Students to play role in shaping future of W1

W1, one of MIT’s oldest and most cherished buildings, will be given new life under a major renovation plan announced this month, and students, faculty and staff will play key roles in shaping its future.

Also known as Ashdown House after a popular former housemaster, W1 is MIT’s oldest graduate residence hall and arguably the cultural center of the Institute’s graduate community. Its dining room has been a focal point of the MIT graduate experience, serving as a meeting place for faculty and their students.

With the scheduled opening of the new NW35 graduate residence hall next summer, administrators had been hoping to turn W1 into an undergraduate residence as early as the fall of 2008. But they have come to realize that W1 needs a major renovation, and the plan to bring the residence hall back into service has been pushed back by two years.

The delay, however, has presented a classic opportunity for MIT to do what it does best: collaborate as a group to solve a problem.

To that end, MIT has named Suzanne Flynn, professor of foreign languages and linguistics, and her husband, Jack Carroll, housemasters of the soon-to-be-renovated W1, and the pair have begun recruiting students to join a founders group that will design the building’s community.

MIT has used the founders group concept for work on Simmons, the Warehouse and Sidney-Pacific. In this instance, the group will be responsible for designing a constitution and bylaws, a form of house government and committee structure, and dining options, among other things.

Chancellor Phillip Clay, who lived in W1 as a graduate student, recalled it as an important meeting place for faculty and students at lunch and dinner.

“Ashdown was a destination—all the rooms were filled. It was the graduate dining and meeting place for faculty and students,” Clay said.

“W1 was a central part of the student community,” said Barry Kudrowitz, a graduate student at MIT and, like Clay, a former Ashdown resident.

“Grad students in science and engineering really want a space to relax and socialize outside of their research.”

At 85 years old, W1 has outgrown its function as a graduate residence hall. Last year, administration announced plans to renovate W1, but the delay until 2010 will give students time to work on the project.

Students interested in becoming founders can contact Suzanne Flynn at 617-253-6154 or sflynn@mit.edu or Jack Carroll at 617-253-3760 or jcarroll@mit.edu.

W1, shown in this file image, will be given new life under a major renovation plan, and students, faculty and staff will play key roles in shaping its future.

Making arts information at MIT more accessible

MIT is making it easier for students, faculty and staff to learn about the hundreds of energizing performances, lectures and other arts events taking place at the Institute.

A new messaging service rolled out this semester gives users up-to-the-minute information about the arts at MIT. For example, users who want to know what is happening in the arts on a given day but who aren’t near a computer can text “arts@mit” to 617-785-9844 and receive a rapid-fire wireless text messaging message of times and locations of all the art events occurring that day.

The service, MANGO Text, was designed by three enterprising MIT graduate students in response to the growth of art events at the Institute.

“More and more of what we want to do online is now available through phones,” said MANGO Text’s Sonya Huang, a graduate student in urban studies and planning. “MANGO will let busy students find out about the latest events while on the go.”

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The art of communication

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MIT's School of Architecture and Planning is the second best U.S. graduate school of architecture, according to Architect magazine's 2008 rankings. The rankings were compiled from 130 architecture firms, 46 architecture deans and 140 architecture students who responded to a national survey.

MIT's position in the Architect rank- ings was its highest in at least five years. In 2007 and 2005, MIT was ranked fourth; in 2002 and 2003, it was sixth in the nation. Harvard University's Graduate School of Design topped the list this year.

JoAnne Stubbe, the Novartis Professor of Chemistry and professor of biochemistry and molecular biology, will be presented with the 2008 Emil Thomas Kaiser Award for her outstanding contributions to the understanding of ribo- nucleotide reductases, enzymes that play a central role in nucleic acid metabolism. The award, sponsored by the Protein Society, recognizes a recent, highly significant contribution in applying chemistry to the study of proteins.

JoAnne Stubbe

Daniel Nocera, the Henry Dreyfus Professor of Energy and professor of chemistry and molecular biology, has been named the 2008 recipient of the Harrison Howe Award. Presented by the Rochester Section of the American Chemical Society, the award was established to recognize a scientist who has made outstanding contributions to chemistry or closely related fields and who shows great potential for further achievement.

