IEEE Members Make History and the IEEE History Center Preserves It

Mary Ann Hellrigel, Ph.D., IEEE History Center Staff

Host: IEEE Santa Clara Valley Section, Silicon Valley Technology History Committee

9 October 2024

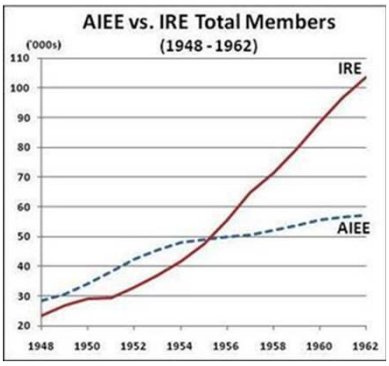
IEEE
Advancing Technology for Humanity

-Pearl Street Central Station, 1882. IEEE Milestone #114, dedicated 10 May 2011.
-Thomas Edison's Menlo Park Laboratory, 1876. IEEE Milestone #68, dedicated 9 Sept. 2006.
-Westinghouse Radio Station KDKA, 1920. IEEE Milestone #25. dedicated1 June 1994.
-Thomas Edison's West Orange Laboratory and Factories (plaque by West Orange City Hall), 1887. IEEE Milestone #76, dedicated, 18 October 2008.
-Superconducting Magnet System for the Fermilab Tevatron Accelerator/Collider, 1973-1985. IEEE Milestone #184 , Dedicated, 13 November 2017. Alvin Tollestrup (22 March 1924 – 9 Feb. 2020)

HISTORY OF IEEE - OVERVIEW

Since 1884, IEEE has been Fostering Technical Innovation for the Benefit of Humanity

IEEE 140 1884 - 2024 YEARS



In 2024, we celebrate our 140th Birthday

AIEE(1884) + IRE (1912) = IEEE in 1963

IEEE

3

The professional home for the engineering and technology community worldwide

Establishing a Professional Identity and a Community of "like-minded" people

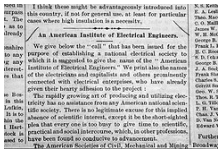
- Looking for a "Home"
- Planned "Birth" of the AIEE
- Practical Engineers
- Telegraph
- Electroplating
- Bells and Alarms
- Electricity:
  - Light, Heat, and Power

IEEE

Cartoon. *Punch* magazine.

Spawned from the ASME: IEEE is 140 Years Old

The American Institute of Electrical Engineers is Founded, 1884



An American Institute of Electrical Engineers.

We give below the "call" that has been issued for the purpose of establishing a national electrical society to which it is suggested to give the name of the "American Institute of Electrical Engineers." We print also the names of the electricians and capitalists and others prominently connected with electrical enterprises, who have already given their hearty adhesion to the project :

The rapidly growing art of producing and utilizing electricity has no assistance from any American national scientific society. There is no legitimate excuse for this implied absence of scientific interest, except it be the short-sighted plea that every one is too busy to give time to scientific, practical and social intercourse, which, in other professions, have been found so conducive to advancement.

Invitation to the AIEE organizational meeting, *Electrical World*, 5 April 1884

Norvin Green, President of Western Union Telegraph, and first president of the AIEE

Program of the 1884 International Electrical Exhibition, Franklin Institute, Philadelphia

- **A small group of individuals met in New York to found the AIEE to advance the new field of Electrical Engineering and represent the U.S. at the 1884 International Electrical Exhibition in Philadelphia.**

IEEE

The professional home for the engineering and technology community worldwide

IEEE History Center slide with slight modification.
ASME is the American Society of Mechanical Engineers.
AIEE is the American Institute of Electrical Engineers.
IEEE is the Institute of Electrical and Electronics Engineers former from the merger of AIEE (1884) and IRE (1912) in 1963.
IRE is the Institute of Radio Engineers.
All images are from IEEE.

American Institute of Electrical Engineers, 1884:

Establishing a Community of Like-Minded People

In 1884, the time had come when the advantages of congregation as opposed to segregation were to be demonstrated; when the lonely investigator was to be brought into contact with his brother toiler and taught the advantages of organized work and a free exchange of ideas.

Edwin J. Houston, Inaugural Address, 1894 [1]

A gathering of "practical electricians"

6

The professional home for the engineering and technology community worldwide

See Mary Ann Hellrigel presentation for the Weston IEEE Milestone ceremony held at NJIT, ca. fall 2016.
Approx. 71 men signed the call for a meeting for the organization of a new professional association.
Edwin J. Houston, AIEE Inaugural Address, 1894. AIEE Proceedings.
Houston, Edwin J. https://ethw.org/Edwin_Houston
Papers of Edwin J. Houston - Edwin J. Houston, along with Elihu Thomson, invented the Thomson-Houston System of arc lighting. He also published a great amount of literature in the field of electrical engineering. Houston was a founding member of the AIEE and served as its president from 1893 to 1895.

Communications:
The first important electrical technology

Franklin Pope, telegraph operator

Overhead wire line congestion

A. G. Bell at the time of the invention of the telephone

Telephone set, 1882

- **Samuel Morse's first U.S. telegraph line connected Washington, D.C. and Baltimore in 1844**
- **By 1866, a telegraph cable connected the U.S. and Europe.**
- **Alexander Graham Bell followed in 1876 with the telephone, a telegraph that talked**

IEEE

The professional home for the engineering and technology community worldwide

IEEE History Center slide with slight modification.

Then A New Industry: Electric Light and Power

Yablochkov Candle, 1876

Thomas Edison and his incandescent light patent, 1878

Nikola Tesla, inventor of the induction motor and a comprehensive system for polyphase AC power

Frank Sprague installed the first electric street railway in 1888

From the 1850s onward, efforts were made around the world to improve arc lighting; Arc lighting continued/continues to be used for special application, but the explosion in electric power and light systems arose primarily from Thomas Edison's work on incandescent light. Edison opened his first electric power plant in New York in 1882. Within a decade, electric power had spread to every corner of the globe, with many new applications, especially traction.

IEEE

The professional home for the engineering and technology community worldwide

Electrical Engineering Education Becomes Established

Early electrical engineering lab, MIT

Professor Dugald Jackson chaired the EE departments first at Wisconsin and then MIT

Electrical Engineering Class, Cornell U., 1916

Technische Universität Darmstadt and MIT had both established the electrical engineering programs in 1882. Within a few years, there were dozens of independent departments in universities around the world. There was tension between the practical and theoretical aspects of the field, but, in the US at least, young engineers typically began their careers with university educations. Curricula were generally heavily oriented towards power engineering. AIEE established the grade of student member, and in 1903, authorized the formation of campus-based student branches. Eta Kappa Nu (later to merge with IEEE) was founded separately in 1904

IEEE

The AIEE Serves the Profession

AIEE badge, 1893

First AIEE standard, 1893

Committee report, 1899

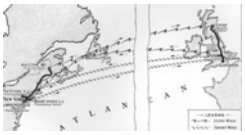
AIEE Code of Conduct, 1912

Through standards, codes of ethics, local sections, technical conferences and publications, the AIEE served its members and their growing profession.

IEEE

Growth of Technological Systems

Between 1921 and 1930 the number of US households with radios grew from close to zero to almost 14 million. Much of what they listened to was supplied by NBC's and CBS's national networks.



Transatlantic radio-telephone circuits connected AT&T's US telephone network with Britain beginning in 1927.

Transmission lines of the Tennessee Valley Authority brought electricity to a wide swath of rural America, 1930s

John Logie Baird and his Noctovisor, 1929

Increasingly, electrical technologies were applied as part of complex and geographically dispersed technological systems such as radio networks, globe spanning telecommunications systems, and electric power grids. This led to further internationalization of the field, and of IRE

IEEE

IRE FOUNDED IN 1912 and the Birth of Radio

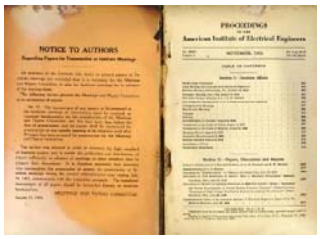
Guglielmo Marconi, and George Kemp with equipment used in transatlantic wireless telegraphy, 1901

Radio telegraph operators' communications with the sinking Titanic demonstrated the power of radio ,1912.

Triode vacuum tube inventor Lee de Forest with a radio

Radio, a new electrical technology, arose in the first decade of the twentieth century. Wireless telegraphy using spark transmitters was the original application, but particularly after the invention of the vacuum tube, first the Fleming Valve, then the de Forest Audion amplifier, it began to be used to transmit speech and music, which became commercialized around 1920

IEEE



Proceedings of the AIEE, September 1916

Proceedings of the IRE
September 1926

NBC engineers at
an IRE banquet

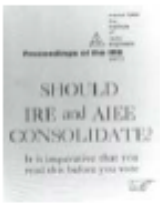
To a large extent, the IRE modeled itself on the AIEE. Both societies ran technical conferences, established local chapters, published journals, promulgated standards, and encouraged the training of student engineers.

IEEE

The professional home for the engineering and technology community worldwide

AIEE + IRE = IEEE

Symposium on the proposed merger. IRE National Convention, 1962



Special merger issue of the *Proceedings of the IRE*

The badge of the new IEEE combined the right- hand rule from the IRE with the kite from the AIEE

The idea that there should be one organization for all electrical engineers was an old one, and it became more powerful as the profession expanded beyond its separate roots in power and radio. In 1962, the boards and memberships of the two institutes agreed to merge. On January 1, 1963, the IEEE, or Institute of Electrical and Electronic Engineers was born with 150,000 members, 140,000 of whom were in the United States.

IEEE

The professional home for the engineering and technology community worldwide

IEEE Centennial 1884-1984

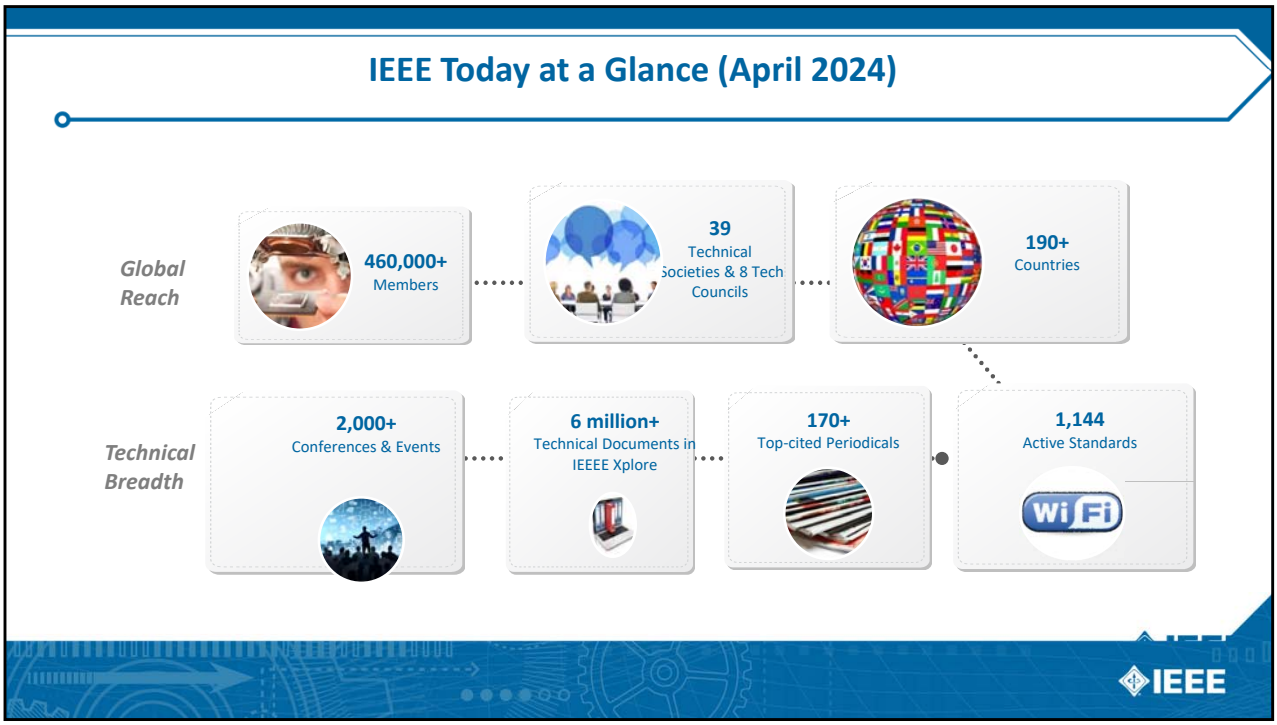
Some of the material IEEE produced for its centennial

Centennial Logo

Membership distribution, 1984

IEEE celebrated its centennial with celebrations of its members' accomplishments for the betterment of society. By 1984, it was well on its way in its transformation from a United States centered to a global institution. As part of the preparations, the IEEE History Center formed to support History Committee, and the Milestones Program started.

