pollution to waste remediation.

The guides are available to members of the media and the MIT community. To obtain a copy, contact Myles Crowley at x3-2700 or <mcrowley@mit.edu>.

## Museum series starts with 'electric' performance

What do a suitcase full of stuffed animals, a seashell, and a nineyear-old superhero have to do with electricity? Families can discover the answer to this puzzle and many more at "The Amazing Adventures of Zap Girl, The Planet's Fastest Superhero." The funny, fast-paced, theatrical performance about the mysteries of electricity takes place Sunday, Sept. 26 from 2-4pm at the MIT

This "performance science" event-the first of the season's Family Adventures in Science and Technology or F.A.S.T. Sundays-will give families the opportunity to investigate electrical safety, atoms, electrons, circuits and conductors through handson activities. Students from the Department of Electrical Engineering and Computer Science (EECS) will be on hand to talk about developments in the department's Digital Project Lab.

At next month's F.A.S.T., which falls on Halloween, families will explore another facet of EECS with a program about wearable science.

F.A.S.T. Sundays, which debuted last spring with popular programs in aeronautics, materials science and robotics, take place on the last Sunday of each month from 2-4pm. The program is free and open to the public with admission to the MIT Museum, which is \$5 for adults, \$2 for seniors and students, \$1 for children under 18, and free with an MIT ID. For more information, call the hotline at x3-4444 or see the museum's web site at <a href="http://">http://</a> web.mit.edu/museum>.

## Faculty hears updates on Task Force, residence system and capital projects

■ By Robert J. Sales **News Office** 

Three topics that will have a profound effect on the MIT of the future occupied center stage at the first faculty meeting of the year last Wednes-

Chancellor Lawrence S. Bacow opened the meeting by reviewing steps taken to implement the recommendations of the Task Force on Student Life and Learning. He was followed by Associate Dean Kirk D. Kolenbrander, who briefly outlined key recommendations made by the Residence Systems Steering Committee.

Executive Vice President John R. Curry followed with an update on capital projects, including the Ray and Maria Stata Center for Computer, Information and Intelligence Sciences and the undergraduate residence hall.

#### STUDENT LIFE AND LEARNING

Chancellor Bacow discussed the Task Force on Student Life and Learning's recommendations point by point, noting steps that had already been taken. "Candidly, there's still a fair amount of work to do," he said.

The recommendations and responses:

**Expand UROP and Institute Fresh**man Advisory research subjects

· Professor Kim Vandiver has been appointed dean for undergraduate research (see story on page 1).

• Educational Design Project has been implemented.

UROP is a capital-campaign priority.

**UROP** recognition · Note participation on transcripts.

· Undergraduate research journals, including those already established in biology and physics, are being created and supported.

Collaborative advising teams

• Pilot program for alumni/ae advisors has been initiated.

· ODSUE will establish a Freshman Office by 2000.

• The Office of Career Services and Preprofessional Advising is establishing school-based teams.

• Enhance MIT's premedical program. Expansion of Freshman-Alumni/ae Summer Internship Program, directed by Professor Arthur Steinberg. This program doubled in size last summer to 60 and is expected to double again next

Continuous review of undergraduate program

· Enhanced ODSUE evaluation sys-

 Specific analysis of poor performances in first-year subjects is planned.

· Develop new evaluation tools by the Educational Studies Working Group. Encourage educational experiments, especially in areas of General Institute Requirements.

Created Education Design Project.

· Developing media arts and sciences alternative freshman curriculum; support from the D'Arbeloff Fund is avail-

Distance learning and educational technology

 Created Council on Educational Technology.

· Learn from Singapore, System Design and Management program and other educational initiatives that use distance learning.

D'Arbeloff Fund support is available.

· "We're looking for ways to use distance learning educational opportunities in 02139," said Chancellor Bacow. Make management subjects available across campus

 Sloan School of Management Dean Richard M. Schmalensee and Provost Robert A. Brown are developing a plan. A proposal in the works would lead to discussion of management minor with Sloan School.

(continued on page 8)

### Shake a leg



Professor Shaoul Ezekiel and Siddhi Shah, a sophomore in biology, take the floor at last Friday's Swing Night in the Sala de Puerto Rico. Photo by Gábor Csányi

## Vandiver aims to help undergraduates with mentoring, research

(continued from page 1) integration of research and other forms of education. When Norma McGavern-Norland retired as UROP [Undergraduate Research Opportunities Program] director last spring, we decided that we needed faculty leadership in UROP to follow up on the Task Force recom-

"We looked at that need and at Kim's experience directing the Edgerton Center and heading the Experimental Study Group, which has a strong mentoring component. Kim was also chair of the faculty from 1991-93, and has a deep background and knowledge of the Institute and how to get things done here.

"His general strengths and leadership combined with his knowledge of undergraduate education make him a perfect fit with the new position. We are really lucky to have him," said Dean Williams.