Ram Sahaskekkharan, professor of biolo- gical engineering and health sciences and technology, is one of four recipients of the 2007 Princess Chulabhorn Gold Medal. This award honors worldwide investigators whose in- dividuals or organizations that have provided outstanding support for the advancement of science in developing countries.

Richard Hynes, Daniel K. Ludwig Professor for Cancer Research, has been named a recipient of the American Society for Cell Biology (ASCB) E.B. Wilson Medal, the society’s highest honor for science, which he will share with Zena Web of the University of California, San Francisco. Hynes is recognized for his seminal contributions to cell biology, including his research on the role of extracellular matrix proteins and their receptors in normal cellular growth and development and in the pro- cess of oncogenesis. Along with Weber, he presented the E.B. Wilson Lecture at the recent ASCB annual meeting.

The American Physical Society (APS) has announced the 2007 APS Fellows, including several MIT faculty members. Fellowship is a distinct honor signifying recognition by one’s professional peers.

Geoffrey Forden, research associate in the Department of Science, Technology and Society, for innovative and important contributions to arms control and interna-

tional security.

Neil Gershenfeld, director of the Center for Bits and Atoms, for significant contributions from quantum computing to advanced technologies for global development.

Mohran Kardar, professor of physics, for pioneering work in a broad range of topics in statistical phys- ics, including the dynamics of growing interfaces and biological systems.

Seth Lloyd, professor of mechanical engineering, for seminal contributions to the theory of quantum com- putation and quantum communication and their physical implementations.

Gareth McKinley, Professor of Teach- ing Innovation in the Department of Mechanical Engineering, for the development of methods for characterization of the rheology of complex fluids and improved understanding of elastic effects and insta- bilities.

Richard Milner, professor of physics and director of the Laboratory for Nuclear Science, for his leadership in the HERMES/DESY and BLAST/Bates experi- ments.

James Terry, principal research sci- entist at the Plasma Science and Fusion Center, for significant contributions in the areas of volume recombination in plasmas, plasma impurity transport, wall-conditioning with lithium, plasma transport, and plasma turbulence in magnetic fusion con- finement devices.

The Hungarian Nuclear Society awarded its first annual Karoly Simony Memorial Plaque and Prize to Miklos Porkolab, professor of physics and Director of the Plasma Science and Fusion Center. The prize, named in mem- ory of Karoly Simony, the first Hun- garian fusion research scientist, was awarded in recognition of Porkolab’s outstanding achievements and contributions to plas- ma physics and fusion research.

MIT’s new Center for Future Civic Media (C4FM) has announced that Ellen Hume has been named research director, effective Jan. 28. A joint effort between the MIT’s Media Lab and Comparative Media Studies Program, C4FM, founded earlier this year with a $5 million grant from the Knight Foundation, develops new techniques and technologies to promote and enhance civic engagement in local communities, providing people with new means to share, prioritize, organize and act on information relevant to their communities.

As research director, Hume will col- laborate closely with C4FM principal investigators Chris Csikszentmihalyi, associate professor of media arts and sci- ence and director of the Media Lab, and the Peter de Florez Herms/DESY and BLAST/Bates exper- iments.

Miklos Porkolab

Spring 2008 Tech Talk Schedule

How to Reach Us

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Making their own music
From duck calls to harpsichords, MIT students craft their own instruments

Sarah H. Wright
News Office

When some MIT students want to hear the sounds of success, they go right to the source and build their own instruments. And when their notes emerge, the result is always the same: Hands-on work is its own reward.

Adam Leeb (S.B. 2007) estimates that he spent about eight months researching and about 300 hours designing and building his own electric guitar. The sounds of success were apparent in the first notes he heard from its strings.

"It wasn’t until the very last moments, when I plugged it in, that I was able to see all of my labor had been worth it," says Leeb, a mechanical engineering major who finished his guitar after graduating in June. "It has a very clean sound.

Cody Edwards (S.B. 2007), an avid hunter who grew up on a farm, heard the sound of success from a different instrument—an acrylic duck call that mimics a Mallard hen.

"When I made the first squeaks on my first attempt at a soundboard, I was very happy. But it sounded terrible," he says. "Making it sound correct involved long hours with a file. All six of Edwards’ duck calls are in use; they sound great.