IEEE



IEEE at a Glance, https://www.ieee.org/about/today/at-a-glance.html (Accessed: 5 April 2024)
There are **195 countries** in the world today. This total comprises 193 countries that are member states of the United Nations and 2 countries that are non-member observer states: the Holy See and the State of Palestine. IEEE is in more than 160 countries.
The world's largest technical professional organization for the advancement of technology and benefit of humanity.

IEEE has:

- Over 460,000 members in more than 190 countries**,** with more than 66 percent from outside the United States
- More than 171,000 Student members
- 344 Sections in ten geographic Regions worldwide
- 2,709 Chapters that unite local members with similar technical interests
- 3,635 Student Branches at colleges and universities in over 100 countries
- 4,194 Student Branch Chapters of IEEE technical Societies
- 639 affinity groups; IEEE affinity groups are non-technical sub-units of one or more Sections or a Council. The affinity group parent entities are the IEEE-USA Consultants Network, Young Professionals (YP), Women in Engineering (WIE), and Life Members (LM)

IEEE:

- Has 39 technical Societies and eight Technical Councils representing a wide range of IEEE technical interests
- Has more than 6 million documents in the IEEE *Xplore*® Digital Library
- Has an active portfolio of 1,144 standards and more than 1,018 projects under development
- Publishes more than 200 transactions, journals, and magazines
- Sponsors more than 2,000 conferences and events in 190 countries while contributing over 4 million total conference papers to IEEE *Xplore* since 1936, with more than 200,000 new papers added annually

IEEE Regions

IEEE

IEEE

IEEE HISTORICAL ACTIVIES

Mission of the IEEE History Committee and Strategic Plan Alignment

The mission of the IEEE History Committee is to preserve, research, and disseminate the history of IEEE and its fields of interest

The History Committee does this by providing information, assistance, and recommendations to the IEEE Board of Directors and OUs, carries out several recognition programs, and guides the IEEE History Center in carrying out IEEE's historical programs; the History Center in turn supports the History Committee. The History Committee consists of up to 15 distinguished technologists and historians of technology

How does the History Committee/Center mission map to the IEEE Strategic Plan 2020-2025?

- Drive global innovation through broad collaboration and the sharing of knowledge
- Enhance public understanding of engineering and technology and pursue standards for their practical application
- Be a trusted source of educational services and resources to support life-long learning
- Provide opportunities for career and professional development
- Inspire a worldwide audience by building communities that advance technical interests, inform public policy, and expand knowledge for the benefit of humanity

19

IEEE

The professional home for the engineering and technology community worldwide

THE IEEE HISTORY COMMITTEE

- A Committee of the Board of Directors
- Responsible for promoting the collection, writing, and dissemination of historical information in the fields covered by IEEE technical and professional activities, as well as historical information about IEEE and its predecessor organizations.
- It provides assistance to all major organizational units, works with institutions of a public nature such as the Smithsonian Institution when helpful information is requested and can be secured, and provides information and recommendations to the IEEE Board of Directors when appropriate.

- The History Committee members will also review nominations for IEEE Milestones, books submitted for the Middleton Electrical Engineering History Award, and scholarship applications.
- Administers Various Award Programs
- The IEEE History Center
  - Guided by the IEEE History Committee

IEEE History Committee. https://www.ieee.org/about/history-center/history-committee.html

IEEE Historical Recognition Programs History Committee

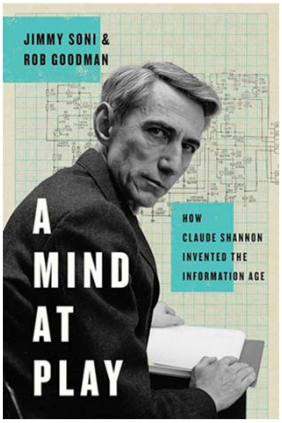
Supported by the IEEE History Center

- IEEE Milestones
  - Established 1984
  - Honor significant technical achievements in IEEE fields of interest at least 25 years ago and of regional impact
  - Proposal by OUs, recommendation by IEEE History Committee, approved by IEEE BoD
  - 258 dedicated to date
- IEEE William & Joyce Middleton Electrical History Book Award
  - Established 2015, endowed by bequest
  - To the author of a book on the history of an IEEE-related technology that both exemplifies exceptional scholarship and reaches beyond academic communities toward a broad public audience
- IEEE Life Members Fellowship in Electrical History
  - Established 1978, funded by the IEEE Life Members Fund
  - Awarded by History Committee to support year of graduate work
- SHOT IEEE/Finn Paper Prize, Pugh Visiting Young Scholar

IEEE HISTORY COMMITTEE

Awards Subcommittee Review Books for the Middleton Prize

- **Awarded to the author of a book in the history of an IEEE-related technology that both exemplifies exceptional scholarship and reaches beyond academic communities toward a broad public audience.**
- **First awarded in 2015**
- **Soni, Jimmy and Rob Goodman. *A Mind at Play: How Claude Shannon Invented the Information Age*. New York: Simon & Schuster, 2019.**



IEEE

22

The professional home for the engineering and technology community worldwide

The IEEE William and Joyce Middleton Electrical Engineering History Award, https://www.ieee.org/about/history-center/middleton-award.html
Initially, the William and Joyce Middleton Electrical Engineering History Award will be for a book published in English. Books that have been translated from another language will be eligible for three years after publication date of the translation. Books will be considered that have been published in the previous three years (e.g., books eligible for the 2014 award will have been published in 2011–2013).
Publishers are invited to nominate published books that they wish to have considered for the award, by sending an email, giving the book's title and publication information, to ieee-history@ieee.org. Nominations must be received by 1 December, in order to be considered for the following calendar year's award. The IEEE History Committee expects to make its decision each year by 1 September.
•Only published books will be considered (no bound galleys or manuscripts).
•For e-books, please provide a digital PDF of the book, including publication date information.
•The publisher shall make each author aware of and consent to the entry of his/her book for the award.

•Books that did not win in a given year will be considered in the coming year up until the three-year period from publication date is exhausted.
•Edited collections will not be considered
•Additional editions (2nd, 3rd, etc. printing) of a previously published book will not be considered
•There is no entry fee.
•If a suitable candidate is not identified in any year, the award will not be given.
•The award consists of a certificate and an honorarium of US$2,000.
•An effort will be made for a high-ranking person from IEEE and/or the IEEE History Committee/Center to present the certificate in person at an appropriate public venue. No travel costs shall accrue against the award funds.
Sponsored by: The estates of William W. & Joyce F. Middleton

2023, Kathy Kleiman, *Proving Ground: The Untold Story of the Six Women Who Programmed the World's First Modern Computer (2022, Grand Central Publishing, New York)*
•2022, David A. Price, *Geniuses At War: Bletchley Park, Colossus, and the Dawn of the Digital Age (2021, Alfred A. Knopf, New York)*
•2021, Martin Collins, *A Telephone for the World: Iridium, Motorola, and the Making of a Global Age (Johns Hopkins University Press)*
•2020, Lillian Hoddeson and Peter K. Garrett, The *Man Who Saw Tomorrow: The Life and Inventions of Stanford R. Ovshinsky (MIT Press)*
•2019, Jimmy Soni & Rob Goodman*, A Mind at Play: How Claude Shannon Invented the Information Age (Simon & Schuster)*

•2018*,* Marc Raboy*, Marconi: The Man who Networked the World (Oxford University Press)*
•2017, Megan Prelinger, *Inside the Machine: Art and Invention in the Electronic Age (Norton & Co.)*

•2016, Walter Isaacson, *The Innovators: How a Group of Hackers, Geniuses, and Geeks Created the Digital Revolution (Simon & Schuster)*
•2015, W. Bernard Carlson, *Tesla: Inventor of the Electrical Age (Princeton University Press)*

IEEE HISTORY CENTER

Mission, Programs, and Outreach

IEEE HISTORY CENTER SUPPORT

- **Funded by:**
  - **IEEE**
  - **Life Members Committee**
  - **IEEE Members**
  - **IEEE Foundation, through**
    - **Annual fundraising**
    - **External grant support**
    - **Planned giving endowment**
  - **NIC – New Initiatives Committee**

IEEE History Center is part of Corporate Activities

- **Michael Geselowitz, Ph.D.**
- **Mary Ann Hellrigel, Ph.D.**
- **Nathan Brewer, M.L.I.S.**
- **Robert Colburn, B.A.**
- **Alexander Magoun, Ph.D.**
- **Kelly McKenna, M.F.A.**
- **Daniel Mitchell, Ph.D.**
- **IEEE History Center: 40 Years of Preserving and Promoting IEEE's Heritage**
- https://www.youtube.com/watch?v=hnE_1yQsbe4&t=9s

IEEE

26

The professional home for the engineering and technology community worldwide

IEEE History Center: Anniversaries often turn an organization's thoughts to its history. **The IEEE History Center was founded in 1980 as part of the planning for the centennial, to provide a professional staff for the IEEE History Committee, and create, preserve, and make known the history of IEEE and its technologies. History Center staff also began organizing the historical records of IEEE, AIEE, and IRE.**
History Center's exhibit, *A Century of Electricals*, 1984. The exhibit was produced in three ways—as a physical exhibit, a set of posters, and a narrated slide show.
Dr. Ronald Kline (r) second director of the History Center at the Westinghouse Atom Smasher Milestone Dedication, Pittsburgh, 1985.

IEEE: Publications, Conferences, Societies, and Councils. See IEEE Aerospace and Electronic Systems Society, http://ieee-aess.org/ and http://ieee-aess.org/publications/transactions-aes. See IEEE Aerospace Conference, https://www.aeroconf.org/

History of History at IEEE
1963 – Permanent History Committee in bylaws (IRE had a history committee, so the idea carried over to IEEE)
1980 – History Center professional staff added to assist with centennial celebrations
1990 – Center moved to New Brunswick campus of Rutgers University, which became strategic co-sponsor in the history space – emphasis on research
2000s – emphasis shifts to outreach
2010s – more focus on education
2014 – Center relocated to Stevens Institute of Technology our new strategic partner in the history/education space
We will help you document your IEEE History
Oral History, First-Hand History, ETHW.ORG, etc.

