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TechTalk
SERVING THE MIT COMMUNITY

Great teachers awarded MacVicars

Sasha Brown
News Office

The 2006 MacVicar Fellows share a passion for education that has earned all three the respect of students and faculty alike.

This year's fellows, announced by Provost L. Rafael Reif during a luncheon held Friday, March 3, are Professor Leslie Norford of architecture; Associate Professor Dennis Freeman of electrical engineering and computer science; and Professor Samuel Bowring of earth, atmospheric and planetary sciences.

The fellowships, given to outstanding teachers, were established in 1992 to honor the life and contributions of Margaret MacVicar (S.B. 1964, Sc.D.), MIT's first dean for undergraduate education and founder of UROP (Undergraduate Research Opportunities Program). The MacVicar Faculty Fellows program provides an annual scholar's allowance to assist each fellow in developing ways to enrich the undergraduate learning experience. Fellows serve 10-year terms.

A member of MacVicar's family, as well as Corporation members and previously named fellows, attended Friday's luncheon at the Faculty Club, which featured a welcome from Corporation Chair Dana Mead and remarks from President Susan Hockfield and Dean for Undergraduate Education Daniel Hastings, in addition to Reif's introductions.

Although Bowring was not able to attend the luncheon, Professor Emeritus John Southard of earth, atmospheric and planetary sciences accepted in his stead. Among other things, Bowring was honored for the way he made difficult concepts accessible to students.

Reif read the remarks of several of Bowring's colleagues and students: "His

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PHOTO / **DONNA COVENEY**

Nuclear Regulatory Commissioner Peter Lyons peers into a 'hot cell' (a shielded room where radioactive materials can be handled remotely) on a tour of the nuclear reactor on Tuesday, Feb. 28. At center is John Bernard, director of reactor operations at the MIT Nuclear Reactor Laboratory, and at right is David Moncton, director of the Nuclear Reactor Lab.

NRC head offers energy views

Deborah Halber
News Office Correspondent

Nuclear power is destined to play a major role in America's energy future, but the industry needs more young scientists, the head of the U.S. Nuclear Regulatory Commission (NRC) told an MIT crowd recently.

In the near future, U.S. utilities will seek to build 17 new nuclear reactors at 11 sites to go online by 2015, but NRC Commissioner Peter B. Lyons says that will be an "immense challenge," partly because the industry is losing people to retirement and there is a dearth of young people going into science and technology.

Lyons, a physicist who worked in weapons research at Los Alamos and as science advisor to Sen. Pete V. Domenici (R-N.M.), was sworn in as NRC commissioner about a year ago. He spoke at MIT on Tuesday, Feb. 28, about current and future

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MIT announces it will match Pell Grants

Acknowledging the decline in federal funding for student financial aid, MIT has announced it will match federal Pell Grants for all eligible students attending the Institute starting in September 2006.

MIT's Pell Matching Grants program will effectively double Pell Grant funds for eligible students. Because the doubled Pell Grant is over and above any need-based MIT scholarship, this new Pell Grant match will limit, or in some cases, eliminate student loan debt for Pell Grant recipients.

Pell Grants, administered by the U.S. Department of Education, are need-based, providing educational funds that students are not required to repay. The grants are typically awarded to those whose family income is less than $40,000.

Congress has frozen Pell Grants at 2003 levels despite rising tuition costs.

In announcing the Pell Matching Grants program, MIT President Susan Hockfield said, "Adequate need-based student aid, especially in the form of scholarships, is essential if this country is to develop the talents of our young people to the fullest."

Hockfield emphasized the Institute's commitment to recruiting and enrolling students of merit and promise. For more than 40 years, MIT has had a policy of admitting students without regard to their financial circumstances, of awarding all MIT financial aid solely on the basis of need and of meeting the full need of every enrolled student.

"The new MIT Pell Grant match reaffirms our commitment to families who are losing their faith in the American dream of sending their children to college," Hockfield said.

In 2006-2007, more than 90 percent of MIT undergraduates will receive approximately $85 million in combined

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Researchers reveal how radiation damages normal tissue

Researchers at MIT have devised a new method for examining how radiation damages normal tissue in the body. The knowledge may make it possible to reduce side effects for cancer patients or to develop treatments for radiation exposure.

About 50 percent of all cancer patients are treated with radiation therapy, either alone or in combination with some other type of treatment. Radiation can be very effective in killing tumor cells, but it also kills normal tissues nearby. In the gastrointestinal (GI) tract, this killing of normal cells can cause such side effects as nausea or diarrhea within days or weeks of treatment, and serious GI tissue damage can occur months or years later.

"The long-term effects that occur six months to a year or more after exposure aren't reversible like the short-term ones, and they are a big unknown," said Associate Professor Jeffrey A. Coderre of MIT's Department of Nuclear Science and Engineering. The damage is similar to scar tissue formation and can seriously affect tissue function in the GI tract.

"We've come up with a tool to selectively irradiate blood vessels to study how radiation damages normal tissue over both the short term and the long term," said Coderre, who is co-author of an article appearing online the week of Feb. 27 in the Proceedings of the National Academy of Sciences (PNAS). "This is the first time it has been possible to do this."

Conventional techniques using external radiation beams are not specific

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HOPE FOR TREATMENT

Researchers have identified a compound that could lead to a treatment for Huntington's disease.

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Men's basketball star Mike D'Auria talks about the team's record-breaking season.

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Professor Robert A. Weinberg wins a major prize for cancer research.

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Basketball star reflects on great season

Sasha Brown
News Office

The highlight of this year's record-breaking men's basketball season was the Feb. 25 game against the U.S. Coast Guard Academy, said senior guard Mike D'Auria.

For that Saturday game in Worcester, a busload of MIT students came to support the team, almost matching the number of Coast Guard fans in the stands.

"We could just feel the energy in the building," said Coach Larry Anderson, who watched the team's spirits rise and propel the team to a 69-57 victory in that game. "We felt like we were playing for a community that was thirsting for something."

"It was an incredible season, culminating with that game," D'Auria said.

The victory helped the team secure the No. 2 seed in the ECAC Division III Men's New England Basketball Tournament, a fitting end to a season D'Auria called, "a really fun ride."

The MIT Engineers trounced their competition this year, going 21-9 and breaking the MIT record for the most wins in a single season. The previous record, set in 1965, was 19 wins.

D'Auria was named New England Women's and Men's Athletic Conference (NEWMAC) Men's Basketball Player of the Year by the league's coaches in all-conference voting. D'Auria has also been named to the ESPN The Magazine Academic All-America men's basketball team.

NEWMAC, which comprises 10 schools, also honored Anderson as Coach of the Year and freshman Jimmy Bartolotta as Rookie of the Year.

This year's team was special, said D'Auria. "The four seniors had been together a long time," he said, referring to himself as well as seniors Danny Kanamori, Philip Murray and Gary Atkins. "We were all ready to lead the younger guys," he said.

The freshman crop was impressive from the start, said D'Auria. "They were able to start contributing right away," he said, also citing the incredible dedication of the entire team, who worked together last summer and immediately after the regular season ended to continue to grow and improve. "It was a roller coaster ride, but being able to watch the team grow was really nice for me," he said.

For many on the team, the season proved that MIT students could be successful on the playing field or court as well as in the classroom, said D'Auria. "We are at MIT and there are (academic) constraints on people that other teams do not have to deal with," he said.

The four seniors played their last game on Friday, March 3, when the team lost to Wheaton College in the ECAC semifinals. The loss had a silver lining for D'Auria, who scored 32 points and closed his MIT career with 1,528 points, making him the third all-time leading scorer in MIT history.

The materials science and engineering major plans to go into consulting next year. "It (basketball) has been something that has been a part of my life so long," D'Auria said. "I don't think it has fully sunk in that I won't be playing on a team anymore … but it was a great way to go out."

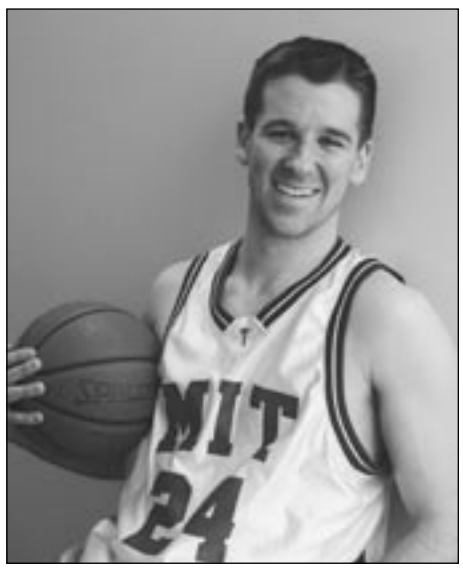

PHOTO / **DONNA COVENEY**

One of the stars of this year's stellar basketball team, senior Mike D'Auria is the third all-time leading scorer in MIT history.

