

# IEEE History Center

ISSUE 117, November 2021

## REMEMBERING LISA NOCKS



*Dr. Lisa Nocks at the U.S. Patent Office in 2019*

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The newsletter reports on the activities of the IEEE History Center and on new resources and projects in electrical and computer history. It is published three times each year—once in hard copy (July) and twice electronically (March and November) by the IEEE History Center.

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Dr. Michael Geselowitz, Senior Director, IEEE History Center

*“Because the History Center staff is such a small team, Lisa had a hand in all of the activities you see highlighted in this issue, from researching and writing for the REACH Program, to editing articles on the Engineering & Technology History Wiki, to conducting oral history interviews.”*

As you can see, this issue is dedicated to the memory of IEEE History Center Historian Dr. Lisa Nocks, who tragically died just a few weeks ago. Because the History Center staff is such a small team, Lisa had a hand in all of the wonderful activities you see highlighted in this issue, from researching and writing for the REACH Program (see page 5), to editing articles on the Engineering & Technology History Wiki (page 7), to conducting oral history interviews (page 6).

### HOW CAN THE HISTORY CENTER HELP YOU?

*A Handy Guide to Some of Our Programs and Contacts*

Engineering & Technology History Wiki: [https://ethw.org/Main\\_Page](https://ethw.org/Main_Page)

List of dedicated IEEE Milestones: [https://ethw.org/Milestones/List\\_of\\_Milestones](https://ethw.org/Milestones/List_of_Milestones)

How to Propose an IEEE Milestone: [http://ieemilestones.ethw.org/Milestone\\_Guidelines\\_and\\_How\\_to\\_Propose\\_a\\_Milestone](http://ieemilestones.ethw.org/Milestone_Guidelines_and_How_to_Propose_a_Milestone)

Milestone proposals in process: [http://ieemilestones.ethw.org/Milestones\\_Status\\_Report](http://ieemilestones.ethw.org/Milestones_Status_Report)

Oral History Collection: [https://ethw.org/Oral-History/List\\_of\\_all\\_Oral\\_Histories](https://ethw.org/Oral-History/List_of_all_Oral_Histories)

REACH Program (free online materials for teaching the history of technology): <https://reach.ieee.org/>

History Events Calendar: <https://www.ieee.org/about/history-center/events.html>

Support for scholars:

Fellowship in the History of Electrical and Computing Technologies:  
<https://www.ieee.org/about/history-center/fellowship.html>

Pugh Young Scholar in Residence:  
<https://www.ieee.org/about/history-center/internship.html>

Middleton History Prize (awarded to a book in the history of technology):  
<https://www.ieee.org/about/history-center/middleton-award.html>

### WAYS YOU CAN HELP HISTORY

As you read this newsletter, you will see the many success stories of the IEEE History Center and the ways it nurtures the heritage of the profession. As successful as the Center is, it relies on the support and contributions—financial, intellectual, and time and effort—of many people. We ask you to help further our work by:

**Proposing an IEEE Milestone**—Milestones recognize significant achievements in technology  
[ieemilestones.org](http://ieemilestones.org)

**Contributing a First-Hand History**—Written and oral histories help us chronicle important innovators and innovations <http://ethw.org/create>

**Authoring an article for the ETHW**—The Engineering and Technology History Wiki (ETHW) is an authoritative collection of historical information about technology’s contributions to society  
[ethw.org/create](http://ethw.org/create)

**Supporting the History Center’s mission with a donation.**

*However you can help, it is always deeply appreciated.*

### NEWSLETTER SUBMISSION BOX

The IEEE History Center Newsletter welcomes submissions of letters to the editor, as well as articles for its **Reminiscences** and **Relic Hunting** departments. “Reminiscences” are accounts of history of a technology from the point of view of someone who worked in the technical area or was closely connected to someone who did. They may be narrated either in the first person or third person. “Relic Hunting” are accounts of finding or tracking down tangible pieces of electrical history in interesting or unsuspected places (in situ and still operating is of particular interest). Length: 500-1200 words. Submit to [ieee-history@ieee.org](mailto:ieee-history@ieee.org). Articles and letters to the editor may be edited for style or length.

