

## **Lemelson-MIT Program**

### **Goals, Objectives, Priorities, and Accomplishments**

The [Lemelson-MIT Program \(LMIT\)](#) undertook significant programmatic changes in fiscal year 2014 and successfully implemented plans to meet several strategic goals.

The Lemelson-MIT Program executed a revised awards program, introduced a new K–12 Invention Education initiative (JV InvenTeams), presented a refocused EurekaFest, and launched a new website in fiscal year 2014. The core activities of LMIT in FY2014 were:

1. Recognizing outstanding inventors—comprising the [\\$500,000 Lemelson-MIT Prize](#), which was celebrated in partnership with [MIT Technology Review](#), and a new, theme-based national collegiate invention competition for graduate and undergraduate students
2. Inspiring youth—made up of Invention Education (focused collaborations with national youth organizations around invention education content), InvenTeams, JV InvenTeams, Community Engagement, and EurekaFest (a multi-day event to celebrate and catalyze InvenTeams, JV InvenTeams, and the Lemelson-MIT National Collegiate Student Prize winners)
3. Communications—LMIT’s efforts to recognize outstanding inventors and inspire youth are leveraged through media coverage.

Further details and LMIT’s goals and accomplishments are described below.

### **Recognizing Outstanding Inventors**

LMIT’s activities to recognize outstanding inventors and inspire youth to lead creative lives through invention include two annual awards: the \$500,000 Lemelson-MIT Prize and the [Lemelson-MIT National Collegiate Student Prize Competition](#).

#### ***\$500,000 Lemelson-MIT Prize***

LMIT strives to increase the number and diversity of high-quality nominations for the \$500,000 Lemelson-MIT Prize each year. Fiscal year 2014’s goals for the prize included having 15 new nominations and two new competitive nominees from groups that are underrepresented in the science, technology, engineering, and mathematics (STEM) fields. The revised nomination process that LMIT introduced in FY2014, featuring fewer requirements and a revised timeline, was well received by nominators. The revised procedure resulted in 12 new nominations, eight comprehensive updates, and three female nominees who placed in the top ten.

The screening committee—comprising MIT alumni and faculty, and including members of the no-longer-awarded Lemelson-MIT Award for Global Innovation (to provide global perspective)—reviewed the 24 nominations received and identified four finalists who advanced to the national jury. LMIT’s national awards jury of influence makers from the scientific, entrepreneurial/venture capital, and media industries met and selected the winner of the 2014 \$500,000 Lemelson-MIT Prize in mid-May. The winner

is to be announced in early September, before EmTech 2014, where he or she will be celebrated. The 2013 winner, Angela Belcher, was recognized at EmTech 2013. The 37 million media impressions for the Lemelson-MIT Prize in fiscal year 2014 are largely attributable to coverage of previous winners, especially Robert Langer.

### ***Lemelson-MIT National Collegiate Student Prize Competition***

The launch of a national collegiate competition focused LMIT's efforts on raising awareness of the program and generating applications. A goal of 15 applications for each theme ("Cure it!" and "Use it!") at the graduate individual and team undergraduate levels was set. An aggressive email and social media campaign raised awareness and attracted applicants. MIT alumni who are employed by or attending top engineering schools were contacted and asked either to make their students aware of the competition or were encouraged to apply to the competition themselves. The majority of applicants reported that they had heard of the competition in "an email from a faculty member," which will help LMIT make the most efficient use of marketing resources. LMIT also created a short recruiting video that ran on social media channels; it earned 936 YouTube views and 1,791 views on MIT Tech TV. Paid advertising through Facebook (109,830 collegiate student views), LinkedIn.com's student groups (reaching 28,650 students), FastCompany.com (221,949 impressions and 216 clicks on banner ads), and StudentCompetitions.com (reaching 25,096 students) also increased awareness of the competition.

