

In Special Recognition

The 2006–2007 academic year saw a number of changes in MIT’s senior academic and administrative leadership.

Three experts in their fields who served MIT as deans of the Schools of Engineering, Management and Science—collectively contributing more than two decades of service to Institute administration—stepped down at the end of the academic year. Thomas L. Magnanti, dean of the School of Engineering since 1999, Richard Schmalensee, the John C Head III dean of the MIT Sloan School of Management since 1998, and Robert J. Silbey, dean of the School of Science since 2000, all indicated their intention to return to academic pursuits.

Dean Magnanti had been a key player in the development of major industrial partnerships with Hewlett-Packard and Microsoft, as well as pioneering collaborations such as the Singapore-MIT Alliance. Named an Institute Professor in 1997, he returned to his research on the theory and application of large-scale optimization. Provost L. Raphael Reif announced that Subra Suresh, Ford professor of engineering in the Department of Materials Science and Engineering, would succeed Professor Magnanti as the next dean of the School of Engineering.

In addition to forming the MIT Sloan Fellows Program in Innovation and Global Leadership, and redesigning the MBA program, Dean Schmalensee catalyzed the development of a landmark 209,000-square-foot management building and helped raise \$220 million for the MIT Sloan School. Under his leadership, many of Sloan’s international efforts have been created or enhanced, including the China Management Education Project and the Global Entrepreneurship Laboratory, the Global Leadership Lab (G-Lab), and the MIT Leadership Center.

An advocate for excellence in teaching, Dean Silbey supported innovative approaches to undergraduate education such as the Technology Enhanced Active Learning (TEAL) program, which changed the way freshman physics is taught, and chaired the Task Force on the Undergraduate Educational Commons. During his tenure, faculty members in the School of Science received four Nobel prizes; the Brain and Cognitive Sciences Complex was constructed; and successful searches resulted in the hiring of more than 80 faculty members. Marc A. Kastner, Donner professor of science and head of the Department of Physics, was announced as the next dean of the School of Science.

Barbara H. Liskov, Ford professor of engineering in the Department of Electrical Engineering and Computer Science, and Wesley L. Harris, Charles Stark Draper professor of aeronautics and astronautics and head of the Department of Aeronautics and Astronautics, were selected to share the newly created position of associate provost for faculty equity. In their new roles, Professors Liskov and Harris will focus on faculty diversity and gender issues across the Institute, including the recruitment, retention, promotion, and career development of minority and women faculty.

Theresa M. Stone, a member of the MIT Corporation since 1996 and chair of the MIT Investment Management Company, was appointed MIT’s executive vice president and

treasurer. Alison Alden, formerly senior vice president for human resources at John Hancock, was named MIT's vice president for human resources. Jeffrey L. Newton, dean for resource development and alumni relations at Harvard Medical School, joined MIT as vice president for resource development. R. Gregory Morgan, formerly the co-managing partner of the law firm of Munger, Tolles & Olson LLP, joined MIT as the Institute's first vice president and general counsel; and Deborah Loeb Bohren, executive vice president of the Washington, DC, public affairs firm of Powell Tate, joined MIT as the Institute's first vice president for external affairs.

Notable changes in the leadership of academic departments, programs, and research activities included Diana Henderson's appointment as dean for curriculum and faculty support; Ernest J. Moniz's appointment as director of the MIT Energy Initiative; Robert C. Armstrong's appointment as the associate director of the MIT Energy Initiative; and Anantha P. Chandrakasan's appointment as director of the Microsystems Technology Laboratories.

Notable administrative changes included the appointments of Stephen A. Dare as interim vice president for resource development; Pamela Dumas-Serfes as executive director of news and communications; and James H. Wallace as deputy director of facilities.



The awards received by MIT faculty, students and staff testify to the distinction of the Institute's programs and its people. Here we note only some of the honors and recognition earned by members of the Institute community during the 2006–2007 academic year.

Two MIT graduates were awarded Nobel Prizes in 2006. George F. Smoot graduated from MIT in 1966 and again in 1970 with a dual SB in physics and mathematics, and a PhD in physics, respectively. Now on the faculty of the University of California at Berkeley, Smoot shared the Nobel Prize in Physics with John C. Mather of the NASA Goddard Space Flight Center “for their discovery of the black body form and anisotropy of the cosmic microwave background radiation” — measurements, in other words, that reveal the origin and evolution of the universe. Andrew Z. Fire, who received his PhD in biology from MIT in 1983 and is now a member of the faculty at Stanford University, shared the Nobel Prize in Physiology or Medicine with Craig C. Mello of the University of Massachusetts “for their discovery of RNA interference—gene silencing by double-stranded RNA.”

