

Report of the President

The world has never needed MIT as much as it does now. Think how many of the major challenges of this uncertain, unsettled age are shaped by science, or technology, or daunting problems of quantitative analysis and complex synthesis. With our expertise in interdisciplinary problem-solving, MIT is uniquely equipped, and obliged, to make a critical difference: to do the analysis, to create the innovations, to fuel the economy and to educate the leaders the world needs now. In that context, and understanding that profound responsibility, I believe MIT must step up to the great global challenges of our day.

Susan Hockfield, Inaugural Address, May 6, 2005

Academic year 2005 was the first since AY91 during which the Massachusetts Institute of Technology had two presidents. On December 5, 2003, MIT's 15th President, Charles M. Vest, announced his intention to step down following the appointment of his successor. On August 26, 2004, the MIT Corporation elected Susan Hockfield, a distinguished neuroscientist and provost at Yale University, to be the Institute's 16th President. Dr. Hockfield succeeded Dr. Vest as president on December 6, 2004.

This report does not offer a personal perspective from either president; instead, it provides a brief look at the year in retrospect, in an attempt to record some of the highlights and convey a sense of the tremendous vitality of the MIT community. In keeping with tradition, significant administrative changes, the signal awards and honors to members of the community, the record of those members of the faculty and Corporation who have passed away, and selected statistics for the year follow this report.



The development of new and extraordinary programs of teaching and research is the surest proof and guarantor of the Institute's continuing excellence. President Hockfield, in her Inaugural Address, highlighted the convergence of engineering and the life sciences in which MIT is leading the way. This year, the first students entered the new doctoral program in Computational and Systems Biology (CSBi), the first of its kind in the country. As Provost Robert A. Brown pointed out, "The CSBi program continues MIT's long tradition of pioneering graduate education in new interdisciplinary fields." Working at the interface of biology, engineering, and computer science, students in the program will blaze new trails in the understanding of complex biological systems. The integrative and interdisciplinary nature of the curriculum is in line with the educational priorities of the National Institutes of Health, which has awarded CSBi a \$16 million

research grant and an additional \$3 million specifically to support students in the PhD program.

The convergence between the life sciences and engineering is also spurring new developments in undergraduate education. In March 2005, the Faculty approved the first entirely new undergraduate curriculum at MIT in almost three decades—a major in biological engineering. Many other universities and medical schools offer programs in biomedical engineering or bioengineering, and there are some biological engineering programs with a focus on agriculture, but MIT's is the first to teach an engineering discipline grounded in molecular and cellular biology and enabling a broad spectrum of applications extending from microelectronic materials to ocean ecology. Before the approval of the biological engineering major, the last brand-new course of undergraduate study established at the Institute was linguistics and philosophy, in 1976.

The MIT Sloan School of Management announced that its long-awaited undergraduate minor in management would open to students in fall 2005. The minor, which will initially be open to 100 students chosen by lottery, responds to longstanding student desires and the interest of employers seeking graduates who are better prepared for the increasingly complex responsibilities in today's workplace. The new minor will serve as a coordinated curriculum aimed at enhancing the effectiveness and leadership potential of students majoring in science, engineering, or other fields. As Dean Richard Schmalensee noted, "With this minor, MIT graduates will be more productive because they will better understand the economic, organizational, and workforce setting in which they will pursue their scientific and technical work."

Maintaining academic excellence and supporting innovation requires not only the establishment of new programs but also the assessment of existing departmental structures and programs. As of January 1, 2005, the Department of Ocean Engineering was merged with the Department of Mechanical Engineering. The future of Ocean Engineering had been under discussion for more than two years, as the School of Engineering sought to address the structural issues affecting a small department with low undergraduate enrollments while ensuring strong future programs of teaching and research. The merged department's educational programs will include an undergraduate major with a specialization in ocean engineering and a continuing commitment to several important graduate programs, including the program in Naval Architecture and Construction and the joint program with the Woods Hole Oceanographic Institution. Dean of engineering Thomas L. Magnanti pointed out that the merged department would offer these programs greater resources. Both mechanical engineering and ocean engineering faculty would participate in strategic planning for the combined department.