Programs of the History Center

Guided by the IEEE History Committee, Standing Committee of the BOD

- Infrastructure
  - Engineering and Technology History Wiki (ethw.org)
  - IEEE Archives
  - Communication (newsletter), fundraising
  - Scholarly outreach
- Oral History Collection
- IEEE REACH (reach.ieee.org)
- IEEE Global Museum
- IEEE Milestones (members driven)

IEEE HISTORY CENTER PROGRAMS

- Oral Histories:
  - Started in 1968
  - More than 900 transcripts on the Engineering and Technology History Wiki (ETHW)
  - https://ethw.org/Oral-History:List_of_all_Oral_Histories
- Personal Narratives (new addition)
- First-Hand Histories (autobiographical)
  - More than 300 on the ETHW
  - https://ethw.org/First-Hand:List_of_First_Hand_Histories

- IEEE REACH, https://reach.ieee.org/
  - Raising Engineering Awareness Through the Conduit of History
  - Free curriculum for K-12 students
  - History of STEM, so we are also STEAM
  - Inquiry Unit (10 available)
    - Primary Sources
    - Multimedia Sources
    - Hands-on Activities

Engineering and Technology History Wiki

ENGINEERING AND TECHNOLOGY HISTORY WIKI (ETHW)

- **ETHW is s a website powered by MediaWiki with thousands of articles, first-hand accounts, oral histories, milestones, archival documents and lesson plans pertaining to the history of technology**
- **ETHW is developed by a partnership between the United Engineering Foundation, the AIAA, AIChE, AIME, ASHRAE, ASCE, ASME, IEEE, SPE and SWE**

- **Launched as Global History Network, 2008**
- **IEEE, AIAA, AIChE, AIME, ASCE, ASME, SPE, SWE, ASEE, and ASHRAE**
- **Growth in all content areas**
- **Enhanced timeline feature**
  - **Funding provided by a grant from the IEEE New Initiatives Committee (NIC)**

About ETHW: https://ethw.org/ETHW:About This page was last edited on 13 October 2021, at 17:47.

The Engineering and Technology History Wiki (ETHW) is a website powered by MediaWiki with thousands of articles, first hand accounts, oral histories, milestones, archival documents and lesson plans pertaining to the history of technology. The ETHW is one of the world's premier sites for the documentation, analysis, and explanation of the history of technology; the scientists, engineers and business people who made these technologies happen; and on the history of the organizations to which these men and women belonged.
The ETHW is developed by a partnership between the United Engineering Foundation, and the AIAA, AIChE, AIME, ASCE, ASME, IEEE, SPE and SWE. It fosters the creation of narratives that not only document the history of engineering practices but also explain when, how, and why these technologies developed as they did. It uses a wiki-based web platform to foster a collaborative online environment that taps into the collective memories, experiences, and knowledge of engineering's worldwide membership – the men and women who provide the imagination, creativity, and know-how to sustain engineering progress and technological innovation. In time, this site will serve as a central historical repository of all the achievements, ideas, and first-hand knowledge of engineering association members, societies, councils and technical communities. The ETHW will also provide a central location for all materials related to engineering's organizational history.
Although the contributions to this site are restricted to registered users, the ETHW is also dedicated to making the social, economic, political, and technical aspects of the history of technology accessible to all. The general public is invited to explore and learn about the history of the technologies that have shaped and will continue to shape their lives.

IEEE, Institute of Electrical and Electronics Engineers (1884)
AIChE, American Institute of Chemical Engineering (1908)
AIME, American Institute of Mining, Metallurgical, and Petroleum Engineers (1871, as American Institute of Mining Engineers)
ASCE, American Society of Civil Engineers (1852)
ASME, American Society of Mechanical Engineers (1880)
SPE, Society of Petroleum Engineers (In 1957, the organization was officially founded as SPE, a constituent society of AIME. SPE became a separately incorporated organization in 1985.)
SWE, Society of Women Engineers (1950)
ASEE, American Society of Engineering Education (1893)
AIAA, American Institute of Aeronautics and Astronautics, (1963)

ENGINEERING AND TECHNOLGY HISTORY WIKI (ETHW)

- **The ETHW** http://ethw.org/Main_Page
- **Encyclopedia** https://ethw.org/Encyclopedia
- **Archival collections** https://ethw.org/Archives:Archival_Collections;
- **IEEE Archives** https://ethw.org/Archives:IEEE_Archives
- **Videos** https://ethw.org/Archives:Videos **some oral histories**
  - **Roger W. Brockett,** https://www.youtube.com/watch?v=QrydaT5zgX4&t=73s
    - Transcript at https://ethw.org/Oral-History:Roger_B...
- **IEEE Milestones** https://ethw.org/Milestones:List_of_IEEE_Milestones
- **First-Hand Histories (300+; 50 about spaceflight)** https://ethw.org/First-Hand:List_of_First_Hand_Histories

➢ **Personal Narratives are a new collection – not written like a First –Hand History; a short interview, so it is not an IEEE Oral History**

IEEE ARCHIVES

32

IEEE

The professional home for the engineering and technology community worldwide

THE IEEE HISTORY CENTER and the IEEE ARCHIVES

- Mary Ann Hellrigel, Ph.D.
- Archivist and Institutional Historian
- Manager, IEEE Oral History Program
- IEEE History Center
- E-mail: m.c.hellrigel@ieee.org
- Help Collect and Preserve IEEE History

IEEE Archives – Operations Center in Piscataway, NJ

Exhibit - Medal of Honor and Edison Medal

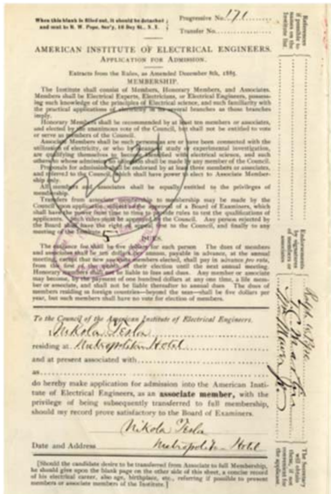
33

IEEE

The professional home for the engineering and technology community worldwide

Used for SPS OH training in August 2021, etc. (last revision: 27 Jan. 2023)
Revised: OH training: Sept. 12, 2022; Sept. 19, 2022; Sept. 20, 2022; Sept. 21, 2022
SPS Women - OH training: 18 Nov. 2022
Va. Tech course – 27 Jan. 2023 (ECE4974, Spring 2023), and other times
VTS Anniversary History Project – 28 July 2023
History Committee Subcommittees, Oral History and WIE (and invited IEEE Members) – 8 May 2024
33

Nikola Tesla (1856-1943), Electrical Pioneer


AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS
APPLICATION FOR ADMISSION.

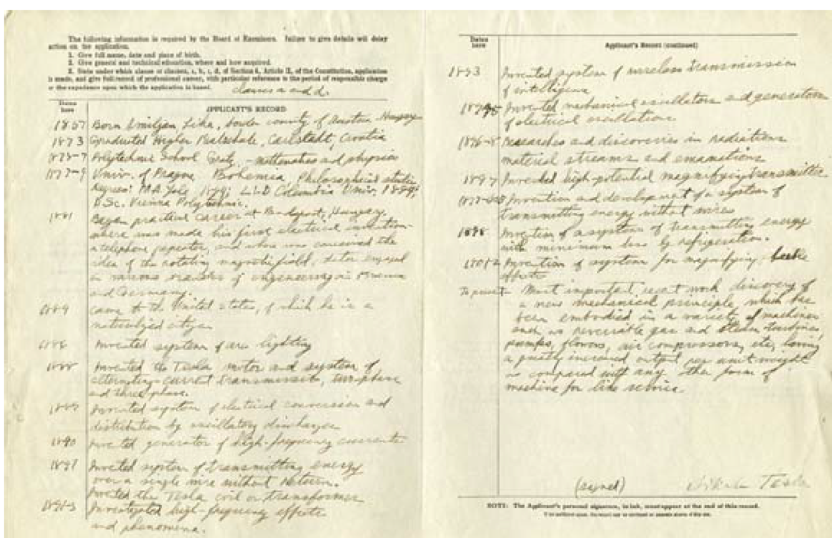
- AIEE application, 1888
- AIEE Edison Medal, 1916
  - for "meritorious achievement in his early original work in polyphase and high-frequency electrical currents."
- In honor of the Sesquicentennial of the birth of Nikola Tesla the IEEE BoD passed a special Citation honoring his work. A special plaque was cast and presented to the Tesla Museum in Beograd. Serbia, Oct. 2006
- https://ethw.org/Milestones:Nikola_Tesla_(1856-1943),_Electrical_Pioneer_(Special_Citation) https://ethw.org/Nikola_Tesla

34

The professional home for the engineering and technology community worldwide

Nikola Tesla, application for admission to AIEE, 1888. Resided in the Metropolitan Hotel at the time of application.
https://ethw.org/Milestones:Nikola_Tesla_(1856-1943),_Electrical_Pioneer_(Special_Citation)
https://ethw.org/Nikola_Tesla

TESLA, AIEE FELLOW APPLICATION, 1916

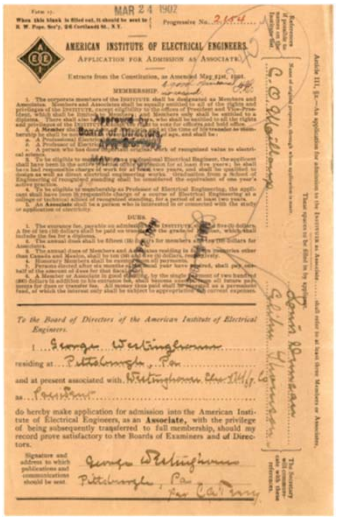


35

The professional home for the engineering and technology community worldwide

Nikola Tesla, application to the grade of AIEE Fellow, 17 Nov. 1916.

George Westinghouse, Jr. (1846-1914), Engineer and Entrepreneur


MAR 24 1902

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

APPLICATION FOR ADMISSION AS ASSOCIATE

- **AIEE Associate application, 24 March 1902,** https://ethw.org/w/images/a/a3/Westinghouse_-_application_for_admission.pdf
- **ETHW entry,** https://ethw.org/George_Westinghouse
- **Archival documents,** https://ethw.org/Archives:Papers_of_George_Westinghouse
- **Edison Medal in 1911 "For meritorious achievement in invention and development of alternating current systems and apparatus."**

IEEE

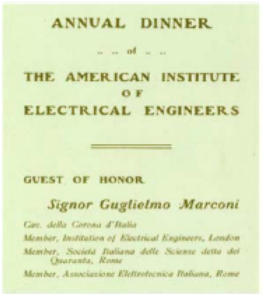
36

The professional home for the engineering and technology community worldwide

George Westinghouse, application for admission to AIEE, 24 March 1902.

