

Lemelson–MIT Program

Transition and expansion characterized the twelfth year of the Lemelson–MIT Program (LMIT). A five-year strategic plan featuring a stronger commitment to young and rising inventors and to the goals of sustainable development was crafted under the leadership of director Merton C. Flemings and executive director Kristin Finn. Approved by the School of Engineering and the Lemelson Foundation, the plan was the basis for a \$14.4 million pledge by the foundation for continued support of activities through FY2012.

LMIT modified its mission to recognize outstanding inventors, encourage sustainable new solutions to real-world problems, and enable and inspire young people to pursue creative lives and careers through invention. Programmatic changes will build on LMIT's strengths as an established invention recognition and educational outreach program.

LMIT began to set the stage for important changes in the awards and high school grants programs at the end of fiscal year 2006. These changes are highlighted below, along with FY2006 achievements.

Annual Invention Awards

2006 Lemelson–MIT Prize

Presented to an outstanding living American inventor-innovator who has significantly benefited society, the \$500,000 Lemelson–MIT Prize is the program's most prestigious and visible vehicle for creating excitement about invention and innovation.

Dean Thomas Magnanti presented the twelfth annual Lemelson–MIT Prize to Dr. James L. Ferguson at the Chicago Museum of Contemporary Art on May 3. Provost Rafael Reif welcomed more than 300 attendees, and the Honorable Shirley A. Jackson, president of Rensselaer Polytechnic Institute, provided keynote remarks.

The Lemelson–MIT Prize Committee awarded Ferguson its \$500,000 prize for his wide range of inventive contributions in the field of liquid crystals. With more than 150 US patents, Ferguson's lifetime contributions range from his early work on cholesteric liquid crystals for temperature-sensing applications to later inventions involving surface mode liquid crystal displays, polymer dispersed liquid crystals, head-mounted displays, and eye-protection technology. More information about Ferguson can be found at <http://mit.edu/invent/n-pressreleases/n-press-06LMP.html>.

2006 Lemelson–MIT Lifetime Achievement Award

Designed to complement the Lemelson–MIT Prize, the \$100,000 Lifetime Achievement Award recognizes a distinguished American inventor for a career of inventive achievement. The 2006 recipient was Dr. Sidney Pestka, known as the "father of interferon" for his groundbreaking work developing antiviral treatments for chronic hepatitis B and C, multiple sclerosis, and cancers. He was recognized for improving the health of those with many serious diseases and for his many remarkable contributions to the biotechnology, chromatography, and pharmaceutical industries.

Dorothy Lemelson, chair of the Lemelson Foundation, presented the award to Pestka at the awards ceremony in Chicago on May 3. More information about Pestka can be found at <http://mit.edu/invent/a-winners/a-pestka.html>.

2006 Lemelson–MIT Student Prize

The \$30,000 Lemelson–MIT Student Prize is awarded annually to a MIT senior or graduate student who has created or improved a product or process, applied a technology in a new way, redesigned a system, or demonstrated remarkable inventiveness in other ways.

At a press conference at the Stratton Student Center on February 15, Dorothy Lemelson announced 28-year-old Carl Dietrich as the prizewinner. A PhD candidate in MIT's Aeronautics and Astronautics program, Dietrich received the prestigious award for a portfolio of novel inventions, including a new personal air vehicle, a desktop-sized fusion reactor, and a lower-cost rocket engine. More information about Dietrich can be found at <http://mit.edu/invent/n-pressreleases/n-press-06SP.html>.

The Lemelson–MIT Student Prize received local and national coverage. Highlights include:

- National print and online coverage in USA Weekend (circulation of 52.5 million), Newsweek (circulation of 3.2 million), BusinessWeekOnline (3 million unique visitors a month); CNET News.com (990,442 unique visitors a month), Discovery.com (7 million unique visitors a month), and TechnologyReview.com (116,473 unique visitors a month)
- National and state Associated Press coverage with print and online pickup in the San Jose Mercury News (San Jose, CA; circulation of 276,166); and San Luis Obispo.com (The Tribune; 106,633 unique visitors a month)
- Local Boston print and online coverage in the Boston Globe (circulation 414,225); Boston Metro (circulation of 170,053); Boston.com (78,932 unique visitors a month); Mass High Tech (25,867 unique visitors a month); and BostonBusinessJournal.com (9,625 unique visitors a month)
- Local Boston broadcast coverage on WBZ-TV, WBZ-AM, and WBUR-FM.

Changes in the Lemelson–MIT Awards Program in FY2007

After an in-depth evaluation and strategic planning by program administrators and the Lemelson Foundation, LMIT is modifying its awards program in ways that continue its proud tradition of honoring world-class inventors while reflecting a greater focus on younger inventors and on inventors committed to addressing some of our planet's most pressing concerns. On June 21, LMIT announced new criteria for the two national prizes, with the goal of transforming them into an even greater force for positive change.