A professor of ocean engineering who teaches a senior-level course in mechanical vibration, Dean Vandiver has proven his commitment to handson learning and other innovative teaching styles by founding the Edgerton Center (with the help of Professor Paul Penfield, then the head of the Department of Electrical Engineering and Computer Science), created in 1992 to provide hands-on resources and skilloriented training for students.

From 1984-89, Dean Vandiver was director of the Experimental Study Group, which employs a system of undergraduate and graduate tutors, lecturers and professors to teach core freshmen subjects in small, self-paced groups, rather than in lecture halls.

He also has two children who attended MIT, providing him with yet another perspective on the undergraduate experience.

As dean, he will continue to serve as director of the Edgerton Center, take on faculty leadership of UROP and work with the Committee on the Undergraduate Program (CUP) to incorporate changes in the undergraduate curriculum, as well as find ways of better integrating the academic, research and residential life of our students.

#### UROP = SKILLS + MENTORING

"I'm a believer in acquiring real skills-the stuff Professor John King calls the 'mulch of experience.' You need to have fooled with a lot of stuff in your life before you'll be a good designer. You need to know things like how to solder, tear apart a motor, type, drive or fly," Dean Vandiver said.

He credits the success of one of his early research projects to experience gained as a student while helping a research biologist repair a boat dock at Woods Hole. "I learned to drive pilings with a water jet. As an assistant professor five years later, I needed steel pipe embedded in the ground of a sandbar to support cables for a vibration project in Castine, ME," he said. "Because of the boat dock experience, I knew how to get the job done. It pays to volunteer, especially when you're looking for a UROP.

"I have a pretty liberal interpretation of which experiences can be valuable learning experiences. For that reason, I think anything that gives you a useful skill is a good UROP project."

But UROP is about more than just acquiring skills.

"I believe the fundamental objective of UROP is to provide students with good mentoring," said Dean Vandiver. But one problem is that first-year students often have a hard time finding their first UROP. They don't know the faculty and they have fewer marketable skills than upperclassmen.

"As director of both the Edgerton Center and UROP, I hope to really get the two organizations working closely together. For instance, we might jointly sponsor training to prepare students for UROPs," he said.

#### STUDENT CONSULTING

One way to make it easier for students to land that first UROP job is to lower the stakes and at the same time change the dynamic between freshmen and faculty. Most UROPs are semesterlong, and sometimes require significant training for the student, "making the threshold high for both faculty and students," said Dean Vandiver. "I'd like to create a UROP-like experience that requires less of a time commitment and gains immediate respect for the student."

To this end, he proposes to establish a student-run consulting company that would provide undergraduate consultants for short-term projects using skills they already have. A faculty member might log onto a web site seeking a student to take on a short-term project such as programming a microprocessor, solving a software problem or building a model for a wind tunnel experiment. The consulting company would match the job with an available student, providing him or her with the chance to earn a little money while also developing a relationship with a faculty mem-

"This would be a very different dynamic between student and faculty. It would start out as a small job, but the faculty would respect what the student brings to that job. It would really create more of a collegial relationship," Dean Vandiver said.

#### CHANGES TO CURRICULUM

Another area highlighted for change by the Task Force is the freshman curriculum. Dean Vandiver has ideas for gently attacking that front as well.

"Students have many different preferred styles of learning. We should offer them a wider variety—beyond just lectures and problem sets," he said. The freshman curriculum is now set up for a lot of "delayed gratification. They don't get to do the neat stuff until they're sophomores or later.'

To solve this problem, he supports a recent faculty proposal to integrate sophomore-level applications into freshmen physics courses to provide real-life context for the work.

"This would be the perfect marriage of theory and application. It would give freshmen the foundation of knowledge they require for upperclass work" as well as provide them with some of the more interesting applications they hunger for. "There's no reason that foundation can't be learned with relevant application of problems."

Dean Vandiver also talks of designing an academic experience that would bring together student residential life with the classroom. "Since we're moving all freshmen on campus, that creates new opportunities. We could have some neat seminars taught in the residence halls. They might have student instructors with faculty participation. They could be student-initiated," he said.

While most of these initiatives are still in the planning stage, it's clear that MIT's undergraduate curriculum will undergo change over the next few years, under a partnership involving the dean's office, the departments and CUP.

In the meantime, Dean Vandiver has a definite plan for extending handson learning to alumni/ae when he and Professor Alex Slocum of mechanical engineering run the Lego-car race at this fall's fundraising campaign kickoff. "The car that's fastest down the tube might not be able to stay on course for the hill," he said. "They'll have to play with the design to get it right."

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

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

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

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

All extensions listed below are campus numbers unless otherwise specified, i.e., Dorm, Lin-

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

Deadline is noon Friday before publication.