As for Anderson, he hopes the school spirit the team saw in the stands will continue to thrive. "I hope that we can carry what we have done this year into next year and for many seasons to come," he said.

MACVICAR—

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lectures were by far the most lively and engaging lectures I have had during my MIT experience," one of his students wrote.

"During one class, he decided that lecturing was not the best way to teach us the current topic, so he took us on a walking tour of the campus, looking at and explaining the rock and mineral composition of each building," said another of Bowring's students.

Of Freeman, one colleague said simply: "He is the best teacher I know." He was praised for his hands-on approach to education as well as his accessibility.

"I have met with him numerous times to discuss graduate school applications, research philosophies, goal setting, and what to look for in seeking a research advisor and Ph.D. thesis," one student wrote. "Simply put, Prof. Freeman places the success and well-being of his students as his utmost priority."

Freeman said of the MacVicar honor, "I am extremely excited." He said he loves to teach and has recently received a d'Arbeloff grant to develop a new course, "Freshman Projects in Microscale Engineering for the Life Sciences."

Norford said he was honored to be named a MacVicar Fellow. "When asked to characterize this place, I often say that the energy level here, the buzz associated with the hard work and the rewards of learning, is higher here than at any place I have been," he said. "MIT undergrads have enormous skills, enthusiasm and energy. To support them is no chore. They motivate faculty to do the best possible job in developing and delivering lectures and labs, in supervising their research and in advising them."

PHOTO / **DONNA COVENEY**

MacVicar Fellows Leslie Norford, second from left, and Dennis Freeman, third from left, were feted for educational excellence on Friday, March 3. Joining them are, from left, Dean for Undergraduate Education Daniel Hastings, President Susan Hockfield, Provost L. Rafael Reif and Victoria MacVicar, sister of Margaret MacVicar. Not pictured is MacVicar Fellow Samuel Bowring.

The respect runs in both directions, said Norford's students. "I truly admire Prof. Norford's dedication to teaching and advising the undergraduate students. Working with him and being one of his students are two of the greatest things that happened to me at MIT," wrote one student.

MacVicar Day ended with a 90-minute showcase of dozens of students' work in "UROP and Beyond," an open fair in the Stata Center Student Street. MacVicar created UROP, which cultivates research partnerships between undergraduates and faculty, in 1969.

In his remarks, Hastings spoke of the UROP's ongoing importance. An advisor in the Department of Aeronautics and Astronautics, he recalled one student's story. "I asked him what had been really great during his time at MIT. He told me that the thing that really made a difference was the UROP he did in the Engineering System Division AgeLab."

"This had really been a good experience for him and he wanted to find a job working in that same kind of field," Hastings said. "This is one of the legacies of Margaret MacVicar."

PELL

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need-based and merit-based financial aid through scholarships, loans and/or work-study. This will include more than $60 million in scholarships from MIT and $1.5 million in federal Pell Grants.

According to Daniel Hastings, dean for undergraduate education, the Pell Matching Grant program builds on MIT's tradition of success in providing and sustaining access to the Institute's world-class opportunities in science, engineering, technology and humanities.

"MIT will continue to recruit, enroll and graduate a diverse student body with a significant number of first-generation college students," said Hastings, a professor of engineering systems and aeronautics and astronautics.

For the academic year 2006-2007, tuition, fees, housing and meals will total $43,550.

Approximately 16 percent of MIT undergraduates come from homes with incomes below $42,000.

A typical financial aid package for a student eligible for the maximum Pell Grant and a need-based MIT scholarship would be $43,550. The aid package would include $42,100 in scholarships — consisting of an MIT scholarship of $34,000, a Federal Pell Grant of $4,050, and an MIT Pell Matching Grant of $4,050 — and a term-time job of $1,450. The student would work about five hours a week to earn $1,450.

Stojanovic named Doherty Professor

Vladimir Stojanovic, assistant professor in the Department of Electrical Engineering and Computer Science, has been awarded the 2006 Doherty Professorship in Ocean Utilization from the MIT Sea Grant College Program. Every year, the program selects one or two new faculty members for a supplemental award of $25,000 per year for two years.

Stojanovic's research will focus on improving the energy efficiency of underwater fiber optic links, which are critical to many marine applications. Currently, most short-range optical interconnects rely on multimode fiber, which exhibits modal dispersion at multi-gigabyte-per-second data rates.

In his Doherty-funded work, Stojanovic plans to compensate for the modal dispersion and turn the multimode fiber into a multiple-input, multiple-output (MIMO) system. Such a system, with its improved energy efficiency and enhanced capacity, will be relevant for applications such as the remote operation of underwater vehicles and telemetry and data acquisition networks for various sensor sites.

Vladimir Stojanovic

In 2005, the two-year Doherty Professorship was awarded to Patrick Doyle, assistant professor in the Department of Chemical Engineering. Doyle's Doherty-funded research focuses on understanding the dynamics of single polymers and biomolecules under forces and fields. By reliably measuring elongational viscosities and comparing these to molecular simulations, Doyle expects to increase that understanding and the ability to effectively reduce drag.

The Doherty Fellowship, endowed by the Henry L. and Grace Doherty Charitable Foundation, encourages promising, nontenured professors to undertake marine-related research that will further innovative uses of the ocean's resources. The area of research may address any aspect of marine use and/or management, whether social, political, environmental or technological.

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Robert Weinberg wins major cancer prize

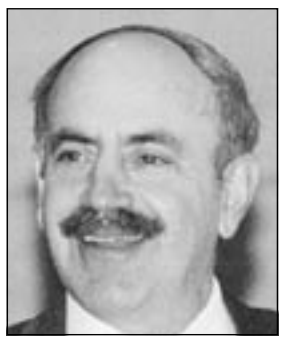
Elizabeth A. Thomson
News Office

Professor Robert A. Weinberg has won one of the largest prizes awarded to cancer researchers by a professional society of peers, according to the American Association for Cancer Research.

He and Angela M. Hartley Brodie of the University of Maryland School of Medicine are being honored with 2006 Landon-AACR Prizes for Basic and Translational Cancer Research. Each will receive an unrestricted cash award of $200,000 and will present successive scientific lectures at the AACR annual meeting on April 3.

Weinberg, a founding member of the Whitehead Institute for Biomedical Research and MIT professor of biology affiliated with the Center for Cancer Research, will receive the fifth Kirk A. Landon-AACR Prize for Basic Cancer Research. Brodie will receive the fifth Dorothy P. Landon-AACR Prize for Translational Cancer Research.

"These extraordinary scientists have spent their careers working to unravel at the molecular level some of cancer's most elusive mysteries," said Dr. Margaret Foti, chief executive officer of the AACR. "Each has spent more than 30 years in the laboratory, pursuing with relentless dedication their theories about cancer's mechanisms of invasion and progression in the complex chemistry of the human body."



Robert Weinberg

According to the AACR, Weinberg's major contribution to the groundbreaking discovery of human oncogenes — genes that cause cancer when mutated — started with a simple question: How does cancer begin?

"If one looks at a human tumor, one realizes it's a conglomerate of many cells which are growing, multiplying out of control," Weinberg told the "NewsHour with Jim Lehrer" on July 28, 1999. On that day, the journal Nature published an article by Weinberg and his research team reporting their successful conversion of normal human cells into tumor cells in a culture dish.

"Looking inside the cells," he continued, "we identified a number of damaged genes, called oncogenes or tumor suppressor genes. They're the regulators that orchestrate the proliferation of the cell."

Weinberg's lab continues to study the molecular mechanisms that control the growth of human tumors and their ability to seed distant growths — metastases. This work has revealed ways in which normal stromal (connective tissue) cells recruited into a tumor aid the growth and survival of the cancer cells. In addition, by studying genes that are normally active early in embryonic development, Weinberg and colleagues have discovered mechanisms by which cancer cells in a primary tumor acquire the ability to invade nearby tissues and to spread to distant sites in the body.

"Cancer research has been a consuming passion of my life for three decades, and so it comes as an extraordinary honor that I am recognized in this way by my peers who include, by all measures, the world leaders in this dynamic and ever-fascinating field of science," said Weinberg. "I am extremely flattered. Never in my wildest dreams could I have imagined that my work begun three decades ago would lead to recognition of this sort."

Future professionals learn manners matter

Sasha Brown
News Office

A "mocktail party" — an annual event sponsored by the School of Engineering's Undergraduate Practice Opportunities Program (UPOP) — brought together more than 200 sophomores, 50 MIT alumni and friends and two deans in the Wang Auditorium on Tuesday, Feb. 28.