SIGNED PROGRAM, AIEE ANNUAL DINNER, 1902

- **M.I. Pupin**
- **G. Marconi**
- **Frank J. Sprague**
- **Charles P. Steinmetz**
- **Elihu Thomson**
- **Alexander Graham Bell**


ANNUAL DINNER

of

THE AMERICAN INSTITUTE
OF
ELECTRICAL ENGINEERS

GUEST OF HONOR

Signor Guglielmo Marconi

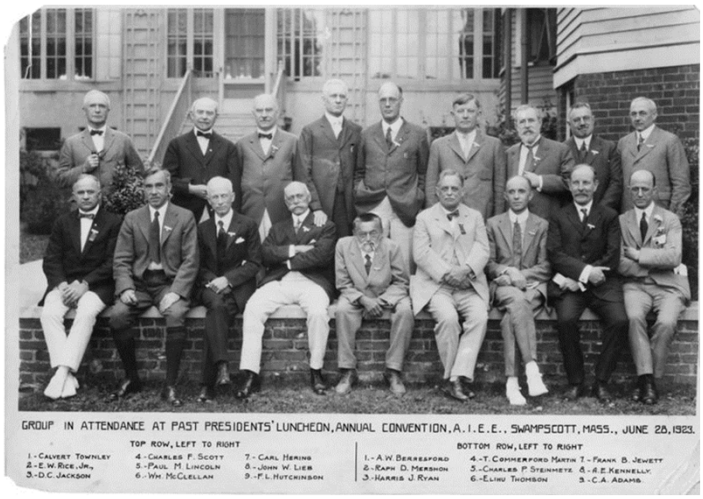
Cav. della Corona d'Italia
Member, Institution of Electrical Engineers, London
Member, Società Italiana delle Scienze detta dei Quarranta, Rome
Member, Associazione Elettrotecnica Italiana, Rome

IEEE

37

The professional home for the engineering and technology community worldwide

PHOTOGRAPH COLLECTION
AIEE PAST PRESIDENTS, 1923



GROUP IN ATTENDANCE AT PAST PRESIDENTS' LUNCHEON, ANNUAL CONVENTION, A. I. E. E., SWAMPSCOTT, MASS., JUNE 28, 1923.

TOP ROW, LEFT TO RIGHT

1 - Calvert Townley
2 - E. W. Rice, Jr.,
3 - D. C. Jackson
4 - Charles F. Scott
5 - Paul M. Lincoln
6 - Wm. McClellan
7 - Carl Hering
8 - John W. Lieb
9 - F. L. Hutchinson

BOTTOM ROW, LEFT TO RIGHT

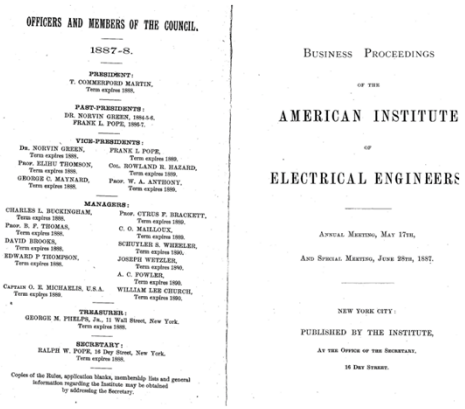
1 - A. W. Berresford
2 - Ralph D. Mershon
3 - Harris J. Ryan
4 - T. Commerford Martin
5 - Charles P. Steinmetz
6 - Elihu Thomson
7 - Frank B. Jewett
8 - A. E. Kennelly.
9 - C. A. Adams.

IEEE

The professional home for the engineering and technology community worldwide

Size of this preview: 800 × 561 pixels. Other resolutions: 320 × 224 pixels | 4,115 × 2,885 pixels.
Original file (4,115 × 2,885 pixels, file size: 7.12 MB, MIME type: image/jpeg)
Copyright IEEE History Center
https://ethw.org/File:AIEE_Presidents_0236.jpg

AIEE DUES WERE $10 (US) in 1887
(Adjusted for inflation, $331 today)



OFFICERS AND MEMBERS OF THE COUNCIL.

1887-8.

PRESIDENT:
T. COMMERFORD MARTIN,
Term expires 1888.

PAST-PRESIDENTS:
DR. NORVIN GREEN, 1884-5-6.
FRANK L. POPE, 1886-7.

VICE-PRESIDENTS:
DR. NORVIN GREEN, Term expires 1888.
FRANK L. POPE, Term expires 1888.
PROF. ELIHU THOMSON, Term expires 1888.
COL. ROWLAND B. HAZARD, Term expires 1889.
GEORGE C. MAYNARD, Term expires 1888.
PROF. W. A. ANTHONY, Term expires 1889.

MANAGERS:
CHARLES L. BUCKINGHAM, Term expires 1888.
PROF. CYRUS F. BRACKETT, Term expires 1889.
PROF. R. F. THOMAS, Term expires 1888.
C. O. MAILLOUX, Term expires 1889.
DAVID BIDDLE, Term expires 1888.
SCHUYLER S. WHEELER, Term expires 1890.
EDWARD P. THOMPSON, Term expires 1888.
JOSEPH WETZLER, Term expires 1890.
A. C. FOWLER, Term expires 1890.
CAPTAIN O. E. MICHAELIS, U.S.A. Term expires 1888.
WILLIAM LEE CHURCH, Term expires 1890.

TREASURER:
GEORGE M. PHELPS, Jr., 31 Wall Street, New York. Term expires 1888.

SECRETARY:
RALPH W. POPE, 16 Dey Street, New York. Term expires 1888.

Copies of the Rules, application blanks, membership lists and general information regarding the Institute may be obtained by addressing the Secretary.

BUSINESS PROCEEDINGS
OF THE
AMERICAN INSTITUTE
OF
ELECTRICAL ENGINEERS

ANNUAL MEETING, MAY 17TH,
AND SPECIAL MEETING, JUNE 28TH, 1887.

NEW YORK CITY:
PUBLISHED BY THE INSTITUTE,
AT THE OFFICE OF THE SECRETARY,
16 DEY STREET.

IEEE

39

The professional home for the engineering and technology community worldwide

$10 in 1887 is worth $331.36 on 2 Oct. 2014. CPI Inflation Calculator,

https://www.in2013dollars.com/us/inflation/1884?amount=10

Business Proceedings of the AIEE, 1887.

U.S. Bureau of Labor Statistics, CPI Inflation Calculator, calculates inflation since January 1913.
https://www.bls.gov/data/inflation_calculator.htm

Don Heirman (1940-2020): "Your IEEE-Related Papers are Worth Saving. The IEEE History Center is the Place" (but not for everything)

40

The professional home for the engineering and technology community worldwide

Don Heirman (1940-2020); Nathan Brewer, Digital Specialist, IEEE History Center; and Mike Geselowitz, Senior Director, IEEE History Center.

https://www.johnedayfuneralhome.com/tributes/Donald-Heirman
Donald N. Heirman, 16 August 1940 - 30 October 2020 (age 80)
Donald N. Heirman, age 80, died October 30, 2020 in Lincroft, New Jersey. His wife of 45 years—Lois (Smith)—predeceased him in early 2009. Don will be alongside his wife at Arlington National Cemetery. He was a communicant of, and member of the choir at St. Leo the Great Catholic Church in Lincroft, NJ for over 50 years.
Don was on active duty in the US Navy from 1963 to 1965. He continued his Navy service in the Naval Reserves until1985 retired with the rank of Commander.
At the time of his death, he was president of Don HEIRMAN Consultants which was a training, standards, and educational electromagnetic compatibility (EMC) Consultation Corporation which he founded in 1997 after his early retirement from Bell Laboratories. Previously he was with Bell Laboratories for over 30 years in many EMC roles.
He is listed in several "Who's Who" publications including Who's Who in Technology, Who's Who in Science and Engineering and Men of Achievement. His contributions were vast to his EMC discipline where he has been called "Mr. EMC Standards". A complete review of his career is on his website: www.donheirman.com
Visitation will be 4-7 pm on November 3, 2020 at the John E. Day funeral home in Red Bank, NJ. A Rite of Christian Burial Mass will be at 10:15 am, on November 4, 2020 at St. Leo the Great Catholic Church in Lincroft. A similar viewing and church service will be performed in his home town of Mishawaka, Indiana the next week. His final resting place will be at Arlington National Cemetery.
In lieu of flowers, it is requested that donations be made to the
American Diabetes Research Foundation, 1701 N. Beauregard Street, Alexandria, VA, 22311.
or
American Cancer Society, Eastern Division, Monmouth Unit, P. O. Box 5066, Cherry Hill, NJ 08034-5066
Please visit Donald's memorial website at www.johnedayfuneralhome.com

Donald N. Heirman Papers, Perdue University, http://collections.lib.purdue.edu/heirman/index.php

IEEE ARCHIVES WISH LIST

- The IEEE Archives is a repository for IEEE institutional history and records
  - We aim to collect several classes of records, publications, and ephemeral material generated by the institute. Examples of what the archives aims to collect include:
    - IEEE Organizational Unit admin. records and minutes
    - Conferences and journals which have not been digitized in IEEE Xplore
    - Photographs and multimedia of award ceremonies or IEEE events
    - Newsletters covering IEEE activities
- If you have similar material and would be interested in donating it to the IEEE Archives, please email ieee-history@ieee.org
- Digitization Projects – consult with the History Center and then digitize for posting on ETHW

IEEE MILESTONES

42

The professional home for the engineering and technology community worldwide

The IEEE Milestones Program

Honors Significant Technical Achievement in all areas associated with IEEE

- Designated fields (per IEEE Bylaw I-104.11):
  - Engineering
  - Computer Sciences and Information Technology
  - Physical Sciences
  - Biological and Medical Sciences
  - Mathematics
  - Technical Communications
  - Education
  - Management
  - Law and Policy
- A program of the IEEE History Committee, administered through the IEEE History Center
- ETHW is the platform
- 258 Dedicated as of today, 9 Oct. 2024
- There are also 4 Special Citations

43

The professional home for the engineering and technology community worldwide

IEEE Milestones Program, https://ieeemilestones.ethw.org/Main_Page

WHAT IS AN IEEE MILESTONE

Criteria to consider before submitting an application

- **The IEEE Milestones program honors significant technical achievements in all areas associated with IEEE.**
- **Milestones are proposed by any IEEE member, and are sponsored by any one or more IEEE Organizational Unit(s) (OU) such as IEEE section(s), society(ies), chapter(s) or student branch(es).**
- **To be proposed as an IEEE Milestone, an achievement must be at least 25 years old, have benefited humanity, and must have had at least regional importance.**
- **Geographical importance will need to be explained in the proposal.**
- **The achievement must not be the subject of current litigation.**
- **The official IEEE plaque is the English-language plaque. The sponsoring organizational unit(s) may, at their expense, request a plaque or plaques in other languages. The translation must be made—or validated by—a third-party professional translator at the sponsoring organizational unit(s)' expense.**
- **Learn more about the IEEE Milestones program.**

IEEE

IEEE Milestone, main page, ETHW.
https://ieeemilestones.ethw.org/Main_Page

IEEE Milestones Program

Main Page on ETHW

- 1 Create a Milestone Proposal
- 2 Milestones In Process
- 3 How to Propose an IEEE Milestone
- 4 Milestones Already Dedicated
- 5 Achievements Suitable for Proposal as Milestones

- MILESTONES ALREADY DEDICATED
- Chronological List of Dedicated Milestones by date of invention or discovery
- List of Milestones by Region
- List of Milestones by Year Dedicated
- Map Showing Dedicated IEEE Milestones
- Gallery of selfies at IEEE Milestone plaques submitted by users

- Robert Colburn, IEEE Milestone Program Manager
  - Email: r.colburn@ieee.org

IEEE MILESTONES

https://ethw.org/Milestones:List_of_IEEE_Milestones

- Milestones, with their plaque citations, are listed below in chronological order of the achievement. When the dates of the milestone are a range and overlap, our convention is to list them by the start date of the work, e.g. 1961-1972 comes before 1962, which comes before 1962-1965, which comes before 1964, etc.
- To make it easier for people to visit the sites of IEEE Milestones we have also made a page with addresses, maps, and satellite images.
- Looking to submit a IEEE Milestone? Here are the Milestone Program Guidelines and submit a proposal here.

