

In Special Recognition

The 2009–2010 academic year witnessed continued change and growth in the senior academic and administrative leadership of MIT.

A highlight of the fall term was US president Barack Obama's visit to MIT on October 23, 2009. President Obama toured MIT laboratories and praised the Institute's commitment to energy research, issuing a strong call for the United States to lead the world in developing new, efficient, and clean energy technologies. In April 2010, President Obama nominated MIT economist and Institute Professor Peter Diamond to serve on the Board of Governors of the Federal Reserve System. If confirmed, Professor Diamond would serve a 14-year term as one of seven governors. Near the end of the academic year, President Obama nominated Subra Suresh, dean of the School of Engineering, to serve as the next director of the National Science Foundation. If confirmed by the United States Senate, Professor Suresh will serve a six-year term.

Dana Mead, chairman of the MIT Corporation since 2003, stepped down at the end of the academic year. John S. Reed, elected to the position at the June 2010 Corporation meeting, will succeed him, assuming the chairmanship on July 1, 2010.

Sylvia T. Ceyer, Sheehan professor of chemistry, was selected to succeed professor Timothy Swager as head of the Department of Chemistry, effective July 1, 2010.

Other notable postings include the appointments of Thomas Magnanti, Institute Professor and former dean of the School of Engineering, as president of the Singapore University of Technology and Design, effective October 1, 2010, and of vice chancellor and dean for graduate education Steven R. Lerman '72, SM '73, PhD '75 as provost and executive vice president for academic affairs at George Washington University. Professor Lerman departed from MIT in June after 40 years of service to the Institute.

Honors and Awards

Each year the awards received by students, faculty, and staff reflect the impressive achievements of the Institute's programs and the remarkable people who animate them. Here we note a few of the many honors received during 2009–2010.

Students

Seniors Tanya Goldhaber and Vinayak Muralidhar won Marshall Scholarships, and Ugwechi Amadi, Caroline Huang, and Steven Mo won Rhodes Scholarships. The three Rhodes Scholarships are the highest number ever awarded to MIT students in a single year.

Seniors Ylaine Gerardin and Maria Monks, together with Patrick Brown, a graduate student in physics, were among the 15 Hertz Fellows named by the Fannie and John Hertz Foundation. The no-strings-attached fellowships—worth \$250,000 each and lasting up to five years—give exceptional scientists and engineers the freedom to innovate while pursuing graduate studies in the applied sciences.

Maria Monks also received a Churchill Scholarship covering a year of graduate study at Churchill College in Cambridge. She is the 11th MIT student to win a Churchill Scholarship since it was first awarded in 1963.

Seniors Timothy Humpton and Yufei Zhao, together with Weifeng Victoria Lee '06, MArch '10 were named Gates Cambridge Scholars and will begin their studies at the University of Cambridge in 2010–2011. MIT students have won 18 of the prestigious Gates scholarships since the program was established in 2000 by the Bill & Melinda Gates Foundation.

Seven 2010 graduates and one student who graduated in 2009 were awarded Fulbright scholarships to study abroad during the 2010–2011 academic year. Anne-Marie Corley, a 2009 graduate in science writing, will study the culture that has developed around the space program in Russia. Charles DeRobetis, who graduated with a double major in biology and foreign languages and literatures, will teach English in Spain; Travis Dunn, who completed a PhD in civil and environmental engineering, will study the deployment of advanced transportation technologies in Mexico; Manvi Goel, a double major in economics and political science, will study the extension of venture capital to micro-entrepreneurs in India; Rachel Licht, a chemical engineering graduate, will study the production of cellulosic ethanol by fermentation in France; Ian Rousseau, a physics graduate, will study innovative techniques for solar energy conversion in Germany; Lauren Shields, a biology graduate, will study inflammation and metabolic syndrome in Switzerland; and Amos Winter, who earned a PhD in mechanical engineering, will travel to India to continue work on a wheelchair he designed specifically for use in the developing world.

Ruben Alonzo, a junior dedicated to improving the lives of at-risk youth through education, was awarded a 2010 Harry S. Truman Scholarship. The \$30,000 award will enable the economics major to pursue a doctorate in education.

Erez Lieberman-Aiden, a PhD student in the Harvard-MIT Division of Health Sciences and Technology, won the \$30,000 Lemelson-MIT Student Prize for innovations in molecular biology, engineering, mathematics, and linguistics.

One current and two former MIT students received Paul & Daisy Soros Fellowships for New Americans, supporting the graduate education of immigrants and children of immigrants. Graduate student Zahir Dossa '08, Reshmaan N. Hussam '09, and Laural Yong-Hwa Lee '05 were among the 31 recipients of the fellowship.

Swetha Kambhampati, a senior in biology, was named one of 12 Merage American Dream Fellows and will receive a \$20,000 stipend over two years to pursue graduate study, travel for research, and other professional opportunities. The fellowship is awarded to outstanding immigrants who possess significant leadership and intellectual ability.

Sabrina Kleinenhammans SMArch '09 won first place and a \$15,000 prize in a worldwide student design competition sponsored by AECOM, a global provider of

technical and management support services. The award was presented at the World Architecture Festival in Barcelona, Spain.