Currently in its fifth year, UPOP provides students with skills and experiences that expose them to the working world early in their academic careers.

Part of UPOP's Spring Professional Development Seminar Series, the "mocktail party" builds on UPOP students' intensive January "boot camp," which introduced them to the professional skills they'll need in the real world of engineering.

Early in the evening, Dean for Undergraduate Education Daniel Hastings emphasized the importance of business etiquette to effectiveness on the job, citing his own experience at the Pentagon in the late 1990s when he served as Air Force chief scientist.

Hastings introduced Jodi Smith of Mannersmith, an etiquette consulting firm, who offered tips on such networking skills as how to shake hands successfully: Eye contact, palm-to-palm contact and making the correct judgment in how firmly to shake are all important, she said.

Later, students and alumni mingled over hors d'oeuvres and punch, getting a chance to practice what they had learned.

"Jodi teaches us that simple things done well really make you stand out," said Chris Resto, UPOP director (S.B. 1999). "Introducing yourself or shaking hands may seem very simple, but when you do it well, it can be the key to opening many opportunities."

Smith also offered polite conversation exits, a component many students particularly appreciated.

"It's amazing how there actually are concrete tips and tricks for how to initiate a conversation and keep it going smoothly, but also equally importantly, how to get away from it," said Katrine Sivertsen, a sophomore materials science and engineering major.

Smith stressed that rather than saying one is headed to the bathroom, bar or to a conversation with another person, it's preferable to say "it was a pleasure to meet you" and just move on. She also advised the participants to choose to eat or drink at a networking event "but never both," to keep a hand free for shaking.

Sophomore materials science and engineering major Mike Vasquez saw a direct link between the skills Smith taught and confident networking later in the evening. Smith had taught students to create a "tagline" for themselves, something to spark further conversation.

"I happened to use 'My name is Mike Vasquez and I'm a baseball nut,'" said Vasquez. "When I used it, it really helped me relax and ease into quite a few conversations with other students as well as a few of the industry professionals attending."

PHOTO / **DIMITRI P. BERTSEKAS**

Jodi Smith of Mannersmith, an etiquette consulting firm, offers hand-shaking tips to students at the Undergraduate Practice Opportunities Program (UPOP) 'mocktail party' on Tuesday, Feb. 28.

Vasquez added, "In my conversations with some of the employers, they kept reiterating how many of the topics Jodi talked about really set people apart in interviews, networking events, and even at work."

Many of the alumni attendees praised the event — and UPOP in general — as important to the future success of MIT's students.

"It (UPOP) helps complement the world-class engineering skills of MIT students with the social skills that will put them at ease in business and social settings and make them more effective," said Paul Edelman (Ph.D. 1978), managing director of Edelman and Associates, an executive search firm.

Associate Dean of Engineering Dick Yue presented a gift to Jerry Morris of the Shell Oil Co. in appreciation of Shell's sponsorship of the event.

This year, 259 students registered for UPOP — about one-fourth of all MIT's sophomores and nearly 40 percent of those majoring in engineering.

Memorial service slated today for Pushpinder Singh

A memorial service will be held at MIT tomorrow for Pushpinder Singh, a postdoctoral associate in the MIT Media Lab who died Feb. 28 in Cambridge. He was 33.

The service will be held in the MIT Chapel at 3 p.m.

Singh's research centered on giving computers human-like common sense — the ability to think about the everyday world as people do — but his interests ranged from developing a theory of beauty to developing an architecture for reflective thinking, according to Media Lab colleagues.

"Push's work has opened the possibility for a true partnership between people and machines," said Walter Bender, senior research scientist and former executive director of the Media Lab.

Pushpinder Singh

"None of us will ever adapt to this loss … Push served as a model of intellectual power, kindness and honesty," wrote Marvin Minsky, professor of media arts and sciences emeritus at MIT. Minsky was Singh's advisor and mentor for many years. "He was like a comet lighting up the intellectual sky with his brilliant, deep ideas and his beautiful personality. His blazing trail remains in his many writings, publications, notes and in the memory networks of his friends. We were all just beginning to know the range and the depth of his ideas."

"Push had great warmth," Bender said. "He was building upon that warmth, developing a model of mind that was attuned to human goals."

Media Lab research scientist Henry Lieberman said, "I saw in Push a great example of the pioneer spirit of the earlier days of AI (artificial intelligence). This means not being afraid to tackle the big questions — common sense, knowledge, problem solving, story understanding, vision."

Born in Dehradun, India, Singh grew up in Canada, and earned his S.B. and M.Eng. in electrical engineering and computer science from MIT in 1998. He was named one of the "IEEE Intelligent Systems 10 to Watch," an award that honors young researchers in artificial intelligence. He planned to take a faculty position at the Media Lab this fall.

Singh is survived by his parents, Mahender and Kulwant Singh of Montreal, Quebec; two sisters, Vindi Singh of San Francisco and Raminder Singh of Schaumburg, Ill.; and his partner, Barbara Barry of Cambridge.

Microbe DNA aids ocean understanding

Elizabeth A. Thomson
News Office
and
Kim Fulton-Bennett
Monterey Bay Aquarium Research Institute

Using DNA analysis, MIT researchers and colleagues have gained new insight into how marine microbes thrive and survive at different depths of the ocean.

"Microbes are the central processors of matter and energy in almost every ecosystem imaginable – especially so in the sea," said MIT Professor Ed DeLong, who led the work. Thousands of different types of microbes, the world's smallest creatures, inhabit every cubic centimeter of seawater. They have huge effects on ocean chemistry and possibly even climate.

However, "their complex interactions are really tough to study in natural environments," DeLong said. "We took a shortcut to understanding their environmental activities by analyzing the DNA from whole communities of microbes."

In the Jan. 27 issue of Science, the researchers describe their analysis of DNA from microbe communities at seven different depths in the tropical Pacific Ocean, from the surface down to 4,000 meters (about 13,000 feet). One of the team's overall goals was to determine how the microbes near the surface are different from those that live thousands of meters down.

The scientists collected water from the open ocean about 100 kilometers (60 miles) north of the island of Oahu. This spot, site of the Hawaii Ocean Time Series station, has been studied continuously for 18 years by one of the co-authors, David Karl of the University of Hawaii. It was chosen because it is far from any terrestrial influences, yet its chemistry and (nonmicrobial) biology are relatively well known.

Still, challenges remained. Because concentrations of microbes were so low in this "oceanic desert" area, the team had to spend five to six hours filtering up to 600 liters (160 gallons) of seawater for each sample to obtain enough microbial DNA for analysis.

What did the researchers find?

Not surprisingly, in samples from the sunlit waters within about 100 meters of the surface, they discovered many microbial DNA sequences that were associated with photosynthesis. This indicates that many microbes in these waters probably use sunlight as a source of energy.

Surface samples also contained microbial DNA associated with movement and propulsion. "This suggests that movement may be especially important for surface-water microbes, perhaps helping them follow chemical gradients or move from food particle to food particle," said DeLong, who has appointments in the Department of Civil and Environmental Engineering (CEE) and in the Biological Engineering Division.

In contrast, DNA from microbes in deeper waters suggests many may survive by attaching to and breaking down particles of organic material. Such particles continually sink down from the surface waters into the deep sea, providing food for many organisms in the form of "marine snow."

Perhaps the most surprising finding was the large amount of DNA that came from viruses, especially in near-surface waters. Since the researchers excluded free-living viruses from their initial sample, they believe that this viral DNA must have come from viruses that had infected living bacteria.

"We're excited about these new views of microbes we and others are developing by analyzing microbial genomes recovered directly from the environment. The approach is really providing new insight into what makes microbes tick in the real world – how they affect each other and influence their surrounding environment," DeLong said.

For fuller text visit web.mit.edu/newsoffice/2006/microbes.html.

PHOTO / **DONNA COVENEY**

MIT Assistant Professor John Ochsendorf of architecture gave a talk to the American Association for the Advancement of Science in February in which he described a new software tool designed to find a structure's most efficient form.

New tool may reveal architectural past

Sarah H. Wright
News Office

A computer design tool originally created for animation may soon unlock the secrets of the structure of ancient cathedrals, according to MIT Assistant Professor John Ochsendorf of architecture.

A structural engineer specializing in architectural and construction history, Ochsendorf recently presented to colleagues a virtual design method that has been extended in novel ways by a team of architects, computer scientists and engineers at MIT.

"This is the kind of work — crossing the boundaries of engineering, history and architecture — that could only happen at MIT," Ochsendorf said.

The method, known as particle-spring systems, is a three-dimensional design tool that was originally developed by computer scientists for creating graphics such as character animation and cloth simulation. For example, particle-spring systems produced the clothes "worn" by virtual characters such as Yoda in "Star Wars Episode III: Revenge of the Sith."