IEEE MILESTONE PROCESS

The Nitty Gritty Advice on Setting Up Milestone Process

- Be adamant about the integrity of the process and protect it. (1 IEEE Milestone was revoked)
- One out of every two Milestones/Landmarks becomes a political football.
- The review/evaluation of the milestone proposals is the weak link. Getting people to serve as advocates, and then keeping them on schedule, is an ongoing task.
- Making sure that the independent expert reviewers truly are objective.
- Have the money in hand before casting the plaque(s).

BUT REMEMBER:

- *Milestones/Landmarks are some of the most publicly-visible ways to celebrate the heritage of the profession.*
- *They represent golden opportunities for media response, member development, local membership pride, volunteer engagement, political engagement, etc.*
- *Keeping the PR people in the loop from early on pays dividends.*
- *Encourage staff as well as top volunteers to attend dedication ceremonies*

47

The professional home for the engineering and technology community worldwide

MILESTONE STATUS REPORT

REPORT ON THE STATUS OF MILESTONES IN SUBMISSION/APPROVAL/DEDICATION PROCESS

- IEEE Milestones Status Report to see Milestones currently in the approval process
- This ongoing report shows the status of Milestones and Special Citations in the various stages of the process, updated frequently by IEEE History Center staff.
- WHAT IS MISSING???
- The IEEE Region and the sponsoring organizational unit are shown in parentheses.
- While in the approval process, proposals have a History Committee advocate assigned to them, whose initials are given in brackets.

- WHAT IS MISSING???

48

The professional home for the engineering and technology community worldwide

https://ieeemilestones.ethw.org/Milestones_Status_Report

IEEE MILESTONE – THE PROCESS

Usually, the process takes at least one year (depends on the dedication of participants)

- Section A. Proposals Needing Advocates
  Section B.1 Proposals Being Written and Awaiting Completion and Submission
  Section C.1 Proposals Submitted, Awaiting Independent Expert Reviews
  Section C.2 Proposals Reviews Received, Awaiting Advocate Decision
  Section D.1 Proposals Approved by Advocate and Awaiting Milestones Subcommittee Chair Approval
  Section D.2 Proposals Approved by Advocate and Awaiting Citation Approval
  Section D.3 Proposals Awaiting Name-in-Citation Approval from Milestones Subcommittee
  Section D.4 Proposals Awaiting Further Development or evaluation from Milestones Subcommittee
  Section D.5 Proposals Awaiting History Committee Action
  Section E Proposals Approved by History Committee and Awaiting Board of Directors Action
  Section F Milestones Approved by Board of Directors and the Dedication Ceremonies Are Being Planned
  Section G Milestones Dedicated

IEEE

49

The professional home for the engineering and technology community worldwide

IEEE MILESTONES: Information and the Process

Information Assembled for a talk at the American Chemical Society, 4 Oct. 2024

- Doc 1. Milestone Program Article by Robert Colburn
- Doc 2. Milestone Orientation
- Doc 3. Advice to People
- Doc 4. Milestone Guidelines
- Doc 5. IEEE ETHW …. What is it?
- Doc 6. Milestones List by year dedicated
- Doc 7. List of Achievements Suitable for Milestone
- MS 1. Milestones - Vulcan Street Plant, 1882 (IEEE Milestone #1, dedicated Sept. 15, 1977)

- ACS has a Landmarks program, and they wanted information about the IEEE Milestone Program and its processes.
- The IEEEE Program Manager, Robert Colburn, has developed an orientation program for IEEE History Committee Members as well as other IEEE Members
- Robert Colburn, IEEE Milestone Program Manager
- Email: r.colburn@ieee.org

IEEE

50

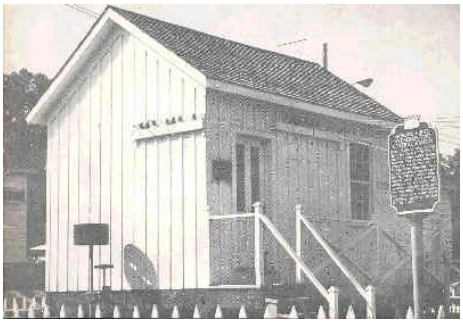
The professional home for the engineering and technology community worldwide

Hellrigel presentation a talk on IEEE Milestones at the American Chemical Society, 4 October 2024.
Assembled packet of materials are available. Send me an email – m.c.hellrigel@ieee.org
Doc 1. Milestone Program Article by Robert Colburn
Doc 2. Milestone Orientation
Doc 3. Advice to People
Doc 4. Milestone Guidelines
Doc 5. IEEE ETHW …. What is it?
Doc 6. Milestones List by year dedicated
Doc 7. List of Achievements Suitable for Milestone
MS 1. Milestones - Vulcan Street Plant, 1882 (IEEE Milestone #1, dedicated Sept. 15, 1977

THE FIRST DEDICATED IEEE MILESTONE – Edison central station

ASME National Historic Engineering Landmark, jointly designated with ASCE and IEEE

- IEEE Milestone #1 - Vulcan Street Plant, 1882
  - Dedicated 15 Sept. 1977
  - IEEE Region 4
  - IEEE Section – Northeastern Wisconsin



- "Near this site on September 30, 1882, the world's first hydroelectric central station began operation. The station, here reproduced, was known as the Vulcan Street Plant and had a direct current generator capable of lighting 250 sixteen candle power lamps each equivalent to 50 watts. The generator operated at 110 volts and was driven through gears and belts by a water wheel operating under a ten foot fall of water."
- Edison DC electric light station
  - Initially illuminated a H.J. Rodgers paper mill and home
  - Appleton, Wisconsin, along the Fox River, hydropower
  - Appleton Edison Electric Light Co., incorporated 25 May 1882

IEEE

51

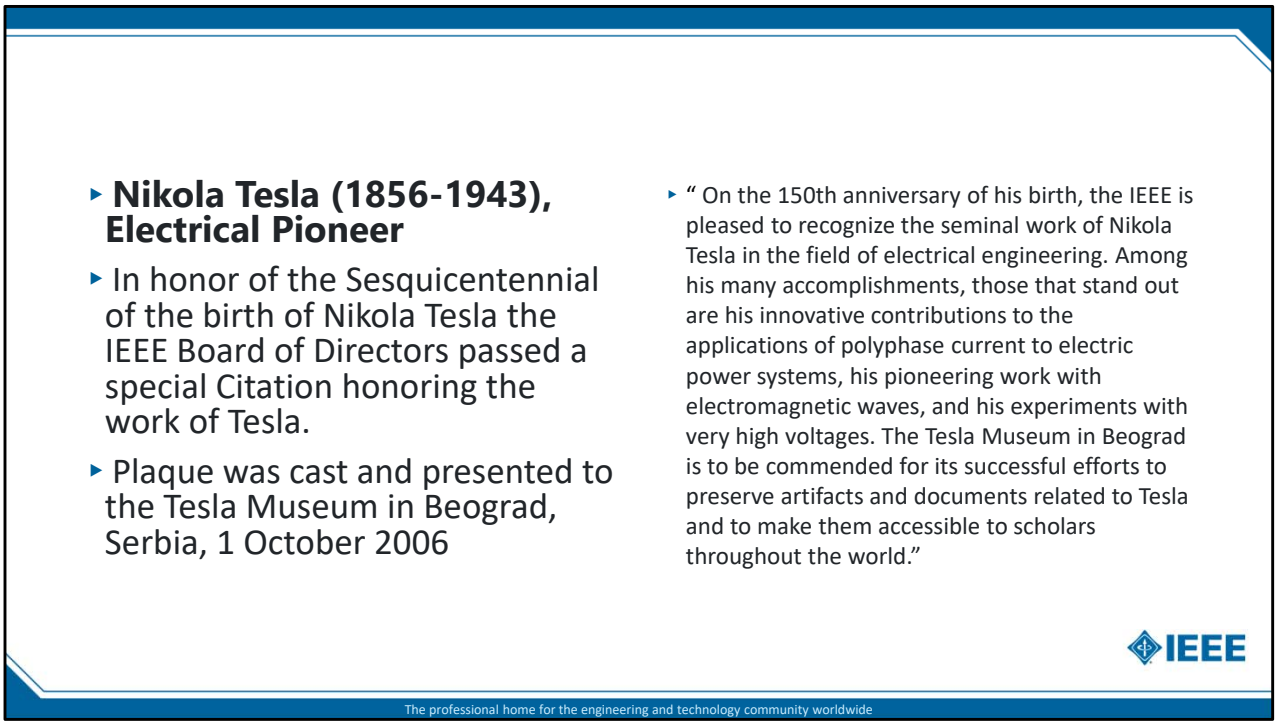
The professional home for the engineering and technology community worldwide

After this meeting, the founders decided to test the viability of hydro-electric lighting by first installing it in their homes and mills. The first buildings to be lit by the Vulcan Street Plant were H.J. Rogers' home, the Appleton Paper and Pulp Company building, and the Vulcan Paper Mill, which were all connected directly to the generator.
After a few days of troubleshooting, the generator was repaired and successfully entered operation on September 30, 1882. This was only twenty-six days after Thomas Edison began to successfully operate his steam-driven Pearl Street Plant in New York, which began operation on September 4, 1882. The output of the original generator was about 12.5 kilowatts.
The Vulcan Street Plant was conceptualized by H. J. Rogers – who was the president of the Appleton Paper and Pulp Co. and of the Appleton Gas Light Co. during this time. H. J. Rogers first came up with the idea for a hydro-electric central station after talking with a friend of his, H. E. Jacobs, while they were on a fishing trip
The plaque can be viewed in the Vulcan Heritage Waterfront Park, on W. Water St. in Appleton Wisconsin.

Thomas Alva Edison Historic Site at Menlo Park, 1876 (#68)

Menlo Park, NJ, U.S.A., Dedicated 9 September 2006 - IEEE Princeton/Central Jersey Section

- "Between 1876 and 1882 at Menlo Park, New Jersey, Thomas Edison developed the world's first industrial research and development laboratory devoted to developing new technology. At this laboratory. Edison and his staff developed the first system of incandescent electric lighting and electric power generation, and invented recorded sound and a commercially successful telephone transmitter."
- Tom Coughlin, 2024 IEEE President, taking a photograph next to the official bronze plaque



Nikola Tesla (1856-1943), Electrical Pioneer, IEEE Special Citation in Electrical Engineering and Computing.

Nikola Tesla (1856-1943), Electrical Pioneer (Special Citation)

Belgrade, Serbia, Dedicated 1 October 2006 - IEEE Serbia and Montenegro Section

On the 150th anniversary of his birth, the IEEE is pleased to recognize the seminal work of Nikola Tesla in the field of electrical engineering. Among his many accomplishments, those that stand out are his innovative contributions to the applications of polyphase current to electric power systems, his pioneering work with electromagnetic waves, and his experiments with very high voltages. The Tesla Museum in Beograd is to be commended for its successful efforts to preserve artifacts and documents related to Tesla and to make them accessible to scholars throughout the world.

