Lemelson–MIT Program

The Lemelson–MIT Program (LMIT) officially relaunched its awards program at the start of FY2007. This began with recruiting for new and modified awards, advising in the administration of expanded awards, and setting the stage for a new celebration to be held in the spring, under the guise of 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*.

Strategic collaborations and creative experimentation were the hallmark of LMIT operations in FY2007. Working with various partners, LMIT shared and implemented novel ideas to drive invention and innovation through two main programmatic thrusts: recognition/awards and mentoring.

Annual Invention Awards (Recognition)

2007 Lemelson–MIT Prize

LMIT awarded its prestigious $500,000 Lemelson–MIT Prize with a tailored focus on midcareer individuals to spur continued work on their inventions and increase the impact of this distinguished honor.

Timothy Swager, John D. MacArthur professor of chemistry and department head at MIT, was announced as the 2007 Lemelson–MIT Prize winner via a press release distributed on April 2. Swager received the prize for inventing amplified chemical sensors through advancements in molecular wires, which are used in detecting explosives and have potential applications in health care, environmental protection, and security. His other inventions include lasing sensors that have the potential to deliver improved sensitivity and low-dielectric-constant polymers for electronics. More information about Swager can be found at http://mit.edu/invent/n-pressreleases/n-press-07LMP.html.

2007 Lemelson–MIT Prize recipient Timothy Swager

2007 Lemelson–MIT Award for Sustainability

Created to recognize and support inventors who are working to safeguard the well-being of our communities and planets, the inaugural $100,000 Lemelson–MIT Award for Sustainability was presented to Lee R. Lynd, professor of engineering and adjunct professor of biology at Dartmouth College. Lynd was honored for his advancement of technologies that convert plant matter into ethanol for motor vehicle fuels through a low-cost, one-step fermentation process called consolidated bioprocessing. A press release was distributed nationally on April 2. More information about Lynd can be found at http://mit.edu/invent/n-pressreleases/n-press-07LMA.html.

2007 Lemelson–MIT Award for Sustainability recipient Lee Lynd

2007 Lemelson–MIT Student Prize

Awarded since the program's inception, the $30,000 Lemelson–MIT Student Prize continues to serve as a highlight of the LMIT recognition activities.

At a press conference at MIT's Stratton Student Center on February 14, Dorothy Lemelson, chair of the Lemelson Foundation, announced Nathan Ball, a graduate student in mechanical engineering at MIT's BioInstrumentation Laboratory and co-host for PBS's *Design Squad*, as the prizewinner. Ball invented the ATLAS Powered Rope Ascender, in collaboration with fellow MIT students, which can raise more than 250 pounds at 10 feet per second, and a dual-action, rapid-fire delivery technology for the BioInstrumentation Lab's novel Lorentz-force actuator—designed to improve the safety and expense of needle-free injectors for mass vaccination of humans in developing and developed countries. More information about Ball can be found at http://mit.edu/invent/n-pressreleases/n-press-07SP.html.

2007 Lemelson–MIT Student Prize recipient Nathan Ball

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

- International coverage in the UK, South Africa, Australia, and Hungary
- National print and online coverage in *Science* (circulation: 150,000), *Popular Science* (circulation: 1,351,242), and *Popular Mechanics* (circulation: 1,200,000), and on *CNN.com* (impressions: 21,245,542), *CNETNews.com* (impressions: 5,183,511), *Forbes.com* (impressions: 6,705,061), and *Newsday.com* (impressions: 1,739,923)
- National broadcast coverage via NPR (impressions: 2,741,496) and the syndicated Paul Harvey radio broadcast (1200 radio stations)
- Local Boston print and online coverage in the *Boston Globe* (circulation: 382,503) and *Boston Metro* (circulation: 170,655), and on *BostonHerald.com* (impressions: 1,023,851) and *Boston Business Journal* (impressions: 38,954)
- Local Boston broadcast coverage on WBZ-TV, WFXT-TV, NECN, and WBZ-AM

National Student Prizes

LMIT collaborated with Rensselaer Polytechnic Institute and the University of Illinois at Urbana–Champaign to establish frameworks and advise on the administration of a student prize, which the program began funding at each school in FY2007. Recipients of the inaugural $30,000 Lemelson–Rensselaer Student Prize and the $30,000 Lemelson–Illinois Student Prize, respectively, were Brian Schulkin, who developed the Mini-Z—a fully-integrated, portable terahertz spectrometer to image materials and human tissue safely and effectively, and Michael Callahan, who invented the Audeo, which translates neurological signals into spoken words or commands for devices, such as a motorized wheelchair. We expect to extend this successful program to additional schools in the future.