Note that all of our activities are made possible by the generosity of IEEE members, both in terms of philanthropic funds and in terms of collaboration (the Life Fellow Oral History Project—a big focus of our efforts this year—is perhaps the prime example). Lisa was the newest member of the team, having joined in 2017. From when she first came on board, Lisa always said that interacting with IEEE Members was her favorite part of the job. The emergence of the global pandemic 20 months ago curtailed her ability to meet in person with the members of the various New York metro-area Sections, but

opened other horizons, such as her keynote lecture to a meeting of the IEEE Southeastern Michigan Section. She was also the lead on our new exhibits program (page 4), who's launch was also delayed by the pandemic, but will involve interaction with IEEE members across the globe.

Lisa is greatly missed. As the rest of the team pulls together and moves forward, I hope we will continue to earn your collaboration with and support of our programs to preserve and make known the heritage of engineering and technology.

## STAFF NOTES

### IN MEMORIAM: LISA NOCKS

Dr. Lisa Nocks, one of our historians at the IEEE History Center, passed away on 9 September.

A noted authority on the history of robotics and related humanoids, Lisa joined the Center in 2017. Her diverse professional training and experiences underlay her contributions to the Center and IEEE. After receiving a B.A. in Fine Arts from Montclair State University, Lisa created and ran her own business, Renaissance Studios, in commercial illustration and graphic design for ten years. At the same time she taught classes in the history and applications of analog and digital design techniques, and explored film and video writing, directing, and cinematography as she began an M.A. in media studies from The New School. A Ph.D. in modern history and literature from Drew University followed. At the latter, Lisa organized one of Drew's first graduate student conferences, on the history of the book. This attracted more than one hundred participants, many of who became senior scholars in the field. Her leadership and collegiality moved her classmates to create the Lisa Nocks Student Award, which is still presented annually to a student who has performed exceptional service in the Caspersen School of Graduate Studies.

Lisa's doctoral dissertation, "To Serve and Obey: A History of the Android, 1850–present," built on an interest in humanoid creations that extended back to her 1997-1998 articles on *Frankenstein* and the golem. As her advisor Jonathan Rose observed, Lisa's great insight was realizing that the early fiction writers on robots were engineers who foresaw the technical problems involved in building robots. Therefore, she argued, authors and technologists relied on each other for inspiration over generations in a pattern of technological and cultural reinforcement. This has driven what she called the "android initiative." Her complementary 2007 book, *The Robot: The Life Story of a Technology* (Greenwood and Johns Hopkins University Presses) became one of the American Library Associ-

ation's Choice magazine's Outstanding Academic Titles. We are the poorer for not seeing the synthesis of her research, themes, and arguments in the anticipated *Humanoids: How a Science Fiction Icon Became a Global Engineering Initiative*. Nonetheless, Lisa's fascination with the technical and cultural causes and consequences of an increasingly relevant subject informed much of her work at the History Center: classes at Stevens Institute of Technology, conference papers and public presentations, an exhibit for Stevens's *Technologies of Frankenstein* conference, and a review of the Science Museum's ROBOT exhibit for *IEEE Spectrum*.

During her tenure at the Center, Lisa continued to teach, drawing on her work as senior lecturer in the New Jersey Institute of Technology's Department of History where she received the Excellence in Teaching award. Among her ten courses there, Lisa's interdisciplinary history of robotics was one of four that she created; it emerged from a National Endowment for the Humanities fellowship.

In four years for the IEEE, Lisa also developed inquiry units for the IEEE REACH Program; recorded oral histories; collaborated on the video histories for the Center's 40th anniversary; published and presented scholarship that raised the visibility of history among IEEE members and staff; and took the lead on conceptualizing and promoting the IEEE Global Museum project that the History and Life Members Committees approved shortly before the pandemic. Building on Life Member John Impagliazzo's support for IEEE exhibits, the Global Museum promises to cap Lisa's patient and thoughtful advocacy of history that serves the members of one of the world's largest international organizations. Her versatility, collegiality, and dedication to a history of technology based on scholarship shone at every institution she belonged to. It will be difficult to replace those qualities in her successor at the IEEE History Center, but until then we honor her spirit and commitment.