During the winter, comments by Harvard University president Lawrence H. Summers on the possible causes of the underrepresentation of women in science and engineering generated national discussion and sparked renewed attention to MIT's success in bringing women into faculty positions. In an opinion piece in *The Boston Globe* written with presidential colleagues John L. Hennessy and Shirley M. Tilghman of Stanford and Princeton universities, President Hockfield argued that our focus should be on the

future rather than on the past: “Our nation faces increasing competition from abroad in technological innovation, the most powerful driver of our economy, while the academic performance of our school-age students in math and science lags behind many countries. Against this backdrop, it is imperative that we tap the talent and perspectives of both the male and female halves of our population. Until women can feel as much at home in math, science, and engineering as men, our nation will be considerably less than the sum of its parts.”

MIT’s own research initiatives exemplify the tremendous contributions universities can make to human health, economic development, and the quality of our lives. As the academic year drew to a close, the president and provost announced the establishment of an Energy Research Council to spearhead efforts to address the world’s mounting energy problems. Professor Ernest J. Moniz of the Department of Physics and the Engineering Systems Division suggested that the time was right for such an effort: “This is arguably the pre-eminent opportunity in the 21st century for bringing science and engineering to bear on human needs.” He argued that, “By mid-century, we will have a very real problem and we cannot wait until then to find the technological answers.” The new council, led by Professor Robert C. Armstrong of the Department of Chemical Engineering and Professor Moniz, has been charged with developing a proposal for an Institute-wide response to this global crisis by February 2006.

There is still much to learn about the earth and its environment. Marine microbes, for example, shape the chemical composition of our oceans and atmosphere, yet we know essentially nothing about them. Major grants from the Gordon and Betty Moore Foundation, announced in September 2004, will enable MIT researchers to learn much more about some of the most important organisms on the globe. Professors Penny Chisholm and Edward DeLong are two of four inaugural Moore Foundation investigators selected nationally; each will receive almost \$5.5 million in research support over the next five years through the foundation’s new initiative in marine microbiology. Both hold faculty appointments in the Department of Civil and Environmental Engineering, in addition to the Department of Biology (Professor Chisholm) and the Biological Engineering Division (Professor DeLong).

The Eli and Edythe L. Broad Institute, launched in May 2004 as a partnership among MIT, Harvard and its affiliated hospitals, and the Whitehead Institute for Biomedical Research, seeks to create the tools for genomic medicine, make them freely available to the world, and pioneer their application to the study and treatment of disease. Groundbreaking ceremonies for its major new research facility, at 7 Cambridge Center, took place in July 2004. Later in the year, the National Center for Research Resources, a component of the National Institutes of Health, announced that it would award the Broad Institute a \$14 million grant to establish the first national center for high-throughput genotyping dedicated solely to the analysis of large-scale single nucleotide polymorphism—the most common type of variation in the human genome. During the year, the Institute continued to forge productive links to businesses in the United States and around the world. In May 2005, MIT and DuPont announced that the firm would commit an additional \$25 million to the DuPont-MIT Alliance, raising its total funding to \$60 million and continuing support through 2010. The alliance is now

the largest single corporate research and development investment at MIT. According to DuPont's chief technology officer, Thomas M. Connelly Jr., "In 2000, we asked MIT scientists to give us their best ideas on science that could enhance our everyday lives. The response and resulting research has led to significant scientific achievements. These first five years," Dr. Connelly noted, "focused on inventing new materials using nature and biology as the design roadmap." In its second phase, the alliance will expand beyond bio-based science to work with nanocomposites, nanoelectronic materials, alternative energy technologies, and next-generation safety and protection materials.