#### FOR SALE

Goodyear St175/80R13 tire mounted on rim, low mileage, \$10. Contact: 978-256-6724

Bianchi limited diamond-frame bicycle, exc touring & racing bike, dark brown, like new, just tuned up for riding season, askg \$300. Sandra <sandra@mit.edu>, x3-0758

1 year old dorm-sized fridge, larger size, v clean, pd \$120 for new last yr, will sell for \$70. Slava 617-787-5630 or < smalkin@fas.harvard.edu>.

Compaq LTE Elite/25c notebk computer, Intel proc 8038625MHz, 12 Meg Ram, 200 Meg HD, color display, Windows 95, built-in 14.4 modem, \$300 orbst. Contact: x3-5134or<pekreutz@mit.edu>

English pram, royal blue, exc cond, \$350. Con-

Sleeper sofa and loveseat, gd cond, cream colored w/stripe, \$300 for set. Contact: 617 389-5956.

M's Giant CFR II road bike, carbon fiber frame, aerowheels, Profile aerobar, computer, pedals & shoes, ~800 mi bike & whls, perfect for tri's, \$925. John 981-0200/1200 or < Benkert@LL.mit.edu>.

Moving sale: solid cherry wall/entertnmt ctr; 89.5"Hx 90"L holds TV, VCR, stereo, books, tapes, CDs, lots of cabinet, shelf, drawer space, lighted curio cab; perf cond, \$1,500; more. Contact: x8-6662.

1997 T500 Cannondale touring bike, red, 19" frame, new Spring 97, used only 1 long disttrip, Lowrider Blackburn frt rack, Expedtn rear rack, panniers, \$400. Contact: <avo@mit.edu> or 3-4177.

Moving sale: mixmaster, Hamilton Beach, stand, bowl, \$15; folding twin bed, sturdy w/matt, \$35; brown metal wardrobe, shelf, rod, \$35; utility table w/ casters, 30"W x 29"H, \$15. Rose 617-776-3748.

#### **■ VEHICLES**

1989 Hyundai Excel Sedan GL, auto, 4-dr, 70K radio/cass, some body rust, runs fine, very dependable, \$1300. Contact: 617-578-9917, <pakter@psfc.mit.edu>.

1991 Ford Explorer, Eddie Bauer, 6-cyl, auto, too many options to mention, v clean, wellmaint, oil changed every 3K, records avail, 116K, \$6200. Contact: 617-389-8174.

1994 BMW 318is, black, auto, loaded, sunrf, power everything, exc cond, dealer maint, garaged, 50K, blue bk \$18,300, askg \$16,300 or bst. Contact:

1995 Honda Civic, exc cond, only 20K miles, 1 ownr, removable AM/FM radio. Anton 617-436-5030, lv mssg.

1996 VW Jetta Spec, Edit Trek, red, 75K hwy, mf splr, pwr locks, bike rack, spec wheels, grt cond, \$7900. Susan 508-875-7379 or <sgillespie@frc.mass.edu>.

#### **■** HOUSING

Brighton/Allston: apts for rent, Litchfield St, spacious 2BRs \$1,250 to \$1,350/mo. Jan Blair, Draper x2843 or 781-643-2618.

Davis Sq: For rent Oct 1, nice 1 1/2BR apt, \$1,350. Suzan x3-9634 or <schin@mit.edu>.

Medford: apt avail 10/1, 3-4BR, 1.5b, walk to bus/Davis Sq, close to Tufts, \$1550/mo. Mike 617-465-7019.

#### ■ WANTED

Watertown/Cambridge/Belmont area: good tenant, F, prof, 40s, seeks person/s with apt to share; wish list includes w/d, prkg, quiet apt. Terry 617-923-1306 or <a href="mailto:chahn@med.mit.edu">.

Volumes of the MIT Radiation Laboratory Series wanted, make offer. Contact <klund@LL.mit.edu>

## Find your arts desires through wide range of MIT programs

s the school year begins, every-A one focuses on class schedules, syllabi and textbooks, but MIT community members can take a break from problem sets and computer screens and take advantage of a rich assortment of creative pursuits, performances and exhibitions—nearly all of which are free.

"There's a wonderful synergy at MIT among art, science, technology and the creativity that is at the center of MIT's identity," said Mary Haller, director of arts communication in the Office of the Arts, established to oversee, coordinate, support and facilitate arts activities.

#### **VISITING ARTISTS**

Each year, hundreds of musicians, theater artists, writers, poets, visual artists and architects visit MIT through various departments and programs. They're here as part of a series or in a one-time special event—as long-term artists-in-residence or discrete recitalists-teaching or performing or sometimes both.