Sixty-eight graduate students and undergraduate student teams from 27 colleges and universities representing 15 states used an online application platform to submit their applications. Three applicants were disqualified, which resulted in 24 applicants for the graduate student "Cure it," 15 for the graduate student "Use it," 21 for the undergraduate student team "Cure it," and five for the undergraduate student team "Use it" themes. The University of Illinois at Urbana-Champaign and Rensselaer Polytechnic Institute, former partners with the Lemelson-MIT Collegiate Student Prize, remain closely affiliated; each contributed five applicants. Rice University and the University of California San Diego were strong contributors also, with three applicants each. Twenty-one applicants were from MIT.

Screening committees were formed to select up to 10 graduate student and undergraduate student team finalists in each of the competition's two categories. These committees included experienced screeners from the Lemelson-MIT Collegiate Student Prize Competition and experts in health technology and consumer products. Finalists submitted videos of their inventive work and additional letters of support. The same national jury that selected the winner of the 2014 \$500,000 Lemelson-MIT Prize then reviewed and selected the winners of the two \$15,000 graduate prizes and two \$10,000 undergraduate student team prizes. Three of the four winners the jury selected were from MIT.

The four [winners of the 2014 Lemelson-MIT National Collegiate Student Prize Competition](#)—David Sengeh (MIT, graduate "Cure it!"), Benjamin Peters (MIT, graduate "Use it!"), Clemson GlucoSense (Clemson University, undergraduate student team "Cure it!"), and MIT NVBots (MIT, undergraduate student team "Use it!")—were announced through a national press release and in coordination with their respective schools on

April 9. LMIT held an event at the MIT Media Laboratory the day before to showcase New England–area applicants to the Lemelson-MIT National Collegiate Student Prize. The announcement resulted in 54 million media impressions (415 million with press release pick-up), including social media impressions. This is significantly more than the number of impressions in FY2012 (10 million) and significantly fewer than the 156 million from FY2013. (The 2013 figure was the result of top publications’ picking up an AP article that quoted that year’s winner on the impact of federal funding cuts on research.) LMIT celebrated the winners of the 2014 National Collegiate Student Prize Competition at the now college- and youth-centric EurekaFest in June at MIT.

The screening committees for the 2014 \$500,000 Lemelson-MIT Prize and the Lemelson-MIT National Collegiate Student Prize, and the national jury were all supportive of the new, national competition. They also favored the use of the online application platform for both awards and LMIT’s changed directions following last year’s evaluation and strategic planning activity, which included the suspension of the Lemelson-MIT Award for Global Innovation and the “mainstreaming” of global perspectives into the Lemelson-MIT Prize.

### **Inspiring Youth**

LMIT’s activities to inspire youth to lead creative lives through invention include Invention Education, InvenTeams, JV InvenTeams, Community Engagement, and EurekaFest.

### **Invention Education**

LMIT’s Invention Education activity mostly consists of collaborations with national youth development organizations, including the Boy Scouts of America, the Girl Scouts of America, and 4-H, to promote inventive thinking and doing. This is also the arena through which LMIT pursues new ideas and opportunities, and through which LMIT engages with the MIT K–12 STEM community.

Accomplishments for Invention Education included a fourth invitation to the [White House Science Fair](#) (WHSF) for InvenTeams, encouraging 100 Boy Scouts to earn the Inventing merit badge that LMIT introduced, holding workshops on invention through other organizations, and developing new, inspiring invention-education content.

LMIT brought two InvenTeams to the White House Science Fair from Massachusetts: the Natick High School InvenTeam and the Newton North High School InvenTeam. Images of President Obama interacting with students from Natick High School were picked up by a wide array of media outlets and mentioned in the *New York Times*, the *Washington Post*, WGBH, the Associated Press, Reuters, and in US Army media.

### **InvenTeams**

On October 16, LMIT announced the selection of 15 2013–2014 InvenTeams, representing 13 US states. Twelve of the 15 teams were based in public schools covering a diverse range of settings: magnet, boarding, charter, alternative, technical, and standard. (The public boarding school is a school for Native American students in Alaska.) Five of the 15 teams came from schools with free and reduced-price meal participation rates that are above 40

percent, and two of the teams are composed of all-girl participants. Ten of the teams came from suburban areas, two from urban areas, and three from rural settings. More than 211 students (122 male, 89 female), 23 educators (12 male, 11 female), and 20 mentors—a student-to-adult ratio of 4.9:1—were involved at the beginning of the project year.