Faculty and Staff

Election to a national academy is one of the highest honors that can be achieved in the fields of engineering, science, and medicine. Five MIT faculty members were elected to the National Academy of Engineering this year: Cynthia Barnhart, professor of civil and environmental engineering and engineering systems; Gang Chen, Soderberg professor of power engineering; Robert E. Cohen, St. Laurent professor of chemical engineering; Andrew Whittle, professor of civil and environmental engineering; and Alan Willsky, Webster professor of electrical engineering and computer science. Also elected to the National Academy of Engineering was Art Gelb, president of Four Sigma Corp. and a member of the MIT Corporation.

Two faculty members were elected to the National Academy of Sciences: Angelika Amon, professor of biology, and Barbara Imperiali, professor of biology and Class of 1922 professor of chemistry.

Amy Finkelstein, professor of economics, and Tyler Jacks, director of the Koch Institute for Integrative Cancer Research, were elected to the Institute of Medicine. Finkelstein is one of only two economists among the 65 new members admitted this year.

Six members of the MIT community were elected fellows of the American Academy of Arts and Sciences: Edward H. Adelson, Wilson professor of vision science; Ricardo J. Caballero, Ford International professor of economics; Nancy Ann Lynch, NEC professor of software science and engineering; Barry R. Posen, Ford International professor of political science; Madhu Sudan, Fujitsu professor of computer science and engineering; and Sir John Adam Thomson, research affiliate with the Science, Technology and Global Security Working Group.

Eight Institute researchers were named fellows of the American Association for the Advancement of Science: Gang Chen, Soderberg professor of power engineering; Qing Hu, professor of electrical engineering and computer science; Roger D. Kamm, Germeshausen professor of mechanical and biological engineering; Thomas F. Knight, senior research scientist in the Department of Electrical Engineering and Computer Science; Barry R. Masters, research affiliate in the Department of Biological Engineering; Tomaso A. Poggio, McDermott professor in the brain sciences and human behavior; Jeffrey I. Steinfeld, professor emeritus of chemistry; and Bruce Tidor, professor of electrical engineering and computer science and of biological engineering.

Three faculty members in the Department of Electrical Engineering and Computer Science and two members of Lincoln Laboratory's research staff were named IEEE fellows: Qing Hu, professor of electrical engineering and computer science; Douglas A. Reynolds, senior staff member in Lincoln Lab's Information Systems Technology Group; Daniela Rus, professor of computer science and engineering; Grant H. Stokes, head of the Aerospace Division at Lincoln Lab; and Madhu Sudan, Fujitsu professor of computer science and engineering.

MIT president emeritus Paul E. Gray received the 2010 IEEE Founders Medal in recognition of his exemplary leadership in education, research, and public policy.

Oliver E. Williamson '55, an economist whose work describing the role of corporations within free markets has been widely influential, was named a co-winner of the 2009 Nobel Prize in economics. In granting the award, the Royal Swedish Academy of Sciences cited Williamson "for his analysis of economic governance, especially the boundaries of the firm."

Professor JoAnne Stubbe was awarded the National Medal of Science for her work elucidating the mechanisms of enzymes that play an essential role in DNA replication and repair. Also winning the nation's top science honor this year was MIT alumnus Rudolf Kalman '53, MEng '54 of the Swiss Federal Institute of Technology in Zurich.

Professor Stubbe also shared the Welch Award in chemistry with Christopher Walsh, a professor at Harvard Medical School and a former MIT faculty member.

MIT economist Esther Duflo, whose research has helped change the way governments and aid organizations address global poverty, received a MacArthur Fellowship—the so-called genius grant awarded for outstanding originality in creative pursuits—and will receive \$500,000 over five years.

Also awarded to Professor Duflo was the John Bates Clark Medal, given by the American Economic Association to the top-rated economist under age 40. Duflo is the second woman to receive the award, often considered a reliable indicator of future Nobel Prize consideration.

Whitehead Institute founding member Gerald Fink won the 2010 Genetics Prize of the Peter and Patricia Gruber Foundation for his groundbreaking research in yeast genetics. Regarded by many as the preeminent genetics prize in the world, the Gruber Prize includes \$500,000 and will be awarded on November 4, 2010, at the annual meeting of the American Society of Human Genetics, where Fink will also give a lecture.

Tomaso Poggio, McDermott professor in the brain sciences and human behavior, was awarded the Okawa Prize for his work in computational neuroscience. The 10 million yen award recognizes his pioneering research ranging from biophysical and behavioral studies of the visual system to computational analysis of vision and learning in humans and machines.

MIT physicist Pablo Jarillo-Herrero won a 2009 David and Lucile Packard Fellowship. The five-year \$875,000 grant will allow Jarillo-Herrero to study a new class of materials known as topological insulators that could have applications in the semiconductor industry and quantum computing.

The US Navy's Office of Naval Research named Martin Zwierlein, assistant professor of physics, one of its 17 Young Investigators. He will receive a three-year research grant worth as much as \$510,000.

Two faculty members in the Department of Mechanical Engineering, Rohit Karnik and Kripa Varanasi, won \$400,000 grants awarded over five years by the National Science Foundation to study cell transport and condensation phenomena on nanoengineered surfaces, respectively.