The music and theater arts section's Guest Artist Series includes concerts by the Miro String Quartet (October 22), the St. Petersburg String Quartet (October 30) and the Philharmonia Orchestra of Yale (November 7)

Performance artist, social and cultural critic, author and NPR commentator Guillermo Gómez-Peña and interdisciplinary artist Roberto Sifuentes

will be visiting artists at MIT (October 28-November 1 and January 2000) and will both present the

1999 Abramowitz Memorial Lecture on November 1.

A number of artists-in-residence are continuing longer-term residencies at MIT: kinetic sculptor Arthur Ganson, in his fifth year at MIT, works with students in mechanical engineering; also in her fifth year at MIT, science photographer Felice Frankel pursues her "visualizing science" work with students and faculty; holographers Susan Gamble and Michael Wenyon begin their fourth year of digital photography and holography at Haystack Observatory, working to-

wards a spring exhibition at the Compton Gallery.

#### FREEBIES FROM CAMIT

**Arts at MIT** 

The Council for the Arts at MIT (CAMIT) offers MIT students free tickets to some of the area's finest

music, theater dance events. Students this year have already been to the Huntington Theater for Mrs. Warren's Pro-

fession and are now signing up for trips to the American Repertory Theater for We Won't Pay! We Won't Pay! and Ivanov, "The Soul of Mbira" and an evening with David Sedaris. Watch for ads in The Tech and see <a href="http://">http:// web.mit.edu/arts/excursions.html>for announcements.

The Council for the Arts also sponsors a program with the Boston Symphony Orchestra whereby MIT students can obtain free tickets for selected concerts during the BSO's Symphony Hall season.

In addition, it funds MIT's mem-

bership with Boston's Museum of Fine Arts, so students can receive free admission just by showing their MIT ID at the museum. Those who work at MIT can come to the Office of the Arts (Rm E15-205) to borrow one of eight membership passes to the MFA for free admission.

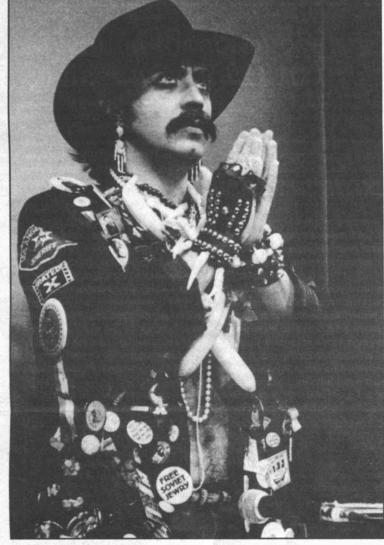
#### DO YOUR OWN THING

You don't have to leave campus to get an "arts fix." The Student Art Association offers instruction, studio experience and 24-hour facilities for artists working at all levels in a varied and extensive range of media.

In performing arts, MIT has nearly two dozen established music groups,

Gamelan Galak Tika (New England's only Balinese gamelan orchestra), chamber ensembles, and numerous a cappella ensembles. In fact, MIT has three substantial programs in world music: Gamelan Galak Tika, MITCAN (African music and dance) and MITHAS (classical performing arts of South Asia).

Theater productions range from classic interpretations by the Shakespeare Ensemble to innovative stagings by the Musical Theatre Guild to improvisational comedy by Roadkill Buffet to original student-written productions in the Playwrights-in-Performance series.



Performance artist Guillermo Gómez-Peña, as Border Brujo, in a 1989 performance in San Diego. Photo by Becky Cohen

## Helen Elaine Lee reads from her new novel

Ithough Helen Elaine Lee, assis-A tant professor in the Program in Writing and Humanistic Studies, is on leave from her teaching duties this fall, she will return to the Institute for an authors@mit event to read from her new novel, Water Marked, a story of two estranged African-American sisters who reunite in a search to under-

stand their father and their family history. The read-

ing will be Tuesday, Sept. 28 at 5:30pm in the Humanities Library. Professor

Lee's own family history determined her career path. Her mother. a literature profes-

sor, and her father, a defense attorney, both had a love of language. Professor Lee began writing after she graduated from Harvard Law School, composing stories and her first novel during her nine years as a practicing lawyer.

"Both my parents had been passionate about their work," she said. "I decided that law was a wrong turn for me-I just didn't have that passion for

Professor Lee observes that in this sense, her life mirrors the philosophy of one of her Water Marked characters, who says it's "most important to find life's 'quick'—the place where you feel most plugged in and alive."

"Because law was not my gift, I looked to see how else I could participate in the world," Professor Lee said. 'I found that writing made me feel most alive. For me, writing was how to find the 'quick.'

'In everything I write, I'm interested in how people make art out of loss, in risk-taking and renewal," she said.

Professor Anita Desai, a colleague in the Program in Writing and Humanistic Studies, wrote that in Water Marked, Professor Lee "blurs the boundaries between prose and poetry, life and art."

Publishers Weekly called Water Marked "moving, infused with eloquent imagery and emotional weight."