EurekaFest

In May 2007, LMIT unveiled its first ever EurekaFest—a multiday celebration designed to empower a legacy of inventors through activities that inspire youth, honor role models, and encourage creativity and problem solving. Presented in partnership with the Museum of Science, Boston (MOS), and others, EurekaFest offered a series of activities in Boston and Cambridge to celebrate the inventive spirit.

The MIT IDEAS Competition marked the start of EurekaFest. LMIT solidified this internal relationship through joint promotion and coordination, including Lee Lynd, the 2007 Lemelson–MIT Award for Sustainability winner, as the keynote speaker. The EurekaFest schedule also featured the following:

- "Inventors Who Shape Our World" panel and presentations, which spotlighted the 2007 LMIT award winners and their work for the public at MOS.
- Private dinner and reception to create an intimate setting to honor the 2007 Lemelson–MIT Prize and Lemelson–MIT Award for Sustainability winners. The dinner was held for 125 guests in the Skyline Room of the MOS, including

Lemelson Foundation staff and board members, MIT VIPs, past LMIT award winners, and family and colleagues of the 2007 award winners. Dean Thomas Magnanti, MOS president Ioannis Miaoulis, and Mrs. Lemelson all contributed remarks at the podium.

2007 EurekaFest: Inventors Who Shape Our World—moderator Daniel Davis from the Museum of Science (L), Lemelson–MIT Student Prize winner Nathan Ball (C), Lemelson–Illinois Student Prize winner Michael Callahan (R)

- "The Windy 500" design challenge—more than 150 Boston-area high school students and teachers collaborated with experienced mentors to design, build, test, and race wind-powered carts during this daylong competition at MOS. The excitement and enthusiasm of participants could be seen all around, while working hands on to create a superior cart. Many spectators congregated to cheer on a team in the final races.
- "Cinema, Science and Invention," a theater lecture at the MOS by MIT alumnus John Underkoffler, who also served as technical advisor for Steven Spielberg's *Minority Report*. This captivating presentation by Underkoffler highlighted the use of his G-Speak Gestural Technology, invented at the MIT Media Lab, and portrayed in the film.
- "Invention to Venture" workshop for rising inventors of affordable technologies, produced in collaboration with the National Collegiate Inventors and Innovators Alliance. Iqbal Quadir, director of MIT's Program in Developmental Entrepreneurship, presided as workshop chair at this Stata Center event.

2007 EurekaFest: Windy 500—high school student teams race to determine who designed and built the fastest wind-powered cart

The event attracted many guests at and outside MIT; tickets were sold out by midmorning.

- "A System of Coordinates: Invention & Sustainability," a new exhibit at the MIT Museum, which showcased emerging technologies for sustainability, including displays of MIT professors Yet-Ming Chiang and Don Sadoway.

Plans for a 2008 EurekaFest are under way. LMIT plans to collaborate with other organizations again and will explore new ideas and activities for the schedule as well, with the goal of growing a network of inventors and forging mentorships to inspire youth.

Lemelson–MIT InvenTeams (Mentoring)

In October 2006, 20 grants were awarded through LMIT's national InvenTeams initiative, which is designed to foster inventiveness among high school students. The InvenTeams grantees were a diverse group from various US locales including Harvard, MA; Newberg, OR; Chicago, IL; San Jon, NM; Columbus, OH; Ardsley, NY; Bellingham, WA; and Hollywood, FL. InvenTeam prototypes yielded five consumer products, seven assistive devices, six health/safety or environmental inventions, and two affordable technology devices.

Over 275 students and more than 50 teachers and mentors were involved in these projects. Twenty percent of the schools were urban based, 70 percent were suburban, and 10 percent were rural. This year, 17 of the 20 grantees were public high schools (including one vocational aviation technology training magnet). We noted a creditable 38 percent female and 27 percent underrepresented minority participation on the teams. Young women led four of the teams; female teachers coached six teams. MIT alumni participated as mentors with six teams. In addition, local companies provided mentors or funding to 14 teams from previous years as part of our practice to encourage schools with follow-on grants.