"Seeing a flock of migrating ducks respond to your call is one of the most satisfying aspects of a duck hunt," he says. For Raphael Peterson, a sophomore in mechanical engineering who spent nine months building a bass in his free time, the long, sometimes frustrating process was so rewarding that he plans to build another.

Currently, Zachary Bjornson, sophomore in biological engineering, is halfway through his second year of building a harpsichord.

"Historical builders, at their prime, were producing an instrument a week. I console myself by hoping that they had a staff of 30 working for them," he says. "It’s a long walk from mind to hand to your final outcome. I found great enjoyment in those long hours with a file and overcome unforeseen challenges," Bjornson says.

Leeb, a mechanical engineering major who finished his guitar after graduating in June, estimates that he spent about eight months researching and designing his harpsichord, expects to spend about 1,000 hours building it. For him, previous MIT generations are inspiring.

"I hear from other harpsichord builders around the world. And K.K. Lee, who drew up the plans for the harpsichord I’m making, not only apprenticed to Frank Hubbard, who built the one at the MFA, but also went to MIT!" Bjornson says.

Both Leeb and Edwards have encouraging words for MIT students now building instruments by hand—and by choice.

"For ambitious guitar-builders, Leeb urges them to just do it.

"Every project is an adventure," he says, recommending an investment in quality parts. "There is no point in putting a lot of time into a project only to have it be hampered by crappy hardware.

He also urges enthusiasts to read as much as possible about the process, to get their hands on a set of plans, and especially to talk with Ken Stone and Hayami Arakawa in the MIT Hobby Shop.

Edwards focuses on persistence. For him, every stage of the duck-call project was a challenge. "I had never used the software, or a CNC lathe. I spent at least 20 hours of solid work before I produced my first successful prototype," he says.

"Don’t get disappointed in what your final outcome is. I found great enjoyment in setting a tough goal for myself, and overcoming unforeseen challenges," he adds.

Leeb, who has already put in 300 hours of research on designing his harpsichord, expects to spend about 1,000 hours building it. For him, previous MIT generations are inspiring. Plus, he can already hear the sound of success from his harpsichord.

"Once I’m done, I would like to perform on it in a small concert: For a solo piece, one of Vivaldi’s brighter concertos; for an ensemble piece, any of Vivaldi’s brighter concertos, like his one in G major," he says.

As Bjornson is discovering, rewards occur even in the early stages of long-term projects: New connections open up—some leading right back to MIT.

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MIT instrument finds surprises at solar system’s edge

David Chandler
News Office

The Voyager 2 spacecraft’s Plasma Science instrument, developed at MIT in the 1970s, has turned up surprising revelations about the boundary zone that marks the edge of the sun’s influence in space.

The unexpected findings emerged in the last few weeks, as Voyager 2’s spacecraft traversed the termination shockwave formed when the flow of particles constantly streaming out from the sun—the solar wind—slams into the surrounding thin gas that fills the space between stars.

The first surprise is that there is an unexpectedly strong magnetic field in that terminating interstellar region. That field permeates the boundary zone that Voyager 2 had already traversed three years ago, but detection of the boundary had been delayed by a glitch in the instrument.

“With Voyager 2, we had already crossed the termina-
tion shockwave three years ago, but the Plasma Science instrument on that spacecraft had by then stopped working. So, the spacecraft could not detect it,” said Robert Cohen, the St. Laurent Professor of Engineering and a principal research scientist at MIT’s Kavli Institute for Astrophysics and Space Science.

The conventional wisdom, then, was that it couldn’t be done on a large scale without very special micro-fluidics that would help to produce the oil-repelling materials. The MIT team overcame the surface-tension problem by developing a technique that simplified the micro-fluidics. They used a process known as electrospinning.

MIT engineers have designed a class of material structures that can repel oil, a novel discovery that could have applications in aviation, space travel and hazardous waste cleanup. Such materials could be used to help protect parts of airplanes or rockets that are vulnerable to damage from being soaked in fuel, like rubber gaskets and o-rings.