Yingxi Lin, assistant professor of brain and cognitive sciences, was named a John Merck Scholar and will receive \$300,000 over four years for research on activity-dependent regulation of inhibitory synapses and neural circuit plasticity.

The Pew Charitable Trusts named Jeroen Saeij, assistant professor of biology, a Pew Scholar in the biomedical sciences. He will receive \$240,000 over four years for research on genetic risk factors for infectious disease.

Professors Catherine L. Drennan and Graham C. Walker were two of the 13 Howard Hughes Medical Institute Professors named in 2010.

Three faculty members were honored at the White House as recipients of the Presidential Early Career Award for Scientists and Engineers: Markus J. Buehler, Edgerton associate professor of civil and environmental engineering; Joel L. Dawson, Hyman career development associate professor of electrical engineering; and Scott R. Sheffield, professor of mathematics.

Five junior faculty members were awarded Sloan Foundation research fellowships: Arnaud Costinot, assistant professor of economics; Konstantinos Daskalakis, assistant professor of electrical engineering and computer science; Jeffrey Grossman, associate professor of materials science and engineering; Jonathan Kelner, KDD career development assistant professor of applied mathematics; and Nickolai Zeldovich, Ross career development assistant professor of software.

Three faculty members were among the 69 recipients of research grants from the Department of Energy's Early Career Research Program: Ruben Juanes, Atlantic Richfield career development assistant professor in energy studies; Youssef Marzouk, Boeing career development assistant professor of aeronautics and astronautics; and Mort Webster, assistant professor of engineering systems. Under the program, the researchers will receive at least \$150,000 a year for five years.

Sally Haslanger, professor of philosophy, was named 2010's Distinguished Woman Philosopher by the Society for Women in Philosophy and the 2011 Carus Lecturer, an honor presented bi-annually by the American Philosophical Association.

Mathematics professors Tobias H. Colding and Paul Seidel were named recipients of the 2010 Oswald Veblen Prize in geometry, given every three years by the American Mathematical Society for an outstanding publication in geometry or topology. Colding shares the prize with co-author William L. Minicozzi of Johns Hopkins University. Seidel shares the prize for work separate from that of Colding and Minicozzi.

Professor emeritus Eugene Covert won the Reed Aeronautics Award of the American Institute for Aeronautics and Astronautics for lifelong contributions to aeronautics teaching and research, including advancements in wind tunnel testing at subsonic, supersonic, and hypersonic speeds.

Professor Miklos Porkolab received the James Clerk Maxwell Prize for plasma physics.

Joe Haldeman, adjunct professor of fiction in the Program in Writing and Humanistic Studies, received the Damon Knight Memorial Grand Master award from the Science Fiction and Science Fantasy Writers of America.

Anette (Peko) Hosoi, associate professor of mechanical engineering; Krishna Rajagopal, professor of physics; Rajeev Ram, professor of electrical engineering and computer science; and Norvin Richards, professor of linguistics and philosophy were named as MacVicar Faculty Fellows.

Ronald L. Rivest, professor of electrical engineering and computer science, was named to receive the James R. Killian, Jr., Faculty Achievement Award for 2010-2011.

Markus J. Buehler, Edgerton associate professor of civil and environmental engineering, received the 2010 Harold E. Edgerton Faculty Achievement Award.

The Gordon Y Billard Award, recognizing special services of outstanding merit to the Institute, was given to Steven R. Lerman, vice chancellor and dean for graduate education, and Blanche Staton, senior associate dean for graduate students.

In Memoriam

Each year death takes from us exceptional men and women who have contributed to the academic excellence and service to the wider world that distinguish the MIT community. The memories of their achievements urge us to our own best efforts.

Charles Batterman, national diving champion and longtime MIT diving coach, died on March 31, 2010, in Peterborough, NH. He was 87. The first to take a scientific approach to the sport of diving, Batterman was the subject of some of Harold E. "Doc" Edgerton's striking stroboscopic photographs and the author of *Techniques of Springboard Diving* (MIT Press, 1968), the first text to apply the principles of physics to the analysis of dives. The book is illustrated both with Edgerton's photographs and with Batterman's own pen-and-ink drawings. Batterman was born in 1922, in Brooklyn, NY, to emigrant parents from Eastern Europe. He attended Ohio State University and was a member of its national champion swim teams in 1942 and 1943. In 1944, as he earned his MA part-time at Columbia University, Batterman was the National Inter-Collegiate and National AAU diving champion in both high board and low board. In 1949 Batterman became an assistant coach at Harvard, and in 1956 he was appointed an assistant professor of physical education at MIT, where he coached swimming, diving, soccer, lacrosse, and water polo. Upon his retirement in 1987, Batterman's colleagues in the swimming and diving community honored him by creating the Charles Batterman Men's and Women's Diving Coach of the Year awards, and the annual Charlie Batterman Relays. In addition

to being a teacher and athlete, he was an accomplished painter of watercolors who counted among his friends Roy Lichtenstein, formerly his roommate at Ohio State.