Professor Linda G. Griffith, director of MIT's Biotechnology Process Engineering Center (BPEC), was the recipient of a 2006 MacArthur Fellowship honoring her research in “shaping the frontiers of tissue engineering and synthetic regenerative technologies.” The so-called genius grant from the John D. and Catherine T. MacArthur Foundation awards \$500,000 in no-strings-attached support over a period of five years.

Three MIT students were recipients of prestigious awards during the 2006–2007 academic year. Graduate student Finale Doshi was awarded a Marshall Scholarship for study at the University of Cambridge in 2007; Alia Whitney-Johnson won a 2007 Harry S. Truman Scholarship; and Katonio A. Butler received an Annenberg Fellowship for a year of study at Eton College in the United Kingdom. Butler's fellowship marks the first time in the 20-year history of the award that an MIT student has received this honor. These three programs select students based upon similar criteria: outstanding scholarship, noteworthy service, and potential for future contribution to national or international welfare and public service.

Ellen W. Faran, director of the MIT Press, received on behalf of the Press the 2007 Grinzane-Cavour Award in recognition of MIT Press's contributions, both substantial and ethical, to the publication of scientific and humanistic titles. The MIT Press is the seventh recipient of the prize.

Two MIT professors won 2007 Franklin Institute Awards for "significant discoveries and achievements, which directly impact our daily lives or contribute to our present and future well-being." Joining the company of past winners including Albert Einstein, Thomas Edison, and Orville Wright are MIT professor emeritus Klaus Biemann of the Department of Chemistry and Merton C. Flemings, the emeritus Toyota professor of materials processing.

President emeritus Charles M. Vest was awarded the 2006 Philip Hauge Abelson Prize from the American Association for the Advancement of Science for his contributions to public policy, education, and university research. The Abelson Prize is awarded annually either to a public servant in recognition of sustained contributions to advancing science or to a scientist whose career has been distinguished both for scientific achievement and for other notable services to the scientific community.

Senior research scientist Timothy J. Berners-Lee, who "imaginatively combined ideas to create the World Wide Web," was awarded the 2007 Charles Stark Draper Prize. Established by the National Academy of Engineers, the \$500,000 Draper Prize is considered to be engineering's Nobel Prize and is granted to those engineers whose accomplishments have significantly benefited society.

MIT Institute Professor Mildred Dresselhaus is the North American winner of a 2007 L'Oréal-UNESCO Award for Women in Science. Dresselhaus is one of four recipients, each representing a different continent. The \$100,000 prize, the only one of its kind to honor eminent women scientists at the national level, is designed to recognize, reward, and advance the role of women in scientific research.

Timothy M. Swager, head of the Department of Chemistry and John D. MacArthur professor of chemistry at MIT, won the \$500,000 2007 Lemelson-MIT Prize, the most prestigious cash prize for invention in the United States. Swager was honored for inventing sensors that detect vapors of common bomb-making chemicals.

Five members of the MIT Faculty were awarded Guggenheim Fellowships for 2007: Professor Edmund Bertschinger, Astrophysics; Erica Funkhouser, Writing and Humanistic Studies; Professor Michel X. Goemans, Mathematics; Professor Erika Naginski, Architecture; and Professor Anne Whiston Spirn, Urban Studies and Planning. Winners of this annual competition are selected on the basis of their “distinguished achievement in the past and exceptional promise for future accomplishment.”

Election to the US national academies—the National Academy of Engineering, National Academy of Sciences, and the Institute of Medicine—is one of the highest honors in the fields they represent. This year, the National Academy of Engineering elected to membership Professor George E. Apostolakis, Nuclear Science and Engineering; Professors James L. Kirtley, Jr., Silvio Micali, and John N. Tsitsiklis, Electrical Engineering and Computer Science; and Timothy Berners-Lee, Computer Science and Artificial Intelligence Laboratory. The National Academy of Sciences elected to membership Professor Tania A. Baker, Biology; Professor Mounqi G. Bawendi, Chemistry; Professor Kerry A. Emanuel, Earth, Atmospheric and Planetary Sciences; Professor Silvio Micali, Electrical Engineering and Computer Science; and Professor Peter H. Schiller, Brain and Cognitive Sciences. Three MIT faculty members were elected to the Institute of Medicine: Elazer R. Edelman, Health Sciences and Technology; Rudolf Jaenisch, Biology; and Susan L. Lindquist, Biology.

