

PAST RECIPIENTS OF THE \$500,000 LEMELSON-MIT PRIZE

Timothy M. Swager, 2007

Building on his knowledge of organic chemistry, Timothy Swager designs molecules with novel functions and applies them in the real world. Through advancements in molecular wires, Swager has invented a new class of highly sensitive materials, which are employed in explosives detection and have potential applications in healthcare, environmental protection, and security. His other inventions include lasing sensors that have potential to deliver improved sensitivity, low-dielectric constant polymers for electronics, and near-infrared optical imaging agents that could aid in the diagnosis of Alzheimer's disease.

James Ferguson, 2006

James Ferguson has immersed himself in the study of liquid crystals, from developing practical uses for cholesteric liquid crystals to applying the twisted nematic field effect of liquid crystals for use in the flat panel display industry. Ferguson started International Liquid Crystal Company (Ilixco), followed by Ferguson Patent Properties LLC to commercialize and further opportunities with his inventions. He has invented many applications for LCDs such as surface mode LCDs, polymer dispersed liquid crystals (PDLC), head mounted displays (HMD), and eye protection technology. Ferguson holds 130 U.S. and 500 foreign patents.

Elwood "Woody" Norris, 2005

Independent inventor Elwood "Woody" Norris' fascination and prior work with sound led him to create HyperSonic Sound (HSS®), a device that mixes sound frequencies to create crisp, clean sound that can be directed like a laser beam. Norris also developed AirScooter®, an ultra-light, easy to operate personal flying craft. He holds 47 patents, with others pending, for inventions including a transcutaneous Doppler system and an ear-mounted speaker/microphone device. In 2005, Norris started a foundation to aid struggling independent inventors.

Nick Holonyak, Jr., 2004

Nick Holonyak, Jr. invented the first practical red LED (light emitting diode) in 1962, an efficient and durable energy source with ever-evolving applications. Collaborating often with others, Holonyak also developed the first visible-spectrum semiconductor laser, the household dimmer switch, and the first quantum well semiconductor laser. His work, most of which resided at the University of Illinois where he has mentored 60 graduate students, has had a profound influence on the lighting industry, global communications and consumer products.

Leroy E. Hood, 2003

A visionary who changed the course of biology by inventing new tools, Leroy Hood has helped unravel the mysteries of human biology. His automated DNA sequencer facilitated the Human Genome Project—to decipher the code of human DNA. Hood's other core instruments, which have impacted medicine and research, include the protein sequencer, protein synthesizer and DNA synthesizer. Hood is co-founder of the Institute for Systems Biology, which focuses on analyzing all the elements of a system at once.

Dean Kamen, 2002

Committed to enhancing human capabilities through technology, inventor and entrepreneur Dean Kamen holds more than 150 patents, mostly for medical devices. Among them are the stair-

climbing Independence™ IBOT™ Mobility System; a wearable infusion pump; a portable dialysis machine; and an improved flexible stent. In 2001, Kamen unveiled the Segway™ Human Transporter (HT)—an electric powered personal transportation machine that moves by shifts in one's body weight. He established For Inspiration and Recognition of Science and Technology (FIRST) in 1989 to inspire young people to pursue opportunities in science and engineering.

Raymond C. Kurzweil, 2001

Futurist Raymond Kurzweil's wide-ranging inventions include the first reading machine for the blind; the first text-to-speech synthesizer; the first musical synthesizer capable of reproducing the grand piano and other orchestral instruments; and the first commercially marketed large vocabulary speech recognition system. He has written extensively about the future of computing and artificial intelligence, which recently includes *The Singularity is Near* (Viking Adult, 2005).

Thomas J. Fogarty, 2000

Thomas Fogarty, a surgeon, inventor and entrepreneur, invented medical devices that have saved millions of lives and limbs. He also developed innovative clinical procedures; founded important medical device firms; and trained countless young surgeons, engineers and scientists. His hallmark invention, the embolectomy balloon catheter, makes it possible for doctors to remove blood clots without major surgery.

Carver A. Mead, 1999

Physicist Carver Mead revolutionized the semiconductor industry with his pioneering application of computer automation to create very-large-scale integrated (VLSI) circuits. His design eventually was adopted among all semiconductor companies and resulted in a variety of new microchips. Mead also laid the foundation for the Information Age with his gallium-arsenide transistor (invented in the 1960s), which evolved into HEMT—the universal amplifying device in microwave receivers, used in myriad telecommunication systems.

Robert S. Langer, 1998

A trailblazer in biomaterials based on polymer research, Robert Langer's innovations in tissue engineering include vaccines, tissue repair, diagnostics, novel therapeutics, and controlled-release drugs such as Gliadel®, a treatment for brain cancer. In 1999, Langer invented the implantable silicon chip known as the pharmacy on a chip—another method of controlled drug delivery. In 2002, he created biorubber, a polymer with elasticity for constructing artificial organs.

Douglas C. Engelbart, 1997

Technological visionary Douglas Engelbart has dedicated his career to designing systems that can help humans collectively manage their increasingly complex world. He holds 20 patents and is best known as the creator of the computer mouse. Founder and Director of the Bootstrap Institute, he also is credited with developing collaborative computing, multiple screen-sharing applications, cross-file editing, hypermedia and community networking systems.

Herbert W. Boyer and Stanley N. Cohen, 1996

Medical researchers Herbert Boyer and Stanley Cohen developed the basic science underlying genetic engineering after succeeding in splicing a piece of foreign DNA into a plasmid carrier. In the process, they transformed biomedical research, launched the multi-million dollar biotechnology industry, opened the way for gene therapy, and initiated a profound change in the way pharmaceuticals and agricultural products are developed and produced.

William J. Bolander, 1995

Automotive engineer William Bolander's inventions have been instrumental in keeping the American automotive industry on the cutting edge. He holds 16 U.S. patents including several in the field of combustion knock control. With innovations like Saturn's traction control system and Cadillac Northstar's limp-home technology, Bolander helped improve passenger safety and automotive performance.