\$500,000 Lemelson–MIT Prize: The Lemelson–MIT Prize will continue to target inventors of extraordinary accomplishment, but the candidate age requirement was set at 45 years old or younger. LMIT is confident that providing funding for mid-career recipients to continue work on their inventions will increase the impact of this distinguished honor.

\$100,000 Lemelson–MIT Award for Sustainability: This new award replaces the Lemelson–MIT Lifetime Achievement Award. This shift reflects the evolution of the program’s mission to emphasize inventions that deliver sustainable benefits globally or locally. Additionally, the new award will increase awareness of sustainability issues and inventors working in these critical areas.

\$30,000 Lemelson Student Prizes: Changes in the 2007 awards program also include an expansion of the \$30,000 Lemelson–MIT Student Prize to Rensselaer Polytechnic Institute and University of Illinois at Urbana–Champaign. The \$30,000 Lemelson–Rensselaer Student Prize and the \$30,000 Lemelson–Illinois Student Prize will be modeled after the Lemelson–MIT Student Prize competition but will be administered separately by the schools. Lemelson-sponsored student prizes will be extended to two more schools by 2009.

Lemelson–MIT InvenTeams

InvenTeams, LMIT’s grants initiative supporting high school invention teams, continued as a national program in FY2006. Grants were awarded on October 20 to 18 high schools in 17 states. They represent a geographically and socially diverse set of communities including Roxbury, MA; Bend, OR; Drexel Hill, PA; Simms, MT; Moscow, ID; Washington, DC; Eureka Springs, AR; Traverse City, MI; St. Paul, MN; and Alexandria, VA. Their projects included six consumer products, seven assistive devices, one health/safety device, two environmental inventions, and two devices for use in developing countries.

Over 227 students and more than 50 teachers and mentors were involved in these projects. Thirty-three percent of the schools were urban, 28 percent were suburban, and 39 percent were rural (up from 23 last year). This year, 18 of the 19 grantees were public high schools (including two vocational technology training magnets and three science and technology magnets). We noted a creditable 33 percent female participation on the teams. Young women led half of the teams; female teachers coached five teams. MIT alumni participated as mentors with six teams, and local companies provided mentors or funding to 13 teams.

Teachers representing the 18 grantees came to MIT in early November for a kickoff workshop featuring engineering design instruction with Minority Introduction to Engineering, Entrepreneurship, and Science instructor Marc Graham, technical reporting pointers from an MIT writing instructor, lessons learned from 2004 and 2005 InvenTeams teachers and students attending area universities, and more. LMIT staff followed up the full-day workshop with personal site visits in early 2006, which were used to reinforce progress, troubleshoot problem areas, improve reporting techniques, and build connections with local mentors and school administrators.

More than 180 high school students, teachers, mentors, and parents gathered at MIT June 14–17 for the third annual Lemelson–MIT InvenTeams Odyssey. The teams' presentations and prototypes showed considerable hard work, ingenuity, and teamwork. At least seven teams plan to seek patent protection for their inventions and 16 of the 18 will continue work on their projects. Dean Magnanti and former Lemelson–MIT Student Prize winner James McLurkin gave inspiring presentations. Feedback from the MIT community, MIT Enterprise Forum, company representatives (Cisco, MicroChip, and iRobot), teams, teachers, and parents was overwhelmingly enthusiastic.

InvenTeams again will grow during the 2006–2007 academic year thanks to budding relationships with Cisco Systems and Industrial Liaison Program members Ciba Specialty Chemicals and Quest Diagnostics, each of which has promised mentoring support and grant funds to local InvenTeams. Select MIT alumni clubs have expressed interest in similar relationships. Partnerships with other companies and organizations, including SolidWorks, igus, and Vernier, continue to further enrich the InvenTeams experience through their generous provision of materials, equipment, and advice. In addition, Saturday Academy, based in Portland, OR, has, with the help of the MIT Club of Oregon, facilitated the growth of an Oregon-focused InvenTeams' initiative.

More information about InvenTeams can be found at <http://web.mit.edu/inventeams/index.html>.

Lemelson–MIT Invention Index

LMIT's annual survey of American attitudes toward invention focused on the notion that in order to encourage future generations to invent, it is important to recognize and celebrate the role invention plays in our everyday lives. In late 2005, LMIT asked teens and/or adults a variety of questions about their own inventive aspirations, the rate of technological change, the potential for technological innovation to solve major societal issues, and the level of interest among young people in addressing these problems. Survey results were released to the media in January.

The media were most interested in reporting that teens are more optimistic than adults in their expectations about what technology might bring over the next decade. For instance, teens foresee the demise of gasoline cars and desktop computers by 2015 and the potential for technology to eventually solve global problems like clean water, hunger, disease, and pollution. The survey also reflected a disappointing percentage of high school students leaning toward careers in science.