Fifteen MIT professors were inducted into the American Academy of Arts and Sciences: K. Daron Acemoglu, Economics; Joshua Angrist, Economics; Stephen D. Ansolabehere, Political Science; Rodney Brooks, Computer Science and Artificial Intelligence Laboratory; Arup K. Chakraborty, Chemical Engineering; Glenn Ellison, Economics; Gregory Chung-Wei Fu, Chemistry; Victor Kac, Mathematics; Evelyn Fox Keller, Science, Technology, and Society; Tomasz Mrowka, Mathematics; Whitney K. Newey, Economics; Peter C. Perdue, History; Peter H. Schiller, Brain and Cognitive Sciences; Timothy M. Swager, Chemistry; and James M. Snyder, Jr., Political Science. The Academy also installed Institute Professor Emilio Bizzi as its 44th president.

The American Association for the Advancement of Science named four members of the MIT faculty to fellowship: Gregory C. Fu, Chemistry; Steven R. Tannenbaum, Biological Engineering; Mujid S. Kazimi, Nuclear Science and Engineering; and Susumu Tonegawa, Biology.

Two MIT faculty members received 2006 Pioneer Awards from the National Institutes of Health (NIH). Professors Arup K. Chakraborty, Chemical Engineering, and James L. Sherley, Biological Engineering, will each receive \$2.5 million over five years. The Pioneer Award is a key component of the NIH Roadmap for Medical Research, supporting exceptionally creative scientists who take highly innovative approaches to major challenges in biomedical research.

Professor of mathematics Tomasz Mrowka was awarded the 2007 Oswald Veblen Prize in Geometry, one of the highest honors in the field of geometry. He shared the award with Harvard University professor Peter Kronheimer. The American Mathematics

Society honored both “for their joint contributions to both three- and four-dimensional topology through the development of deep analytical techniques and applications.”

Professor Troy Van Voorhis of the Department of Chemistry received a 2006 David and Lucile Packard Foundation fellowship. He will receive an unrestricted research grant of \$625,000 over five years that will permit him to further explore how electrons create and destroy chemical bonds.

Two MIT professors were among eight winners of 2007 Ernest Orlando Lawrence Awards from the United States Department of Energy (DOE). Professor Arup K. Chakraborty, Chemical Engineering, won in the category of life sciences, while Mounqi Bawendi, Chemistry, shares the award and honorarium with Paul Alvisatos of the University of California at Berkeley for research completed in the category of materials research. These awards honor scientists and engineers in mid-career for exceptional contributions in research and development that support the DOE and its mission to advance the national, economic, and energy security of the United States.

Professor Douglas Lauffenburger, head of the Biological Engineering Division, won the 2007 Pierre Galletti Award from the American Institute for Medical and Biological Engineering (AIMBE). The Galletti Award, AIMBE’s highest honor, recognizes “contributions to public awareness of medical and biological engineering, and to the promotion of the national interest in science, engineering and education.”

Professor Sara Seager, Earth, Atmospheric, and Planetary Sciences, won the 2007 Helen B. Warner Prize from the American Astronomical Society. The Warner Prize, recognizing an astronomer who is not yet 36 years of age and a resident of North America or a member of a North American institution, was awarded to Professor Seager for her development of “fundamental techniques for understanding, analyzing, and finding the atmospheres of extrasolar planets.”

This year, five faculty members were named MacVicar Faculty Fellows in honor of their accomplishments and innovative methods in undergraduate education: Professors Yoel Fink, Materials Science and Engineering; Jonathan Gruber, Economics; Charles E. Leiserson, Electrical Engineering and Computer Science; James B. Orlin, Management; and David Wallace, Mechanical Engineering.

Institute Professor Isadore Singer received the 2005–2006 James R. Killian Junior Faculty Achievement Award. Established in 1971 as a tribute to MIT’s 10th president, the Killian Award recognizes extraordinary professional accomplishment by an MIT faculty member. The winner delivers a lecture during the spring term.

