**Engineered yeast improves ethanol production**

**Anne Trafton**

MIT scientists have engineered yeast that can improve the speed and efficiency of ethanol production, a key component to making biofuels a significant part of the U.S. energy supply.

Currently used as a fuel additive to improve gasoline combustibility, ethanol is often touted as a potential solution to the growing oil-driven energy crisis. But there are significant obstacles to producing ethanol: one is that high ethanol levels are toxic to the yeast that ferments corn and other plant material into ethanol. By manipulating the yeast genome, the researchers have engineered a new strain of yeast that can tolerate elevated levels of both ethanol and glucose, while producing ethanol faster than unengineered yeast. The work is reported in the Dec. 8 issue of Science.

Fuels such as E85, which is 85 percent ethanol, are becoming common in states where corn is plentiful; however, their use is mainly confined to the Midwest because corn supplies are limited and ethanol production technology is not yet efficient enough.

Boosting efficiency has been an elusive goal, but the MIT researchers, led by Hal Alper, a postdoctoral associate in the laboratories of Professor Gregory Stephanopoulos of chemical engineering and Professor Gerald Fink of the Whitehead Institute, took a new approach. The key to the MIT strategy is manipulating the genes encoding proteins responsible for regulating gene transcription and, in turn, controlling the repertoire of genes expressed in a particular cell. These types of transcription factors bind to DNA and turn genes on or off, essentially controlling what traits a cell expresses.

The traditional way to genetically alter a trait, or phenotype, of an organism is to alter the expression of genes that affect the phenotype. But for traits influenced by many genes, it is difficult to change the phenotype by altering each of those genes, one at a time.

Targeting the transcription factors instead can be a more efficient way to produce desirable traits. "It is the makeup of the transcripts that determines how a cell is going to behave and this is controlled by the transcription factors in the cell," according to Stephanopoulos, a co-author of the paper.

The MIT researchers are the first to use this new approach, which is akin to altering the central processor of a computer (transcription factors) rather than indi-

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**PARTNERSHIP**

Robin H. Ray
News Office Correspondent

The seven-year, $25 million iKampus partnership between MIT and Microsoft, which has borne fruit across the globe, was celebrated at a symposium at the Tang Center Dec. 1 and 2.

Called "Learning Without Barriers: Technology Without Borders: Celebrating the MIT-Microsoft iKampus Alliance," the symposium brought together industry leaders, educators and government officials to discuss the progress that Campus has facilitated in educational technology, to reflect on the challenges facing science, technology, engineering and math (STEM) education, and to sample the remarkable initiatives that are being undertaken amid a climate of ever-accelerating technological change.

Tom Magnanti, dean of engineering, and Rick Rashid, senior vice president for research at Microsoft, delivered the symposium’s opening remarks to a crowd of some 150 participants. Magnanti observed that a national self-examination was underway, as statistics point to a deadly decline in the percentage of U.S. students concentrating in engineering and computer science, while elsewhere in the world the numbers are rising. This trend, coupled with the continuing failure to attract talented female and minority students to these fields and to retain those who express early interest, has grave implications for the United States’ long-term competitiveness and the ability of the economy’s tech sector to grow and thrive.

As Rashid commented during the morning panel discussion, “It’s reasonable to start thinking about panicking.”

But there are also many signs of dynamic innovation in STEM education, including numerous projects sponsored by the Campus alliance, that show promise...
Stephen Meyer, expert on interaction of science, economics and politics, dies at 54

Stephanie Schorow
News Office/Department

Stephen M. Meyer, MIT political science professor, an expert in national security and arms control who co-founded a climate advocacy group, died Dec. 10 at the age of 54. The cause was cancer.

Meyer, the director of an MIT Project on Environmen-
tal Security and Policy, and a member of the MIT Council on the Environment, focused his teaching and research on the interac-
tion of science, economics and politics in policymaking, par-

icularly in the areas of natural resource exploitation, land use and wildlife habitat preservation.

A researcher with a wide range of interests, Meyer concentrated on arms control, Soviet military programs and weapons proliferation. He first joined the MIT faculty in 1980. In 1984, he pub-
lished his first book, "The Dynamics of Nuclear Security," with Carlo Cap- 

poggi. Later, he turned his attention to environmental issues, publishing "Environmental Protection and Eco-

nomics," (MIT Press), in 1990. In September Meyer published "The End of the World" (Boston Review), a call to action on preserving it, was left to -

sustainability, including the creation of transregional "meta-research" hot-

kitchen. He was a coauthor of many journal articles, research papers and book chapters on

problems, structure and organization of the issues that exist today—in or,

have and will."