“The are vulnerability points in many aerospace applica-
tions,” said Robert Cohen, the St. Laurent Professor of Chemical Engineering and an author of the paper on the work that appeared in the Dec. 7 issue of Science.

“IT would be nice if you could spill gasoline on a fab-
cric or a gasket or other surface and find that instead of spreading, it just rolled off,” Cohen said.

Creating a strongly oil-repelling, or “oleophobic,” mate-
rial has been challenging for scientists, and there are no natural examples of such a material.

Nature has developed a lot of methods for waterproofing,” Cohen said. “But the big question is whether we can do it on a large scale.”

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MIT corrections sickle-cell anemia in mice

Research involves reprogramming adult cells

Eric Bender
MIT News Office

MIT researchers have successfully treated mice with sickle-cell anemia in a process that begins by directly reprogramming their own cells to an embryonic-stem-cell-like state, without the use of eggs.

“This is the first proof-of-principle of therapeutic application in mice of directly reprogrammed inducible pluripotent stem cells (iPSCs), which recently have been derived in mice as well as in humans,” said Voldman, who led the study. “This demonstrates that iPSCs have the same potential to help patients as established embryonic stem cells, said MIT biology professor Rudolf Jaenisch, a member of the Whitehead Institute for Biomedical Research.

The research, reported Dec. 6 in Science online, was carried out in Jaenisch’s laboratory. The iPSCs were derived using modifications of the approach originally discovered in 2006 by the Shinya Yamanaka laboratory at Kyoto University.

A disease of the blood marrow caused by a defect in a single gene, sickle-cell anemia is the most common inherited blood disorder in the United States, affecting more than 70,000 Americans and one in 500 African-Americans, according to the National Institutes of Health.

The scientists in Jaenisch’s lab studied a therapeutic approach to curing sickle-cell anemia modeled mouse developed by the laboratory of Tim Townes of the University of Alabama at Birmingham. The mouse model had been designed to include relevant human genes involved in blood production, including the defective version of that gene.

To create the iPSCs, the scientists started with cells from the skin of the diseased mice, explained lead author Jacob Hanna, a postdoctoral researcher in the Jaenisch lab. These cells were modified by a standard lab technique employing retroviruses customized to insert genes into the cell’s DNA. The inserted genes were Oct4, Sox2, LIF and c-Myc, known to act together as master regulators to keep cells in an embryonic-stem-cell-like state. iPSCs were selected based on their morphology and then verified to express gene markers specific to embryonic stem cells. To decrease or eliminate cancer in the treated mice, the c-Myc gene was removed by genetic manipulation from the iPSCs.

Next, the researchers followed a well-established process for differentiating embryonic stem cells into precursors of bone marrow adult stem cells, which can be transplanted into mice to generate normal blood cells. The scientists created such precursor cells from the iPSCs, replaced the defective blood-production gene in the precursor cells with a normal gene and injected the resulting iPSCs back into the diseased mice.

The blood of treated mice was tested with standard analyses employed for human patients. The analyses showed that the disease was corrected, with measurements of blood and kidney functions similar to those of normal mice.

While iPSCs offer tremendous promise for regenerative medicine, scientists caution that major challenges must be overcome before medical applications can be considered. First among these is to find a better delivery system, since retroviruses bring other changes to the genome that are far too random to let hope in humans.

“We need a delivery system that doesn’t integrate itself into the genome,” said Hanna. “Retroviruses can disrupt genes that should not be disrupted or activate genes that should not be activated.”

Potential alternatives include other forms of viruses, synthetic versions created by the scientists, or master regulator genes that are modified to enter the cell nucleus, and small molecules, Hanna says.

Despite the rapid progress being made with iPSCs, the scientists at MIT, Whitehead and the other institutions say the technique is not yet ready for临床 settings, not just in big, centralized research projects that might not have been feasible before, its inventors say. It could cost only a few thousand dollars. As such, it is relatively inexpensive compared to more expensive separation techniques.

Looking through the microscope, either a technician or a computerized system can check each cell to determine whether it has fluorescence in the right area or at the right time to meet the selection criteria. If so, its position is noted by the laser method and the cell is levitated out of its trap using the pressure of a beam of targeted light from a low-cost laser. A flowing fluid then sweeps the selected cells off to a separate reservoir.