### **Junior Varsity InvenTeams**

LMIT's experience working with InvenTeams from schools with high ratios of students receiving free or reduced-price meals encouraged the creation of a stepping-stone initiative specifically focused on helping ninth- and 10th-grade students and educators from low-resourced schools to develop the skills and mindset needed to participate in InvenTeams and other hands-on STEM programs. LMIT's new JV InvenTeams initiative was announced at the June 2013 meeting of the Clinton Global Initiative: America as a "Commitment to Action." Goals for FY2014 included developing four units of instruction, recruiting sites that would work with up to 20 students each during school hours or in after school time, identifying implementation partners and sponsors, and officially launching the initiative at five pilot sites each in Massachusetts and Texas.

### **Communications**

LMIT continued to focus on the communications goal of increasing overall media coverage. This year, LMIT had more than 1.2 billion impressions (there were 1.5 billion in FY2013). Given the ease with which websites post and report press releases, however, we now report and place greater weight on proactive impressions numbers—that is, those without press release pick-up. LMIT garnered slightly less than 607 million such impressions in FY2014 (605 million in FY2013). These numbers do not include the results of a Lemelson-MIT Prize announcement, which was shifted to September, after the end of the fiscal year, for the first time. Media coverage of each of LMIT's initiatives is discussed below.

LMIT achieved two additional communications goals in FY2014: the launch of a [new website](#) and the development of a [new overview video](#).

### **Administration**

The close of fiscal year 2014 marks the midway point in the Lemelson-MIT Program's current grant award from the Lemelson Foundation. LMIT will begin to develop its proposal for beyond FY2016 during FY2015.

## **Recognizing Outstanding Inventors: Specific Initiatives**

### **2013 and 2014 \$500,000 Lemelson-MIT Prizes**

Presented to an outstanding mid-career American inventor who is dedicated to improving our world through technological invention, the \$500,000 Lemelson-MIT Prize is the Lemelson-MIT Program's most prestigious vehicle for creating excitement about invention.

LMIT established a three-year partnership with *MIT Technology Review* to implement the decision to move the annual celebration of the Lemelson-MIT Prize winner to a peer-level event that is distinct from the EurekaFest activity. Angela Belcher was

lauded on the first night of EmTech 2013, which included a fireside chat with Jason Pontin, *Technology Review*'s editor in chief; remarks from Carol Dahl, the Lemelson Foundation's executive director; and a reception. The partnership and event were deemed successful, with nearly 850 people from 25 countries and 28 states in attendance. Some 61% of MIT's C-level staff, directors, and vice presidents attended, as did 64 media outlets; many more watched online. A video of the appearance can be viewed [here](#). Social media coverage of LMIT and Angela at EmTech included more than 687,000 impressions through Twitter and nearly 39,000 impressions through Facebook.

Recruiting for the 2014 Lemelson-MIT Prize began with the announcement that Angela Belcher had won the 2013 prize. It included several underwriting/marketing slots on National Public Radio shows in major markets, online advertisements with *Fastcompany.com* (300,374 impressions and 49 clicks) and *MIT Technology Review* (50,007 advertisement impressions and 59 clicks, 326,804 newsletter impressions and 201 clicks); and outreach and email campaigns to LMIT's network. LMIT lowered the barrier to nomination by dividing the process into three submission stages. The initial submission, due on November 22, 2013, required a brief profile summary of the nominee, his or her curriculum vitae or résumé, and the abstracts to two of his or her patents. LMIT has also encouraged the nomination of mid-career inventors working in global markets—not only those focused on developed world markets—to advance the “mainstreaming” of invention for the developing world and to highlight that modern invention-based ventures must be global. Twelve new and eight updated nominations were received.

The winner, who was selected in late May, will be announced in early September 2014 and celebrated later that month at EmTech 2014. The celebration will again include a fireside chat with Jason Pontin, the presentation of the prize, and a reception.