Following a term off for maternity, Professor Lee is on leave on an Old Dominion Fellowship, which is awarded to nontenured professors in their third or fourth year of appointment to provide them with a paid semester's leave to pursue research. Eligibility is restricted to nontenured faculty members working on humanistic subjects in anthropology/archaeology, foreign languages and literatures, Science, Technology and Society, history, literature, music, philosophy and writing. She will return to MIT in spring

Authors@mit is sponsored by the MIT Press Bookstore and MIT Libraries and cosponsored by the Program in Women's Studies. For more information, call x3-5249, send e-mail to <authors@mit.edu> or see <a trip:// mitpress.mit.edu/bookstore/events>.

Lynn Heinemann

## Institute

For more arts-related information call the 24-hour hotline at 253-ARTS or consult the World Wide Web at <a href="http://web.mit.edu/arts">http://web.mit.edu/arts</a>

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

#### September 22-October 3

#### **MUSIC**

CANCELLED-SONOS\*-Sept 24. The 'hands across the river" ensemble includes MIT Professor Marcus Thompson, viola and Senior Lecturer David Deveau, piano and BU's Bayla Keyes, violin and Michael Reynolds, cello. 8pm, Killian Hall (14W-111). x3-2826.

CANCELLED—Affiliated Artist Concert\*— Sept 25. Margaret O'Keefe, soprano, Carlos Archuleta, baritone. Concert of Spanish music. 8pm, Killian Hall. x3-2826.

MIT Women's Chorale First Rehearsal\*-Sept 30. 7:45-10pm in the Emma Rogers Rm (10-340). New members welcome through Oct 14. Jennifer Recklet, x3-1614.

Mala Chandrasekhar: Carnatic Flute\*-Oct 3. S.Indian flute. MITHAS (MIT Heritage of South Asia) concert. Also: H.N. Bhaskar. violin and Madipakkam Suresh, mridangam. Winner of Kalaimamani Award from Tamil Nadu Government, South Indian flutist Mala Chandrasekhar, a pioneer in women's music and playing the flute in concert, is on her first American tour. \$15; \$12-students & seniors, MITHAS & New England Hindu Temple members; \$10 MIT students. 4pm. Wong Auditorium (E51). x8-7971 or <a href="http://">http:// /web.mit.edu/mta/mithas/>.

Singers Needed\*-Mondays. The Meridian Singers, MIT's mixed classical and madrigal chorus, is recruiting for all parts, especially tenors and basses. Must be able to sing well and carry your part in a mixed SATB chorus. Performs at various times during the year. Repertoire consists of madrigal, classical, and early as well as contemporary folk music. Membership comprised of MIT staff and students and is open to the public. Noon, Rm 4-148. Nancy Howells, dir, x3-1948 or <howells@mit.edu>.

MIT Guild of Bell Ringers\*—Change ringing on hand bells. Beginners always welcome. Will also ring for occasions. Meets Mondays, 6:30pm, 2nd floor balcony of Lobby 7. Roberta Young, x3-3573, <rey@mit.edu/or <a href="http://web.mit.edu/bellringers/www/>">http://web.mit.edu/bellringers/www/>">.

#### **■ READINGS**

authors@mit: Helen Elaine Lee\*-Sept 28. The assistant prof. in the Program in Writing and Humanistic Studies reads from her new novel, Water Marked (Scribner). authors@mit is sponsored by The MIT Press Bookstore and MIT Libraries; cosponsored with Program in Women's Studies. 5:30pm, Humanities Library, 2nd floor Hayden Memorial Library. x3-5249, <authors@ mit.edu> or <a href="http://mitpress.mit.edu/book-">http://mitpress.mit.edu/book-</a> store/events>

#### EXHIBITS

List Visual Arts Center\* (E15): Annual Student Loan Art Exhibition. Annual exhibition featuring over 300 framed contemporary prints and photographs from MIT's permanent collections. Through the LVAC's unique Student Loan Program, the original signed prints, artist-designed posters, and

photographs will all find homes in the dormitories and work spaces of MIT students at the close of the exhibition. Works include those by 20th century artists Berenice Abbott, Alexander Calder, Jasper Johns, Robert Motherwell, and Andy Warhol, pick-up: Sept 22-23; free-for-all: Sept 24. Daily 12-6pm, List Visual Arts Ctr, E15. x3-4680

MIT Museum\* (N52): Flashes of Inspiration: The Work of Doc Edgerton. Long-term installation celebrates the life and work of Prof Harold ("Doc") Edgerton (1903-1991), whose work with stroboscopic light rede fined photography. Doc first came to MIT as a graduate student and remained for 60 years, as professor in the Department of Electrical Engineering and Computer Science. Ongoing Exhibits. Gestural Engineering: The Sculpture of Arthur Ganson; LightForest: The Holographic Rainforest; Holography: Artists and Inventors; MIT Hall of Hacks; Light Sculptures by Bill Parker, Math-in-3D: Geometric Sculptures by Morton C. Bradley, Jr.; MathSpace. 265 Mass Ave. Tues-Fri 10-5, Weekends 12-5. x3-4444.