The laser levitation of the cells acts like a “fire hose” so that the timing of cell selection can be fine-tuned to keep cells in an embryonic-stem-cell-like state.

“I was able to pick cells very easy,” said Voldman. “It’s not hard.”

The cycle by which MIT/Whitehead scientists successfully treated mice with a human sickle-cell anemia disease trait, using a process that begins by directly reprogramming the mice’s own cells to an embryonic-stem-cell-like state.

Jaenisch emphasized that this field is very young and that it’s critical to continue full research on embryonic stem cells as well. “We wouldn’t have known anything about iPSCs if we hadn’t worked with embryonic stem cells,” said Jaenisch. “For the foreseeable future, there will remain a continued need for embryonic stem cells as the crucial assessment tool for many of the decisions about the potential of iPSCs.

This work was funded in part by the National Institutes of Health.

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Laser beam ‘fire hose’ used to sort cells

System could enable new kinds of biological research

David Chandler
Whitehead Institute

Separating particular kinds of cells from a sample could become faster, cheaper and easier thanks to a new system developed by MIT researchers that involves pushing up the cells with a laser beam “fire hose.”

The system, which can sort up to 10,000 cells a second, could make it easier thanks to a new system developed by researchers that involves pushing up the cells with a laser beam “fire hose.”

Present methods allow cells to be sorted based on whether or not they emit fluorescent light when mixed with a marker that responds to a particular protein or other compound. The new system allows more precise sorting, separating out cells based not just on the overall average fluorescence response of the whole cell but on responses that occur specific parts of the cell, such as the nucleus. The system can also pick up responses that vary in how fast they begin or how long they last.

“We’ve been interested in looking at things inside the cell that either change over time or are specific to particular places,” said Voldman. “For example, cells differ in how quickly they move. So, you could be looking for particular calcium used in the fluorescent labeling, the new system allows you to selectively ‘fire hose’ only the ones that are faster or slower, and see what’s different,” said Voldman, who also co-lead the study in MIT’s Research Laboratory of Electronics and the Micro-systems Technology Laboratory.

“It seems like that should be easy, but it isn’t,” he said. There are other ways of accomplishing the same kind of cell separation, but they require complex and expensive equipment or are limited in the number of cells they can process.

The new system uses a simple transparent silicone layer bonded to a conventional glass microscope slide. Fabricated in the layer are a series of tiny cavities, or traps, in which cells settle out after being added to the slide in a solution. As many as 10,000 cells could be sorted on a single slide.

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Heads or tails? Scientist IDs gene key to regenerating flatworms

Cristin Carr
Whitehead Institute

When cut, a planarian flatworm can regenerate a complete new tail or even entire new organisms from a tiny fragment of its body—a phenomenon that has puzzled biologists for more than 100 years.

Now, scientists in the lab of Peter Reddien, a member of the Whitehead Institute for Biomedical Research and an MIT assistant professor of biology, have discovered a gene that regulates development in the head-versus-tail polarity in regenerating flatworms.

Their results, published in the Dec. 6 issue of Science online, could help explain how regenerating animals “know” what missing tissues to make.

“Evolution has selected for mechanisms that allow organisms to accomplish incredible feats of regeneration,” and planarians offer a dramatic example,” said Reddien. “By developing this model system to explore the molecular underpinnings of regeneration, we now have a better understanding of... the process.”

The researchers used a technique called RNA interference to screen a group of genes known to be involved in animal development.

“We discovered that inhibiting the gene Smed-beta-catenin-1 caused animals to regenerate a head instead of a tail at the site of the wound,” said Reddien. “Other members of the Whitehead postdoctoral fellow and lead author on the paper. “This resulted in a worm that possessed two oppositely facing heads. Smed-beta-catenin-1 is the first gene found to be required for this regeneration polarity.”

Genes very similar to Smed-beta-catenin-1 are found in animals ranging from jellyfish to humans, and they have been implicated in posterior tissue specification in frogs, sea urchins and many other animals.

See GENES
Powering up

MIT’s biggest array of solar panels (left) is expected to go into service this month, producing an estimated 50,000 kWh annually in clean energy. That’s equivalent to removing 65,000 pounds of carbon dioxide from the atmosphere, according to the Department of Facilities, which oversaw the project.