### **2014 Lemelson-MIT National Collegiate Student Prize Competition**

The 2014 fiscal year was the inaugural year of the Lemelson-MIT National Collegiate Student Prize Competition, a nationwide search for the most inventive undergraduate and graduate students that was informed by a FY2013 strategic evaluation. The national prize builds on the legacy of the Lemelson-MIT Collegiate Student Prize, which has served as a springboard for collegiate inventors for nearly 20 years. The Lemelson-MIT Program had awarded a student prize at MIT since 1994, and had also awarded additional prizes in collaboration with Rensselaer Polytechnic Institute and the University of Illinois at Urbana-Champaign since 2007 and with the California Institute of Technology from 2009 to 2011.

The new competition launched in fall 2013 with two categories: health care (“Cure it!”)—to recognize students' work in technology-based inventions to improve health care—and consumer products (“Use it!”)—to recognize students' work in technology-based inventions to improve consumer devices and tools. LMIT substituted consumer products for food and agriculture after deciding that there was too much overlap between health care and food and agriculture, and observing that the University of Wisconsin had unveiled a US Office of Science and Technology Policy–encouraged Agriculture Innovation Prize in spring 2013. Individual graduate students and teams of undergraduate students were the competitors.

The applicants' showcase in April provided exposure for all of the regional applicants, increased awareness of their work and of the competition, and provided an opportunity for applicants to network with one another. The 2014 Lemelson-MIT National Collegiate Student Prize winners are discussed below.

David Sengeh, the "Cure it!" graduate winner, designs the next generation of wearable, mechanical interfaces that improve comfort and mobility for amputees. His approach, which uses quantitative and human data, merges magnetic resonance imaging and three-dimensional (3D) printing to produce customized prosthetic interfaces that are designed to reduce socket pressure on the human body. Veterans and other patients, including amputees injured in the Boston Marathon bombings, have tested these prototypes.

Tyler Ovington led the team that won the "Cure it!" undergraduate prize—a team from the Clemson College of Engineering and Science's Department of Bioengineering. The team is developing GlucoSense, a low-cost glucometer and strip system for diabetics in resource-poor settings. The test strips are printed using a standard inkjet printer, allowing local manufacturing and reduced prices. GlucoSense has the potential to improve quality of life and lower disease complication rates in large patient populations where standard monitoring systems are difficult to obtain.

Benjamin Peters, the "Use it!" graduate winner, invented critical technology that enables the production of a new breed of machine tool: a high-resolution, reconfigurable molding surface. Like a desktop pin-impression toy, Ben's reconfigurable molding surface combines the high production rate of injection molding with the custom reconfigurability of a 3D printer. This "digital mold" has the potential to be a fast and flexible industrial fabrication tool used in commercial manufacturing, prototyping, and the emerging market of do-it-yourself fabrication.

Christopher Haid led the team that won the "Use it!" undergraduate prize—a team from MIT that is creating a 3D printer designed for the classroom. The automated, easy-to-use cloud interface and remote monitoring capabilities allow teachers and high-school students to print continuously from any device. The team's invention, commercialized by their company NVBots, gives students the ability to turn their designs into physical objects.

LMIT continued work on identifying the best mechanisms to assess general awareness of LMIT, the Lemelson-MIT National Collegiate Student Prize Competition, and invention among the larger MIT student population. LMIT is working with MIT Institutional Research to place questions in any of the periodic surveys that Institutional Research conducts of incoming, enrolled, and exiting undergraduate and graduate students. Additional sponsors will be sought to fund the greater expense of the activity, likely as prize category supporters.

The Lemelson-MIT National Collegiate Student Prize Competition continued to serve as a highlight of LMIT's recognition activities, with more than 415 million media impressions in outlets such as the *Boston Globe*, Discovery News, and NBCNews.com. Other highlights include:

- Nikolai Begg and Benjamin Peters—the 2013 and 2014 Lemelson-MIT National Collegiate Student Prize winners—gave talks at [TEDx Beacon Street](#). Benjamin also gave a tour of his laboratory through TEDxAdventures. Nikolai’s talk was recently the TedTalk of the day and was featured on [www.ted.com](#).
- LMIT awarded Alfonso (AJ) Perez a Jerome Lemelson Fellowship in August. A prolific inventor, engineer, and patent holder, Jerome Lemelson, and his wife, Dorothy, established the Jerome Lemelson Fellowship Fund in 1993 to support the work of graduate students at MIT whose research involves invention, innovation, and intellectual property. AJ, who is an alumnus of both the Minority Introduction to Engineering and Science Program and the Gordon-MIT Engineering Leadership Program, was awarded the fellowship to fund his studies in the [Master of Engineering in Manufacturing program](#), which he entered in fall 2013.