Eduardo Catalano, a noted architect who designed MIT's Stratton Student Center and taught at MIT from 1956 to 1977, died on January 28, 2010. He was 92. Born in Buenos Aires, Catalano pioneered the architectural development of shell structures, beginning with his own home, Raleigh House, constructed in 1954 following his appointment to the School of Design in Raleigh, NC. The modernist house featured a 4,000-square-foot hyperbolic paraboloid as its roof. Sheltered beneath the shoehorn shape was a square interior enclosed entirely in glass. The undulation of the roof provided openness in some areas and privacy in others. Seeking harmony in science, technology, and the visual arts, Catalano also designed the US embassies in Buenos Aires and Pretoria and the Juilliard School of Music at Lincoln Center.

Michael S. Feld, professor of physics, died on April 10, 2010, after an eight-year struggle with multiple myeloma. He was 69. As director of MIT's George R. Harrison Spectroscopy Laboratory, Feld made fundamental contributions to the field of laser science and later directed the Laser Biomedical Research Center, where he worked on the use of fluorescence and Raman spectroscopy to diagnose biological tissues and image disease via endoscopy and optical tomography. Feld came to MIT as an undergraduate in 1958 and never left. Completing his PhD in 1968, he joined the faculty and contributed actively to the MIT community. He was particularly noted for his efforts to develop a welcoming environment for minority students, faculty, and staff. Feld's research interests ranged from fundamental physics—superradiance and innovations in laser spectroscopy—to biomedicine and biomedical engineering, new types of microscopy, spectroscopic identification of cancer cells, and novel uses of the electric field to study cell behavior. Feld received the Thompson Award in 1991 for the development of biomedical Raman spectroscopy and the Vinci of Excellence (France) in 1995 for the development of the single atom laser. He was a research member of the joint faculty of the Harvard-MIT Division of Health Sciences and Technology, as well as an adjunct staff member in the Department of Cardiovascular Research of the Cleveland Clinic Foundation.

Norman D. Ham SM '52, AE '57, ScD '68, an internationally recognized aeronautical engineer, died in Brookline, MA, on February 13, 2010. He was 80. Known in the aeronautical industry as the "father of individual blade control," Ham contributed extensively to helicopter rotor design and the rotorcraft community. A 1951 graduate of the University of Toronto, he earned advanced degrees in aeronautics at MIT. After nearly a decade of work in the aircraft industry in Canada and the United Kingdom, Ham returned to the United States to work for Doman Helicopters in Danbury, CT, where he assisted in the certification of the Model LZ-5 helicopter, a unique design advanced for its time. Ham joined the faculty of MIT's Department of Aeronautics and Astronautics in 1962 and created the VTOL Technology Laboratory, where he conducted pioneering research on dynamic stall, stall flutter, individual blade control, and gust response for helicopter rotors. Before and after his retirement, industry leaders regularly sought his technical knowledge, and he consulted extensively for NASA as well as aircraft companies such as Boeing, Honeywell, and Raytheon. In 1995

Ham was recognized with a Certificate of Appreciation by the NASA Ames Research Center, and in 2001 he was honored by the American Helicopter Society for outstanding achievements and contributions to vertical flight technology. A natural athlete, Ham was a skilled competitive curler. His team represented Massachusetts at the Men's National Curling Championships in 1968 and again in 1981, and he was chairman of Canadian Club of Boston Curling for many years.

Once called "the best damn university president in the U.S." (by *Fortune* magazine), president emeritus and former chairman of the Corporation Howard Wesley Johnson succumbed to a long illness on December 12, 2009. He was 87. Johnson became MIT's 12th president in 1966 after serving as dean of the Sloan School of Management. He drew upon his management acumen to guide the Institute during the tumultuous 1960s and gained respect for listening to all sides while holding progressive views on issues such as the Vietnam war and the environment. Johnson described those times in his book, *Holding the Center: Memoirs of a Life in Higher Education*. "Students have told me, and I agree with them, that they found the Institute to be academically vibrant during that time despite the uproar," he wrote. "Much that was positive emerged from the upheaval, and, as in the aftermath of every revolution, it is important to build upon the good results and minimize the damage. That is what we tried to do at MIT, sometimes with success." A number of long-lasting changes were accomplished during Johnson's administration, including the creation of the Undergraduate Research Opportunities Program and the Independent Activities Period. The change from full-letter grades to pass/no credit for freshmen was also introduced during his presidency, and he oversaw major initiatives including the opening of multiple new residence halls: Eastgate in 1967, Random Hall and the east wing of McCormick Hall in 1968, and MacGregor House in 1970. Johnson said of his presidency upon resigning, "They have been the best years of my life. They have been years of strength for MIT as well." He went on to serve as chairman of the MIT Corporation from 1971 to 1983 and participated on numerous governmental panels. He also contributed his time and expertise as a trustee or director of institutions such as the Federal Reserve Bank of Boston, Radcliffe College, the Museum of Fine Arts, and the Boston Symphony Orchestra. Born to a Scandinavian family in Chicago in 1922, Johnson attended Central College in Chicago on scholarship, concentrating on economics and political science, and working forty hours a week to pay for expenses. He received his BA in 1943 and enlisted in the Army Infantry, serving in civil affairs and military government. After the war, he studied political economy at the University of Glasgow before returning to the United States to undertake graduate study in economics at the University of Chicago, where he received an MA in 1947. He served on the faculty of the University of Chicago from 1948 to 1955, when he came to MIT as an associate professor of management and director of the Sloan Fellowship Program. He became professor and dean of the School of Industrial Management in 1959, serving until 1966. In 1964 the School was renamed the Alfred P. Sloan School of Management. At the conclusion of Johnson's chairmanship, he remained at MIT as a special faculty professor, where his energy, grace, and intelligence continued to solve problems, soothe tensions, and establish new partnerships, including the creation of the Whitehead Institute and the MIT Leadership Campaign. The Johnson Athletics Center carries his name and, with it, the constant reminder of his tremendous impact on the Institute.