"Family Adventures in Science and Technology" or "F.A.S.T. Sundays"\*—Sept 26. Families work with MIT students and staff in interactive activities to explore the mysteries of science and technology. No reservation required. Free with the price of Museum admission. F.A.S.T. Sunday takes place on the last Sunday of every month. 2-4pm, MIT Museum, x3-4422.

Compton Gallery- Dreams in Brick and Mortar: MIT, Alvar Aalto, and the Design of Baker House. Exhibition celebrating the 50th anniversary rededication of the Finnish architect's masterpiece of student life-to this day, the most popular dormitory at MIT. Opening reception: Sept 30, 5-7pm. Compton Gallery (Rm 10-150). Sept 30-Jan 28. Weekdays 9-5. Special weekend viewing: Oct 2-3, 16-17 and Nov 6-7 from 10-5pm. x3-4444 or <a href="http://web.mit.edu/museum/exhibits/compton.html> or <http:// web.mit.edu/bakerhouse/>

Hart Nautical Gallery—Deep Frontiers: Ocean Engineering at MIT. Long-term exhibit exploring the latest advances in underwater research. Opens March 19. Ship Models: The Evolution of Ship Design. Ongoing. Daily 9am-8pm. x3-5942.

The Dean's Gallery- Material Shape. Doug behavior of materials. Nylon, wax, honeydew, pollen, plant bristle and linseed oil are combined through the media of sculpture and photography to create invented, organic forms and images. Bosch's attention to ma terials reveals a structure and depth which is romantic in style and reminiscent of early scientific experimentation. Sept 15 through Nov 4. The Dean's Gallery, Sloan School of Management, E52-466. Weekdays 9-5pm. x3-9455 or <a href="http://web.mit.edu/deans-gal-">http://web.mit.edu/deans-gal-</a>

Women's Studies. Permanent exhibition of archival photographs documenting the role of omen at MIT over the decades. Rm 14E-316. x3-8844.

Strobe Alley-Never Stop Learning: The Life and Legacy of Harold Edgerton. Photographs, instruments and memorabilia documenting the life of Harold Edgerton, inventor of the strobe light. Bldg 4, 4th floor corridor. x3-4444.

Institute Archives and Special Collections: Object of the Month: The Telephone Banquet Program. Technology Review called the alumni banquet of June 14, 1916, "the greatest celebration ever held by any institution of learning in the world." Through Sept

30. Hallway exhibit across from Rm 14N-118. x3-5136.

Rotch Library: The Coincidence of Opposing Extremities: Mathematico-Architectural Planning Principles of the Central European Baroque Church. Exhibition on architectural design, using photographs of central European churches. Through Oct 15. Rotch Library, Rm 7-238. x8-6693

#### OTHER

Arts Colloquium\*\*—Sept 24. All MIT faculty and arts staff are invited to hear Laura Harrington, lecturer in the Theater Arts Section speak on her work at 12noon. Lunch will be served; reservations required. For more information, contact Laura Moses (x3-9821 or laura@mit.edu) by Sept 21. One in a series of arts colloquia organized by Associate Provost for the Arts Alan Brody.

Arts Grants Deadline\*-Sept 24. First deadline for 1999-2000 Council for the Arts funding. Forms available at the Office of the Arts, E15-205. x3-4005

Interpreting Aalto: Baker House and MIT\*-Oct 1-2. Two-day Dept of Architecture conference celebrating the restoration, rededication and 50th anniversary of Baker House. MIT students \$35; non-MIT students \$50 MIT faculty and staff \$50; all others \$75 Credit card payments may be faxed to x8-7005 or register on-line at <a href="http://">http:// architecture.mit.edu/events/aac/>. Info: x3-

Applications for Wiesner Student Art Gallery\*\* All students welcome to apply to put up an exhibit. x3-7019

## Graybiel studies habits

(continued from page 1) things like reward signals. As an animal is rewarded for learning new behavior, changes occur in the neurons of

its basal ganglia.

"Reward is incredibly powerful and drives a lot of the learning we do," she

New scanning methods show that this deep section of the brain lights up when we develop and express sequential motor acts, and also in response to rewards. With the new ability for researchers to see the brain's electrical activity while learning is in progress, they can actually see patterns of activity change permanently after learning

#### IT'S HABIT-FORMING

Learning a habit is different from other kinds of learning: often we are not aware of developing a habit, and we develop it slowly over time. "The process doesn't seem to go in reverse, or else we don't have access to the means to reverse it," Professor Graybiel said.

Unlike an association between an object and a word ("Oh, so that's a blue jay!"), learning a habit is very slow. It takes many repetitions, often reinforced with positive feedback, before an action or series of actions become a habit.

Strong positive or negative motivators help develop or break habits. Positive feedback works better than negative. "The brain has an absolutely fabulous system for getting reward signals," said Professor Graybiel. The system is so sensitive that researchers have seen nerve cells fire in response to a single word, evoking a craving long after a habit has been kicked.