## Inspiring Youth: Specific Initiatives

### Invention Education

Direct LMIT instructional leadership in two Boy Scout STEM merit badge expositions meant the award of 2,704 Inventing merit badges to participating Boy Scouts in 2013. LMIT also:

- Ran a workshop at the Girl Scouts of America’s “[Geek Is Glam STEM Expo](#),” held at Worcester Polytechnic Institute in October
- Completed work on a new installment with [Howtoons](#) that focuses on building solutions to a real-world problem (a playground) with safe tool use
- Launched a collaboration with [GiantOtter](#) that will use artificial intelligence to model personality, social interaction, and communication for simulations and games to develop inventive youth and educators; and
- Ran a workshop during 4-H’s “Making and Inventing Your Future” training series for 45 4-H agents from Virginia in May

LMIT submitted a revised and stronger grant proposal to the National Science Foundation for an Invention Education massive open online course (MOOC) for educators through the [Advancing Informal STEM Learning](#) opportunity. LMIT recently learned that it again did not receive the grant and is pursuing other opportunities to scale Invention Education, including invention project “how-to” video modules that can be shared through its [new website](#) and the exploration of potential online learning collaborations.

Invention Education, through White House Science Fair coverage, received 171 million impressions, including 50 million impressions on social media. A *New York Times* photograph featuring President Obama riding an InvenTeam’s bicycle-powered water purification system at last year’s White House Science Fair was a featured tweet on the White House’s twitter feed for four days.

LMIT continued to be a leader in MIT K–12 outreach activities in fiscal year 2014, including active engagement and collaboration with the Edgerton Center, the Office of Engineering Outreach Programs, the MIT Museum, and MIT K–12 meetings, as well as through MIT alumni interest groups.

## InvenTeams

[InvenTeams](#), LMIT's premier hands-on invention experience for teams of high-school students, educators, and mentors, continued as a national program in FY2014, with 15 new grants.

Teams were composed predominately of juniors (39%) and seniors (42%). Voluntary surveys conducted at beginning of the grant year showed that 23 educators and 20 mentors were involved in the projects, helping 211 students. Ten percent of students self-identified as Hispanic or Latino. The top four reasons for involvement in InvenTeams were to "help people or make a difference" (80%), "explore engineering" (77%), "gain or develop real-world skills," (75%), or "make or invent something" (75%). Surveys taken at the end of the grant year indicated that 88% of students plan on attending a four-year college and that 49% want to major in engineering or engineering technologies. Eighty-three percent of students worked between three and eight hours per week on their invention project, 89% rated their InvenTeams experience as a "seven" (33%), "eight" (29%), or "nine" (27%), on a sliding scale where "nine" meant "excellent."

LMIT implemented several programmatic improvements to InvenTeams this year. These included:

- Conducting all InvenTeams site visits earlier than in previous years (and before the end of the calendar year)
- Holding trainings in communications/public relations and "finance 101" using Google+ Hangouts; Video conferencing with the teams
- Adding one Invention Education master teacher
- Requiring teams to hold mid-grant technical progress reviews open to their respective communities
- Establishing a team blog as the monthly report medium (the blogs will feed into LMIT's website)
- Setting an earlier deadline for the 2014–2015 cycle

The earlier deadline will allow Excite Award recipients more time to plan and to work with their students and mentors to develop their final project proposals before EurekaFest and the end of the school year. Recruitment for 2014–2015 InvenTeams resulted in at least one Excite Award recipient from each of our four "hotspot" (target) regions—Massachusetts, Texas, Oregon, and California—to support our JV InvenTeams initiative.