Meyer received his M.A. and Ph.D. in political science from the University of Michigan. He joined MIT as an assistant professor in 1980 and earned promotion to associate professor in 1990. In 1997, he became a faculty associ-
ate with the Tufts School of Veterinary Medicine.

Meyer also worked in a wide range of nonacademic positions. He was a member of the RAND Corporation from the 1980s as a consultant to the RAND Cor-

poration and the U.S. government. From 1997 on, he was as the principal investi-
gator for the National Council on Soviet and East European Studies. In the late 1990s, he served on committees of the Massachusetts Division of Fisheries and Wildlife and the Massachusetts Depart-
ment of Environmental Protection. In 2002 he became a principal investigator of the National Science Foundation in the area of dynamics of community-based environmental protection. In 2003 he was awarded the Francis W. Sargent Conservation Award from the Massachusetts Division of Fisheries and Wildlife.

In 2004, Meyer was honored with the Arthur C. Smith Award, which is given to MIT faculty members for meaningful con-

tribution to undergraduate student life at MIT. Meyer also served on the board of advisors of the National Geographic Society's Fund for the Future from 1999 to 2002, the editorial board of Inter-

national Studies Quarterly from 1998 to 2000, and the editorial board on Science, Arms Control and National Security of the American Association for the Advanc-

tement of Science from 1989 to 1992. He was an adjunct research fellow at the Cent-

er for International Security and Arms Control at Harvard University from 1989 to 1995.

Meyer was a research associate in the office of the author of numerous journal articles, research papers and book chapters on

issues of arms control and the environ-

ment. His MIT activities ranged from a

seat on the MIT ROTC Committee from 1987 to 1994 to a position on the executive commit-


In September, even while struggling with cancer, Meyer agreed to write an essay about the issues he explored in "The Dynamics of the Wild" for "The Science of the Globe," using speech-to-text software because, as he told the organizers of the essay, his hands were paralyzed. In a e-mail to editors, published by the Globe on Sept. 28, Meyer wrote, "This will be the last article I ever publish and I'm happy about the message it carries."

In the article, Meyer concluded: "The global biodiversity collapse under way is unstoppable. Yet we can influence how it plays out in our own backyards. Obvi-

ously we should protect ourselves from insect-borne disease. But our solutions must be effective, and we must thorough-

ly examine the consequences. This means becoming more aware of the diversity of the living space with us and how our individual actions matter. It would be a shame if fireflies, spring peepers and lady

bugs become mere memories in our backyards."

Meyer was survived by his wife, Deborah M. Dünser, a son, Seth Meyer, his parents, Harvey and Rebecca Meyer of Worcester; and a brother, Kenneth, son of Joseph and Florence Tenn.; a sister, Deborah Blumenthal of Rockville, N.Y.; and nephews.

The memorial service will be held Wednesday, Dec. 13, from 3 to 7:30 p.m. at Jesus' University Memorial Chapel, 665 East Post Rd. (Rte. 20), Sudbury. In lieu of flowers, the family requests donations to the Dr. Stephen M. Meyer Environmental Research Fund, c/o of Sudbury Employees Federal Credit Union, 278 Old Sudbury Rd., Sudbury, MA 01776.

SENSEable City Lab reveals ‘friendspotting,’ new social networking application

MIT researchers today unveiled a new social networking application that will make it possible for anyone to see the location of another person's cell phone — even if they share no direct ties to the phone owner.

Known as iFIND, the new technology was developed by researchers in the Insti-
tute for Soldier Nanotechnolo-

gy's (ISN) iFIND project. iFIND will give all 20,000 members of the MIT community the ability to accu-

rately calculate their location on campus, using WiFi access points, and to choose if, personal information could be managed

in a way that maintains their privacy. iFIND currently deals with loca-
tion data, but a whole array of additional

information about a person — such as their health, moods and behaviors — could potentially be accessed.

"Our goal is to create a tool that would allow friends to track each

friend, and to share that information with classmates," said Scott Ratti, whose research projects have explored the connection between wireless technologies and physical space.