The interdisciplinary MIT team proposes to employ particle-spring systems dynamically: They are using the software, which models the gravitational load on a given shape's exterior, to find a structure's most efficient form and to allow the architect or engineer to interact with the form-finding program while it is still running.

Ochsendorf, assistant professor in the Building Technology Program, described the software to colleagues at the annual meeting of the American Association for the Advancement of Science (AAAS). The meeting, held Feb. 16-20 in St. Louis, was attended by more than 6,000 people. Ochsendorf's talk was titled "Arches: Gateways From Science to Culture."

The team's software is the "next generation of design tools. My dream is to use it to understand Gothic cathedrals," he said.

Historically, finding and creating new structural forms was accomplished by painstaking physical means. Antoni Gaudi, Spanish architect and designer of the chapel of Barcelona's Colonia Guell, devoted 10 years to a "hanging chain" model made of weights on strings that would serve as an upside down version of the efficient arched forms he sought.

Gaudi's work followed the 17th century discovery by English scientist Robert Hooke that, "As hangs the flexible chain, so but inverted will stand the rigid arch."

MIT's virtual method, Ochsendorf said, is as straightforward as Gaudi's physical method for exploring and testing new forms, but it uses time, materials and money more efficiently.

"Using the particle-spring approach, a three-dimensional structure such as a cathedral can be created in only a few minutes. Most importantly, the user can change form and forces in real time while the solution is still emerging," Ochsendorf and Axel Kilian (Ph.D. 2006) wrote in a recent paper, "Particle-Spring Systems for Structural Form-Finding."

Ochsendorf said he envisions MIT's particle-spring systems method being used to analyze and illuminate historic masonry methods (these secrets were closely guarded by guilds) and to support sustainable modern building practices by discovering more efficient — and less-resource-consuming — structures.

MIT's own Kresge Auditorium, designed by Eero Saarinen and built in 1955, offers an example. The hanging chain software program could have reduced the amount of concrete used in its roof.

"The Kresge roof is one-eighth of a sphere. The shell is made of 6 inches of concrete, and it could have been made using only 3 inches of concrete," Ochsendorf said.

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Continued from Page 1

enough for this type of study. "We are selectively delivering a radiation dose to all of the cells that make up the microscopic blood vessels throughout the body," he said.

The method Coderre and his colleagues at MIT and UCLA came up with involves putting boron into a drug administered intravenously in mice, and then subjecting the animals to whole-body neutron radiation using the MIT research reactor. Individual boron atoms in the blood capture a neutron, become unstable, and immediately split in half, giving off two short-range radiations (an alpha particle and a lithium ion) in the process.

The boron is kept in the blood by trapping it inside a type of nanoparticle known as a liposome, which is only billionths of a meter in size. These particles are too big to move from the blood into normal tissues, so the short-range radiations from the boron-neutron reactions in the blood only reach the blood vessel walls and cannot damage the normal tissues outside the blood vessels.

> *We've come up with a tool to selectively irradiate blood vessels to study how radiation damages normal tissue over both the short term and the long term.*
>
> **Jeffrey A. Coderre**
> Associate Professor

By selectively irradiating the blood vessels, it is possible to see where the breakdown of tissue structure and function starts following radiation exposure. And that information could lead to more effective and less damaging treatments, Coderre said.

Coderre said the method can be applied to other tissues. It also has implications for the development of radioprotectors or treatments for radiation exposure. But perhaps the greatest potential is in understanding the sequence of steps that begin at the time of irradiation but take years to create damage.

For example, there will be approximately 240,000 new cases of prostate cancer diagnosed in the United States in 2006. Depending on the dose of radiation delivered to their tumor, anywhere from 20 percent to 40 percent of those patients could show some degree of late damage.

The lead author on the PNAS paper is Bradley W. Schuller, a graduate student in Coderre's lab. Peter J. Binns and Kent J. Riley, both research scientists in MIT's Nuclear Reactor Lab, also are authors on the paper, as are Ling Ma and Professor M. Frederick Hawthorne, both at UCLA.

This research was funded by the U.S. Department of Energy, the National Institutes of Health and the MIT Center for Environmental Health Sciences.

Two named IEEE fellows

Two MIT engineers have been named fellows of the Institute of Electrical and Electronics Engineers (IEEE) for their "extraordinary record of accomplishments in any of the IEEE fields of interest."

They are among 271 IEEE members named fellows effective Jan. 1. The MIT fellows are:

— Jesus del Alamo, a professor in the Department of Electrical Engineering and Computer Science, "for contributions to microelectronic devices."

— Eric Evans, a division head at Lincoln Laboratory, "for technical leadership in development of advanced air and missile defense systems."

Research holds promise for Huntington's treatment

Anne Trafton
News Office

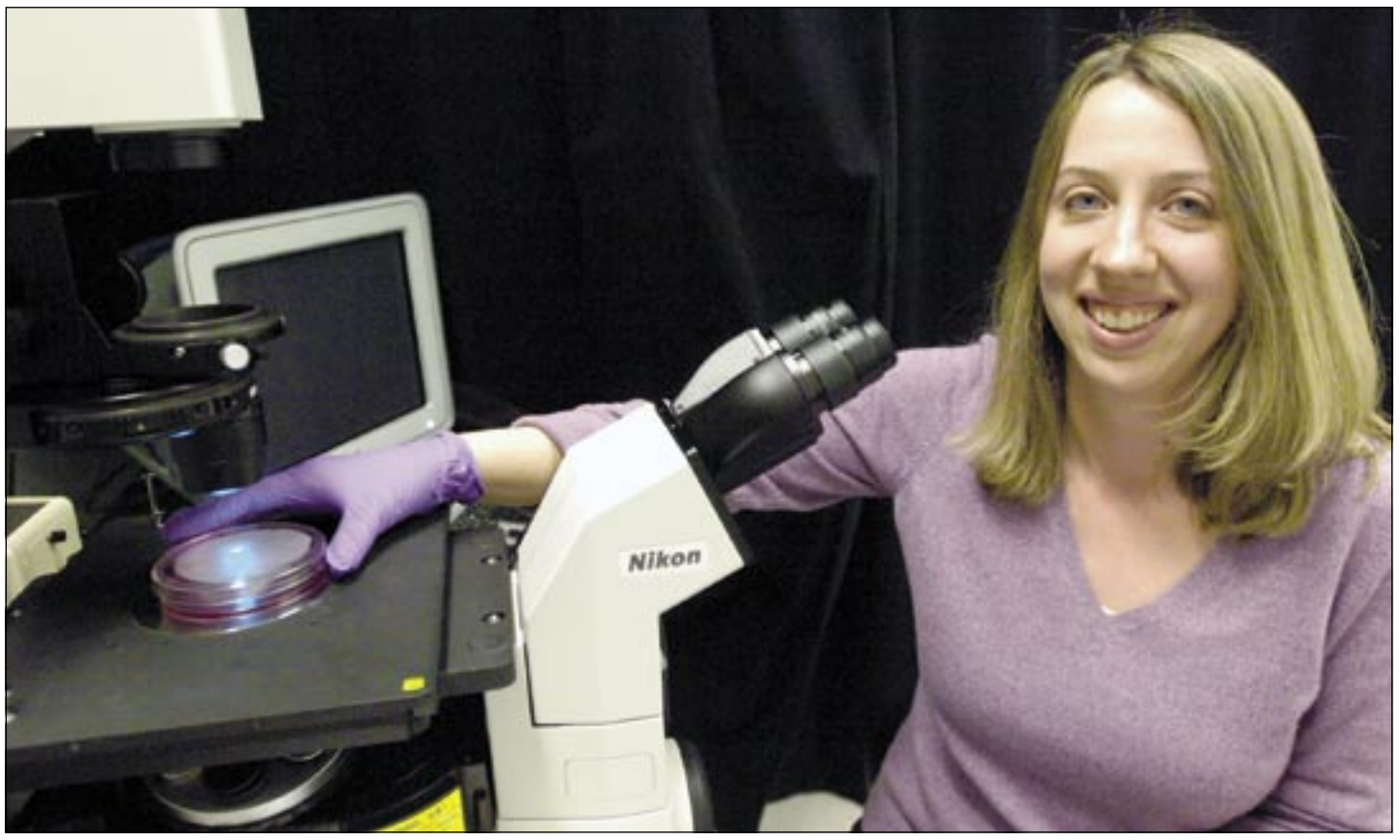

PHOTO / **DONNA COVENEY**

Ruth Bodner, a postdoctoral fellow in MIT's Center for Cancer Research, and co-workers have discovered a compound that could lead to the development of a new treatment for Huntington's disease, a fatal neurodegenerative disorder.