Negative feedback, like feeling sick after eating or drinking something, can nip a bad behavior in the bud. In certain behaviors, like drinking alcohol, consequences such as a hangover occur too long after the original binge to do much good as a deterrent.

Many receptors are housed in the basal ganglia, which draw neurotransmitters such as dopamine like a magnet. And like a strong magnet, these receptors don't easily let things go. Once the basal ganglia have been exposed to a powerful addictive agent, they seem to recognize it forever.

Graybiel and her colleagues are looking at how long this kind of response lasts. They have found that even a single dose of an addictive drug will evoke a physiological response after three weeks of abstinence similar to the response that it evoked after a few days. They hope to study the response after as much as a year of withdrawal.

While humans and animals have inborn pattern generators (people automatically swing their arms when they walk like their ape ancestors; birds are born knowing how to peck), humans can develop these automatic behaviors on their own.

When the light turns green, we position one foot to press on the gas pedal, tighten our grip on the steering wheel and get ready to go, even though there is no evolutionary precedent for driving. "The brain is so malleable, we can make our own pattern generators," Professor Graybiel said.

She suspects, however, that the more fine-tuning aspects of physical habits are accomplished elsewhere in the brain. While pounding out Chopsticks on the piano may become automatic, caressing the keys to produce just the right nuances of a Chopin prelude is not the same function, she says.

What we're doing when we learn a new habit may end up triggering the habit itself because, she said, as we develop habits we develop "chunks" of behavior. The process of walking, for instance, involves a series of movements, not just an isolated lifting or lowering of a foot.

When we repeat a behavior, physiological changes may occur not only in the parts of the brain responsible for motor control but also in the parts that deal with more cognitive functions.

The basal ganglia are the only places in the brain to deal with both physical and cognitive actions simultaneously, leading researchers to speculate that the way we program movements and the way we program thoughts may be deeply related.

#### RESPONDING TO THE CALL

When animals see a light flash or hear a beep when they get something to drink, they come to associate the light or sound with quenching their thirst. Researchers can see physical changes in their brains as the habit forms. "After a week, you begin to see a change," Professor Graybiel said. "The neurons in the striatum actually change what they respond to. The brain changes when you pick up a simple habit."

While nerve impulses travel at lightning speed, genes take a little longer to change, but they too change in response to stimuli. But because brains are as individualized as our fingerprints, no two brains have an identical response to an identical stimulus. While it may take one person one week to develop a habit, good or bad, it may take another person considerably more time.

"Learning more about dynamic changes that occur in the brain as we make and break habits has great therapeutic potential. We may learn, for example, what a harmless habit has in common with an addiction and what is different about the two. This is a subject that interests us all," Professor Graybiel said.



Associate Professor Dennis M. Freeman and RLE colleagues have devised methods to "see" the motions of cells in the inner ear.

## Minute ear-cell movements visualized

(continued from page 1)

processing worked exactly as planned, but it didn't seem to help people with hearing loss. Frustrated by the setback, Professor Freeman decided to take a month off to study how the ear worked.

'I wanted to work on figuring out how the ear processed sound, with the goal of providing information that would help engineer better hearing aids. It turned out that the answers to my questions were hard to find, and it became a career in itself to understand the physiology.

"I really wanted to understand the neural code for sound, but that was already known to be quite complicated. Evidence suggested that motions of cells might be important," Professor Freeman said.

At this point, his focus shifted to physiological modeling to the hydrodynamics of sensory cells in the inner ear. He analyzed mathematical models to determine how the mechanically sensitive parts of the sensory hair cells should move. However, after the models were analyzed, there were no data available to test the theory. So the next step was to figure out how to get experimental data.

To measure motions as small as nanometers, Professor Freeman and his colleagues use video microscopy. The development of the charge-coupled device camera brought high quality and video together, but motions in the ear are much smaller than the pixels of a camera. Working on an entirely different class of problems, Berthold Horn and his colleagues at the Artificial Intelligence Lab developed powerful algorithms to determine motions from video images, algorithms that can reliably measure motions much smaller than a pixel.

Only one problem remains. The interesting motions of sensory cells in the inner ear are at audio frequencies and are faster than the fastest commercial cameras. To overcome this problem, Professor Freeman uses stroboscopic illumination to slow the apparent motion. The result is slowmotion, three-dimensional movies of inner ear motions.

He and his group have demonstrated motion measurements with much greater precision than had previously been thought possible. Using methods similar to their auditory research, they have extended their research into the realm of microelectromechanical systems (MEMS), including micro-fabricated silicon structures that measure acceleration and angular velocity.

#### THE FUTURE

The invention of the transistor made it possible to make much smaller electronic devices than had previously been possible. The development of very large scale integration VLSI) is perhaps even more significant. It is inconceivable that one could fabricate a modern computer with discrete components. MEMS are allowing the large-scale integration of not just electronic, but also mechanical, optical and fluidic devices.