"iFIND is unique compared with similar applications that are being developed for the market, in part because of the extreme precision of its positioning system. More significantly, iFIND has been built with par-
ticular attention to privacy and data storage issues," Ratti said. "It's

in the interests of everyone involved to maintain privacy. iFIND currently deals with loca-
tion data, and everything happens on encrypted peer to peer transmissions among users.

"If one user logs into a new wireless hot-

dot network, the whole network is intellige-
to the client application instead of an internal server, so nobody can track your position unless you want them to, and you decide how long that information is available to others," said Ratti.

ISN’s distributed platform gives users full control over the sharing and anonymi-

sation of their data—something that could potentially be an issue today’s smartphones share their locations. In this sense, iFIND's locationing platform was made possible with the technology of the SENSEable City Lab, which has pioneered "friendspotting," a social networking application that will be able to identify the presence of friends in a social networking application.

"We want to make sure that we can maintain the privacy of people's personal data," Ratti said. "iFIND’s distributed platform gives users full control over the sharing and anonymi-

sation of their data—something that could potentially be an issue today’s smartphones share their locations. In this sense, iFIND's locationing platform was made possible with the technology of the SENSEable City Lab, which has pioneered "friendspotting," a social networking application that will be able to identify the presence of friends in social networking application.

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**MIT-CIMIT winner will research ways to assess neuromuscular disease**

The Center for Integration of Medicine and Engineering (CIMIT), in collaboration with the MIT School of Engineering recently announced the award of the first MIT-CIMIT Engineering Fellowship. Olumuyiwa Ogunnaike, a graduate student in the Department of Electrical Engineering and Computer Science at MIT, will use the $50,000 award to support research toward a device for assessing neuromuscular disease.

Thomas L. Magnanti, dean of the MIT School of Engineering, said of the new joint award, “Since medicine and health care is increasingly among the most critical issues that we all face, we are delighted to partner with CIMIT in offering the new MIT-CIMIT Medical Engineering Fellowship. It not only provides support for one of our outstanding and talented students; it advances all of us toward our common goal of improving medicine and medical care in all its forms.”

The award was announced at the CIMIT reception held at the Boston Harbor Hotel in November.

Ogunnaike’s current project involves the development of an integrated circuit for a handheld electrical impedance probe for the assessment of muscle function. His other interests are in the application of analog and mixed-signal circuit design techniques to solving biomedical instrumentation and diagnostic problems.

**Political scientists comment on Iraq**

The Iraq Study Group, headed by former Secretary of State James A. Baker, released its report to the White House on Dec. 6. That day, four former foreign policy experts presented their background papers at a press conference which dealt with the emerging situation. Below are excerpts from the commentary:

**Barbara Bodine**

**Terror, Insurgency and the State** (Penn Press, 2007)

- **The United States and other interested parties should look into the possibility of setting up an international financial mechanism for Iraqi oil revenues.**
- **Iraqi and international parties—regional and other powers—should be convened to try to contain any civil war in Iraq, and possibly to limit its duration and intensity.**

**Barry Posen**

**The Ford Foundation Professor of Political Science and director of the Security Studies Program**

- **The United States should set a date certain for the disengagement of its combat forces from Iraq and announce it to the world.**
- **There is no magic formula, but the disengagement date should be soon enough so that it seems real to the parties, and delayed long enough so that we can plan and conduct the disengagement carefully.**

**Stephanie Schorow**

**Office News Correspondent**

- **The United States and other interested parties should look into the possibility of setting up an international financial mechanism for Iraqi oil revenues.**
- **Iraqi and international parties—regional and other powers—should be convened to try to contain any civil war in Iraq, and possibly to limit its duration and intensity.**

**December 13, 2006 PAGE 3**
Researchers find nearly 47,000 genetic variations in parasite responsible for one death every 30 seconds

An international research team has completed a map that charts the genetic variability of the human malaria parasite, Plasmodium falciparum. The work, published in the Dec. 10 advance online edition of Nature Genetics, has already unearthed novel genes that may underlie resistance to current drugs against the disease.

The study reveals striking variation within the pathogen’s genome, including an initial catalog of nearly 47,000 specific genetic differences among parasites sampled worldwide. That's more than double the expected level of diversity in the parasite’s DNA. These differences lay the foundation for dissecting the functions of important parasite genes and for tracing the global spread of malaria.

