

## *Innovation At MIT*

The Massachusetts Institute of Technology is one of the world's pre-eminent research universities, dedicated to advancing knowledge and educating students in science, technology, and other areas of scholarship that will best serve the nation and the world in the 21<sup>st</sup> century. It is known for its rigorous academic programs, cutting-edge research, a diverse campus community, and its longstanding commitment to working with the public and private sectors to bring new knowledge to bear on the world's great challenges.

### **Patents, License Agreements and Economic Contribution**

- MIT has had over 1,500 issued U.S. patents in its portfolio and is one of the most active university patent and licensing offices in the country. In each of the past five years, MIT has had over 100 U.S. patents issued, and its Technology Licensing Office has signed 60 to 100 option and license agreements.
- Each year, more than \$750 million in sponsored research is conducted at Lincoln Lab, Whitehead Institute and on MIT's campus, leading to approximately 400 new inventions per year.
- MIT inventions add more than \$20 billion and 150,000 jobs to the economy each year.

### **Notable Research Achievements of the Past Century**

- Creation of modern food preservation process
- First chemical synthesis of penicillin and Vitamin A
- Invention of magnetic core memory which made possible the development of the digital computer
- High-speed photography
- Development of the inertial guidance systems for the Apollo space program
- Development of modern technologies for artificial limbs
- Development of steel-making
- The space program, including the landing of humans on the moon

### **Notable Recent Achievements by MIT Research Teams and External Collaborations**

- Developed a semi-conductor polymer that is able to detect the presence of TNT vapor even at the concentration of parts per billion
- Developed a gas that shows high-temperature superfluidity
- Used viruses to assemble nanomaterials exhibiting the specific chemical and electrical properties selected by the designer
- Created a compound that produces hydrogen the way plants do, through a process similar to photosynthesis
- Developed possibilities for cancer prevention treatments based on an understanding of the chemical makeup of cancer cells
- Developed a method of gene therapy that could correct sickle-cell disease
- Provided first-time measurements of the snow and frost on Mars, observing seasonal changes in the planet's atmosphere
- Located the gene responsible for myotonic dystrophy, the most frequent form of muscular dystrophy, and identified the nature of the mutation
- Fabricated a single-electron transistor
- Developed a new optical technique to measure galaxy distances with unprecedented accuracy and reliability
- Developed a microchip that releases different chemicals on demand from tiny reservoirs built into its structure; the microchip has many potential uses in medicine and other fields
- Created the first atom laser, a device analogous to an optical laser that emits atoms instead of light, with potential uses in fundamental research and industry

### **Achievements of the MIT Community**

- 62 current and past members of the MIT community have won the Nobel Prize—eight current faculty members are Nobel laureates
- 31 current, emeritus and past members of the MIT faculty have received National Medals of Science; one has received National Medals of Technology
- Four former members of the MIT faculty have received the Kyoto Prize
- Four current and former staff members have received the Japan Prize
- There are 20 MacArthur Fellows, 80 Guggenheim Fellows, and six Fulbright Scholars among current MIT faculty and staff

### **International Programs and Cooperation**

- The Singapore-MIT Alliance (SMA) is pioneering an innovative approach to global engineering education and research. Founded in 1998, SMA utilizes advanced communications technologies in what may be the largest distance education collaboration in the world today.
- The World Wide Web Consortium (W3C) was founded at the MIT Laboratory for Computer Science in collaboration with the European Organization for Nuclear Research (CERN) in 1994. The mission of the W3C is to lead the World Wide Web to its full potential by developing protocols and guidelines that ensure long-term growth for the Web. Currently, it is an international consortium administered by the MIT Computer Science and Artificial Intelligence Laboratory (CSAIL), the European Research Consortium for Informatics and Mathematics (ERCIM), and Keio University in Japan.
- In a partnership, MIT, the Swiss Federal Institutes of Technology, and the University of Tokyo established the Alliance for Global Sustainability (AGS), joined by Chalmers University of Technology in 2001. AGS brings scientists, engineers, and social scientists together to address the emerging set of complex global environmental issues that profoundly affect social and economic progress.
- The MIT International Science and Technology Initiatives established regional programs in Japan (launched in 1981), China (1995), Germany (1996), India (1999), Italy (1999) and France (2000). The goals of these programs are to enlarge students' opportunities for international learning.
- In 1999, MIT and Cambridge University announced a partnership that would facilitate student and faculty exchange between the two universities, as well as collaborative research and curriculum development projects. While most exchanges usually involve only a few departments, the Cambridge-MIT Institute will engage faculty from all schools.
- MIT OpenCourseWare (OCW) debuted on the Web in 2001 to provide free, searchable, access to MIT's course materials for educators, students and self-learners around the world. OCW is a large-scale, Web-based publishing initiative funded by the William and Flora Hewlett Foundation, the Andrew W. Mellon Foundation and MIT.
- In 2002 the Deshpande Center for Technological Innovation was launched with an initial gift of \$20 million from Jaishree and Desh Deshpande to serve as a catalyst for innovation and entrepreneurship by supporting research and collaboration among entrepreneurs, young companies and MIT students, alumni and faculty. The Center is committed to bridging the innovation gap by nurturing marketable inventions, fueling market driven innovation, and implementing innovation in the marketplace.

### **MIT School of Engineering**

MIT's School of Engineering serves to meet societal needs through education, research and public service through its objectives: to develop future leaders in industry, government and educational institutions, and to influence directions of engineering education and practice. Recognized as a premier academic institution in engineering, the School has distinguished itself as a leader in engineering education and in teaching applied, hands-on engineering. MIT's School of Engineering has created many new fields of engineering inquiry and has contributed to the betterment of humanity through numerous groundbreaking innovations of the 20<sup>th</sup> century. In 2006, *U.S. News and World Report* ranked MIT's School of Engineering #1 in the country. Comprising seven departments and two divisions, the School has pioneered a range of programs that partner with industry or other universities. In a world increasingly influenced by scientific and technological innovation, MIT's School of Engineering is uniquely poised to lead the next generation of engineering innovation.