MIT continues to play a leading role in the ongoing information technology revolution. The MIT Computer Science and Artificial Intelligence Laboratory will be home to a new five-year, \$20 million joint research project with Taiwan's Quanta Computer Inc. The project, known as "TParty," will address the complexity of the current computing landscape. Whereas people currently have to maintain a wide array of "smart" devices—from cell phones to computers to personal digital assistants—on their own, TParty seeks to move that work into the background, making such tasks as upgrades and backups more or less invisible to the user. This will require reengineering and an extension of the underlying technical infrastructure, the creation of new interfaces, and the exploration of new ways of accessing and managing information.

While it is sometimes tempting for academic institutions to look inward, MIT benefits greatly from strong relationships with the local community. President Vest put his own signature on the relationship between MIT and Cambridge on his final weekday in office, signing an historic agreement that provides long-term tax protection for the city by capping how much commercial property the university can take off the tax rolls in a given year. The 40-year agreement also calls for a 20 percent increase in the base payment in lieu of taxes that MIT makes annually on its tax-exempt property and guarantees an annual increase in that payment of 2.5 percent. The assessments on MIT's 84 acres of commercial property make the Institute the largest taxpayer in Cambridge; city manager Robert W. Healy, who signed the agreement on behalf of the city, pointed out that it would provide the city with "a revenue protection program well into the future."

While MIT is firmly rooted in Greater Boston, it also benefits from the support of a worldwide community of graduates and friends. That support took tangible form during the Campaign for MIT, which came to a successful close during the winter. The largest campaign in the Institute's history, it began with an ambitious goal of \$1.5 billion, reached it, raised it, and made it to the \$2 billion mark. The nearly 68,000 donors included more than 50 percent of the alumni community. Gifts to the campaign provided 87 endowed faculty chairs, 227 endowed and 67 expendable scholarships, and 110 endowed and 244 expendable graduate fellowships. They also made it possible to launch new interdisciplinary programs, enrich the learning environment, and set in motion one of the most ambitious building initiatives in MIT history. This tremendous collaborative effort was truly, as campaign chair Raymond S. Stata said, "a phenomenal accomplishment."

The presidential transition offered opportunities for the Institute community to celebrate the accomplishments of the recent past and to look to the future. In mid-September, a crowd of hundreds paid tribute to President Vest and Rebecca McCue Vest during an afternoon of celebration in the Stata Center, culminating in a speaking program representing all segments of the Institute. Dean Philip S. Khoury of the School of Humanities, Arts, and Social Sciences said, "I honestly cannot think of another university president in the past decade who has done more for his institution or for higher education and research in this country."

Generous gifts from many in the MIT community established the Charles M. Vest Presidential Fellowship Fund to provide critical support for graduate education, while the Executive Committee of the Corporation named the garden at Gray House, her home for 14 years, in honor of Mrs. Vest. Shortly after announcing his intention to step down, Dr. Vest had told the Faculty, "after having given heart and soul to this great university for so long, I don't intend in any way, shape, or form to move to another institution." He remains at the Institute as a member of the faculty in the Department of Mechanical Engineering.

Susan Hockfield was formally inaugurated as the Institute's 16th president on May 6, 2004. The theme of the varied inaugural festivities was "Uncommon In Common—A Celebration of MIT," a reference to the exceptional aspects of MIT's culture: Uncommon but in common are the things MIT people share. The Inaugural ceremony itself featured greetings on behalf of the academy by Alison Richard, President Hockfield's predecessor as provost at Yale and now vice chancellor at the University of Cambridge. In her official investiture, President Hockfield accepted a copy of MIT's charter from Dana G. Mead, chairman of the MIT Corporation, after advancing to the front of the stage in the company of presidents emeriti Paul E. Gray, Howard W. Johnson, and Charles M. Vest, whom she called an "extraordinary succession of leaders who have helped shape the world-changing institution we celebrate today."

Concluding her Inaugural Address, President Hockfield noted, "The presidency of this unique institution is a tremendous responsibility. Fortunately, I know that all of you will be my partners in the years to come. Not individually, but together, we steward this great Institute, building on its magnificent past to grasp the challenge of the future. I am deeply honored that you have asked me to share the journey with you. And I thank you very much."

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