Media coverage of this year's announcement was extraordinary, with total proactive impressions amounting to more than 95 million, not including press release pickup. The InvenTeams announcement garnered 47 million impressions last year. National stories appeared on CNN TV, Discovery.com, Education Nation online, *Katie*, Mashable.com, NBCNews.com, Popular Mechanics online, STEMDaily News Alert online, and TIME online. Articles about the announcement also appeared in the regional *Austin American-Statesman*, the *Colorado Springs Gazette* online, *The Oregonian* print and online, NJToday.net, the *Wausau Daily Herald* online, WSAU online, WTOP online, and WTVR online. Regional broadcasts appeared on KLS-TV NBC Salt Lake City, WBFF-TV FOX



Baltimore, WRIC-TV ABC Richmond, WRTV-TV ABC Austin, and WXIX-TV FOX Cincinnati, among others. In all, 30 regional broadcast stations aired the news, including 15 local ABC, eight local FOX, two local NBC, and five local CBS stations. Online influencers, including [www.populamechanics.com](http://www.populamechanics.com) (approximately 72,000 followers), DCPublicSchools (approximately 15,000 followers), and STEMConnector (approximately 10,000 followers), spread the news via Twitter. The Benjamin Banneker Academic High School InvenTeam (Washington, DC) received two offers from law firms to provide pro bono support as a result of the media coverage. The Providence Day School InvenTeam (Charlotte, NC)—one of the all-girl teams—was invited to appear on Katie Couric’s talk show, *Katie*, and the team’s members were flown to New York City for taping.

### **Junior Varsity InvenTeams**

*JV InvenTeams*, LMIT’s hands-on/minds-on invention experience for ninth- and 10th-grade students and their educators at low-resourced schools, was officially launched in January 2014 with five teams in Massachusetts and five teams in Texas. The Massachusetts sites were B.M.C. Durfee High School (Fall River), Chelsea High School (Chelsea), North High School (Worcester), Putnam Vocational Tech Academy (Springfield), and Triton Regional School District (Byfield). The Texas sites were Cypress Springs High School (Cypress), Hastings High School (Houston), KIPP Generations Collegiate High School (Houston), KIPP Sunnyside High School (Houston), and Reagan High School (Houston).

The first two content units—on shoe soles and wearable electronics—were completed in early FY2014 and the next two units—hydroponics and speakers—were started with the help of three MIT undergraduate student interns. Activities were tested at the Community Charter School of Cambridge (Cambridge, MA), Hillsboro High School (Hillsboro, OR), Cesar Chavez High School (Laveen, AZ), and KIPP Sunnyside High School (Houston, TX), before the January launch.

LMIT staff conducted in-person professional development training on invention and the *JV InvenTeam* activities for educators and administrators from the selected sites in January at MIT and at Rice University in Texas. LMIT staff supported educators consistently during the January to April experience via phone and video conferencing. A total of 136 students and 18 educators participated in the first two units. Stanley Black & Decker, Inc., supplied each team with approximately \$1,000 (retail value) in hand and power tools. Formative evaluations were also conducted.

Work continued working on all four units, with Columbia Sportswear, the Ministry of Supply, Bose, and the MIT Media Laboratory providing content for the refinement of the two existing units and the development of two new units. Boston’s Fenway High School and the Community Charter School of Cambridge continued as LMIT’s education testing collaborators, with their students first trying out the new units’ activities, which will be introduced during next year’s cycle. Two *JV InvenTeams* in Massachusetts plan to adapt the *JV InvenTeam* activities for summer school or camp programming.

LMIT became partners with the 21st Century Community Learning Center network in Massachusetts, which helped identify sites that match the *JV InvenTeam* target

populations and provided \$10,000 in funding for educators' fellowships. A similar partnership with the KIPP Houston School District in Houston was less successful—one of the sites lost its educator to layoffs—but it did attract \$5,000 in project funding. LMIT will rethink its strategy in Texas and will revisit the 21st Century Community Learning Center network there.