Teachers representing the 20 grantees came to MIT in early November for a workshop to set the grant period in motion. Seminars featured instruction on the invention process and peer review with MIT instructors, plus demos and tutorials from corporate donors such as Solidworks and Microsoft/iCampus. Beginning in early 2007, LMIT staff personally visited each team to reinforce progress, troubleshoot problem areas, improve reporting techniques, and build connections with local mentors and school administrators.

More than 300 high school students, teachers, mentors, and parents gathered at MIT June 19–23 for the culminating event, the InvenTeams Odyssey, to present and showcase their prototypes and discuss next steps to continue developing their inventions. At least 18 of the 20 will continue work on their projects or tackle others, which signifies a culture of invention forming in these schools. Lemelson–MIT Student Prize winners James McLurkin and Nathan Ball gave inspiring talks. Testimonials from the students, teachers, and mentors reflected a positive spirit to continue their inventiveness, in addition to showing much gratitude to have been afforded the opportunity to participate in an enriching project under the umbrella of MIT.

InvenTeams showcase at the 2007 Lemelson–MIT InvenTeams Odyssey at MIT

Joining the 2007 InvenTeam grantees for part of the Odyssey were teachers who received Excite Awards (those who had been selected to submit a final InvenTeams application for the upcoming school year). Targeted workshops were held at the Odyssey to guide these teachers in best practices for application submissions, in addition to the design process and a visit to SolidWorks in Concord, MA, where the teachers received personalized training. Thirty-five Excite Award teachers attended the InvenTeams Odyssey in June. They received encouragement from students and teachers alike, and they were very impressed with the final projects, teamwork, and coordination of the finale.

During the grant year, Cisco Systems in Massachusetts supported and mentored the local Acton-Boxborough High School InvenTeam. Cisco Systems has expressed interest in continuing an InvenTeams alignment. Other prospective team sponsors and mentors include Ciba Specialty Chemicals and MIT Alumni Clubs. Partnerships with other companies and organizations, including SolidWorks, igus, and Vernier, continue to enrich the InvenTeams experience through their generous provision of materials, equipment, and advice.

In FY2008, LMIT will target companies and organizations suitable for supporting and mentoring InvenTeams. LMIT aims to expand the inventor network and forge connections to inspire others to invent and highlight inventiveness in the community; ultimately, we hope to create a premiere event for inventors. More information about InvenTeams can be found at http://web.mit.edu/inventeams/.

Lemelson–MIT Support for MIT Programs and Classes

MIT IDEAS Competition

LMIT helped sponsor the sixth annual MIT IDEAS Competition, organized by MIT's Edgerton Center, Public Service Center, and International Development Initiative. The team-based competition provides awards for students to develop inventions and innovations that will make a positive change in the world. In addition to supporting operations, LMIT sponsors two awards, which are geared toward technological innovations for the developing world.

New DOTS received the $5,000 IDEAS award sponsored by LMIT for its tuberculosis-monitoring plan, which involves urinalysis test strips, patient health care worker cell phone reporting, and microfinance incentives. A $7,500 LMIT-sponsored award went to Vac-Cast Prosthetics, which developed a low-cost sand-casting prosthetic fitting

technique that is easy to use, is human-powered, and is designed with materials commonly found in a mechanic shop.

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.

In FY2007, LMIT provided significant bridge funding to IDI. Beginning In FY2008, IDI will continue receiving support directly from the Lemelson Foundation.

Product Engineering Processes

In subject 2.009 Product Engineering Processes, students work in large 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 USDA 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/.

Personnel Changes

Kristin Finn, executive director of LMIT until the spring of 2007, left her position to spend more time with her family. We are grateful for Kris's dedication to the program and her leadership over the last five years. After an extensive search, Joshua Schuler, former InvenTeams grants officer was named the new executive director. During FY2007,

LMIT welcomed three new staff members: Leigh Estabrooks, InvenTeams coordinator (a newly created position to support this growing initiative); Kayla Willis, communications assistant; and Amy Bishop, administrative assistant.

Joshua Schuler
Executive Director

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