The scientists who created the map are from the Broad Institute of MIT and Harvard, the Harvard School of Public Health and Cheikh Anta Diop University in Senegal, where malaria is endemic.

“Malaria remains a significant threat to global public health, driven in part by the genetic changes in the parasite that causes the disease,” said senior author Dyann Wirth, a professor at the Harvard School of Public Health and co-director of the Broad Institute’s Infectious Disease Initiative. “This study gives us one of the first looks at genetic variation across the entire malaria parasite genome—a critical step toward a comprehensive genetic tool for the malaria research community.”

Plasmodium falciparum—the deadliest of the four parasites that cause malaria in humans—kills one person every 30 seconds, mostly children living in Africa. Despite decades of research, the genetic changes that enable it to escape the body’s natural defenses and to overcome malaria drugs remain largely unknown.

To gain a broad picture of genetic variability—worldwide and genome-wide—the scientists analyzed more than 50 different P. falciparum samples from diverse geographic locations. This included the complete genome sequencing of two well-studied samples, as well as extensive DNA analyses of 16 additional isolates.

By comparing the DNA sequences to each other and to the P. falciparum genome sequenced in 2002, the researchers uncovered extensive differences, including 47,000 single-letter changes called single nucleotide polymorphisms (SNPs). Although there are probably many more SNPs to be found, this initial survey provides a launching point for future systematic efforts to identify parasite genes that are essential to malaria.

“The roles of most of the malaria parasite’s genes are still not known,” said Sarah Volkman, a research scientist at the Harvard School of Public Health. “An important application of this new tool will be in pinpointing the genes that are vital to the development and spread of malaria.”

Volkman and Pardi Sabot, a postdoctoral associate in chemical engineering Gregory Stephanopoulos, left, postdoctoral associate Hal Alper and professor of biology Gerald Fink. The researchers have engineered a new strain of yeast that can produce ethanol more rapidly and efficiently.

Chemists propose methods for storing solar energy

Chemistry’s role in bridging the gap between solar energy’s limited present use and enormous future potential was the topic of a recent article by MIT Professor Daniel G. Nocera and a colleague.

In 2001, approximately 86 percent of the world’s energy was obtained from fossil fuels. While fuel reserves are sufficient to support an energy demand that is expected to triple by 2110, the more immediate problem lies in stabilizing excess atmospheric carbon dioxide, a key contributor to global warming, by adopting more carbon neutral power sources.

The sun’s vast energy could be an ideal power source. More energy from sunlight strikes the Earth in one hour than is consumed by the planet in one year. Yet in 2001 solar energy accounted for less than 0.1 percent of total electricity.

The major hurdle to overcome is developing a cost-effective method of storage. “We need energy when the sun doesn’t shine,” said Nocera, the W. M. Keck Professor of Energy and professor of chemistry.

Nocera and Nathan S. Lewis of Caltech suggest that we borrow from nature and store solar energy in the form of chemical bonds, as plants do in photosynthesis. The mechanism would involve splitting water to generate oxygen and storable fuels such as methane or other hydrocarbons.

In an October issue of the Proceedings of the National Academy of Sciences, the two propose several possible reactions. They note, however, that advances in chemistry such as the development of suitable catalysts for water-splitting are crucial for solar energy to reach its full potential.

MIT professor of chemical engineering Gregory Stephanopoulos, left, postdoctoral associate Hal Alper and professor of biology Gerald Fink. The researchers have engineered a new strain of yeast that can produce ethanol more rapidly and efficiently.

BIOFUELS

Continued from Page 1

vital software applications (genes), says Fink, an MIT professor of biology and a co-author on the paper.

In this case, the researchers targeted two different transcription factors. They got their best results with a factor known as a TATA-binding protein, which when altered in three specific locations caused the over-expression of at least a dozen genes, all of which were found to be necessary to elicit an improved ethanol tolerance, thus allowing that strain of yeast to survive high ethanol concentrations.

Because so many genes are involved, engineering high ethanol tolerance by the traditional method of overexpressing individual genes would have been impossible, says Alper. Furthermore, the identification of the complete set of such genes would have been a very difficult task, Stephanopoulos adds.

The high-ethanol-tolerance yeast also proved to be more rapid fermenters. The new strain produced 50 percent more ethanol during a 21-hour period than normal yeast.