The original JV funding model provided sites with \$2,000 for educator stipends and required sites to raise matching funds to purchase materials. The Massachusetts 21st Century Community Learning Center sites all had matching funds and infrastructure already in place, including stipends for educators to run the activities. What the sites lacked was access to high-quality, activity-based STEM projects that would provide the needed consumable materials. This led LMIT to adopt an additional matching funds model that allowed for partnering with other granting organizations (such as 21st Century Community Learning Centers) that can cover educator stipends but cannot pay for consumable materials. A third funding model will be developed for those sites in poorly resourced communities that do not have access to grant funding organizations and need help to raise local matching funds.

LMIT also partnered with the MIT Museum and the Children's Museum of Houston for the two regional capstone events held in May 2014, and began discussions with the Oregon Museum of Science and Industry for a JV InvenTeams capstone event in Oregon in 2015. The Children's Museum of Houston provided LMIT with a \$5,000 event credit. LMIT will continue to reach out to potential corporate sponsors and in-kind supporters of the JV InvenTeams activity.

The mid-February 2014 [announcement](#) of the JV InvenTeam initiative, which included mention of Stanley Black & Decker and its support, generated seven million proactive media impressions. Another 276,000 impressions were garnered via Twitter.

LMIT met with officials in Oregon's Department of Education who manage the 21st Century Community Learning Center grants in that state and presented at the annual statewide workshop in late May to facilitate the extension of JV to Oregon in winter/spring 2015. LMIT has started to reach out to California's 21st Century Community Learning Center network to prepare for JV InvenTeam activities in the 2015–2016 season. LMIT plans to introduce one to two new units each year.

LMIT worked with an outside assessment consultant to develop a formative evaluation for the students and educators involved in JV activities. Once available and implemented, the evaluation will inform subsequent years of JV InvenTeams activity.

### **Community Engagement**

LMIT sent letters to local, state, and federal elected and appointed officials and emails to civic and education leaders in each of the InvenTeams' communities in early October as part of the Community Engagement activity. The intent of Community Engagement is to raise awareness of the local JV InvenTeam and LMIT, and to help cultivate support for the team and invention education. InvenTeam site visits are also leveraged with Community Engagement efforts; public officials have attended evening presentations and met LMIT representatives.

LMIT connected the InvenTeams and Community Engagement activities more strongly through mid-grant technical reviews that doubled as Community Engagement events in each of the InvenTeams' communities. These Community Engagement events were held with minimal LMIT support and without LMIT staff attending—a requirement for a Community Engagement event to be “official” last year—allowing for an increase from three to 15 events. Teams reported that 900 community members and other students attended these events. The Wallenpaupack High School InvenTeam (Hawley, PA) received a donation of \$2,000 from representatives of Pennsylvania Power and Light who were in attendance at the technical review and Community Engagement event. The mayor of Hawley declared April 26 to be InvenTeam Day during Earth Day celebrations. LMIT sent notification letters to 175 elected officials. Fourteen officials (8%) issued congratulatory letters and certificates to InvenTeam educators and students. Three elected officials attended InvenTeams Community Engagement events.

### **EurekaFest 2014**

LMIT held its eighth annual EurekaFest event June 19–21. EurekaFest was focused on InvenTeams and the Lemelson-MIT National Collegiate Student Prize winners. The event was a day shorter this year than last year, which was made possible by moving the celebration of the Lemelson-MIT Prize to EmTech and ending the Lemelson-MIT Award for Global Innovation. The reduced amount of time limited some programming but streamlined the experience and the training needed beforehand. It also reduced costs and stress on LMIT staff.

EurekaFest is a multi-day celebration designed to establish a tradition of invention through activities that inspire youth, honor role models, and encourage creativity and problem solving. It comprises three major components: a series of events, held at MIT over two weekdays, that serves as a capstone for InvenTeams students and also as training for prospective InvenTeams educators; and a celebration of the Lemelson-MIT National Collegiate Student Prize winners. The two days include an all-day design challenge and public engagement event. LMIT's faculty director, professor Michael Cima, and associate dean of innovation Vladimir Bulovic presided over the awards ceremony on Friday, June 20. Dorothy Lemelson and the other members of the Lemelson Foundation's board of directors were unable to attend EurekaFest again this year because of personal obligations; however, Carol Dahl, executive director of the Lemelson Foundation, attended EurekaFest and spoke on behalf of the family and the foundation.