The 2006 Harold E. Edgerton Faculty Achievement Award was presented to David Kaiser, associate professor of the history of science in the Program in Science, Technology, and Society. This award recognizes junior faculty for achievements in teaching, research, and service to the MIT community.

This year's Gordon Y Billard Award, recognizing special services of outstanding merit to MIT, was presented to Dean Robert Silbey of the School of Science.



The accomplishments and honors of MIT's current students, faculty, and staff are links in a chain of distinguished achievement by members of the MIT community. The memory of colleagues who passed away during the year is a source of inspiration for us, and for future generations of the MIT family.

Walter Alan Backofen, emeritus professor of metallurgy and materials science, died at his Marblehead home on December 2. He was 80. Born in Rockville, CT, Backofen graduated from Rockville High School in June 1943, entered MIT within days, and soon enlisted in the US Navy. In February 1946, he graduated from MIT with a bachelor's degree in metallurgy and an ensign's commission. In 1950 he received his doctorate from MIT and was appointed an assistant professor in the Department of Metallurgy. Backofen taught at MIT for 25 years, where he designed new courses and a new laboratory, and became recognized for bridging theory and practice over a wide range of real-life problems. A paper he wrote in 1964 on superplasticity identified the ability of metals, temporarily given a near-nano-size grain structure, to behave like Silly Putty. That paper was recognized for its seminal influence on a now-burgeoning global industry at an International Conference on Superplasticity held in Chengdu, China, in June 2006. Backofen was the first in his field to receive its three principal achievement awards: the Bradley Stoughton Award for teaching, Howe Medal for research, and the Campbell Lecturer award for professional leadership. He was a popular speaker and became a pioneering popular-science lecturer on live television.

Manson Benedict, a former Institute Professor who worked on the Manhattan Project, died on September 18 at his home in Naples, FL. He was 98. A native of Lake Linden, MI, Benedict received his BS in chemistry from Cornell University and his PhD in physical chemistry from MIT. While at MIT, he met his wife, Marjorie Allen Benedict, who also earned a PhD in chemistry. Benedict developed the gaseous diffusion method for separating the isotopes of uranium and supervised the engineering and process development of the K-25 plant in Oak Ridge, TN, where fissionable material for the atomic bomb was produced. He received many awards for his work on the Manhattan Project during World War II, as well as for his later career, which focused on nuclear power and other peaceful uses of atomic energy. In 1951 he was invited to be MIT's first professor of nuclear engineering, in the Department of Chemical Engineering. The Department of Nuclear Engineering was established in 1958 with Benedict as its first department head. From 1958 to 1968, Benedict was a member and chair of the Advisory Committee of the Atomic Energy Commission, appointed by Presidents Eisenhower and Kennedy. Benedict won the William H. Walker Award in 1947, the Perkin Research Medal in 1966, the Robert E. Wilson Award in 1968, the Enrico Fermi Award in 1972, and the National Medal of Science, presented by President Gerald Ford, in 1975. The Wilson Award citation said of Benedict, "He has served education, industry and government

with quiet and unwavering dedication.” The Manson Benedict (1932) Fellowship fund was established in November 1983 to support graduate fellowships awarded for excellence in academic performance and professional promise in research in nuclear engineering.

E. Cary Brown, a member of the MIT economics faculty for more than 60 years and a leading expert on fiscal policy and the economics of taxation, passed away on June 8. He was 91. Brown received his BA from the University of California at Berkeley in 1937 and pursued graduate work in economics at Berkeley and Harvard. He was an economist at the War Production Board during 1940–1941 and served in a similar capacity at the Division of Tax Research in the US Treasury Department between 1942 and 1947. Brown was a leader in post–World War II research efforts to understand the economic effects of different tax instruments and to design an equitable and efficient tax system. He received his PhD in economics from Harvard in 1948, after joining the MIT faculty the previous year. During the early 1960s, he was actively involved in the Kennedy Administration’s consideration of proposals for accelerated depreciation of capital goods, and he was one of the architects of the 1962 investment tax credit. He served as head of MIT’s Economics Department for 18 years, presiding over a period of expansion when it achieved recognition as one of the world’s leading economics departments. Brown was widely acclaimed for his seminal research on the design of depreciation allowances, and his insights, while remaining a touchstone for virtually all subsequent research on this issue, are still prominent in the public policy debate on the choice between income and consumption taxation.