The prospect of using this approach to engineer similar tolerance traits in industrial yeast could dramatically impact industrial ethanol production, a multistep process in which yeast plays a crucial role. First, cornstarch or another polymer of glucose is broken down into single sugar (glucose) molecules by enzymes, then yeast ferments the glucose into etha

Last year, four billion gallons of ethanol were produced from 1.43 billion bushels of corn grain (including kernels, stalks, leaves, cobs, husks) in the United States, according to the Department of Energy. In comparison, the United States consumed about 140 billion gallons of gasoline.

Other co-authors on the Science paper are Joel Mosley, an MIT graduate student in chemical engineering, and Elke Nevoigt of the Berlin University of Technology.

The research was funded by the DuPont-MIT Alliance, the Singapore-MIT Alliance, the National Institutes of Health and the U.S. Department of Energy.

For spacious skies

MIT alumn Nicholas J.M. Patrick (S.M. 1990, Ph.D. 1996, mechanical engineering) and his six astronaut colleagues were launched aboard Discovery on a mission to the International Space Station on Dec. 9. While at MIT, Patrick was a research assistant in the Human-Machine Systems Lab in the Department of Mechanical Engineering. He was selected as a NASA astronaut in 1998. Discovery also carried key elements of MIT’s SPHERES experiment developed by the Space Systems Lab in the Department of Aeronautics and Astronautics.
### Beyond silicon: New MIT transistor technology may power next-generation microelectronics

MIT engineers have demonstrated a technology that could introduce an entirely new phase of the microelectronics revolution that has already brought us iPods, laptops, and much more.

"The work will be presented at the IEEE International Electron Devices Meeting Dec. 11-13 by Dae-Hyun Kim, Karl Reid, and Karl Deutsch," said Jesús del Alamo, director of the Microsystems Technology Laboratories (MTL). "Unless we do something very radical pretty soon, the microelectronics revolution that has enriched our lives in so many different ways might come to a screeching halt," said del Alamo.

The problem? Engineers estimate that within the next 10 to 15 years we will reach the limit, in terms of size and performance, of the silicon transistors key to the industry: "Each of us has several billion transistors working on our behalf every day in our phone, laptop, iPod, car, kitchen and more," del Alamo noted.

As a result, del Alamo’s lab and others around the world are working on new materials and technologies that may be able to reach beyond the limits of silicon. "We are looking at new semiconductor materials for transistors that will continue to improve in performance when the silicon devices get smaller and smaller," del Alamo said.

One such material del Alamo and his students at the MTL are investigating is a family of semiconductors known as III-V compound semiconductors. Unlike silicon, these are electronic materials. A particularly hot prospect is indium gallium arsenide, or InGaAs, a material in which electrons travel many times faster than in silicon. As a result, it should be possible to make very small transistors that can switch and process information very quickly.

Del Alamo recently demonstrated that this promising material could be used in InGaAs transistors that can carry 2.5 times more current than state-of-the-art silicon devices. More current means the key to faster operation. In addition, each InGaAs transistor is only 60 nanometers, or billionths of a meter, long. That’s similar to the most advanced 65-nanometer silicon transistors available in the world today.

The 60-nanometer InGaAs quantum-well transistor demonstrated by Professor del Alamo’s group shows that it’s a good idea to mix up the groups in classes—"You can even get InGaAs materials working at 65 nanometers,” del Alamo said.

In addition to Intel, this research is sponsored by the Singapore-Austria Institute of Materials Engineering and Technology of Singapore.

Del Alamo notes, however, that InGaAs transistor technology is still in its infancy. Some of the challenges include manufacturing transistors in large quantities, because InGaAs is more prone to breakage than silicon. But del Alamo expects prototype InGaAs microdevices at the required dimensions to be developed over the next two years and the technology to take off in a decade or so.

"With more work, this semiconductor technology could greatly surpass silicon and allow us to continue the microelectronics revolution for years to come," del Alamo said.

In contrast, Silicon Valley is working on new materials and technologies that may be able to reach beyond the limits of silicon in the long term. These technologies include silicon-on-insulator (SOI), germanium (Ge) and other materials that have different bandgaps than silicon.

However, the promise of these technologies is not yet fully realized, and they are unlikely to replace silicon in the near term. In fact, silicon remains the dominant material for transistors and other electronic devices, due to its superior properties and scalability.

