AWARDING EXCELLENCE

Munich, Germany

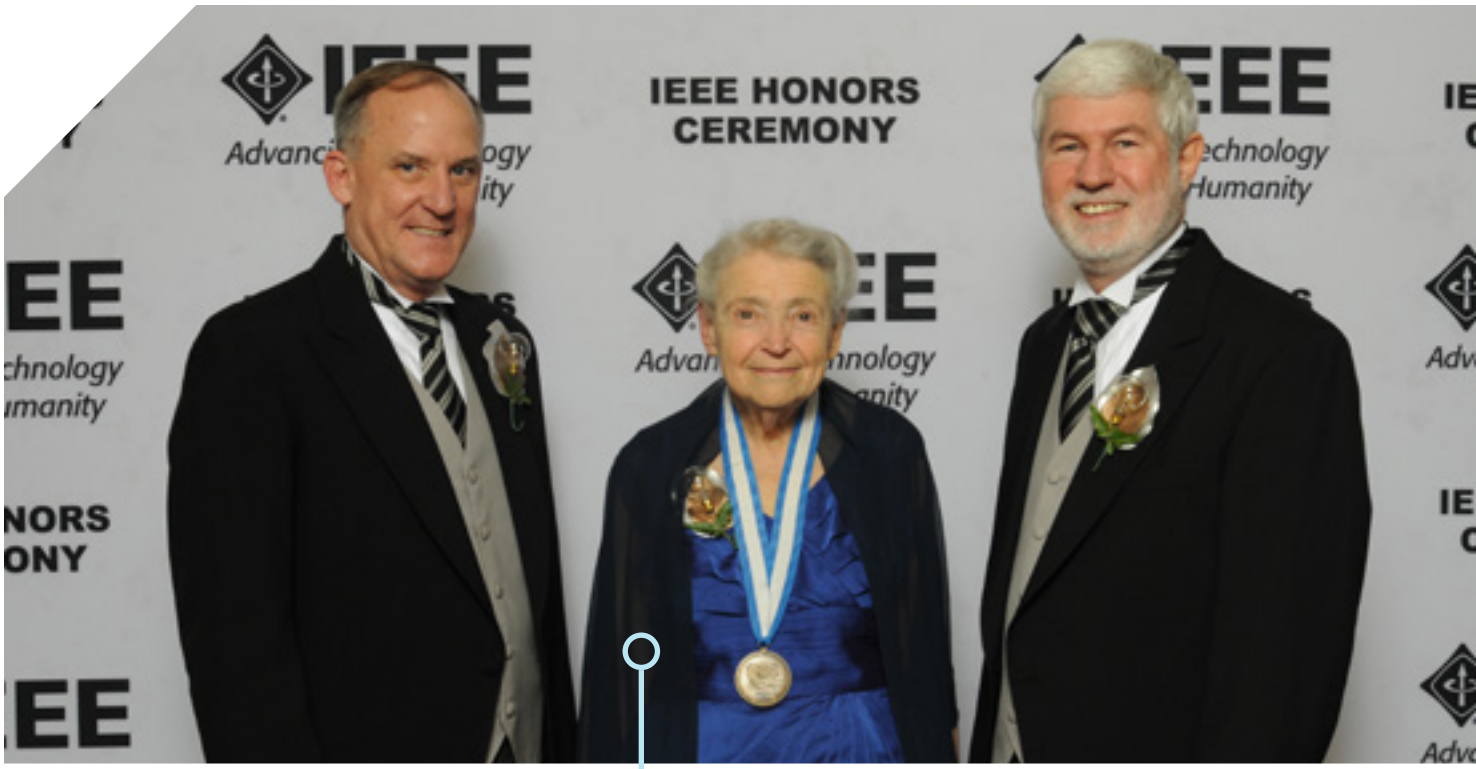
Contributions made by IEEE were recognized in 2015 by a broad range of institutions and associations around the world. As every year, IEEE recognized the accomplishments of our members with awards of our own.

Dr. Mildred Dresselhaus Receives IEEE Medal of Honor

Dr. Mildred Dresselhaus, a professor of electrical engineering and physics at MIT and a member of the U.S. National Academy of Engineering, received IEEE's highest honor, the IEEE Medal of Honor. Sponsored by the IEEE Foundation, the award was presented at the 2015 IEEE Honors Ceremony which was held at the historic Waldorf Astoria in New York City. IEEE President Howard Michel and IEEE President-elect Barry Shoop served as the Masters of Ceremonies.

Dr. Dresselhaus, an IEEE Life Fellow, is known in tech circles as the "Queen of Carbon Science." The discoveries made on the semiconductive properties of graphite at the nanoscale and carbon-based materials can be traced back to Dr. Dresselhaus' research, which began in the 1960s. This work also earned her the Presidential Medal of Freedom from U.S. President Barack Obama in 2014, the highest honor a U.S. civilian can receive. Dr. Dresselhaus began her research nearly half a century ago and helped bring carbon-based technologies to where they are now: on the brink of bringing computing into its next era and boosting battery-storage capacities. Today advanced aviation materials, paper-thin batteries, and indestructible touchscreen electronics all use carbon-based technology.