William R. Dickson, who supervised major building projects that tripled the size of MIT’s campus, died on August 14 at the age of 71. Dickson worked at MIT for nearly 40 years, starting in Physical Plant and working his way up to senior vice president, a title he held for 16 years before retiring in 1998. In this position, he was responsible for most of the operations of the Institute and much of its financial planning and activities. The building projects he brought into fruition included Kresge Auditorium, the Green Building, Eastgate, Westgate, McCormick, the Whitaker Building, Building 16, and the Stata Center. As an MIT graduate with a degree in building construction and engineering (Course 17), Dickson said his proudest accomplishment was helping the Institute grow from 3.5 million square feet of built space in 1960 to 10 million square feet at the time he left. MIT’s co-generation plant, named in his honor, was built after he initiated efforts to combine hot water production with electricity generation in one plant. The Dickson facility, which uses natural gas to make the electricity that powers 80 percent of MIT’s buildings, has won awards for design and environmental excellence. Among his colleagues, Dickson was known not only for his encyclopedic knowledge of the Institute, but also for his ability to make things happen. He was beloved for his sense of humor and for the respect he held for everyone with whom he worked.

Vernon Ingram, known as the “father of molecular medicine,” died August 17 from injuries suffered during a fall. He was 82. Ingram was best known for his discovery, in the 1950s, that a single amino acid substitution is responsible for the molecular

abnormality leading to sickle cell anemia. A native of Breslau, Germany, Ingram studied at Birkbeck College in the University of London, earning his BSc in chemistry in 1945 and his PhD in organic chemistry in 1949. In 1952, after two years of postdoctoral research in the United States, Ingram took a position studying protein chemistry in the Cavendish Laboratory of the University of Cambridge. He focused on the genetics of hemoglobin, the molecule that carries oxygen in the blood, and those studies led to his discovery that the misshapen hemoglobin molecules that characterize sickle cell anemia are caused by a single mutation. Ingram joined the MIT faculty in 1958, originally planning to stay for only one year, and became one of a distinguished group of scientists who started a world-renowned center for the study of molecular and cell biology. In recent years, his research was focused on neuroscience, especially Alzheimer's disease. Ingram and his wife, Elizabeth, served as housemasters at Ashdown House beginning in 1985. He enjoyed art, music, and photography, and was very involved with the Rockport Chamber Music Festival. He was elected to the National Academy of Sciences in 2002.

Francis E. Low, a physicist and MIT provost who worked on the Manhattan Project, died of heart failure on February 16 at a retirement home in Haverford, PA. He was 85. During World War II, Low worked on the mathematics of uranium enrichment processes for the Manhattan Project at the Oak Ridge National Lab in Tennessee. He left the project to join the Army's 10th Mountain Division in Europe, serving as a mule driver and later as an artillery surveyor. After the war, Low attended Columbia University, where he earned his PhD in physics in 1950, followed by postdoctoral work at the Institute for Advanced Study in Princeton. He spent a few years teaching at the University of Illinois at Urbana before joining MIT's Physics Department in 1957. In 1969, he became a founding member of the Union of Concerned Scientists, serving as chair for a short period. Low was MIT's provost from 1980 to 1985. In that position, he encouraged a prominent role for the humanities in MIT's curriculum. He was also proud that MIT became affiliated with the Whitehead Institute for Biomedical Research during his tenure as provost. He retired from MIT as an Institute Professor in 1991 but continued to teach physics. He had a pilot's license, enjoyed tennis, and was a gifted piano player, known among friends for his ability to sing and play tunes by Cole Porter.