The installation on the roof of Building 57 (the Alumni Pool) is twice as large as MIT’s other solar-panel installations—on buildings 14, W20 and N51—combined, said MIT Director of Utilities Randall Preston.

Of the energy produced by the array will feed into MIT’s central electrical grid. Any unused clean energy the Institute otherwise would have had to purchase. About a quarter of what is produced is fed to MIT’s energy consumption. Any excess energy the efficient system launched earlier this year atop the Great Dome, Preston said.

The installation cost approximately $365,000, around 49 percent of which came from a competitive grant awarded by the Massachusetts Institute of Technology-Collaborative, a state agency that invests in renewable energy projects in the state. An MIT alum who wishes to remain anonymous also made a significant donation to the project.

Several other alumni played key roles: James (S.B. 1989) and Anita (S.B. 1993) Worden of Solectria Renewables significantly discounted the cost of three 130W inverters used in the project; Wrightie Chleboski (S.B. 1987) of Evergreen Solar supplied the 216 Evergreen 180W solar panels used in constructing the array at a greatly reduced cost.

Finally, a small amount of funding came from the Utilities Budget within the Department of Facilities.
IAP poetry course to mark 10th year

Strong and versatile, the IAP poetry course provides an eclectic mix of poetry by classic and contemporary figures including John Milton, Alfred, Lord Tennyson, and William Wordsworth, as well as Brenda Marie Oskey, Venus Khoury-Ghata, and Grace Paley. Literature Professor David Thorburn, director of the MIT Communications Forum, is the series’ founder and organizer.

“I am always surprised and inspired by the diversity and aesthetic energy of the poems our moderators choose,” Thorburn said. “We’re all volunteers, and each decision leader selects poems from their personal favorites. This year there is a good selection of canonical English poems, as well as several provocative, unexpected texts. Our audiences are always a wonderful mix of students, faculty, and staff from all parts of the Institute. I love the core message this activity sends every January: Poetry thrives at MIT.”

For more information or to receive a packet of the poems, please e-mail Julie Saunders at juliacs@mit.edu.

-Sarah H. Wright

ARTS

Continued from Page 1

A new book “Sacred Games,” the Boston jazz saxophonist and composer Charlie Kohlhase performing with the Festival Jazz Ensemble, and an American Shakespeare Ensemble’s performance of “Titus Andronicus.”

There are also the ongoing public art exhibits at the List Visual Arts Center and the newly expanded MIT Museum, and many other cultural and artistic opportunities.

In addition to the messaging service and the revamped arts calendar, an arts blog, ARTALK, will soon be available through the popular MIT admissions web site. The blog will focus on the active arts scene at MIT as students, faculty and staff will discuss exhibitions or concerts they have attended, courses they are enrolled in, plays they have acted in or other art-related activities or ideas worth blogging about.

“It’s about getting the MIT perspective out there,” said freshman Ken Keating, a student coordinator of the arts blog and editor of the blog. “There are so many events we go to and classes to take, and I hope ARTALK will show not only how strong our art community is but also a distinctively MIT interpretation of the arts.”

Lori Gross, director of arts initiatives and adviser to the associate provost, explained that the communications changes are part of a strategic push to emphasize the role of the arts at the Institute.

As the same time as they advance the communication of information at the arts at the Institute, the arts arts committee, seeks to position the essential role of the arts at MIT.

The arts at MIT are rooted in risk taking and problem-solving, connecting creativity across boundaries and shaping a lifetime of exploration and discovery. The languages and processes of the arts, the mind and hand, menus et manus, are essential to rethinking the challenges of the 21st century to build a better society.

Look for the arts blog beginning in January. To learn more about the arts at MIT, go to web.mit.edu/arts.

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Continued from

The languages and processes of the arts, the mind and hand, menus et manus, are essential to rethinking the challenges of the 21st century to build a better society.

More and more of what we want to do online is now available through phones.

Sonia Huang
MIT graduate student

‘Wondrous Life’ tops critics’ fiction lists

The “Brief Wondrous Life of Oscar Wao,” by Junot Díaz, associate professor in writing and humanistic studies, has been named best novel of the year by critics Time and New York magazines, topping their influential “must-read” lists.