LMIT continued its partnership with the Museum of Science, Boston, on an iteration of last year's “Duck 'n Hover” design challenge, in which high-school students from across the country designed and built a wind-powered device that could hover three stories in the air while carrying rubber ducks as payload. The devices were built in the morning on the MIT campus and displayed in the afternoon finale at the Museum of Science. Students from the Science Club for Girls and the Museum of Science participated in EurekaFest along with InvenTeam students. [Continuum](#), a product and engineering design consultancy, helped LMIT and the Museum of Science further refine the design challenge and set up a “meet the inventor” station at the museum, where Continuum showcased many of the products it has helped bring to market.

Lemelson-MIT Collegiate Student Prize winners were presenters and critiqued InvenTeam's presentations. Excite Award recipients (finalists for InvenTeams grants) participated in active learning workshops on tools, electronics, and the invention process. They were also able to learn about the InvenTeams experience from teachers and students. Surveys were conducted at the end of the event to collect information on InvenTeam students' and educators' experiences, but the responses have not yet been analyzed.

LMIT aggressively marketed EurekaFest, and especially EurekaFest at the Museum of Science, with expanded radio spots on WBUR, announcements in local events calendars, on-campus promotions intended to reach the broader MIT community, and large MBTA bus-stop posters around Kendall Square that featured Lemelson-MIT National Collegiate Student Prize winners.

EurekaFest garnered more than 12.5 million media impressions and many prominent listings of events, including in the *Boston Globe*, Boston, and an interview on NECN-TV.

### **Support of MIT Programs and Classes**

The Lemelson-MIT Program aims to cultivate a larger community of student inventors at MIT through sponsorship opportunities. Supporting organizations that promote projects at different stages of the invention process creates stories and resources that can be leveraged as inspirational and informative content for youth. The new, non-school-based structure and the introduction of a team undergraduate tier to the Lemelson-MIT National Collegiate Student Prize underscores the importance of supporting opportunities for MIT undergraduates to invent.

### **Product Engineering Processes**

This senior-level mechanical engineering class, [2.009 Product Engineering Processes](#), has teams of 15 to 19 students design and build working alpha prototypes of new products, while they 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's theme was "Be Well." Guided by professor David Wallace, students designed and built prototypes for a variety of projects that they presented in early December in a highly educational, thought-provoking, and entertaining evening event for class sponsors and the MIT community. LMIT funds are used in this class primarily for team project budgets, but they also provide resources for the students to participate in a number of engaging, creativity-enhancing, and hands-on learning experiences.

### **Finances and Funding**

Fiscal year 2014 was the second year of our current, four-year funding cycle with the Lemelson Foundation. The FY2014 grant was approximately \$3 million, plus \$198,308.75 in carryover/unexpended balance from the previous grant year. Additional sources of funding were sponsorships and gifts of up to \$10,000 each from Time Warner Cable (for executive director Joshua Schuler's service on the board for Connect A Million Minds) and from alumni.

## **Future Plans**

The Lemelson-MIT Program plans to:

- Continue to execute the revised proposal to the Lemelson Foundation for fiscal year 2015–fiscal year 2016
- Continue to increase female representation in InvenTeams, both through outreach to more girls' schools and in invention education outreach overall, through renewed efforts to engage with the Girl Scouts of America
- Identify partners for the expansion of JV InvenTeams
- Further refine the annual awards program, including continuing emphasis on obtaining nominations of women and other groups whose members are underrepresented in STEM fields, for the Lemelson-MIT Prize and the new Lemelson-MIT National Collegiate Student Prize Competition
- Celebrate the 20th anniversary of LMIT
- Cultivate additional sources of funding

## **Personnel Changes**

LMIT filled one position in FY2014. Marlena Love joined LMIT in February 2014 as our awards program officer to run the Lemelson-MIT National Collegiate Student Prize Competition. Shannon O'Brien, the awards program associate, left LMIT in November 2013. LMIT did not complete the hiring process for a programmatic administrative assistant.

**Joshua Schuler**  
Executive Director