Part of the honors ceremony bridged the past and present, and featured a "colleague" of Thomas Edison who exchanged observations with a robot throughout the evening. The setting paid homage to 1902, when one IEEE's predecessor societies, the American Institute of Electrical Engineers, held a ceremony at the Waldorf Astoria with Guglielmo Marconi as the guest of honor.



2015 IEEE Medal of Honor recipient Mildred Dresselhaus, 2015 IEEE President-elect Barry Shoop (left) and 2015 IEEE President Howard Michel (right) at the IEEE Honors Ceremony

Martin Cooper Presented with 2015 IEEE Masaru Ibuka Award

Martin Cooper, the "father of the cell phone," received the prestigious 2015 IEEE Masaru Ibuka Award, presented at the IEEE International Conference on Consumer Electronics in Las Vegas. The award is named in honor of Dr. Masaru Ibuka and is given for outstanding contributions to the field of consumer electronics. Cooper, an IEEE Life Fellow, conceived and led the effort to develop a personal, portable radio handset that could be utilized as a normal telephone by anyone, anytime, anywhere. The result was the introduction of the first truly mobile phone in 1973.

After receiving his Ibuka certificate and award in January, IEEE Life Fellow Martin Cooper (right) compared his first cell phone to 2013 IEEE President Peter Staecker's current phone.

IEEE Life Fellow Martin Cooper, the "father of the cell phone"

IEEE Magazines Capture Industry Awards

IEEE's flagship publication, *IEEE Spectrum*®, continued its winning ways in 2015, garnering numerous industry awards, including a Tabbie Award for Feature Article ("Unclean at Any Speed") and Best B2B Website. It also took home the Gold Award for Best Cover from the Society of Publication Designers, as well as Azbee Awards for Website Design, Landing Page Design and Video Tutorial ("Brew Your Own Conductive Ink"). *IEEE Spectrum* also captured two 2015 Jesse H. Neal Awards for Best Blog ("Cars That Think") and Best Theme Issue of a Magazine ("The Future We Deserve").

In 2015, IEEE publications also received the top prize in three categories at the 27th Annual APEX Awards for Publication Excellence. *IEEE Women in Engineering magazine* won for Feature Writing with "The Future of Malawi." *IEEE Consumer Electronics* magazine was honored with the Departments & Columns Award for "IP Corner." *IEEE Power & Energy* magazine was recognized with Design & Illustration (Spread) for "No Light in August." Two IEEE publications, *IEEE Power & Energy* magazine and *IEEE Potentials*, were also finalists in the prestigious Min's Editorial & Design Awards.

IEEE *Xplore* Digital Library Celebrates 15 Years of Innovation

The IEEE *Xplore* Digital Library celebrated 15 years of providing online access to millions of highly cited articles in engineering and technology. Since its launch in May 2000, IEEE *Xplore* has grown from a collection of 500,000 documents going back to 1988 to a robust database of more than 3.8 million documents stretching as far back as 1872. It is now considered one of the leading resources of scientific and technical information in the world. Technologists rely on it to stay up to date, accelerate their research and drive innovation. IEEE *Xplore* reached another important milestone in 2015, with over one billion total article downloads since its launch.

Noteworthy upgrades and enhancements include the addition of hundreds of thousands of historic legacy articles, the incorporation of more than two million articles in a robust, interactive HTML format, and a new mobile-friendly design for remote users. Additionally, IEEE has partnered with leading organizations and publishers, including IET, IBM, VDE, MIT Press, Alcatel Lucent, the Beijing Institute of Aerospace Information, Tsinghua University Press, Morgan & Claypool and, most recently, the Society of Motion Picture and Television Engineers to deliver diverse, high-quality content to its worldwide base of users and to expand the reach of IEEE *Xplore* to a broader audience.

IEEE 802.11 Turns 25

IEEE 802.11, the standard also known as Wi-Fi, celebrated its 25th anniversary in 2015. The wireless standard has come a long way since it first originated at a working group meeting in September 1990. Early Wi-Fi supported data rates were just two megabits per second. By comparison, the latest Wi-Fi standard supports 3,500 times faster data rates, ranging up to seven gigabits per second. IEEE 802.11 standards underpin wireless networking applications such as wireless access to the Internet from offices, homes, airports, hotels, restaurants, trains, and aircrafts. Today's computers, smartphones and tablets are often equipped with an IEEE 802.11 radio or Wi-Fi. Twenty-five years later, IEEE 802.11 working group participants continue to push the limits of the technology, enabling new devices and applications such as the Internet of Things, wearable technology, and the smart grid.