## EXHIBIT PLANNING FOR THE IEEE GLOBAL MUSEUM

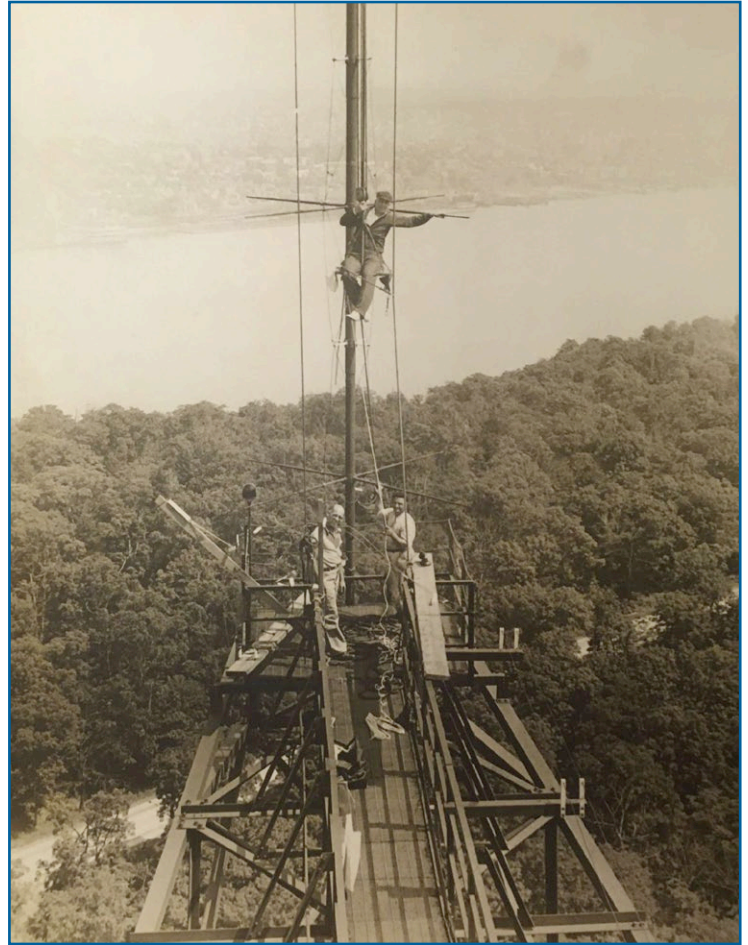
Alexander B. Magoun, Ph.D.

As far back as 1906, when “models of inventions and patents as may be of undoubted scientific or historic value” were collected, IEEE leaders have intermittently considered the creation of a museum to recognize the technical achievements of members, the evolution of IEEE, and

the broader history of milestones in its fields. Life Fellow Dr. John Impagliazzo, who underwrote the IEEE History Center Historical Showcase Project, is the latest proponent of what is now the IEEE Global Museum. The pandemic and the unexpected death of the museum’s staff champion and project manager, Dr. Lisa Nocks, have complicated plans for the pilot year, which has been funded by a seed grant from the IEEE Life Members Committee under its chair, T. Scott Atkinson. Nonetheless, the continuing support and encouragement by Impagliazzo, IEEE History Committee chair Janina Mazierska, and History Center director Michael Geselowitz mean that the first museum exhibits will go on, only a couple of years later than planned.

During the pandemic, Nocks proposed that one of the two pilot exhibits be installed at IEEE’s 3 Park Avenue office in New York City: a history of *IEEE Spectrum* magazine. Inaugurated in 1964 with the merger of the Institute of Radio Engineers (IRE) and the American Institute for Electrical Engineers (AIEE) into IEEE, *Spectrum* set a new standard for technical society membership publications with its full-color covers and informed but accessible articles on the full gamut of IEEE technologies and innovative businesses. Informed readers have appreciated journalistic quality ever since that has received five National Magazine and four Grand Neal Awards. Given its intended location near the Spectrum offices, the planned exhibit has been met with understandable enthusiasm from current staff, who are helping collect historical material. The goal is to install and open that exhibit early in 2022, in conjunction with the anticipated return to more in-person activity at 3 Park. This plan supersedes the anticipated exhibit on IEEE Contributors at Bell Labs, which will be revived later in 2022 or 2023.

The second pilot will not debut in Region 1 as initially intended, but in Region 5. Thanks to a generous gift, the History Center is developing a public exhibit on the recipient of IEEE’s first Medal of Honor, in 1917 when it was awarded by the IRE. Armstrong is recognized for inventing practical electronic circuits for regeneration of continuous wave wireless signals; for superheterodyne tuning of radio



*Armstrong assembling a turnstile antenna on his FM station tower 100 meters above Alpine, New Jersey, U.S.A. c. 1938. Box 267, folder 18, Edwin Armstrong papers, Rare Book & Manuscript Library, Columbia University in the City of New York.*

frequencies; and wideband frequency modulation transmission and reception. Less well known is that he was an excellent student at Columbia University: three times a member of Theta Xi and one of only fifteen graduates in electrical engineering in 1913. A mystery remains as to why Armstrong was not among the first federal radio licensees in 1913, following passage of the Radio Act of 1912 (David Sarnoff was the seventeenth to pass the exam). Although there is no evidence that he joined Columbia’s wireless club, Armstrong named his FM radio station W2XMN in 1936 after Columbia’s 2XM. Plans are under way to stage the exhibit’s “soft opening” at the San Antonio Museum of Science and Technology (SAMSAT) in Texas, in conjunction with the February 2022 Board of Directors meeting. SAMSAT is being expanded for a public opening in the following month.