National security expert Carl Kaysen, the emeritus Skinner professor of political economy and former director of MIT's Program in Science, Technology, and Society, died on February 8, 2010, in Cambridge, MA. He was 89. Trained as an economist, Kaysen expanded his interests early in his career and participated in significant national-security initiatives in the Kennedy administration. A native of Philadelphia, Kaysen received his BA from the University of Pennsylvania in 1940. He worked as an economist for the Office of Strategic Services during the war, participating in intelligence operations with the US Army Air Force. After the war, Kaysen resumed his studies, earning an MA and PhD in economics at Harvard, where he became a professor of economics in 1957. As one of many scholars recruited from Cambridge to join the Kennedy administration, Kaysen served from 1961 to 1963 as deputy special assistant for national security affairs. In a 2008 interview, Kaysen said that his work on the team negotiating the Limited Test Ban Treaty was among the proudest moments of his career. Signed in 1963 by the United States, the Soviet Union, and the United Kingdom, the treaty prohibited all nuclear test detonations except those underground. After a brief return to Harvard, Kaysen left again to become director of the Institute for Advanced Study in Princeton, NJ, founding its School of Social Science. In 1976 he joined MIT and directed the Program in Science, Technology, and Society from 1981 to 1987. In retirement, Kaysen remained committed to an internationalist view of policymaking and was an active scholar, affiliated with the Center for International Studies. He was also co-chair of the Study Committee on International Security Studies for the American Academy of Arts and Sciences. Colleagues remember Kaysen as a conscientious intellectual who analyzed issues thoroughly before arriving at conclusions.

Edward H. Linde '62, co-founder and CEO of Boston Properties Inc. and a former member of the MIT Corporation, died on January 10, 2010. He was 68. Raised in New York City, Linde arrived at MIT as an undergraduate in 1958 and earned a degree in civil engineering. After receiving an MBA from Harvard Business School in 1964, he joined the development firm Cabot, Cabot & Forbes. In 1970 he co-founded Boston Properties, which became one of the largest real estate investment trusts in the country, with Mortimer B. Zuckerman. Linde was president of the company until his son, Douglas T. Linde, succeeded him in 2007. A term member of the Corporation from 1990 until 1995, Linde was a tireless supporter of his alma mater. In October 2008, Linde and his wife, Joyce, together with the Linde Family Foundation, pledged \$25 million to MIT, one of the largest pledges in support of undergraduate financial aid in the history of the Institute. As a prominent philanthropist, Linde served as chairman of the Boston Symphony Orchestra and chairman of the board of Beth Israel Hospital in Boston. He was inducted into the American Academy of Arts and Sciences in October 2009.

William J. Mitchell, Dreyfoos professor of architecture, professor of media arts and science, and former dean of the School of Architecture and Planning, died on June 11, 2010, at the age of 65. Considered one of the world's leading urban theorists, Mitchell used the work of his Smart Cities research group at the Media Lab to pioneer new approaches to making cities more responsive to their citizens and more efficient in their use of resources. A major focus of the work was the revamping of urban transportation, including the development of the CityCar, a lightweight, electric, shared vehicle that could fold and stack like supermarket shopping carts at convenient locations, with all

essential mechanical systems housed in the car's wheels. Born in 1944 and raised in rural Australia, Mitchell received a BA from the University of Melbourne, a master's in environmental design from Yale University, and an MA from the University of Cambridge. Before coming to MIT, Mitchell taught at Yale, Carnegie-Mellon, and Cambridge, served as head of the Architecture/Urban Design Program at UCLA's Graduate School of Architecture and Urban Planning, and was director of the Master in Design Studies Program at the Harvard Graduate School of Design. Joining MIT in 1992, Mitchell championed the importance of the visual arts and recruited a number of innovative, young faculty members to infuse new energy and visibility into the School of Architecture and Planning. As architectural advisor to then-president Charles M. Vest, Mitchell left his most visible and lasting mark on the Institute campus by guiding one of the most ambitious building programs in US higher education: a metamorphosis that added nearly one million square feet to MIT's 154-acre campus. Central to the \$1 billion building program were five innovative architectural projects by world-renowned designers: Frank Gehry's Stata Center, Kevin Roche's Zesiger Sports and Fitness Center, Steven Holl's Simmons Hall, Charles Correa's Brain and Cognitive Sciences complex, and Fumihiko Maki's Media Lab complex. Mitchell offered an insider's look at the conceptualization, design, and construction of the five buildings in his 2007 book *Imagining MIT* (MIT Press). A prolific author, he was a fellow of the Royal Australian Institute of Architects and the American Academy of Arts and Sciences.