1 BILLION

TOTAL NUMBER OF DOCUMENTS **DOWNLOADED** BY IEEE *XPLORE* USERS

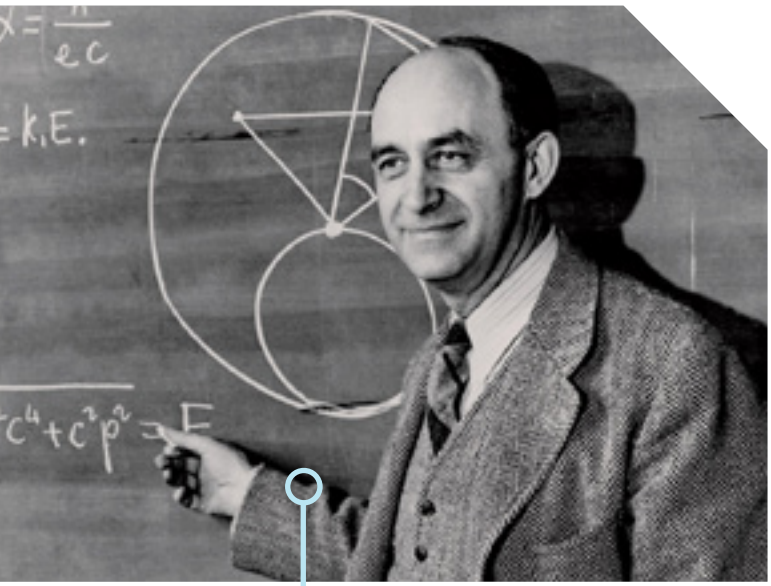
IEEE *Xplore* by the Numbers

IEEE *Xplore* Content	Year 2000	Year 2015
Periodical titles	100	200+
Annual conference titles	350	1,400+
Papers published per year	77,000	215,000+
Author records	350,000	3,500,000+
Total documents	**533,000**	**3,800,000+**
Annual # downloaded	**11,000,000**	**100,000,000+**

IEEE Honors Historic Milestones

Each year, the IEEE Milestones in Electrical Engineering and Computing program recognizes exceptional technical achievements that occurred at least 25 years ago. In past years, the program has acknowledged the work of landmark inventors like Benjamin Franklin, Alexander Graham Bell, and Thomas Edison.

The IEEE Milestones recognized in 2015 included:



Source: The Atomic Heritage Foundation

Semiconductor Statistics, 1924-1926

Nobel laureate Enrico Fermi developed the quantum statistics that would be named after him while teaching at the School of Engineering of the University of Florence. Fermi-Dirac statistics were a fundamental contribution to semiconductor physics and to the development of electronics.

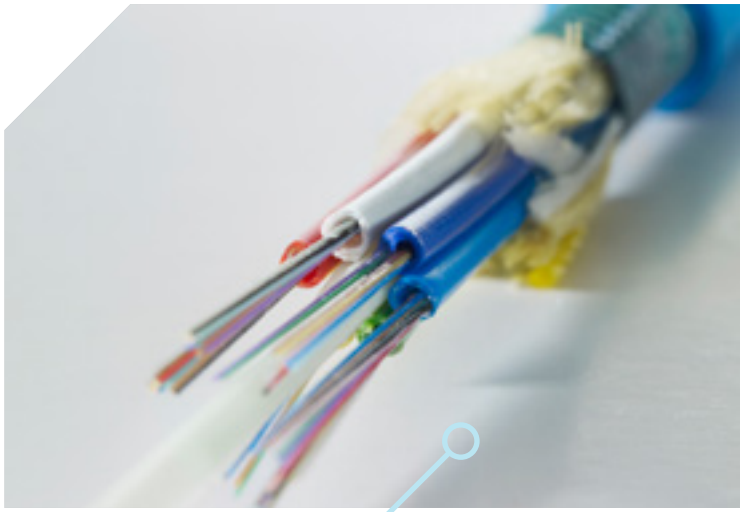
Stereo Sound Reproduction, 1931

Alan Dower Blumlein filed a patent for a two-channel audio system called "stereo" on 14 December 1931. It included a "shuffling" circuit to preserve directional sound, an orthogonal "Blumlein Pair" of velocity microphones, the recording of two orthogonal channels in a single groove, stereo disc-cutting head, and a hybrid transformer to mix directional signals. Blumlein brought his equipment to Abbey Road Studios in 1934 and recorded the London Philharmonic Orchestra.

Source: The Smithsonian

Interactive Video Games, 1966

The "Brown Box" console, developed at Sanders Associates (later BAE Systems) between 1966 and 1968, was the first interactive videogame system to use an ordinary home television set. This groundbreaking device and the production-engineered version Magnavox Odyssey game system (1972) spawned the commercialization of interactive console video games, which has become a multibillion-dollar industry.



Optical Fibers, 1977-1983

In 1977, Dr. Tatsuo Izawa of Nippon Telegraph and Telephone Corp. (NTT) invented the vapor-phase axial deposition (VAD) method suitable for the mass production of optical fiber. NTT, Furukawa Electric, Sumitomo Electric, and Fujikura collaboratively investigated the fabrication process. The technology successfully shifted from research and development to commercialization. The VAD method contributed greatly to the construction of optical-fiber networks.

Other milestones recognized in 2015:

- Computer History Museum, 1979
- RISC Microprocessor, 1980-1982
- Middle and Upper Atmosphere Radar, 1984
- SPARC/RISC Architecture, 1987
- High-Voltage Converter Station, 1988