In summary, the MIT research on InGaAs transistors represents a promising step forward in the development of next-generation semiconductor technologies. However, more work is needed to overcome the challenges associated with these materials, such as manufacturing and integration issues.

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### Virtual lab partners and plush robo-pet are fruits of iCampus

**Robbin H. Ray**

*News Office Correspondent*

The iCampus celebration, “Learning Without Borders,” featured not only a symposium to honor the MIT-Microsoft alliance, but also live demonstrations of some educational technology initiatives that emerged from the eight-year partnership.

The MIT Museum offered compelling glimpses of technologies that promise to revolutionize science teaching, from classrooms to hospital wards. These include Technology-Enabled Active Learning (TEAL), iLab, Classroom Learning Partner (CLP) software; and the Huggable, a robotic companion animal.

Peter Dourmaschkin, senior lecturer in physics at MIT and associate director of the Experimental Study Group, was on hand to present TEAL. The TEAL classroom was renamed Dourmaschkin Classroom after it started with real estate. Instead of having the lecturer poised before an inert mass of students who eventually enroll in the college at which they were accepted,” the article said.

Among the 30 highest-ranked universities in the country, MIT ranked 12th in terms of black enrollment. The University of North Carolina at Chapel Hill was number one with 12.3 percent, and MIT was 12th with 8.1 percent.

This year’s freshman class of 1,000 includes 81 black freshmen—8.1 percent. This is up from 58 blacks in the 2005 entering class.

A recent survey obtained information on the number of African-American applicants, their acceptance rates, enrollment numbers and yield rates (the percentage of students who eventually enroll in the college at which they were accepted),” the article said.

### MIT ranks 12th in black enrollment

**Sasha Brown**

*News Office*

MIT has made huge diversity gains this year, according to the Journal of Blacks in Higher Education’s 14th annual survey of the percentages of black students at the nation’s highest-ranked universities and liberal arts colleges.

This year’s freshman class of 1,000 includes 81 black freshmen—8.1 percent. This is up from 58 blacks in the 2005 entering class.

"The survey obtained information on the number of African-American applicants, their acceptance rates, enrollment numbers and yield rates (the percentage of students who eventually enroll in the college at which they were accepted),” the article said.

Among the 30 highest-ranked universities in the country, MIT ranked 12th in terms of black enrollment. The University of North Carolina at Chapel Hill was number one with 12.3 percent, and MIT was 12th with 8.1 percent.

This recent progress is an outward reflection of our rigorous and sustained commitment to ensure that talented students from all walks of life have access to MIT,” said Karl Reif, executive director for special programs for the School of Engineering. "While we are proud that African-Americans are coming to MIT in almost record numbers, we are even more proud that they, like all our students, are thriving both academically and socially at MIT."

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### Exner Medal

Shuguang Zhang, associate director of MIT’s Center for Biomedical Engineering, received Austria’s 2006 Exner Medal for outstanding contributions to science and technology. The Exner Medal, named after President of Austria, Heinz Fischer, pictured left, Zhang, right, was honored for his work with self-assembling peptides—microporous structures of amino acids with seemingly inexhaustible possibilities for producing new materials. Two other MIT scientists have won the Exner Medal: Charles H. Townes (1970), a physicist who served as provost of MIT and Austin (Gus) F. Witt (1975), Zhang is the first Chinese scientist to receive the Exner Medal.

**Photograph COURTESY OF HOFBURG PALACE, PRESIDENTIAL OFFICE OF AUSTRIA**
Sage on a stage — no more

The keynote address given by John Searle, professor of philosophy at the University of California at Berkeley, and a renowned philosopher who is often described as a mono-Logos to lasers

In the afternoon session, educators took the floor, presenting creative educational strategies and models from the United States and abroad. Cindy Williams, a professor of biology at MIT and a member of the Whitehead Institute for Biomedical Research, described the use of human subjects in research. She said, "We are clearly doing many things right."
MIT musicians perform at MFA

Joanna Michalowski
Office of the Arts

Two MIT-based musical groups, each drawing from a different cultural tradition, will perform over the next two weeks at the Museum of Fine Arts in Boston, as part of its “MFA for the Holidays” series (Dec. 9-17), featuring an array of eclectic performances taking place each day at various locations within the museum.