Leo Osgood, former associate dean and director of the Office of Minority Education, died on November 11, 2009. During his MIT career, Osgood had a profound impact on the students, faculty, and staff with whom he worked. He joined MIT in 1977 as an assistant basketball coach and became head coach in 1986, a position he would hold for the next nine years. Beginning in 1983, he was also an assistant dean in the counseling section of the Office of the Dean for Student Affairs. For 12 years, he was the sole dean on call, helping students work through academic and personal emergencies after hours. In this role, he personally touched the lives of many students, often in their most desperate time of need. As an assistant professor of athletics, he was thoroughly engaged in fostering the development of underrepresented students, faculty, and staff, serving on the faculty advisory board of the Office of Minority Education (OME) and contributing significantly to OME's Interphase, a summer program providing academic enrichment and community building for newly admitted freshmen. He co-chaired MIT's Martin Luther King Jr. Committee as it conceived and initiated the Martin Luther King Jr. Visiting Scholars Program and also co-chaired a presidential task force for career development of underrepresented minority administrators. In 1995 he was appointed associate dean and director of the Office of Minority Education, serving in this role until his retirement from MIT in 2006. A native of Charleston, SC, Osgood came to Boston as a young boy. He earned a BS in business administration and an MS in education from Northeastern University, where he was a highly successful basketball player. When he graduated in 1970, he was Northeastern's fifth all-time leading scorer and later was inducted into the Northeastern Athletic Hall of Fame.

Former MIT professor Thomas Pigford SM '48, ScD '52, who helped launch the Institute's graduate program in nuclear engineering, died on February 28, 2010, in Oakland, CA. He was 87. Pigford championed nuclear power but not at the expense

of appropriate safeguards for health and the environment, and he was respected among scientists and environmentalists alike for his technical expertise and objectivity. Pigford was born in 1922 in Meridian, MS, and received a bachelor's degree in chemical engineering from the Georgia Institute of Technology in 1943. His graduate studies at MIT were interrupted when he joined the US Navy to serve in the Pacific theater during the last stages of World War II. Discharged at the end of the war, he returned to MIT to resume his studies. While completing his doctorate, Pigford was asked to join the MIT faculty. He became associate professor of nuclear and chemical engineering in 1955. In 1959, Nobel laureate Glenn Seaborg, chancellor at the time of the University of California, Berkeley, recruited Pigford to UC Berkeley faculty as a full professor. Pigford became the first permanent chair of the nuclear engineering department, which had just been elevated to full departmental status. He also held a position as a senior scientist at the Lawrence Berkeley National Laboratory. Pigford retired from UC Berkeley in 1991.

Robert Rines '42, an internationally recognized patent lawyer, inventor, composer, and Loch Ness monster hunter who lectured at MIT from 1963 until his retirement in 2008, died on November 1, 2009. He was 87. Born in Boston in 1922, Rines studied physics at MIT and made his first contributions to the emerging technology of high-resolution image-scanning radar. Following duty as a radar officer in World War II, Rines received a law degree from Georgetown University while also serving as a patent examiner in the US Patent Office. Returning to New England, he joined his father's law practice and began lecturing on patent law at Harvard. While at Harvard, Rines wrote *Create or Perish*, a book that later became the cornerstone text for two MIT classes he would teach—6.901 and 6.931. At the encouragement of electrical engineering and computer science professor Lan Jen Chu and several others under whom he had studied at MIT, Rines brought his teaching skills to the Institute in 1963. His classes focused on using intellectual property to start new companies and nurturing entrepreneurship and innovation. During 45 years of teaching at MIT, Rines continued to be active in research and inventing, earning more than 100 patents, many for electronic devices to improve the resolution of radar and sonar scanning. In 1973, Rines founded the Franklin Pierce Law Center in Concord, NH, now among the country's foremost institutes for the study of intellectual property law. Rines was inducted into the National Inventors Hall of Fame in 1994. Beyond teaching and inventing, Rines pursued scientific discovery in other ways as well. As documented by WGBH television's *Nova* series, Rines joined MIT professor Harold "Doc" Edgerton in the 1970s in a bid to provide evidence of the Loch Ness creature in Scotland. Using Rines' inventions in radar and sonar imaging and Edgerton's stroboscopic photography, they were able to produce a partial image of the Ness creature's outline and size, but the findings were inconclusive. Still, Rines maintained that he had, in fact, caught a glimpse of the creature. Yet his first love was music and, amazingly, he composed more than 10 Broadway and off-Broadway shows. He shared an Emmy in 1987 for his compositional work on the television production "Hizzoner The Mayor." He also held more than 800 patents.