Seen also: Nikola Tesla Museum, https://tesla-museum.org/en/home/

IEEE REACH: Raising Engineering History Through the Conduit of History

IEEE REACH

Curriculum for Pre- University Education (resources are FREE)

- Provides teachers and students with educational resources that explore the relationship between technology and engineering history and the complex relationships they have with society, politics, economics, and culture
- Inquiry Units –
  - Background Information for teachers
  - Primary Sources
  - Multimedia Resources
  - Hands-on Activities

- Information Theory
- Electronic Music
- Skyscrapers
- Electric Lighting
- Refrigerated Railcar
- UAV (Drones)
- Radio
- Triremes
- Early Maritime Navigation
- The Printing Press

GLOBAL MUSEUM

IEEE Global MUSEUM

Presented by IEEE History Center

- Promote understanding of electrotechnology and its societal impact by bringing museum-quality exhibits directly to IEEE members and the public
- Engage with local museums, private collectors, universities and corporations to curate traveling exhibits and install them at technology museums or IEEE conferences, facilities, and events around the world

Vision for the IEEE Global Museum

IEEE Member Engagement

Pilot exhibits for Unseen Signals: Edwin H. Armstrong's Radio Revolution

Soft launch of *Unseen Signals* at February 2023 Board Series, New York City

***Unseen Signals* at Sections Congress, Ottawa, Canada, August 2023**

Member exhibits enabled us to pilot our flagship public exhibit.

Public Engagement

Unseen Signals: Edwin H. Armstrong's Radio Revolution

Three major innovations:

- Regeneration
- Superheterodyne
- Frequency Modulation (FM)

Unseen Signals Traveling Exhibit

Edwin H. Armstrong's Radio Revolution

IEEE Board Series, New York City (Feb. 2023)

***Unseen Signals* design concept**

National Museum of Industrial History

Smithsonian Affiliate in Bethlehem, Penn.

- Housed in the former Electric Repair Shop of the Bethlehem Steel Plant site
- Part of the SteelStacks arts and culture campus
- Permanent Exhibits (see photo)
- Temporary Exhibits
  - IEEE History Center's Armstrong exhibit will have its opening on Saturday, 2 Nov. 2024

- NMIH - Smithsonian Affiliate in Bethlehem, Penn.

https://www.nmih.org/

ORAL HISTORY

Dr. Mary Ann Hellrigel, Archivist, Institutional historian, and oral history program manager. IEEE History Center records oral histories and helps capture the voices of prominent engineers, scientists, and technologists for IEEE and the IEEE History Center. These voices are captured and preserved as part of the oral history collections posted on Engineering and Technology History Wiki.
Photo: Harold O. Peterson, Paul Godley, & Harold Beverage.
https://ethw.org/File:1423_-_Peterson,_Godley,_%26_Beverage.jpg

HAROLD H. BEVERAGE AND H.O. PETERSON: An Interview conducted by Mrs. Norval Dwyer, IEEE History Center, July 1, 1968, with additional written comments from Beverage, July 1973. Interview #001 for the IEEE History Center, The Institute of Electrical and Electronics Engineers, Inc.
https://ethw.org/Oral-History:Harold_H._Beverage_and_H._O._Peterson

Martha Sloan, 1993 IEEE President, 0pening Singapore Office - IEEE Life Fellow
https://ethw.org/File:3177_-_Martha_Sloan_in_Singapore.jpg

John D. McDonald, https://corporate-awards.ieee.org/speaker/john-d-mcdonald/

Mildred Dresselhaus, 2015 IEEE Medal of Honor Recipient. Photo: 28 Sept. 2012, U.S. Dept of Energy, https://commons.wikimedia.org/wiki/File:Millie_Dresselhaus_(8050499922).jpg

Maxine Cohen an oral history, #863, conducted in 28 Sept. 2021 by Mary Ann Hellrigel, IEEE History Center, Piscataway, NJ USA. https://ethw.org/Oral-History:Maxine_Cohen

T. Scott Atkinson,
https://www.ieee.org/ns/periodicals/Life%20Members%20Newsletter/Sept2020/index.html

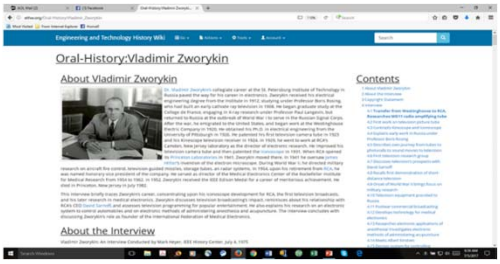
She will also review the "voices lost," the life stories not captured and often "hidden" in main-stream history, including Edith Clarke, AIEE Fellow (1948); Katherine Johnson, NASA, https://www.nasa.gov/content/katherine-johnson-biography and others.

IEEE ARCHIVES

THE IEEE ORAL HISTORY COLLECTION

- Recordings in various formats
  - Reel to Reel Tapes - audio
  - Cassette Tapes - audio
  - Mini Cassette Tapes - audio
  - Camcorder: Video tapes – audio and visual
  - "Chips" – digital audio and visual
- Recordings
  - In person with a camcorder
  - If a "customer" wants to hire a videographer or IEEE TV that is an option, but it increases the cost
  - Virtually via WebEx (sometimes Zoom)

Oral Histories/First-Hand Histories



- ***Oral Histories:***
  - ***Started in 1968***
  - ***More than 900 transcripts on the ETHW***
  - ***About 750 are IEEE***
  - *92 from the SWE*
  - *102 from AIME societies*

- First-Hand Histories
  - More than 300 on the ETHW

IEEE

66

The professional home for the engineering and technology community worldwide

There are 950+ oral histories posted

750+ from the IEEE History Center

92 from the SWE (Soc. of Women Engineers)

102 from AIME societies (American Institute of Mining, Metallurgical, and Petroleum Engineers

https://ethw.org/Oral-History:List_of_all_Oral_Histories

See also

Videos https://ethw.org/Archives:Videos some oral histories

YouTube channel: engineeringhistory

https://www.youtube.com/user/engineeringhistory

First-Hand Histories Include

- A few Group First-Hand Histories
- **Special Project: 50-year IEEE members; ASEE Fellows; Individuals; Spaceflight and Moon Walk – Apollo 11's 50th Anniversary**
- **A few group first-hand histories**
- **IEEE Life Members**
- **IEEE Members**
- **IEEE Anniversaries, etc.**

- IEEE Awards Recipients – Q&As with Icons of Engineering and Technology
  - 2020 IEEE Medal of Honor Recipient: Chenming Hu
  - 2022 IEEE John von Neumann Medal Recipient: Deborah Estrin
- Lighting and Lazers
- Materials
- Microwaves
- Nuclear and Plasma Sciences
- Radio and Radar
- Transportation, Aerospace, and Military
- My Time at NASA Houston, by T. Scott Atkinson - NASA in 1967 and 1968

IEEE

67

The professional home for the engineering and technology community worldwide

First-Hand Histories, https://ethw.org/First-Hand:List_of_First_Hand_Histories
List of all 50 Year Member First-Hand Histories
List of all ASEE Fellows First-Hand Histories
First-Hand Histories, https://ethw.org/First-Hand:List_of_First_Hand_Histories
Group First-Hand Histories:
Evolution of the 2-Person Crew Jet Transport Flight Deck, by Delmar M. Fadden, Peter M. Morton, Richard W. Taylor, and Thomas Lindberg - The authors of this article provide an account of their experiences in conceptualizing and developing the two-person cockpit for commercial airlines.
Gigabit Wireless Networks, by Arogyaswami J. Paulraj, Helmut Bölcskei, Rohit U. Nabar, and Dhananjay A. Gore - A brief account of the development of gigabit wireless networks in the late 1990s and early 2000s.

Solid State Circuits Society First Hand Histories - A collection of first hand histories initially published in the IEEE Solid-State Circuits Society newsletter and subsequently its magazine, including Dale L. Critchlow, Gene M. Amdahl, Barrie Gilbert, Robert H. Dennard, Mitsumasa Koyanagi, Eric A. Vittoz, Christian Enz, Gordon Bell, Erik H. M. Heijne, Federico Faggin, Marcian E. Hoff, Stanley Mazor, Masatoshi Shima, Joseph A. Fisher, Robert P. Colwell, Ken Smith, Tom Rent, John W. Meredith, Alberto Sangiovanni-Vincentelli, and Robert Brayton.

- **Spaceflight first-hand histories posted on ETHW in 2019**
- **https://ethw.org/First-Hand:List_of_First_Hand_Histories**

IEEE's Oral History Program: Initiatives and Projects

- Why bother documenting the life, education, and work experiences of IEEE members and others?
- The famous as well as the "working engineer" are IEEE members
- "IEEE Life Fellows – Capturing an Oral History" (NIC funding for Peer-to-Peer training)
- IEEE Computer Society – plans to expand beyond its Past Presidents
- IEEE Robotics and Automation – plans to record additional oral histories
- Planning stage: IEEE Vehicular Technology Society; IEEE Magnetics Society
- Institutional History of IEEE and its predecessors
  - Merger Collection
  - IEEE Past Presidents
  - IEEE Life Members
  - Awards – Medal of Honor recipients
  - Anniversaries (Region, Section, Society, etc.)

IEEE Oral History Collections Include

- IEEE Life Fellows
- IEEE Past Presidents
- IEEE Merger
- IEEE Foundation
- IEEE Communications Society
- IEEE Computer Society Presidents
- IEEE Control Systems Society
- IEEE Council on Superconductivity
- IEEE Electromagnetic Compatibility Society
- IEEE Signal Processing Society
- Marconi Fellows
- MIT Radiation Lab
- Queen Elizabeth Prize for Engineering Recipients
- RCA Engineers
- Robotics History
- Society of Women Engineers
- Space Travel Technologies
- Women in Computing

https://ethw.org/Oral-History:List_of_all_Oral_Histories

•**One of my projects – Superconductivity**

- **Since 2014, IEEE History Center, ongoing series of Oral Histories with prominent individuals in the field of superconductivity (Peter Lee, IEEE Council on Superconductivity)**
- **University professors and researchers**
- **National Labs and CERN**
- **Industry**

https://ethw.org/Oral-History:IEEE_Council_on_Superconductivity_Interviews

Applied Superconductivity Oral Histories

The IEEE History Center has undertaken an ongoing series of Oral Histories with prominent individuals in the field of superconductivity, the first group of which were done in August 2014.

René Flükiger - Flükiger, working mainly at the University of Geneva and at Karlsruhe, studied the metallurgy and structure of a variety of superconductivity, and then applied that knowledge to the production of superconducting wires and tapes.

Herbert Freyhardt - Accomplishments of Freyhardt include being the head of the "Crystal Growth Laboratory" as well as the "Superconductivity Section" of the Institute of Metallphysik.

Michael Green - He is a licensed mechanical engineer in the State of California and is a founding board member of the IEEE Council on Applied Superconductivity. He has worked at the Lawrence Radiation Laboratory, Kernforschungszentrum Karlsrue, Lawrence Berkeley Laboratory, and Oxford University.

Clark A. Hamilton - He spent most of his career at NIST in Boulder, Colorado. His many awards include the IEEE Council on Superconductivity Lifetime Achievement Award in 2012, and two U.S. Department of Commerce Gold Medals for his work on superconducting integrated circuits using Josephson devices, 1984 and 1989.

Richard Harris - Harris spent much of his career at the National Institute of Standards and Technology (NIST) where he researched superconductive technologies and introduced NIST to lithography and superconducting integrated circuits. He was also the Group Leader for the Cryoelectronic Metrology Group on superconducting electronics as well the Quantum Devices Group. In 2016, Harris received the 2016 IEEE Max Swerdlow Award for Sustained Service to the Applied Superconductivity Community.

Yukikazu Iwasa - Born and raised in Japan, Iwasa earned his undergraduate and graduate degrees at MIT. He has spent his entire career at the Francis Bitter Magnet Lab at MIT, where his work has focused on the study, development, and design of superconducting magnets.