Please send queries about the Global Museum, or suggestions for venues, to [ieee-history@ieee.org](mailto:ieee-history@ieee.org).

## IEEE REACH PRESENTS AT THE OPEN EDUCATION GLOBAL ANNUAL CONFERENCE

On Sept 27th, Kelly McKenna, IEEE REACH Program Manager and Maryanne Karamagi, CEO of Silver Bolt, Uganda, presented *“Empowering Girls to Pursue STEM in Africa: An Interdisciplinary OER Program, Co-Branded with UNESCO under a New Pilot Program, is Inspiring Students, Engaging Teachers, and Garnering Significant Stakeholder Interest,”* at the annual Open Education Global (OEG) on-line conference. OEG is a global, members-based, non-profit organization supporting the development and use of open education around the world. The 2021 conference focused on the UNESCO OER Recommendations engaging a global audience in actions associated with Capacity Building, Policy, Access, Sustainability, and International Collaboration.

The presentation shared the IEEE REACH Program’s pre-university teacher resources that bridge the Humanities and STEM, and explore the dynamic nature of Science, Technology and Society through the lens of history. In addition, it highlighted the co-branded REACH/UNESCO pilot program that took place in Uganda with implementation partner, Silver Bolt, and the Smart Girls Foundation, with support from the IEEE Uganda Section and the IEEE Africa Council. Maryanne Karamagi explained how the REACH content was modified to meet Uganda’s curricular needs and how it was delivered to students, predominately girls, in the region. She also shared insights on the impact of the program. The presentation concluded with examples of how IEEE REACH provides broad applications that cross-cut UNESCO’s sectors – education, science, and culture, and how the implementation of the REACH/UNESCO pilot program has opened doors to key stakeholders, such as the Uganda Ministry of Education which is considering expanding the program in the country, and with UNESCO which is exploring exporting the program elsewhere.

The presentation was very well received, reaching fifty-two attendees from around the globe. In addition, the presentation was live streamed, giving the program and IEEE global recognition for the work being done with lifelong learning in



*As presenters at the 2021 OEG conference and for the work being done in Uganda through the IEEE REACH program, Kelly McKenna and Maryanne Karamagi received the UNESCO OER Implementation Award for Excellence*

open education. Positive comments from open education scholars were posted in the chat during the presentation, such as, “As a K-12 educator I am so excited to see such extensive resources to support our students! I am excited to share this open learning design ideas in Canadian schools as well – Thank you!” and, “IEEE REACH is an amazing program and resource! Really amazing!”.

The webinar has since been posted on the OE Global YouTube Channel and may be viewed here: <https://www.youtube.com/watch?v=5V4sd0VaE0c> (It is the first presentation in the video.)

On October 1, 2021, OEG announced that all the presenters from the Open Education Global 2021 online conference are the winners of the UNESCO OER Implementation Award for Excellence, given for exemplary leadership in advancing the UNESCO OER Recommendation in their own practice. Kelly McKenna and Maryanne Karamagi received the award for their presentation and the work being done in Uganda through the IEEE REACH Program.

(This article is written in honor of Lisa Nocks, Ph.D., who enjoyed sharing her knowledge with scholars across the globe.)

## HISTORY CENTER STAFF LECTURES AND PUBLICATIONS IN 2021

As part of the IEEE History Center’s mission to promote the history of IEEE’s fields of interest, staff write articles and give presentations throughout the year. Here are some of the highlights of their outreach.



*Satellite sandwich with fractal antenna metamaterial over solar cells. (Courtesy © Fractal Antenna Systems, Inc.)*

Publications:

- The August issue of IEEE-USA *Insight Magazine* carried an article by Research Coordinator Robert Colburn about the history of the invention of fractal antennas.