Richard D. Robinson, professor emeritus at the Sloan School of Management, died on September 5, 2010, in Gig Harbor, WA, at the age of 88. While at MIT, Robinson initiated the study of international business management and helped establish MIT's postwar relationship with China in the late 1970s. A graduate of the University of Washington,

Harvard Graduate School of Business, and MIT, where he earned his PhD, Robinson also spent a year at the School of Oriental and African Studies at the University of London, where he studied Turkish history, language and literature, and Islamic law. Moving to Turkey in 1947, Robinson was among the first Americans to explore, photograph, and write about the central and eastern part of the country, initially as a fellow of the Institute of Current World Affairs and later as the Turkish-area specialist for the American Universities Field Staff. Returning to the United States in 1956, Robinson taught contemporary Turkish history at Harvard while researching the activities of American corporations in developing countries. Over more than two decades as a professor at MIT, Robinson wrote pioneering textbooks on international management and founded the Academy of International Business, continually emphasizing the importance of cultural values within the study and practice of international management. Later, Robinson chaired the Florence R. Kluckhohn Center for the Study of Values in Bellingham, WA, which has helped resolve cultural conflicts in a number of areas, most notably between Native Americans and the Alaskan government.

MIT economist Paul A. Samuelson, the Nobel laureate whose mathematical analysis provided the foundation on which modern economics is built and whose textbook influenced generations of students, died on December 13, 2009, in Belmont, MA. He was 94. An Institute Professor and Gordon Y Billard Fellow, Samuelson was one of the world's leading economists for more than half a century. He was instrumental in bringing the Department of Economics, which did not train graduate students when he joined it in 1940, to its current status as the top-rated economics faculty in the world. He produced the best-selling economics text of all time, *Economics: An Introductory Analysis*, first published in 1948 and originally prepared for MIT's then-mandatory undergraduate course in economics. Samuelson's textbook, the first to explain the principles of Keynesian economics to beginning economics students, has since been translated into 40 languages and is now in its 19th English edition. In policy, Samuelson never held a major government post, but true to his belief that economists should be involved in social issues, he served as an adviser to Presidents Kennedy and Johnson and was a consultant to government, foundations, and companies. He also commented publicly through his column in *Newsweek*. Samuelson continued to work long after his official retirement in 1985, arriving at his MIT office regularly and remaining an active member of the department. Born in Gary, IN, in 1915, Samuelson received a BS from the University of Chicago in 1935 and an MA and PhD from Harvard in 1936 and 1941. He was an early junior fellow of the Harvard Society of Fellows and was appointed an assistant professor of economics at MIT in 1940. He became an associate professor in 1944 and a full professor in 1947. In 1966 he was named an Institute Professor. In his first major work, *Foundations of Economic Analysis* (1947), which was his PhD thesis, he told economists they had been practicing "mental gymnastics of a particularly depraved type" and were like "highly trained athletes who never ran a race." He did not claim mathematics would cure the ills of economic analysis, but did insist it was essential. The Swedish Royal Academy said in its Nobel citation that through this first book and a large number of articles, Samuelson had "rewritten considerable parts of central economic theory and ... in several areas achieved results which now rank among the classical theories of economics." In addition to winning a Nobel Prize and the National Medal of Science, Samuelson was the inaugural winner of the John Bates Clark Medal,

the American Economic Association's award for the best American economist under the age of 40, which he received in 1947. He served as president of the American Economic Association and the Econometric Society, authored hundreds of articles in professional journals and magazines, and served as associate editor and a member of the advisory and editorial boards of multiple professional journals. *The Collected Scientific Papers of Paul A. Samuelson* (MIT Press) has been published in five volumes, containing about 400 articles. Another 200 papers will be published in volumes 6 and 7. His numerous honors include membership in the American Academy of Arts and Sciences, the British Academy, Phi Beta Kappa, the National Academy of Sciences, and the American Association for the Advancement of Science.

Arthur C. Smith, an electrical engineering professor who contributed significantly to the enhancement of student life and learning during nearly half a century of dedicated service to MIT, died on April 23, 2010. He was 80. Smith received a BS in physics from the University of Kansas in 1951, an MA in physics from Harvard in 1954, and a PhD in applied physics from Harvard in 1958. He came to MIT as an assistant professor of electrical engineering the following year, became an associate professor in 1963, and was promoted to full professor in 1968. His research focused on thermoelectric energy conversion and semiconductors, and he co-authored two textbooks on electronic conduction in solids. Smith was chairman of the faculty from 1983 to 1985 and received the Gordon Y Billard Award for distinguished service to the Institute in 1987. He agreed to serve as acting dean for student affairs in 1990 and was appointed to a two-year term as dean the following year. An administrative reorganization after the death of Margaret MacVicar, MIT's first dean of undergraduate education, added responsibility for undergraduate education to his portfolio. In 1996, when he stepped down as dean for undergraduate education and student affairs, the Institute honored him with the creation of the Arthur C. Smith Award, which recognizes a member of the MIT community "for meaningful contributions and devotion to undergraduate student life at MIT."

Ain Sonin, emeritus professor of mechanical engineering, died on June 27, 2010, at the age of 72. An expert in advanced fluid mechanics, Sonin displayed compassion and boundless dedication to his students. Born in 1937 in Tallinn, Estonia, he spent most of his childhood in Stockholm, Sweden, and moved with his family to Toronto as a young adult. Following his childhood love of airplanes, he earned his PhD in engineering physics and aerospace sciences from the University of Toronto in 1965. Soon thereafter, he joined MIT's Department of Mechanical Engineering as an assistant professor. Sonin served as the department's graduate officer for a quarter-century. During his tenure, he earned several teaching awards, including the Graduate Student Council Teaching Award in 1973 and 1989, and the Spira Teaching Award in 1992. He guided students through academic and personal challenges with grace and dignity, and his door was always open, his motto being "We'll figure it out." Sonin taught undergraduate courses in fluid mechanics and thermodynamics, all the fundamental graduate-level subjects in fluid mechanics, and was especially well known in the MIT community and beyond for his artfully crafted course in advanced fluid mechanics. His work and writings on the subject of dimensional analysis are considered the clearest exposition of the field and also the most useful for applying the concepts to modeling and real-world systems.