Moises Levy - Levy's research, chiefly at the University of Wisconsin-Milwaukee, focused on the intersection of ultrasonics and superconductivity. He also played a central role in the development and evolution of the IEEE Council on Superconductivity.

Alexis P. Malozemoff - Malozemoff spent the first nineteen years of his career at IBM research, where he was best known for the co-discovery of the "giant flux creep" and the irreversibility line in high temperature superconductors (HTS). He spent the remainder of his career at American Superconductor, where he was in charge, among other activities, of AMSC's rise to a leading role in high temperature superconducting wire and its applications.

Arnold Silver - Silver is best known for his role in the Invention of the Superconducting Quantum Interference Device, better known as the SQUID, while working at the Ford Motors Scientific Lab. He later continued his work at superconducting electronic devices as a scientist and administrator at the Aerospace Corporation and TRW.

Richard J. Thome - He spent his career working in both industry and academia. In industry, his projects included the design and fabrication of superconducting and conventional magnetic systems. Later, at MIT he taught both undergraduate and graduate courses on electromagnetic systems design. Then he established a consulting firm, providing advice on research, management, and the business development in superconducting and conventional electromechanical systems for applications and in mechanical and electrical engineering.

Theodore Van Duzer - Van Duzer spent his long career at the University of California-Berkeley developing superconducting devices and circuits. He was also the founding editor of the *IEEE Transactions on Applied Superconductivity*.

Women's History Related Oral History Projects.

Society of Women Engineers

- SWE Pioneers Oral History Project
- SWE StoryCorps
- SWE Grassroots Oral History Project

Janet Abbate's Women in Computing Oral History Collection

- Oral histories with American and British women in computing
- Published two academic books
- IEEE History Center worked with her and preserved the oral histories

IEEE member and physics professor, Mary Lanzerotti, created a program in which undergraduate women STEM students recorded oral histories with well-know women (sort of a mentoring project)

ANNIVERARY AND SPECIAL PROJECTS

IEEE Signal Processing

- IEEE Signal Processing Society
- For its 50th anniversary in 1998, the IEEE Signal Processing Society worked with the IEEE History Center to prepare a monograph outlining the history of the Society, during which a number of oral histories were conducted.
- For its 75th anniversary upcoming in 2023, additional interviews have been and are being conducted

SPS Pioneers Include:

- Goldsmith, Andrea - 5 G; Dean of Engineering and Applied Science, Princeton; Marconi Prize
- Atal, Bishnu - Bell Labs
- Alex Acero - Apple's Siri Project
- John Cioffi - "father of DSL,"
- Alan Oppenheim - MIT
- John Proakis – Northeastern Univ.
- Ron Schafer - MIT

https://ethw.org/Oral-History:List_of_all_Oral_Histories
IEEE Signal Processing Society Oral Histories,
https://ethw.org/Oral-History:IEEE_Signal_Processing_Society_Oral_Histories

140th Anniversary: Capturing the Voices of IEEE Past Presidents:

Recording, Processing, and Posting Transcripts on ETHW (as of 9 Oct 2024)

- Previously recorded & in-process
  - Leah Jamieson, 2007
    - Reviewing 2 transcripts
  - Richard Gowen, 1984
    - Multiple oral histories
    - Staff preparing transcripts
- Recorded Part 1 : Gordon Day, 2012
- Awaiting response to invitation
  - Pedro Ray, 2010
  - Peter Staecker, 2013

- Recorded and Posted/Will Be Posted Soon
  - Moshe Kam, 2011,
  - Howard Michel, 2015
  - Barry L. Shoop, 2016
  - Karen Bartleson, 2017
  - James Jefferies, 2018
  - José M. F. Moura, 2019
  - Toshio Fukuda, 2020
  - Susan K. (Kathy) Land, 2021

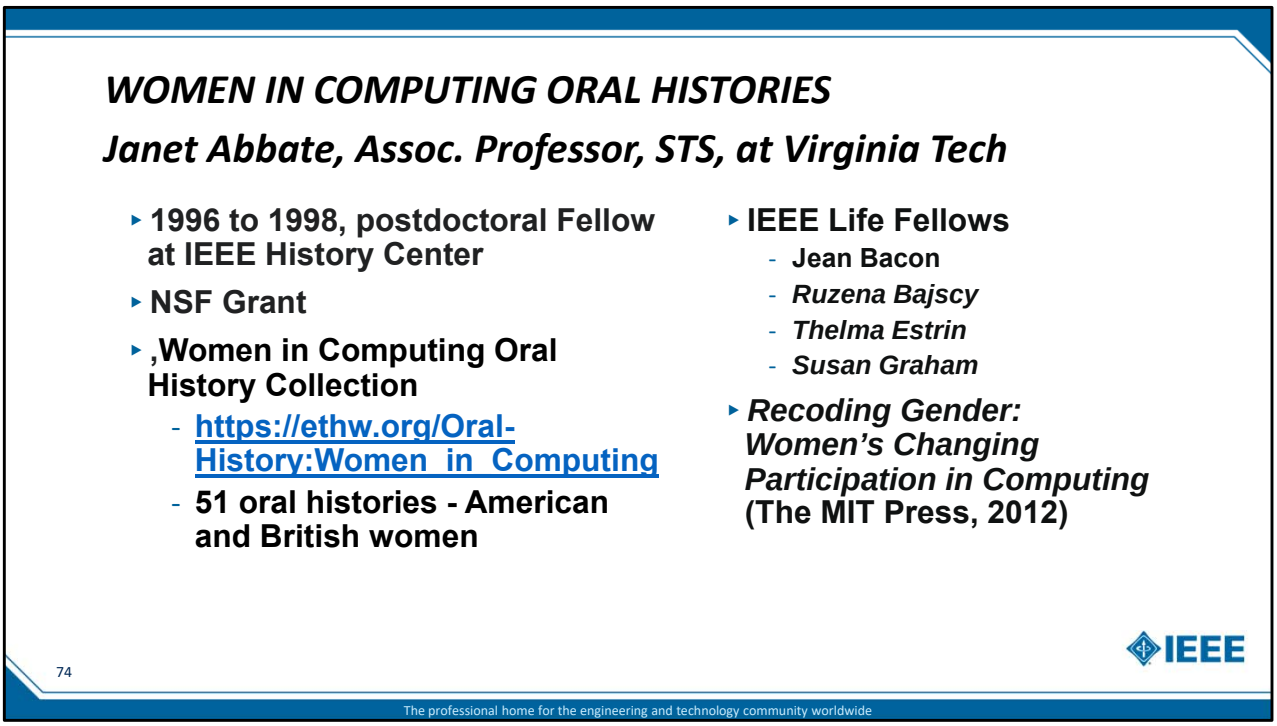
IEEE Past Presidents Oral History Collection,
https://ethw.org/Oral-History:IEEE_Past_Presidents

IEEE COMPUTER SOCIETY PROJECTS

Past Computer Society Presidents

- IEEE Computer Society Presidents
- 2013, the Computer Society History Committee, initiative — IEEE Computer Society Leaders Oral History Project for past presidents and select staff
- Interviewers: Janet Abbate, Andrew Russell, Jeffrey Yost, and David Walden
- Laurel Kaleda, 1994 Society president (Yost)
- Susan (Kathy) Land, 2009 Society president (Yost)
- True Seaborn, long-time leader of the Society's publications office (Yost)
- Martha Sloan recorded an oral history as a past president of IEEE

Laurel Kaleda, an oral history conducted in 2015 by Jeffrey R. Yost, IEEE Computer Society.
Susan K. (Kathy) Land, an oral history conducted in 2014 by Jeffrey R. Yost, IEEE Computer Society.
H. True Seaborn, an oral history conducted in 2014 by Jeffrey R. Yost, IEEE Computer Society.
IEEE Computer Society, past chairs and presidents, https://www.computer.org/about/cs-history/computer-society-presidents
IEEE Computer Society, History Committee, https://www.computer.org/volunteering/boards-and-committees/history
David Brock, Chair, 2023 History Committee, IEEE Computer Society.



In 1996-1998, Dr. Janet Abbate served as a post-doctoral fellow at the IEEE History Center. Her chief focus during her fellowship was the completion of her book on the history of the internet, *Inventing the Internet* (MIT Press, 1999).
Soon after, she chose as her next project a study of female participation in computer science and technology, with the goal of writing a book on the subject. A major part of her research in 2001-2003 was conducting fifty-two oral histories with American and British women in computing. She contacted the IEEE History Center to see if it was interested in the project (it was) and if it would be willing to work with her, and preserve the finished oral histories
A decade later she published her book, *Recoding Gender: Women's Changing Participation in Computing,* (MIT Press, 2012). With its completion, the oral histories are being made available for the first time to other researchers through the ETHW.
Today, Dr. Abbate is Associate Professor of Science and Technology in Society at the Northern Virginia campus of Virginia Tech University.
The 52 Oral Histories include:
•Jean Bacon - Bacon, an IEEE Life Fellow, helped establish computer science as an academic discipline. She is currently Professor of Distributed Systems at the University of Cambridge Computer Laboratory, Director of Studies in Computer Science at Jesus College, and heads the Opera Research Group.
•Ruzena Bajscy - Bajcsy, an IEEE Life Fellow, founded the General Robotics and Active Sensory Perception Laboratory at the University of Pennsylvania. After serving as head of the National Science Foundation's Computer and Information Science and Engineering Directorate, she began teaching at UC Berkeley. Her recent research in machine perception, robotics and artificial intelligence earned her the 2009 Benjamin Franklin Medal in Computer and Cognitive

IEEE COMPUTER SOCIETY PROJECTS

World of Computing – Women's Voices

- World of Computing
- 2020, initiated by IEEE Computer Society History Committee
- 13 transcripts posted
  - Relatively brief
  - 4 women
- Bala, Kavita
- Doi, Miwako
- Marimuthu, Ramalatha
- Payton, Fay Cobb

- Fay Cobb Payton, Ph.D. (1997)
- Prof. Emeritus, NC State Univ. , 1999-2022
- Research areas include healthcare IT/informatics/disparities
- Industry, Government, and Academia
- Health Care IT and Disparities, Data Management, STEM Issues, Diversity and Systems Implementation
- Interviewer, Roli Varma (14 Dec. 2020, Zoom)

Fay Cobb Payton, an oral history conducted by Roli Varma, 14 Dec. 2020, World of Computing Collection, https://ethw.org/Oral-History:Fay_Cobb_Payton
See also: https://cobbpayton.com/
B.S., accounting and mathematics, Clark Atlanta University
B.S. Industrial and systems Engineering, Georgia Institute of Technology
MBA, Clark Atlanta University
1997 - Ph.D., Information and Design Systems (Design and Innovation group), Case Western Reserve University, Weatherhead

https://poole.ncsu.edu/people/fcpayton/
Emeritus Professor of Information Technology and Business Analytics
IT, Graduate Faculty
Department of Business Management
https://www.linkedin.com/in/cobbpayton/

1993 IEEE PRESIDENT MARTHA SLOAN

Opening Asia Pacific Office, 22 April 1993

Luchi Gandia, Dr. Nakahara, Bill Habingreither, Fanny Su Behnoi, Martha Sloan (1993 IEEE President) and Don Bolle.