The MIT Klezmer Band, under the direction of Prof. Jonathan Haas, will be among the performers featured in the nine-day series of events. Appearing on Thursday, Dec. 14, from 1:30 to 2:30 p.m. in the Koch Gallery, the band will perform traditional klezmer music, which originated centuries ago in Eastern Europe, in an energetic performance art that incorporates exhilarating drumming, circle dancing, and singing.

Composed of students from MIT, Harvard, Boston University and other schools, as well as community members from the greater Boston area, the MIT klezmer band comprises two violins, a piano and bass, played by Scott Arfin, a Ph.D. student in electrical engineering and computer science. Klezmer music, which originated centuries ago in Eastern Europe, is a traditional but secular music of the Jewish people that was performed during religious occasions, particularly weddings.

The band has experienced “a renaissance in the United States in the past 20 years or so,” said Arfin. While KlezMITron (previously known as MIT Klez), a klezmer group comprised of two violins, a bass, a daf (a small drum), and the gong (a barrel drum), has participated in several klezmer music festivals, the MIT Klezmer Band enjoys a more unique format. Says Arfin: “The fusion of klezmer with jazz.”

Performing in the museum’s Lower Rotunda on Sunday, Dec. 17, from 2:30 to 4 p.m. is KlezMitron (previously known as MIT Klez), a klezmer group comprised of two violins, a bass, a daf (a small drum), and the gong (a barrel drum). Jang, who has participated in the group since she was a freshman, recalls the first time she saw the klezmer performances before coming to MIT: “I really loved the energy. They embodied the phrase, ‘bursting with joy.’”

The MIT Museum is currently showcasing the exquisite beauty of the simple microscope, the portable single-lens instruments invented in the 17th century and famed by naturalists such as Antoine van Leeuwenhoek, Carl Linnaeus and Charles Darwin. Titled “ Singular Beauty,” it is the site of a comprehensive exhibition of this instrument by an American museum. It runs through Sept. 16, 2007.

The microscope is one of the iconic instruments of the life sciences. While a display of this type is of great interest to historians and collectors of scientific instruments, what is less obvious is how fascinating these instruments are to those on the cutting edge of microscopy research, said MIT Museum curator of science and technology Deborah Douglas. Underlining the value of displaying historical instruments, the exhibition features images from six MIT laboratories and displays 127 instruments from the rich collection of Raymond V. Giordano. Along with Douglas, Giordano co-curated the exhibition and authored the catalogue. A noted appraiser of scientific instruments and books, Giordano has collected simple microscopes for 30 years.

“Besides its historical aspect, the simple microscope, in its many variations, is a pleasure to handle and study. Clearly instrument makers used their ingenuity to advance the field, and importantly, to gain a competitive edge. Today we can marvel at their accomplishments—optical, mechanical and aesthetic.”

The exhibit, called “Singular Beauty,” offers a variety of ingenious instruments. Examples range from one of the early simple microscopes of the type designed by the Dutchman van Leeuwenhoek to the pocket instruments made by the American optical firm Barlow & Lamb. Most of the instruments are tiny, some less than an inch across, but even the largest can be easily carried. These elegant tools are made of wood, silver, brass, ivory, horn and glass. In addition to the microscopes, the exhibition includes reproductions of illustrations from historic scientific texts, catalogs, brochures and handbills.

A small display of images of contemporary microscopy at MIT is also on view in the gallery. This display was researched and co-curated by MIT student Isolante Chronis, Class of 2006, with the support of the MIT Undergraduate Research Opportunities Program.
Hobby Shop aids shelter makeover

Sasha Brown
News Office

Thanks to the MIT Hobby Shop and a group of dedicated partners, the Project Hope shelter in Boston will have a sturdy storage unit for their belongings.

Project Hope is a multiservice Boston agency dedicated to helping families move past poverty. It provides low-income mothers with access to education, jobs, housing and emergency services. Over the past month, the Project Hope Shelter has been refurbished, repainted and generally restored as part of WCBI-TV Channel 5’s Extreme Makeover: Hometown Edition.

The Project Hope makeover, which aired in November, renovated the entire Dorchester shelter, including 11 bedrooms, two bathrooms, two family rooms, two play spaces, a meeting room, four offices, a hallway and three flights of stairs, all in two weeks. Only storage was missing, said Kenneth Stone, director of the MIT Hobby Shop.