In addition to his long academic career, Sonin consulted frequently in private and government sectors. He contributed articles to more than 70 publications and developed four patents—one for a water-desalination system and three for “sniffer” systems now used to detect drugs and explosives at major airports and security checkpoints. Sonin was a member of the American Society of Mechanical Engineers, American Physical Society, American Nuclear Society, and the American Association for the Advancement of Science.

H. Guyford Stever, who served as chief science adviser to Presidents Nixon and Ford, died on April 9, 2010, in Gaithersburg, MD. He was 93. During his long, illustrious career, Stever headed two MIT departments and was professor in another, served as president of Carnegie Mellon University, headed the National Science Foundation, and led the committee that brought about the creation of the National Aeronautics and Space Administration in 1958. He also chaired the committee that redesigned the space shuttle’s boosters after the Challenger accident in 1986. He was a superlative administrator, always quick to comprehend a problem, and just as quick to find the right people to solve it. Stever was born in 1916 in Corning, NY. Graduating from Colgate in 1938, he received his PhD in physics from the California Institute of Technology in 1941. Within weeks, he went to work at MIT’s Radiation Laboratory and joined the MIT faculty in 1946. Eventually he headed the Department of Mechanical Engineering and the Department of Naval Architecture and Marine Engineering, all the while holding a professorship in aeronautical engineering. He left MIT in 1965 to become president of Carnegie Mellon. Stever’s tenure there was marked by significant change and growth in the institution, including the establishment of a College of Humanities and Social Studies, the addition of the School of Urban and Public Affairs, the formation of a Department of Computer Science and a Statistics Department, and a Transportation Research Center. As director of the National Science Foundation, Stever strengthened NSF’s core mission of supporting basic research primarily conducted in universities by peer-reviewed principal investigators. But a secondary role also emerged during his tenure. Responding to the OPEC oil embargo of 1973, Stever rapidly increased NSF-funded research on non-fossil and renewable energy sources. Following his work in the Nixon and Ford administrations, he served as an independent corporate board member, a nonprofit organization trustee, and a science and technology consultant. He was also a member of the National Academy of Sciences, the National Academy of Engineering, and the Carnegie Commission on Science, Technology and Government.

Richard Yamamoto, a physicist whose work revealed the interactions of subatomic particles, died on October 16, 2010, at the age of 74. Born and raised in Hawaii, Yamamoto came to MIT as a freshman in 1953 and spent his entire career at the Institute. He was known for his love of working with his hands as well as for his contributions to the understanding of elementary particles. Yamamoto worked for many years at Fermilab and the Stanford Linear Accelerator Center, where his team showed that a type of particular interaction called a weak interaction appears differently if viewed in a mirror—a phenomenon known as a parity violation. As part of this research, he devised a way to use a laser to accurately count the number of left-handed and right-handed electrons in an electron beam. This method was used to measure the interaction strength of a particle called the Z boson, a heavy elementary particle first discovered

in 1983. Yamamoto's research team also carried out very precise studies of the decay of particles containing heavy quarks if time were to flow backward. Yamamoto earned his SB and PhD, both in physics, from MIT in 1957 and 1963. He joined MIT's Laboratory for Nuclear Science in 1963 and became an instructor of physics in 1964. He was appointed an assistant professor in 1965 and a full professor in 1972. He was a colleague, teacher, and friend to many, and his kindness and enthusiasm helped make the physics department a supportive place.

Sadly, we also report the unanticipated passing of three of MIT's extraordinary students.

Graduate student Peter N. Curtin, age 23, died after collapsing while running the Baltimore Marathon. A graduate student in inorganic chemistry, Curtin was in his second year as a member of the Nocera research group. He had recently been selected to receive a National Defense Science and Engineering Graduate Fellowship.

Joshua Jahnke, a lieutenant in the US Navy, passed away from pancreatic cancer. He was 29. Intent on completing his graduate degree at MIT despite chemotherapy, he received an SM in naval architecture and marine engineering. The Office of Graduate Education and the Department of Mechanical Engineering arranged for Jahnke to receive his degree before passing away. Born in Florida, he earned a BS in mathematics with a minor in law from the University of West Florida in 2003 and an MBA from Charleston Southern University in 2008. In addition to receiving his MIT degree, Jahnke also received the Naval Sea Systems Command Award in Naval Construction and Engineering while at MIT. He was authorized to wear the Navy-Marine Corps Commendation Medal, the Navy Achievement Medal, the Humanitarian Service Medal, and several other awards.

Kabelo Zwane, a sophomore and MIT's first student from Swaziland, died in an apparent suicide. He was 21. Coming from a small village, Zwane made a big impression among students and administrators at MIT with his quiet, inquisitive manner. He enjoyed biking, running, reading and writing poetry, and drawing.