Researchers at MIT and Harvard Medical School have identified a compound that interferes with the pathogenic effects of Huntington's disease, a discovery that could lead to development of a new treatment for the disease.

There is no cure for Huntington's, a neurodegenerative disorder that now afflicts 30,000 Americans, with another 150,000 at risk. The fatal disease, which is genetically inherited, usually strikes in midlife and causes uncontrolled movements, loss of cognitive function and emotional disturbance.

"There are now some drugs that can help with the symptoms, but we can't stop the course of the disease or its onset," said Ruth Bodner, lead author on a paper that appears this week in the online edition of the Proceedings of the National Academy of Science and will appear in the print edition March 14. Bodner is a postdoctoral fellow in MIT's Center for Cancer Research.

The compound developed by Bodner and others in the laboratories of MIT Professor of Biology David Housman, Harvard Medical School Assistant Professor Aleksey Kazantsev and Harvard Medical School Professor Bradley Hyman might lead to a drug that could help stop the deadly sequence of cellular events that Huntington's unleashes.

"Depending on its target, any one compound will probably block only a subset of the pathogenic effects," Bodner said.

Huntington's disease is caused by misfolded proteins, called huntingtin proteins, that aggregate and eventually form large clump-like "inclusions." The disease is characterized by degeneration in the striatum, an area associated with motor and learning functions, and the cortex. The proteins may disrupt the function of cellular structures known as proteasomes, which perform a "trash can" function for the cell — disposing of cellular proteins that are misfolded or no longer needed, said Bodner.

Without a functional proteasome, those cellular proteins accumulate, poisoning brain cells and impairing patients' motor and cognitive function.

Until now, most researchers looking for Huntington's treatments have focused on compounds that prevent or reverse the aggregation of huntingtin proteins. However, recent evidence suggests that the largest inclusions may not necessarily be harmful and could in fact be protective, said Bodner. So, the MIT and Harvard scientists decided to look for compounds that actually promote the formation of large inclusions.

The highest concentration of protein inclusions was found when the researchers applied a compound they called B2 to cells cultivated in the laboratory. The compound also had a strong protective effect against proteasome disruption, thus blocking one of the toxic effects of the huntingtin protein.

The B2 compound also promoted large inclusions and showed a protective effect in a cellular model of Parkinson's disease, another neurodegenerative disorder caused by misfolded proteins.

In Parkinson's disease, the mutant proteins destroy dopamine-producing cells in the substantia nigra. Normally, the dopamine transmits signals to the corpus striatum, allowing muscles to make smooth, controlled movements. When those dopamine-producing cells die, Parkinson's patients exhibit the tremors that are characteristic of the disease.

The researchers are now working on finding a more potent version of the compound that could be tested in mice.

This work was funded by the Hereditary Disease Foundation, Massachusetts Biotechnology Research Council, National Institutes of Health, American Parkinson's Disease Association and the MassGeneral Institute for Neurodegenerative Disease.

Lighter vehicles may win 'Oil Endgame,' author says

Deborah Halber
News Office Correspondent

Even the quintessential gas-guzzling SUV could become energy-efficient if it weighed a lot less and was run by a hybrid engine or a fuel cell, according to noted author and environmentalist Amory Lovins, who spoke Monday, Feb. 27, to a packed crowd in Wong Auditorium.

Lovins is the founder and CEO of the Rocky Mountain Institute, a nonprofit organization that "fosters the efficient and restorative use of resources to make the world secure, just, prosperous and life-sustaining."

By increasing efficiency and substituting fuels such as biodiesel and natural gas saved through increased efficiency, the United States can be oil-free by 2040, said Lovins, featured speaker at the third colloquium sponsored by the Energy Research Council (ERC) and the Laboratory for Energy and the Environment (LFEE).

In a talk that shared the title "Winning the Oil Endgame" with his 29th book, Lovins presented a picture of an energy future in which more American cars will be manufactured that are competitive in the world marketplace, emissions will be drastically reduced, the economy will improve and the United States will be freed from its dependence on Middle East oil — all with no radical shifts in government policy, taxes or regulations.

The catch? Cars, trucks and planes, which consume 70 percent of the U.S. oil supply, will virtually all have to be made of lightweight carbon composites or new ultralight steel.

This is not such a big hurdle, Lovins said, noting that aerodynamic, low-drag, crashworthy hybrid cars can be manufactured by retooled and retrained automakers.

While Lovins acknowledged that the automobile industry is "risk-averse," he said, "Car companies are starting to recognize that their only salvation is in radical innovation. I've heard things in Detroit lately you would not have heard six months ago. You can make cars big, protective and comfortable without also making them heavy."

In fact, oil is already going away as a fuel source, Lovins argued. Just as the whaling industry ran out of customers before it ran out of whales, oil should become less profitable as new technologies make it less necessary and desirable, he said.

"We have choices to make," Lovins said. "Our security and competitiveness are at risk from oil insecurity, geopolitical rivalry, price volatility, perhaps depletion and climatic stability." Other countries are already working toward the same goals. "China plans to produce cars that don't use much oil, then no oil, and plans to be the world leader in fuel cells," he said. "Europe in 2003 made 17 times as much biodiesel as the U.S."

Even after a $180 billion investment in the transportation industry to facilitate the conversion to ultralight vehicles — and an additional investment in the biofuels industry to establish cellulosic ethanol as a viable alternative fuel — the million-plus new jobs created, the jobs saved and the substantial reduction in carbon dioxide emissions make this a win-win proposition.

"This is an endgame we should all be playing together to win, whatever your political persuasion," Lovins said.

PHOTO / **DONNA COVENEY**

Tsunami project exhibit

Rui Borges, house manager at Simmons Hall, checks out a panel from 'Sri Lanka: A Year After Tsunami,' an exhibition on the Tsunami Safe(r) Design, a project to build tsunami-resistant houses. The exhibition at Simmons Hall will be up through Friday, March 10. Viewing hours are 11 a.m. to 5 p.m. For more information on the project, visit web.mit.edu/newsoffice/2005/saferhouse.html.

AWARDS AND HONORS

Two MIT graduate students have been awarded 2006 Paul and Daisy Soros Fellowships. **Anna Bershteyn**, a native of Ukraine and graduate student in materials science and engineering, and **Theodore Marentis**, a native of Greece who is studying in the Harvard/MIT Division of Health Sciences and Technology, were both awarded Soros fellowships. The charitable trust founded by the Soroses was established to support graduate studies for immigrants and children of immigrants.

MIT's 2005 Rossby Award for outstanding Ph.D. thesis in the Program in Atmospheres, Oceans and Climates has been awarded to **Takamitsu Ito**. His thesis, "The Biogeochemistry and Residual Mean Circulation of the Southern Ocean," has laid the foundation for an understanding and quantification of the role of the Southern Ocean in the uptake of fossil fuel carbon dioxide and in biological productivity.

A team of four MIT undergraduates placed second in the Rotman International Trading Competition in February. Approximately 40 teams from around the world took part in the two-day competition, which consisted of a series of rigorous finance cases that required both technical and fundamental analysis. The team members are seniors **Paul Chou, Juthica Mallela** and **Irene Yen** and junior **Andrew Lisy**.

Endy gives talk on DNA programming

Deborah Halber
News Office Correspondent

In an effort to understand the enormous complexities of genes and proteins in a living organism, Drew Endy, assistant professor of biological engineering, is taking apart the pieces and putting them back together.

Endy and other researchers in the new field of systems biology are finding the experience a little like taking apart an engine and discovering they have no idea what most of the parts do.

Endy spoke on "languages and grammars" for programming DNA on Friday, March 3, as part of the spring 2006 seminar series on computational and systems biology sponsored by the MIT Computational Systems Biology Initiative (CSBi).

To simulate gene expression and get a sense of the dynamics of gene products, Endy and colleagues are coding the results of past experiments in a computation framework. "The goal is to engineer a surrogate genome that encodes a viable organism whose behavior is easier to predict," he said.

Applying engineering techniques to biology, he said, is a complementary approach to other ways of studying biological systems. If you take a gene and move it, what is the effect? It could result in too many variations to imagine.

"The approach we decided to take is to make a model of the system being explored using a computer so we can more quickly characterize the landscape of this system as it changes in the natural world," he said. The computer model allows more flexibility than a real-life laboratory experiment and allows the researchers to begin to develop a framework in which they can predict the effects of perturbations to the genome.

"Could we make a number of simultaneous changes to a genome that we could debug?" Endy said. To try, they assemble fragments of DNA to see if they can mimic Mother Nature.