The 2006 Lemelson–MIT Invention Index received local and national coverage. Highlights include the following:

- National and state Associated Press coverage, with print and online pickup in more than 37 markets, including CNN.com (26 million unique visitors a month); USAToday.com (11 million unique visitors a month); BusinessWeek Online (3 million unique visitors a month); San Jose Mercury News (San Jose, CA; circulation of 276,166); and SiliconValley.com (135,455 unique visitors a month)

- Boston-based coverage on BostonHerald.com (1.2 million unique visitors a month) and in MIT Tech Review (circulation of 116,473)
- Local Boston broadcast coverage on WMUR Channel and WRKO (Taste of Boston).

A press release with more information about the Lemelson–MIT Invention Index can be found at <http://mit.edu/invent/n-pressreleases/n-press-06index.html>.

Lemelson–MIT Support for MIT Programs and Classes

MIT IDEAS Competition

LMIT helped sponsor the fifth annual MIT IDEAS Competition, organized by MIT's Edgerton Center, Public Service Center, and International Development Initiative. The team-based competition provides awards for student inventions and innovations designed to make a positive change in the world. Winning teams must use their prize money to refine their ideas or products and evaluate their performance in the field.

While the competition invites creative solutions to community problems locally, nationally, and internationally, LMIT focuses its support on technological innovations for the developing world. This year, LMIT sponsored two awards and provided operational support for the program.

A \$5,000 IDEAS award, sponsored by LMIT, was presented to the team that developed TurnPure, a patent-pending technology to rapidly and effectively purify contaminated water. The rugged, lightweight device uses an integrated germicidal bulb powered by a built-in hand crank generator. Light sensors inside the bottle indicate when the water is safe to drink and alert the user if the UV bulb burns out. A \$7,500 LMIT-sponsored award went to the Aerovax team, which developed a go-anywhere vaccination unit that aerosolizes and propels vaccine through a sterile chamber, thus eliminating the need for needles. The versatile system can use a variety of power sources, from a simple foot pump to the electrical grid, making it appropriate for deployment in developing countries and beyond.

More information about the IDEAS Competition can be found at <http://web.mit.edu/ideas/www/index.htm>.

MIT International Development Initiative

The MIT International Development Initiative (IDI) is a joint program of the Edgerton Center and the Public Service Center, created to expand opportunities at MIT for work in international development, particularly for students. IDI promotes hands-on, collaborative work with communities, offering systems and resources that enable MIT faculty and students to share their technical expertise, skills, and problem-solving abilities with communities in developing regions.

LMIT support for IDI over the past year helped MIT's D-Lab expand into a suite of four international development classes (development, design, dissemination, and continuing projects) and associated field trips. Over the January 2006 intercession, D-Lab students

worked on development projects with community partners in Brazil, China, Ghana, India, Lesotho, and Zambia. In addition to covering student travel expenses for these trips, LMIT helped provide salary for staff members focusing on dissemination issues, D-Lab projects and community partnerships in Brazil, administration of IDI, and organizing the “World Wide Innovations” series of lectures and workshops that brought world class leaders in development to MIT in the fall.

IDI also piloted an interdisciplinary fieldwork program (U2U) in partnership with Harvard Medical School and the University of Zambia. Students and faculty from these institutions collaborated on needs assessment and development projects in the village of Mwape, Zambia, over the summer and during the January intercession. One successful outcome was the design and manufacture of a bicycle ambulance that has already saved lives. LMIT supported travel expenses for the MIT participants in U2U.

Product Engineering Processes

In subject 2.009 Product Engineering Processes, students work in teams of 14–16 individuals to design and build working alpha prototypes of new products. In this highly interactive and stimulating class, students develop skills in product design, creativity, innovation, group dynamics, team management, consensus building, and communication. Working within a budget, they engage in a unifying engineering experience.

This year, projects focused on an agricultural theme. Guided by Professor David Wallace, 79 students designed useful products that can be sustainably produced in developing or developed countries. Products developed this year included an efficient, human-powered water pump for irrigation in rural India; a manioc grater for use in Haiti and other developing countries; a banana-harvesting device for use in Costa Rica; a lentil sorting machine; a tree-planting device for use by a Boston inner-city planting organization; and a machine for the US Department of Agriculture that grinds a fungus that has the potential to replace synthetic nitrogen fertilizer.

LMIT funds are used primarily for team project budgets, but they also provide resources for the students to participate in a number of engaging, creativity-enhancing, hands-on learning experiences.

More information about 2.009 Product Engineering Processes can be found at <http://web.mit.edu/2.009/www/>.

Kristin Finn
Executive Director

More information about the Lemelson–MIT Program can be found at <http://mit.edu/invent/>.