What if we could make a machine with a million moving parts? Will VLSI have the same enormous effect on mechanics, optics, and fluidics that it had on electronics?" Professor Freeman said. "I suspect yes. After all, the inner ear is a biological VLSI micromechanical system. Why shouldn't we use the same ideas in making artificial systems? And our toolbox is getting bigger. It is inevitable that we will learn to assemble biological parts into artificial machines.

Today, molecular biologists can determine the structure of an ion channel and its exact sequence of amino acids. Then they can manipulate and change its structure, and figure out the relation between a molecule's structure and function. This biological endeavor looks a lot more like engineering than did any aspect of biology just 10 years ago.

Professor Freeman's research is sponsored by the NIH (the hearing project) and DARPA (the MEMS project).

## Faculty updated on Task Force, residence system, capital projects

(continued from page 6) Recognize student/faculty community involvement

· Dr. Kolenbrander has been appointed associate dean in ODSUE.

 Continued support for LeaderShape. Make residence system an integral part of the education program

· Integrate housing, dining, the firstyear program and orientation.

· Residential System Steering Committee (RSSC) report.

· Founders Group created for new undergraduate residence.

· Actions by Committee on Student Affairs to stimulate new initiatives. · Orientation revised around the "Navi-

gating the Freshman Year" theme. Phase in a system to house all undergraduates in residence halls during

the first year · Decision to house all freshmen on

campus in 2001. · Planned construction of a new undergraduate residence.

Creation of the RSSC.

Involve undergraduates, graduate students and faculty in shared experience during orientation

Pre-orientation programs expanded.

· First-night welcoming dinner.

• Residence Midway.

· Killian Court freshman picnic revived.

· Create groups of 10 freshmen with upperclass orientation leaders.

Encourage better faculty-student interaction in housing system • Incorporate five faculty units in new

undergraduate residence. · A commitment to develop faculty housing adjacent to west campus over

 New initiatives to be brought forward by the Founders' Group.

Encourage community interaction

through the dining system · Richard Berlin named to newly created

position of dining director. Commitment to upgrade facilities.

 Central role planned in new residence. · Revive "Take a Professor to Lunch" program.

Attractive and convenient sites needed for community interaction

 Enhance spaces in new facilities. · Coffee/juice bar adjacent to exercise

area in planned sports and fitness center planned.

· New performing arts facilities planned for Wiesner Building.

· "Student Street" included in Stata

Center plans.

· Artificial turf field completely refur-

Fund activities that encourage com-

· Student activities funding tripled.

· Request process streamlined.

• Funds expanded for graduate student · Expanded planning for large-scale

Institute functions. Education and research on campus

· Focus international and distance learning activities on enhancing educational opportunity at MIT.

· Created Office of the Chancellor to focus high-level attention on integration of educational, research and student life activities across schools and departments.

Information technology and the library system

 Expand technology-related library staff. · Expand digital resources available through the libraries.

Create strategic planning group involving the president, provost, chancellor and those they may designate Group formed and has been meeting

dent since last year.

opinion." **CAPITAL PROJECTS** regularly with the Executive Vice Presiprogress, related projects and projects in development.

Undergraduate residence-Target occupancy date: 2001. Architect: Steven Holl. Site: Vassar Street. To house 350 students and include suites for five housemasters and/or visiting faculty. Stata Center—Target date: 2003. Architect: Frank O. Gehry. Site: Building 20. Halfway through design development. 300,000 square feet. Site work

Sports and Fitness Center-Target date: 2002. Architect: Kevin Roche. Site: behind Stratton Student Center. New swimming pool, exercise facility. Construction drawings in works.

Media Laboratory extension—Target date: 2003. Architect: Fumihiko Maki. Site: south of Wiesner Building. Will include significant space for performing

arts. Schematic design underway. Related projects include a central

utility plan expansion to provide chilled water, improvements to Vassar Street, a new Albany Street garage and Campus Plan 2000. Projects in programmatic development include a graduate student residence, a neuroscience complex and a new building for the Sloan School of Management.

Vice President Curry reviewed the progress and status of projects in

· Process for departmental planning

sharpened by chancellor and provost;

budget process separated from strate-

streamlining committee structure to

Continue closer coordination between

ODSUE and Committee on the Under-

· Continue tighter coupling between

faculty governance initiatives and ad-

Dean Kolenbrander reviewed the

process followed by the Steering Com-

mittee from the design contest last Janu-

ary through the final report issued this

month. He said the report and minutes

from subsequent public discussions of

the proposals will be presented to Chan-

specific way, or the faculty feels this

way," he said. "There is a wide range of

"You can't say the students feel one

cellor Bacow on October 1.

ministration financial planning.

**RESIDENTIAL PLAN** 

support educational triad

gic planning.

graduate Program.