“It seemed like an ideal project for the MIT Hobby Shop,” Stone said, and although the MIT portion was not completed in time to air, the students who worked on the project did so sporting blue T-shirts from Extreme Makeover.

“I don’t think it would have happened if we had not been on TV,” Stone said, “but it really is a wonderful project.”

Stone and a few of the students planned to travel to Boston to oversee the shelter unpacking this past weekend.

Once complete, each of the six birch storage units will be 2 feet deep by 8 feet high. Stone hoped the project would be complete by the end of this week so that installation could take place before finals start on Dec. 18.

“Any architecture student or practitioner embedded in digital practice to learn about architectural representation from centuries-old, hand-drawn, handmade artifacts, and to apply years of research and veneration to a contemporaneous project. This exhibition is contrary to what is usually presented in a museum: It is about one object, not many, and about an object that would not normally be considered beautiful because it is so damaged.”

Amy Farnsworth
Office of Arts

It’s four centuries old and has been owned by a succession of architects and owners, but the Italian Renaissance drawing on display in the Compton Gallery (Room 10-150) is now a part of MIT's history.

“Four centuries’ slings and arrows enrich architectural drawing”

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Amy Farnsworth
Office of Arts

The 21-inch-by-34-inch drawing is one of the oldest architectural drawings in the MIT Museum’s collection.

Music staff picks
Hanukkah hits

Staff members from the music and theater arts section and the Office of the Arts offered up these picks.

“Odd Potatoes” — Judd Hirsch narrates this Hanukkah story with music performed by 20 Tony Award winners, including Elaine Stritch, Sutton Foster, Hal Linden and Hal Prince. It’s produced by Variety—The Children’s Charity, and a portion of the proceeds benefit children with special needs. Also, it’s available from Broadway Casts/Equity Fight Night, one of the nation’s leading industry-based organizations raising funds for the care and comfort of those living with HIV/AIDS.

The Klemer Conservatory Band: “Oy Chanukkah” (Rounder Records, 1987)—Originally produced as a radio show in association with Boston’s WGBH Radio, this recording features the Klemer Conservatory Band, a collection of oral history by special guest contributors.

“A Test of Chanukkah” (Rounder Records, 1989)—Recorded live in Jordan Hall, this compilation of Hanukkah tunes features folk musician and Broadway star Theodore Bikel, with musical director Hankus Netsky, students from the New England Conservatory, cantor Morton Shames and the Boston Community Gospel Choir. The “taste” of Hanukkah is literally the recording also as a demonstration of how to make latkes (potato pancakes).

MUSIC

Continued from Page 1

(Norwalk) — This disc captures the luminous voice of Lorraine Hunt Lieberson singing the love poetry of Chil

The Who: “Endless Wire” (Reprise) — “Who would have thunk it! This CD is an explosive blast from Who remaining the other two B’s—Bach and Beethoven—in richness, range and sheer beauty.

Chamber Music

Marcus Thompson, Robert R. Taylor Professor of Music, heads programs in chamber music and performance studies. As an internationally acclaimed violist, he has performed throughout the Americas, Europe and the Far East. He recommends:

“Chamber Music: The Nash Ensemble (Brilliant Classics 92337) — This disc displays the quality I prize most in chamber music performance and composition: nuance.

Gabriel Fauré: Complete Chamber Music performed by the Nash Ensemble (Brilliant Classics 92237) — This is a rare compilation of all the chamber works of this master of harmonic and tonal shading.”

Jazz/Gospel/Folk

Daniel Wood, senior lecturer in music and coordinator of sight-singing classes, is also a soprano whose performances have been acclaimed in concerts around the world. Wood recommends:

Bobby McFerrin: “Bend” (Blue Note, 1996) — “It’s sunshine on a disc! Along with his inimitable, incomparable, composer, shares his masterful vocal improvisation.

Richard Smallwood: “Miraculous Moments” (EMI Gospel, 1995) — “I’m repeatedly inspired at depth by Smallwood’s virtuosity as a classically trained pianist, singer, composer who is working in the contemporary jazz-funk idiom.”

Bessie Jones: “Put Your Hand on Your Hip and Let Your Backbone Slip” (Rounder Records, 2001) — “This is a unique collection of songs, singing games and stories from the Georgia Sea Islands. For decades, Miss Bessie was the living repository of this body of folk literature, often performing with the Georgia Sea Island Singers.”

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