To make the job easier, Endy and others at MIT are standardizing biological building blocks. In the 1800s, he pointed out, screw threads made in different machine shops were all slightly different, and a screw from one shop was not interchangeable with a screw from another. The industry agreed on standards, allowing many fields to move forward in a way not previously possible.

To that end, MIT has created the Registry of Standard Biological Parts so people can begin to use pieces of DNA in combination and see if they work. "You can grab a sequence and put it into your DNA synthesizer and give it a try," Endy said. "In Building 32, we have the DNA for a dozen terminators" (the DNA code that stops a genetic process so another one can begin). Anyone can try to fit the pieces together and engineer a unique living system, as students from around the world do each summer as part of the International Genetically Engineered Machine (iGEM) competition hosted by MIT.

CSBi is a campus-wide education and research program that links biologists, computer scientists and engineers in a multidisciplinary approach to the systematic analysis of complex biological phenomena.

NUKE

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regulatory perspectives on the U.S. nuclear power infrastructure.

While working for the senator, Lyons helped craft incentives for the nuclear power industry, hoping for one or two applications for new plants. Now that he's at the NRC, he's worried that the strategy was too successful: "The NRC is tremendously strapped (in terms of staff). We have to figure out how to process all these applications and do due diligence," he said.

No new U.S. construction permits have been issued for plants since 1978. In the meantime, countries such as Japan and France have moved ahead as world leaders in the industry, leaving the United States, which originally led the development of nuclear power, behind. The United States also lags in standardization that would allow more streamlined review of reactor design proposals and interchangeable training for different sites. "Our capability has partially atrophied," Lyons said.

> *Our civilian power plants are among the most secure sites in the entire world.*
>
> **Peter Lyons**
> Nuclear Regulatory Commissioner

Worries aside, Lyons is convinced nuclear power is central to America's energy future. "There's no doubt the national challenge is to meet growing needs for electricity in future decades," he said. "We should encourage fuel diversity and reduce dependence on foreign energy sources."

He predicted that the "intermittent character of solar and wind" will prevent them from playing a dominant role as future energy sources. "I don't know how to get a large percentage — as much as 15 or 20 percent — from intermittent sources," he said.

Coal may be tapped for electricity needs but will require new cost-efficient and environmentally friendly plants.

"The only other source is nuclear energy," Lyons said, and for nuclear energy to play a "strong supporting role, the public has to be confident of the safe and secure operation of existing plants."

Lyons cited a "very serious incident" in 2002 at the Davis-Besse Nuclear Power Station in Oak Harbor, Ohio, in which boric acid ate through six inches of a reactor pressure vessel head. "This could have been worse," he said; nevertheless, it indicated "serious failures on the part of the licensee and the NRC. We definitely don't want to see that again."

Lyons said a new oversight process is in place with more "objective, timely criteria for assessing performance" in reactor safety, radiation safety and safeguards against security threats.

Despite questions raised by the media about the security of research reactors such as the one at MIT, Lyons said, "Our civilian power plants are among the most secure sites in the entire world … no credible scenarios could result in radiological consequences from an attack."

Lyons' talk was sponsored by the Center for Technology, Policy and Industrial Development and the Engineering Systems Division.

Water purifier wins soldier design prize

Keeping soldiers healthy and safe was the theme of the day for competitors from MIT and the U.S. Military Academy at West Point, who vied for the top prize in the third annual Soldier Design Competition sponsored by MIT's Institute for Soldier Nanotechnologies.

"You make a difference," said U.S. Army Gen. Benjamin Griffin in his introductory remarks at the Wednesday, March 1, event on MIT's campus. "You make a difference to young men and women around the world." Past winners of the Soldier Design Competition have gone on to seek patents on their inventions, receive small business innovation research grants, and compete in the MIT $50K Competition.

The MIT team Radiant Flux took the first place award of $5,000 for designing and building a water purifier that sterilizes a liter of water in less than a minute using ultraviolet light. The portable device employs a hand crank to power the UV bulb. Team members are seniors Chandan Das and Justin Holland, junior Adam Leeb, and Gary Long, a staff member at Lincoln Laboratory.

Team EVCO, also from MIT, took second place, winning $3,000 for its device that distills water by harnessing the waste heat from an automobile engine.

Four $2,000 awards went to Team Battle Beacon of West Point for its GPS unit that works with current radio communications systems; the MIT students of team Safety Blast, who created a lightweight polycarbonate material that augments the Army's Interceptor Body Armor system by protecting lower-risk areas of the body; West Point's JoeProof team, for an improved door-breaching tool; and MIT team WaveMaster, for a height and velocity sensor to improve the accuracy of cargo airdrops.

Professor Ned Thomas, director of the Institute for Soldier Nanotechnologies and head of the Department of Materials Science and Engineering, presented the $1,000 Director's Award for Innovation to the MIT undergraduates of team HydrAlert, who designed a device to monitor soldiers' hydration levels.

The panel of judges included MIT Professors Merton Flemings and Henry Smith, Sycamore Networks founder Desh Deshpande, and Ethernet pioneer Robert Metcalfe (S.B. 1969). The competition is sponsored with donations from Raytheon, L3 Communications, Boeing, Foster-Miller, General Dynamics C4 Systems and Lockheed Martin.

Research at the Institute for Soldier Nanotechnologies, a multidisciplinary research center established in 2002 by a $50 million, five-year contract with the U.S. Army, focuses largely on materials and devices that will better protect soldiers.

PHOTO / **L. BARRY HETHERINGTON**

The great debate

Team Latke insisted on the superiority of the potato pancake over its rival Jewish delicacy, the hamentashen, during the annual Latke-Hamentashen Debate held Monday, March 6, in Room 10-250. Team members are, from left, Dean Robert Silbey, Associate Professor Diana Henderson, freshman Sara Segal and Assistant Professor Brian Robison. For the Team Hamentashen photo, visit web.mit.edu/newsoffice/.

OBITUARIES

Joan E. Wingo

Joan E. Wingo, a senior administrative assistant in the MIT Sloan School of Management, died Feb. 13.

Wingo had been an administrative assistant in the Management Science Area since October 1988. For the past six years, she also served as managing editor of the journal Operations Research, published by the Institute for Operations Research and the Management Sciences.

Wingo is survived by a brother, R. Scott Wingo of Vero Beach, Fla.; and two sisters, Pamela Harless of Plymouth, Mich. and Christina M. Larsen of Braintree.

Donations may be made to the Massachusetts Society for the Prevention of Cruelty to Animals, 350 S. Huntington Ave., Boston, MA 02130.

Frederick H. Anderson

Frederick H. Anderson Sr., a retired technical instructor in the metals processing lab, died Jan. 8 at his home in Derry, N.H. He was 83.

Anderson, a Navy veteran of World War II, worked at MIT for 42 years.

He is survived by three sons, Frederick H. Anderson Jr. of South Hampton, N.H., Robert E. Anderson of North Hampton, N.H. and Donald R. Anderson of Pelham, N.H.; a daughter, Judith A. MacNeill of Derry, N.H.; eight grandchildren and two great-grandchildren.

He was predeceased by his wife, Phyllis (Stewart) Anderson, and a special friend, Doris Kenney.

Donations may be made to the Rockingham County VNA and Hospice, 137 Epping Road, Exeter, NH 03833.

Salvatore J. Albano

Salvatore J. Albano, a longtime mechanic at MIT, died Feb. 7 at his home in Arlington, Mass. He was 88.

Albano worked at MIT from 1968 to 1987, repairing and operating wind tunnel machinery in the aerophysics laboratory.

He is survived by his wife, Civitina; a son, John Albano of Lake Forest, Calif.; a daughter, Jane Castiglioni of Arlington; three brothers, Rocco Albano and Cosmo Albano of Woburn, Mass., and Anthony Albano of Jacksonville, Fla.; two sisters, Mary Albano of Bedford, Mass., and Polly Calderone of Burlington, Mass.; five grandchildren; two great-grandchildren; and numerous nieces and nephews.

Donations may be made to the Arlington Boys and Girls Club, 60 Pond Lane, Arlington, MA 02474.

CLASSIFIED ADS

Members of the MIT community may submit one classified ad each issue. Ads can be resubmitted, but not two weeks in a row. Ads should be 30 words maximum; they will be edited. Submit by e-mail to ttads@mit.edu or mail to Classifieds, Rm 11-400. Deadline is noon Wednesday the week before publication.

HOUSING

Seeking roommate for 2BR apt. in Arlington. Avail. immediately. $600 + utilities. Near Mass. Ave. and #77 and 79 buses to Harvard & Alewife. ~7 mile drive to Lincoln Lab. Contact dheggestad@ll.mit.edu or David at 781-316-1729 (home) or 781-981-2329 (work).