- **IEEE's Globalization intensified in the 1980s and 1990s**
- **Region 10 – Asia Pacific**
  - **China**
  - **Oral history has stories about her family's experiences**
- **Region 8 – Europe, Middle East, and Africa**
  - **Russia**
- **Oral History, 2009**

72

The professional home for the engineering and technology community worldwide

Martha Sloan, cutting the ribbon opening of the IEEE Asia Pacific Operations Center, 22 April 1993. Luchi Gandia, Dr. Nakahara, Bill Habingreither, Fanny Su Behnoi, Martha Sloan (1993 IEEE President) and Don Bolle.
Sloan, Martha. Profile. https://www.computer.org/profiles/martha-sloan

https://ethw.org/Oral-History:Martha_Sloan
Martha Sloan received a BSEE an MSEE and a Ph.D. from Stanford University. After two years of working at Lockheed Corporation Sloan moved to work at Michigan Technological University. In 1993, she became the first female President of the IEEE. In this interview, Sloan speaks about her early education, inspiration and journey toward engineering, as well as her involvement with the IEEE Computer Society, of which she became President in 1984. Her reflections include important issues in the history of American computer engineering – including interactions between the Computer Society and the Association for Computer Machinery (ACM), accreditation for computer sciences, controversies over professional registration of computer engineers and the differences between computer engineers and computer scientists. She also reflects extensively on the gendered aspects of being a woman in engineering – on her experience of running for elections at the IEEE, and the rising but peaked numbers of women in engineering. The interview also includes important anecdotes about her meetings with Presidents Bill Clinton and Boris Yeltsin.
Martha Sloan received a BSEE an MSEE and a PhD from Stanford University. After two years of working at Lockheed Corporation Sloan moved to work at Michigan Technological University.
In 1993, she became the first female President of the IEEE.
In this interview, Sloan speaks about her early education, inspiration and journey toward engineering, as well as her involvement with the IEEE Computer Society, of which she became President in 1984. Her reflections include important issues in the history of American computer engineering – including interactions between the Computer Society and the Association for Computer Machinery (ACM), accreditation for computer sciences, controversies over professional registration of computer engineers and the differences between computer engineers and computer scientists. She also reflects extensively on the gendered aspects of being a woman in engineering — on her experience of running for elections at IEEE, and the rising but peaked numbers of women in engineering. The interview also includes important anecdotes about her meetings with Presidents Bill Clinton and Boris Yeltsin.
1990 Richard E. Merwin Distinguished Service Award
"In recognition of outstanding contributions to the computer profession."

DISTINGUISHED FEMALE LEADERS: INSPIRING THE NEXT GENERATION

Oral History Collection – Mary Lanzerotti's undergraduates

- **Female leaders in science, technology, engineering, and mathematics (STEM) interviewed by female undergraduate students**
- **The students focused their interviews on three research questions:**
- **1. "What are the key factors that led to the success of the distinguished leaders?"**
- **2. "What are the crucial skills that enabled their success?"**
- **3. "What is the impact on my career path?"**

- Deborah Anderson
- Emily Carter
- Li-Chyong Chen
- Mildred Dresselhaus
- Jennie S. Hwang
- Elisabeth Paté-Cornell
- Susan Coppersmith
- Heidi Ries
- Eva Andrei

IEEE

76

The professional home for the engineering and technology community worldwide

Distinguished Female Leaders: Inspiring the Next Generation in STEM
Oral Histories conducted by Kelsey Irvin:
•Deborah Anderson
•Emily Carter
•Li-Chyong Chen
•Mildred Dresselhaus
•Jennie S. Hwang
•Elisabeth Paté-Cornell

Oral Histories conducted by Hannah Bech
•Susan Coppersmith
•Heidi Ries
Oral Histories conducted by Amanda Kapetanakis
•Eva Andrei

MARCONI FELLOWS ORAL HISTORY

Andrea Goldsmith, first woman Marconi Fellow

2020 Marconi Fellow
Ph.D. UC Berkeley
Photo: Princeton Univ.

- **Dean of Engineering and Applied Science and the Arthur LeGrand Doty Professor of Electrical and Computer Engineering at Princeton University.**
- **IEEE Fellow (2005) For contributions to the development of adaptive techniques and the analysis of fundamental capacity limits for wireless communication systems.**
- **IEEE Communications Society**
- **IEEE Information Theory Society**
- **Chair, IEEE Committee on Diversity, Equity, and Inclusion**
- **29 patents**
- **5G**

IEEE

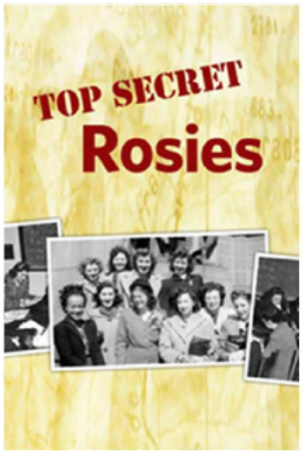
The professional home for the engineering and technology community worldwide

$100,000 Marconi Prize to the Marconi Society to start an endowment that will fund technology and diversity initiatives
She is author of the book "Wireless Communications'' and co-author of the books "MIMO Wireless Communications'' and “Principles of Cognitive Radio,” all published by Cambridge University Press, as well as an inventor on 29 patents. She received the B.S., M.S. and Ph.D. degrees in Electrical Engineering from U.C. Berkeley

TOP SECRET ROSIES: THE FEMALE “COMPUTERS” OF WWII

Documentary film, premiered on PBS, 2010

- Women “computers”
  - WWII - ballistic accuracy
  - Later, 6 women programmed early computer, ENIAC
- LeAnn Erickson, director
- Focus on Doris Polsky, Shirley Melvin, Marlyn Meltzer, Jean Bartik, Kathleen Antonelli
- Women in Computing oral history collection includes Jean Bartik
- IEEE Foundation provided some funding
- Program for IEEE Members
  - WIE Movie Night - 10 Dec. 2021
  - Mary Ann Hellrigel, IEEE History Center



IEEE

78

The professional home for the engineering and technology community worldwide

WIE Movie Night - 10 Dec. 2021.
The movie is produced and presented in part by donations to the IEEE Foundation.
https://wie.ieee.org/tec/movie-night-top-secret-rosies-the-female-computers-of-wwii/

Jean Bartik - Among the first generation of women programmers, Bartik worked on the ENIAC and UNIVAC computers.

Personal Narratives, an emerging collection

- **Trained more than 130 IEEE Members (and a few staff) as part of the Peer-to-Peer interviewing process developed as part of the NIC funded IEEE Life Fellows oral history project**
- **Six people have served as INTERVIEWERS**
  - **An IEEE Oral History is a LIFE STORY**
  - **Some IEEE Members either did not have the interest, time, desire to record a two-hour oral history**
  - **Event specific project – IEEE Awards; IEEE Foundation, various societies**
  - **Some people were recording short almost commentaries about a specific technology, conference, etc.**
  - **I had to break the news – these are not IEEE Oral Histories**
  - **But they are preserving an aspect of history**
  - **So, I said, why not have a "new product" – PERSONAL NARRATIVE**

History Center's YouTube Channel: engineeringhistory

(data on 9 Oct. 2024)

- Historical videos related to all disciplines of engineering (electrical, mechanical, chemical, civil, mining)
  - www.youtube.com/@engineeringhistory
  - 2.46K subscribers
  - 413 videos
  - 1,025,476 views
  - Joined Nov 25, 2013
  - Posted materials include conversations and interviews, but not "life story" oral histories
- There is 1 Life Story Oral History – John Vig, broken into 26 clips, recorded in 2019, https://ethw.org/Oral-History:John_Vig

IEEE ORAL HISTORY TRAINING

VIRTUAL WEBINAR CONDUCTED BY MARY ANN HELLRIGEL

- Training Webinar (approximately 2 hours including Q & A)
  - Broken into 5 to 10 minute "chapters"
- Live Webinars and Workshops as requested
- Best Practices and Policies: from preparing for and conducting interviews to processing transcripts
- Documents – topics, questions, release forms
- Guidance through the Entire Process from Identifying Interviewees and Interviewers to Posting Transcripts on ETHW
- Consultation and help as needed
- 1st Oral History Transcript Editing Webinar, 18 Jan. 2023 (Gene Freeman, R5, Pikes Peak)

IEEE

Document Your History + IEEE History

Be an IEEE Oral Historian – Training and Guidance

- The IEEE History Center will help you document your IEEE History by capturing the "voices" before they vanish

- Video and Workshops
- This PowerPoint talk
- Policies and Practices
- Topics and questions
- Documents – release form/agreement form
- The Process from Idea to Posting Transcript on ETHW
- SHADOW ME DOING AN ORAL HISTORY
  - Observer

IEEE

How is technology invented, commercialized, and adopted into "everyday life"?
The installers and users: WPA recorded life histories in the era of the Rural Electrification Administration and the Tennessee Valley Authority

History of History at IEEE

1963 – Permanent History Committee in bylaws (IRE had a history committee, so the idea carried over to IEEE)
1980 – History Center professional staff added to assist with centennial celebrations
1990 – Center moved to New Brunswick campus of Rutgers University, which became strategic co-sponsor in the history space – emphasis on <u>research</u>
2000s – emphasis shifts to <u>outreach</u>
2010s – more focus on <u>education</u>
2014 – Center relocated to Stevens Institute of Technology
2020 – Center relocated to the IEEE Operations Center in Piscataway, N.J.

MAXINE COHEN, IEEE Life Member: VOLUNTER & ORAL HISTORIAN

Maxine Cohen an oral history, #863, conducted on 28 Sept. 2021 by Mary Ann Hellrigel, IEEE History Center, Piscataway, NJ USA. https://ethw.org/Oral-History:Maxine_Cohen

- **About Maxine Cohen**
- **Short biographical entry**
- **Short abstract/synopsis of the oral history**
- **Transcript**

Maxine then recorded the oral history of John Impagliazzo and T. Scott Atkinson

IEEE

83

The professional home for the engineering and technology community worldwide

Maxine Cohen an oral history, #863, conducted on 28 Sept. 2021 by Mary Ann Hellrigel, IEEE History Center, Piscataway, NJ, USA. https://ethw.org/Oral-History:Maxine_Cohen

John Impagliazzo, an oral history, #889, conducted on 27 March 2023 by Maxine Cohen, IEEE History Center, Piscataway, NJ, USA. https://ethw.org/Oral-History:John_Impagliazzo

Maxine Cohen, photo from IEEE Life Member's Newsletter, Aug. 2022. https://www.ieee.org/ns/periodicals/Life%20Members%20Newsletter/LM_Aug2022.pdf?mkt_tok=NzU2LUdQSC04OTkAAAGGMaa8ARFZqLM4PgsqwnaItVTWX0-8Cp9bHEyHZdVFdRMD_FI4gwctYMTCmH9i5qM8FlzRSSy--ELUpP_di4wU4sQ6ENGDq9Jrg0LvpyWC3gs

T. Scott Atkinson, an oral history, #915, conducted on June 18, 2024, by Maxine Cohen, IEEE History Center, Piscataway, NJ, USA.

2024 IEEE PRESIDENT TOM COUGHLIN

TRAINED ORAL HISTORIAN – recorded two oral histories for the IEEE History Center

- **Parker, Alice C.** - IEEE Fellow (1991) "for contributions to design automation in the areas of high-level synthesis, hardware descriptive languages, and design representation." **(IEEE)**

ALICE PARKER: An Interview Conducted by Tom Coughlin, IEEE History Center, 2 March 2022

Interview #875 for the IEEE History Center, The Institute of Electrical and Electronics Engineers, Inc.

QUESTIONS AND SUGGESTIONS?

- Thank you for your time
- Thank you for your support
- The Big Metaphysical Question
  - In case you are asking, yes, chickens do cross the road (at least in Key West, FL)
  - Photo: MAH personal collection