Time described the book as a “massive, heaving, sparkling tragicomedy,” while New York hailed its “marvelous balance” of comic-book plots and “honest, messy realism.”

Díaz’s novel was also cited among the best novels of 2007 by critics and reviewers at The Village Voice, The Washington Post, the Los Angeles Times and Publishers’ Weekly.

A poll of more than 100 critics and authors also cited “Wondrous Life” as best fiction of the year. Initiated by the National Book Critics Circle, the poll surveyed new releases in fiction, nonfiction and poetry.

A round of critical praise greeted “Wondrous Life” when it was published in September: Book critic Michiko Kakutani of The New York Times described “Wondrous Life” as both a comic portrait of a lovesick second-generation Dominican geek and a harrowing meditation on public and private history.

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Mechanical engineering graduate student Barry Kudrowitz, who teaches a toy product design course at MIT, began his design life building an Epcot theme park out of LEGOs. Here he is shown with some of his more recent creations.

Toy soldier: At play with Barry Kudrowitz, MIT toy designer

Sarah H. Wright
News Office

'Tis always the season for Barry Kudrowitz to think about toys.

A doctoral student in mechanical engineering, Kudrowitz specializes in toys: He plays with them, he designs them, and he pioneered MIT's first course in toy design, now in its third year.

Kudrowitz often gets asked to name his favorite toy, especially at this time of year: Who wouldn’t want to know what might top an MIT toy expert’s wish list?

The toys I love usually fit into one of three categories: Toys that allow me to create freely; toys that are humorous, weird, gross or random; and toys that are elegantly designed and simple, like magnets,” he said.

Kudrowitz, whose MIT office is lined with toy projects and toy parts, began his design life building an Epcot theme park out of LEGOs; he grew up near 20 theme parks—including eight major ones such as Epcot, Magic Kingdom and Universal—and to this day, theme parks are his favorite form of play.

“Storytelling is an important element in toy design, and I try to incorporate it into the toy class. Some theme-park attractions and interactive shows are the ultimate form of storytelling. They put you inside the story,” he said.

Children get inside the story when they play with toys, Kudrowitz noted, but adults need more of a nudge, if they’ve lost the ability to immerse themselves in a fantasy world.

“Theme-park attractions get us to suspend our disbelief. The most serious of adults will flinch at the 100-foot dinosaur that swings down to eat you; they’ll squirm when the ‘rats’ crawl around by your feet or cheer when you get rescued by the superhero,” he said.

For Kudrowitz, suspension of disbelief—getting grown-ups to stop making sense—is a toy-and-play-specialist’s dream. So his doctoral dissertation focuses on design for entertainment.

“I’d like to research adult play, it seems to be an area that is not very well developed. Adults needs play, too. I want more options than poker and Scrabble,” he commented.

Kudrowitz has worked on immersing people in play as a 2005 member of an MIT product design class and in a 2006 externship with 5-Wits, a Boston-based interactive entertainment company.

In the externship, the class worked on 5-Wits’ latest adventure, Tomb, which immerses adventurers in a dark Egyptian maze. In the design class, Kudrowitz worked on a 5-Wits show at the International Spy Museum in Washington, D.C., an interactive adventure in which participants race to save the world from nuclear madness.

Kudrowitz and his team developed new special effects and plot elements for the show, Operation Spy. They also designed and prototyped an elevator simulator that features Kudrowitz’s favorite inside-the-story experience.

Now part of the exhibit, their elevator is a stationary steel-grated room whose walls “scroll” up and down to make it appear to move and whose floor pulsates, thanks to an attached industrial vibrator. “With light and sound it seems very realistic,” said Kudrowitz.

A scale model of the elevator sits on Kudrowitz’s desk. “Basically, you’re in a cage that shakes,” he says, holding it up.

The little elevator is a case in point. By itself, it’s got a dollhouse appeal. In Kudrowitz’s hands, it’s a story and it’s a toy.

“A great toy is something that you always have out on the desk. It’s something you can’t wait to show the next person who walks into the room,” he said.