3BR tri-level for rent/option to buy in Peabody. FHA, hrdwd, 1 1/2 baths, finished basement, garage, 19 miles from Lincoln Lab. Walk to school. One owner. $1,500/month + utilities. 781-521-9931 or calvani@ll.mit.edu.

For sale — contemporary townhouse in Somerville, 3 flrs, 5 rooms, 2BR, 1 1/2 baths, loft, private deck, deeded parking, central air, easy access to anywhere, public transportation. Asking $416,000, call 617-776-7507.

FOR SALE

Epson Stylus color flatbed all-in-one (print, copy, scan) Model #CX 4200, brand new in original carton. $60 /bst. Call 781-863-8421.

Student flutist winds up 10 years of solos

Lynn Heinemann
Office of the Arts

For the past decade, Ole Mattis Nielsen (S.B. 2001, S.M. 2002), a Ph.D. candidate in electrical engineering, has made his flute recitals an annual event at MIT.

This evening, he will perform his 10th and final student solo recital at MIT, with a program that includes Walter Piston's Sonata for Flute and Piano (with Yukiko Ueno, piano), Astor Piazzolla's "Études tanguistiques," and Beethoven's Serenade for Flute, Violin and Viola, opus 25 (with Professor Marcus Thompson, viola, and Sherman Jia '06, violin). The free concert is at 5 p.m. in Killian Hall.

Professor Marcus Thompson, who directs the Emerson Music Performance Program, estimates that Nielsen has performed in nearly 50 concerts at MIT. "It's fair to say that in the last decade Ole has performed impressively in more concerts at MIT than any other artist," said Thompson, who recalled Nielsen's "brilliant" fall 1998performance of Carl Nielsen's (no relation) flute concerto with the MIT Symphony Orchestra as "the one that still leaves me and my colleagues speechless."

PHOTO / **GRAHAM G. RAMSAY**

Ole Nielsen, a graduate student in electrical engineering, will perform his 10th and final student solo recital at MIT on Wednesday, March 8, at 5 p.m. in Killian Hall.

Although Nielsen says he never seriously considered becoming a professional musician, flute performance has been his most important hobby. "As a student at MIT, I have found it particularly important to have a non-academic activity to relax with, which at the same time feels purposeful and not a waste of time," Nielsen said.

A flutist since the age of 8, Nielsen acknowledges that he has taken advantage of all of MIT's performance opportunities, including those with the Emerson Music Performance Program, the MIT Chamber Music Society, the MIT Symphony Orchestra and the Ptolemy Players, a chamber music group created by his late friend and accompanist Jaemin Rhee.

"I have seldom said no to various small performance opportunities around the Institute," he said. "And I always feel honored to get the call."

After 10 years of recitals, has he run out of repertoire?

Nielsen's policy is not to repeat himself, and he says he's found that the flute repertoire is only limited if restricted to music from the romantic era. He credits his teacher, Sue-Ellen Hershman-Tcherepnin, one of Boston's most active and prominent flutists, with exposing him to music that postdates Mahler.

Hershman-Tcherepnin, who has taught at MIT since 1991, praises Nielsen's talent as well as his bravery, calling him undaunted by any challenge. She cites his performance of a composition by Icelandic composer Thorkell Sigurbjörnsson, in which Nielsen shrieked, hit the keys on his flute, hummed and played simultaneously. "One of the more striking things he had to do was swing a wind hose over his head," Hershman-Tcherepnin said.

According to Nielsen, the many friends and fond memories he's formed while making music at MIT "feels like half of my MIT life."

He said he hopes to finish his Ph.D. by June and then plans to work at Bose Corp. in Framingham. "I'll be in the area," he said. "And I will definitely keep up the flute!"

Science and art merge in 'Einstein's Dreams'

PHOTO / **MAURA J. ZIMMER**

An adaptation of 'Einstein's Dreams,' a novel by MIT physicist and author Alan Lightman, will be performed at MIT on Monday, March 13 at 7:30 p.m. in Room 10-250.

"Einstein's Dreams" keep coming to life.

Now translated into more than 30 languages, the best-selling novel "Einstein's Dreams" (1993) by MIT physicist Alan Lightman has been the basis for more than two dozen independent theatrical and musical productions.

One of these, an adaptation by Brian Niece and David Alford, has been selected as the inaugural event for a new multiyear collaboration between MIT and Underground Railway Theater (URT) that is dedicated to developing new plays about science. The new initiative is called the Catalyst Collaborative at MIT (CC@MIT).

"The sciences and the arts have a great deal to say to each other," said Lightman. "I'm delighted that MIT will be involved with a theatrical production of 'Einstein's Dreams,' not only as my home institution, but a place where science and the arts and creativity in general have always lived together happily."

On Monday, March 13, at 7:30 p.m., Boston actor, playwright and director Jon Lipsky will direct a free staged reading of "Einstein's Dreams," featuring Boston actors Eric Rubbe, Debra Wise and John Sarrouf, in Room 10-250.

A post-performance panel discussion will include Lightman; Debra Wise, artistic director of URT and artistic co-director of Catalyst Collaborative at MIT; and Robert Jaffe, the Jane and Otto Morningstar Professor of Physics at MIT.

A second free staged reading of "Einstein's Dreams" will take place at First Parish Church (3 Church St.) in Harvard Square on Tuesday, March 14, at 7:30 p.m. with a post- performance panel discussion with Lightman and Alan Guth, the V.F. Weisskopf Professor of Physics. Guth is a leading theoretical cosmologist best known for the role he has played in developing the fundamental ideas of cosmic inflation.

Set in Berne, Switzerland, in 1905, just before Einstein finished his Theory of Relativity, "Einstein's Dreams" creates time-tangled, absurd and poetic worlds that illustrate the tragedy and beauty of the human condition.

Future CC@MIT programs include a May reading of a play by Ira Hauptmann about the mathematician Ramanujan that is loosely based on "The Man Who Knew Infinity" by Robert Kanigel, head of the MIT Science Writing Graduate Program.

Associate Provost for the Arts Alan Brody, one of the collaborative's artistic directors, said, "CC@MIT will provide a large and diverse audience with a better understanding of our increasingly scientific and technological environment by presenting plays based on these complex themes."

The readings are supported in part by a grant from the Cambridge Arts Council.

For more information, call x3-2341.

Opera director puts talents to work at MIT

One of an occasional series featuring MIT staff members who are practicing artists.

Lynn Heinemann
Office of the Arts

ARTISTS AT WORK

Like many at MIT, Patricia Weinmann keeps a lot of proverbial balls in the air.

At MIT she is assistant coordinator of the Technology and Culture Forum (T&C), helping to organize lectures and symposia that explore the role of science and technology in promoting positive social, ecological and economic change.

But she is also a full-time faculty member in the New England Conservatory's Opera Studies Department and director of its Opera Workshop.

This weekend she is directing Mozart's opera, "Così fan tutte," New England Conservatory's salute to Mozart's 250th birthday.

Patricia Weinmann

Weinmann is also a director for Utah Opera and its Young Artist Program, traveling to Salt Lake City three to four times a year to train some of the country's most talented young singers. And, she directs the featured opera for Utah Symphony and Opera's Deer Valley Festival in Park City, Utah.

In addition, Weinmann is education advisor on the board of directors for the Boston-based Prometheus Dance, and partner in a new consulting company for presentation and communication skills.

How can one person juggle so much?

"Somehow it all gets done," Weinmann said, admitting that sleep is in short supply. "I've always been a very energetic person."

Weinmann said she finds renewal through her activities at MIT. She started working here 21 years ago while at graduate school at the Boston Conservatory. "I was always interested in global issues and politics, so it seemed like a great part-time job to get me through grad school," she said. But Weinmann enjoyed her work so much that even after she got her degree in opera direction/production, she decided to stay.

"The students and faculty we work with at T&C are fantastic people and they give me hope that mankind may have a chance yet," she said.

"Così fan tutte," New England Conservatory's salute to Mozart's 250th birthday, will be staged on Saturday, March 11, at 8 p.m. and Sunday, March 12, at 3 p.m. at the Cutler Majestic Theater (219 Tremont St., Boston). Tickets cost $15 plus fees. For more information, visit www.maj.org/P2006/nec_cosi.html.

PHOTO / **KIRSTIE LAIRD**

Sounds of India

Vocalist Shweta Jhaveri will perform khyal, a genre of Indian classical music, in a concert on Sunday, March 12, in Wong Auditorium at 4 p.m. The event, will also feature Uttam Chakraborty playing the tabla. Tickets range from $10 to $18; free for MIT students.