Stephen M. Meyer, who died of cancer on December 10 at the age of 54, was an expert on national security issues and a passionate advocate of global biodiversity. As director of the MIT Project on Environmental Politics and Policy, Meyer focused his teaching and research on the interaction of science, economics, and politics in policy making, particularly in the areas of natural resource exploitation, land use, and wildlife habitat preservation. He was the author of *Environmental Protection and Economic Prosperity* (2004) and *The End of the Wild* (2006). Meyer earned his MA and PhD at the University of Michigan. He joined MIT as an assistant professor of political science in 1980, gaining tenure in 1990. He also worked in a wide range of non-academic positions, beginning in the 1980s as a consultant to the RAND Corporation and the United States government. From 1992 to 1993, he was the principal investigator for the National Council on Soviet and East European Studies. In the late 1990s, he served on committees of the Massachusetts Division of Fisheries & Wildlife and the Massachusetts Department of Environmental Protection. In 2004 Meyer received the Arthur C. Smith Award, given to MIT faculty members for meaningful contributions and devotion to undergraduate

student life at MIT. In 2005 he received the Francis W. Sargent Conservation Award by the Massachusetts Division of Fisheries and Wildlife.

William H. Orme-Johnson, professor emeritus of chemistry, died on January 1 after a long illness. He was 68. A native of El Paso, Texas, Orme-Johnson received his BS and PhD from the University of Texas at Austin. He taught biochemistry at the University of Wisconsin at Madison for 15 years before joining the MIT faculty, in 1980, in the then-new research area of biological chemistry. Much lauded for his research, Orme-Johnson's lab was one of the first research groups to apply rapid freeze quench methods with analysis using electron paramagnetic resonance spectroscopy to study metal-based radicals and organic radical intermediates in many enzymatic reactions. In 2002 the *Journal of Inorganic Biochemistry* published a special issue dedicated to Orme-Johnson in recognition of his contributions over four decades. At MIT, Orme-Johnson served as Housemaster at Bexley Hall for nine years, and his 1992 Independent Activities Period class, Applied Chili Chemistry, was so enthusiastically received that a second section had to be formed.

George B. Thomas, a mathematician who turned a one-year teaching appointment at MIT into a 38-year career, died on October 31 of natural causes in State College, PA. He was 92. Thomas was born in Boise, ID, and educated at Spokane University, Washington State College, and Cornell, where he completed his PhD in mathematics in 1940. Hired at MIT that same year, he soon demonstrated a gift for communicating mathematical concepts and was regarded as an outstanding teacher, willingly taking on new courses. In 1951 the publisher Addison-Wesley hired him to revise its calculus textbook, but rather than revise, he wrote his own, a classic text that remained in use for more than 50 years. Thomas's interest in teaching mathematics intensified following the launch of Sputnik in 1957, and he contributed widely to a national effort to improve math and science education in American schools. As a member of the Commission on Mathematics of the College Entrance Examination Board, he coauthored monographs on mathematics and spoke at numerous forums about high school curriculum reform. He served on the Executive Committee, Mathematics Division, of the American Society for Engineering Education from 1956 to 1959 and was elected the first vice-president of the Mathematical Association of America, an organization devoted to mathematics teaching, especially at the undergraduate level, in 1958–1959. He retired from the MIT faculty in 1978.

Frederick Sanders, mentor and friend to an entire generation of weather researchers, died on October 6 after a long illness. A longtime resident of Marblehead, he was 83. Sanders was preeminent in the field of synoptic meteorology, which he had elevated to a respected science. Sanders helped develop one of the first successful computer models for forecasting hurricane tracks, as well as new techniques for forecasting rain and snow amounts. He made important contributions to the analysis, understanding, and prediction of weather fronts, low pressure systems, squall lines, and flood-producing storms, coining the term "bomb" to describe explosively intensifying winter storms. Born in Detroit in 1923, Sanders spent much of his childhood in Bloomfield Hills, MI. Attending Amherst College, he studied mathematics, economics, and music before

enlisting, in 1941, in the Army Air Corps, which was recruiting math and physics students to be trained as weather forecasters. He then spent 15 months at MIT studying math, physics, and meteorology and graduated as a second lieutenant shortly after D-Day in Normandy. Assigned to Greenland, he spent the rest of the war making weather predictions to assist flight crews. When the war ended, Sanders worked briefly as an air inspector at Grenier Air Force Base in New Hampshire before joining the US Weather Bureau, where he worked for two years as a transatlantic aviation forecaster. Returning to MIT, Sanders earned his ScD degree in 1954 and joined the faculty of MIT's Department of Meteorology, where he taught until his retirement in 1984. Sanders influenced his field not only through his own research but also through nurturing the talents of his students. He took entire classes for outings on his sailing yacht, Stillwater, bringing joy as well as knowledge to the study of weather.