MIT EVENT HIGHLIGHTS MARCH 8-12

Science/ Technology | Performance | Architecture/ Planning | Humanities
Music | Exhibit | Reading | Special Interest
Business/ Money | Film | Sports | Featured Event

Buffalo boy

'Buffalo Boy' (2005), Nghiem-Minh Nguyen-Vo's award-winning film about a 15-year-old Vietnamese boy and his family's buffaloes, will be screened Saturday, March 11, in Room 10-250 at 7 p.m. The screening will be followed by a discussion with director Nguyen-Vo.

WEDNESDAY March 8

Chinese Foreign Policy Debates: "North Korea, Japan and the 'Peaceful Rise'"
Talk by Bonnie Glaser of the Center for Strategic and International Studies. Noon. Room E38-615. 253-7529.

Communications Forum: TV's New Economics
Talk by David Poltrack of CBS Television and Jorge Schement of Penn State. 5–7 p.m. Room E15-070. 253-3521.

Advanced Music Performance Recital
Recital by grad student and flautist Ole Nielsen. 5 p.m. Killian Hall. 253-2826.

THURSDAY March 9

MIT Chapel Concert: Pentimento
Eric Haas on recorders and flute and Olav Chris Henriksen on the lute play music from the Tudor courts. Noon. MIT Chapel. 253-2826.

Yoga Class
Yoga classes to be followed by lecture/discussion on Bhagwad Gita. 6:30–8:30 p.m. Room 34-302.

Chicks Make Flicks: "Nothing Like Dreaming"
Film and talk by Nora Jacobson. 7 p.m. Room 6-120.

Karaoke Night at the Thirsty Ear
Must be 21+. Proper ID required. 8 p.m. The Thirsty Ear Pub. 258-9754.

FRIDAY March 10

Women's Studies Open House
Learn more about women's studies, check out syllabi for women's studies classes, meet and talk to faculty, staff and students. 1:30-3:30 p.m. Room 14-316. 253-8844.

"The Husbandry of John Muir"
Talk by Donald Worster of the University of Kansas. 2:30–4:30 p.m. Room E51-095. 253-4965.

"Sustainable Energy Technologies — The Importance of Multiscale and Multidisclipinary Research"
Chemical Engineering Spring 2006 Seminar Series. Talk by Professor Jefferson W. Tester. 3–4 p.m. Room 66-110. 253-6500.

MIT Anime Club Weekly Showing
The MIT Anime Club shows both current and classic Japanese animated films and programs. 7 p.m. Room 6-120.

SATURDAY March 11

"Buffalo Boy"
Film screening followed by discussion with director Nghiem-Minh Nguyen-Vo. 7 p.m. Room 10-250.

"Life Is Beautiful"
LSC movie. $3. 7 p.m. and 10 p.m. Room 26-100. 253-3791.

Ballroom Social Dance (participatory)
8 p.m. $6 students; $10 general. Morss Hall in Walker Memorial.

hiLaRiUm @ Thirsty Ear Pub
The Walsh Brothers perform every Saturday. Must be 21+. ID required. 8 p.m. Thirsty Ear Pub. 258-9754.

SUNDAY March 12

Gallery Talk
Talk by List Visual Arts Center staff in conjunction with "America Starts Here — Kate Ericson and Mel Ziegler 1985-1995." 2 p.m. Building E15. 253-4680.

MITHAS Concert
Shweta Jhaveri on the khyal and Uttam Chakraborty on the tabla. $18; $14 MITHAS members; $10 students; MIT students free. 4 p.m. Building E51, Wong Auditorium. 258-7971.

Go Online! For complete events listings, see the MIT Events Calendar at: http://events.mit.edu.
Go Online! Office of the Arts website at: http://web.mit.edu/arts/office.

EDITOR'S CHOICE

MEXICAN CELEBRATION
Mar. 8
Event will feature Mexican culture, food and music. $3.
W85 Basement Lounge
7-9 p.m.

SIMON STARLING
Mar. 9
CAVS Artist's Presentation: British-born artist Simon Starling discusses his sculptures.
Room N52-390
6:30 p.m.

PIRATES' BALL
Mar. 12
Pirate tales and storytelling, treasure hunt, pirate movies and much more. $6, ages 3 and up.
Morss Hall
2-4 p.m.

MIT EVENT HIGHLIGHTS MARCH 13-19

MONDAY March 13

"The Citadel of Jerusalem Revisited: An Architectural and Archaeological Investigation"
Talk by architect Mahmoud Hawari. 5:30-7:30 p.m. Room 3-133. 253-1400.

"Being Young, Being Here, Being Muslim"
A panel discussion with MIT students. 7 p.m. Room 32-124. 253-4771.

Staged Reading of "Einstein's Dreams"
Adaptation by David Alford and Brian Niece of the best-selling novel "Einstein's Dreams" by author and MIT physicist Alan Lightman. 7:30 p.m. Room 10-250.

Purim Party
Come in costume. 8-10 p.m. W11, main dining room 253-2982.

TUESDAY March 14

"How Were the Arab Peoples Betrayed?"
Talk by Rima Khalaf Hunaidi, U.N. assistant secretary-general and director of the United Nations Development Program's Regional Bureau for Arab States. 4:30–6:30 p.m. Room E51-095. 253-8961.

The 13th Pietro Belluschi Lecture: "Working Progress"
Talk by architect Thom Mayne. 6:30 p.m. Room 10-250. 253-7791.

Free Beginner Salsa Lesson and Dance
7:30-11 p.m. Morss Hall, Walker Auditorium

St. Patrick's Day Gala Contra Dance
Spring PE credit available. $5, MIT/ Wellesley students free. 8-10:30 p.m. Stratton Student Center, Room 407. 354-0864.

WEDNESDAY March 15

Fourth Annual Juried Student Origami Exhibition
Exhibition of winners of student competition. Open 24 hours. Wiesner Student Art Gallery (Stratton Student Center 2nd floor). Open 24 hours. 253-7019.

Object Lesson: "RoboTuna and the Future of Marine Robotics"
Gallery talk by Kurt Hasselbalch, curator of the Hart Nautical Collections, who will discuss "RoboTuna" and some of the latest research from MIT's Center for Ocean Engineering. Noon. MIT Museum. 253-4444.

Israeli Dancing
Every Wednesday. 8-11 p.m. Room W20-407. 253-FOLK.

THURSDAY March 16

MIT Chapel Concert
John Ferguson playes Cage's "One10" and Bach's "Partita in B minor BWV 1002" on the violin. Noon. MIT Chapel. 253-2826.

House Music Project
Project conceived and performed by Associate Professor Thomas DeFrantz with special guest dance artists. March 16-19. $10, $6 students. 8 p.m. except 2 p.m. on March 19. Kresge Little Theater. 253-4720.

"King Lear"
MIT Shakespeare Ensemble production. March 16-18 and 23-25
$8, $6 students. 8 p.m. Sala de Puerto Rico. 253-2903.

FRIDAY March 17

Advanced Music Performance Concert
MIT sophomore pianist Crystal Chao plays J.S. Bach's "French Suite No. 2 in C minor"; Elliott Carter's "Piano Sonata" and Johannes Brahms' "Three Intermezzi." 5 p.m. Killian Hall. 253-2826.

No Longer "New" — Public Art of the '80s and '90s in Retrospect
Panel discussion with MIT Associate Professor Wendy Jacob and artists Mel Chin and Miwon Kwon. 6:30 p.m. Bartos Theater. 253-4680.

MIT Symphony Orchestra
Mozart's overture to "The Magic Flute"; Shostakovich's "Prelude and Scherzo, Op. 11"; Harbison's "Darkbloom: Overture to an Imagined Opera"; Copland's Symphony No. 3. $5. 8 p.m. Kresge Auditorium. 253-2826.

SATURDAY March 18

Gallery Talk
Talk by Bill Arning, curator of the List Visual Arts Center, in conjunction with "America Starts Here — Kate Ericson and Mel Ziegler 1985-1995." 2 p.m. List Visual Arts Center. 253-4680.

MIT Juggle Mania II Performance
Performance by the MIT Juggling Club members and professional performers. 6:30–8 p.m. Room 54-100.

MIT Wind Ensemble
Strauss' "Serenade in E flat"; Holst's "Suite in E flat"; Schuman's "George Washington Bridge"; Husa's "Music for Prague 1968." $5. 8 p.m. Kresge Auditorium. 253-2826.

SUNDAY March 19

Hibur: MIT-Technion Link's Lecture Series
Talk by Uri Shamir of the Technion-Israel Institute of Technology. 10-11:30 a.m. Room 9-057. 253-2982.

Chantey Sing
Local chantey singers perform a variety of historic songs that celebrate the sea and the hard work that went into exploring it. 1-4 p.m. MIT Museum.