<https://insight.ieeeusa.org/articles/why-mobile-phones-can-do-so-many-things-the-invention-of-the-fractal-antenna/>

- September's IEEE-USA *Insight Magazine* carried an article about REACH's pilot program in Uganda: <https://insight.ieeeusa.org/articles/ieee-reach-unesco-partnership/>

## Lectures:

- Archivist Dr. Mary Ann Hellrigel started the year in January with her lecture on Erik Larson's book *Dead Wake* and the technological aspects of the liner *Lusitania* and its sinking after being torpedoed.
- On 10th February, IEEE History Center Outreach Historian Dr. Alexander Magoun marked UNESCO World Radio Day by giving a lecture to the IEEE staff: "How David Sarnoff Imagined Our Wireless World." Dr. Magoun's talk explored Sarnoff's inspirations, from his immigrant background and appreciation of the value of information to the technologies and opportunities available to a dynamic leader in a patent monopoly.
- In March, Magoun presented remotely to the New Jersey Antique Radio Club on "Who Put Electronics on your Wrist in the 20th Century?"
- On 13 July, History Center historian Dr. Lisa Nocks presented "Let the Patient Be Electrified: The Public Understanding of

Medical Electricity from Franklinism to Quell<sup>®</sup>" at the 2021 virtual meeting of the British Society for the History of Science.

- 29 July, Dr. Alexander Magoun presented "The United States' Wireless Women of World War I," at the 26th International Congress of History of Science and Technology. <https://www.ichst2021.org/>.
- Digital Content Specialist Nathan Brewer presented "Engineers and Scientists as Science Fiction Authors: From Kepler to Bose"
- Research Coordinator Robert Colburn presented "Spies and Their Toys: A Selected Look at the History of Espionage Technology".
- By the time you read this, History Center Senior Director Michael Geselowitz will have presented "Ponies vs Electrons: The Transcontinental Telegraph," and Alexander Magoun will have been a guest lecturer for Prof. Vincent Poor's freshman seminar at Princeton University on "David Sarnoff's Research Center and the Princeton Roots of the Information Age"

For more information on History Center events, we invite you to keep up to date with the History Events page <https://www.ieee.org/about/history-center/events.html>

## LIFE FELLOWS ORAL HISTORY PROJECT

In 2021, the IEEE History Center embarked on an important project to collect oral histories of IEEE Life Fellows. This project, funded by the New Initiatives Committee (NIC), "IEEE Life Fellows: Capturing Oral History," is designed to capture the life stories and career experiences of some of IEEE most distinguished members, as well as to develop a pilot program to build the infrastructure for peer-to-peer oral history interviewing. Peer-to-

peer interviewing, in which IEEE members would interview each other, offers the opportunity to expand greatly the numbers of oral histories that the IEEE History Center will be able to collect. Instead of being limited by its small staff in the amount of interviews it can conduct each year, the History Center will be able to make use of the energy, expertise, and enthusiasm of IEEE members worldwide to collect many more.

In August 2021, Mary Ann Hellrigel, Ph.D., Archivist, Institutional Historian, and Oral History Program manager, conducted four webinars (more training webinars will be offered) which trained forty IEEE members to conduct oral histories. The History Center emailed IEEE Life Fellows (more than 3,300 people) and is working with IEEE Regions, Societies, Affinity

*"Recently, the History Center launched a new oral history project, 'IEEE Life Fellows – Capturing Oral History.' IEEE's more than 3,200 Life Fellows have contributed to the world's body of knowledge in IEEE fields of interest, demonstrated a strong commitment to the profession, and achieved extraordinary accomplishments. They and their career experiences are a vital resource within IEEE."*

Groups, and all Operating Units. Thus far, nearly one hundred and fifty IEEE Life Fellows have either personally volunteered or were recommended to have their oral history recorded. During the past few months, History Center staff recorded thirteen oral histories, including Tariq Durrani, Janina Mazierska, John Proakis, and C.R. Rao. Many more are scheduled before year end.

The History Center continues working closely with Jim Jeffries, 2018 IEEE President, the volunteer lead on this Life Fellows Oral History Project, and Janina Mazierska, Chair, IEEE History Committee. In addition, the IEEE Life Members Committee representatives, T. Scott Atkinson, Maxine Cohen, and Howard Wolfman serve as advisers.

The History Center eagerly solicits help from IEEE Life Members and Life Fellows to volunteer to serve as interviewees, interviewers, and ambassadors for the IEEE Life Fellow Oral History Project. If you would like additional information, or seek to volunteer, or recommend an IEEE Life Fellow to be interviewed, please contact Mary Ann Hellrigel, [m.c.hellrigel@ieee.org](mailto:m.c.hellrigel@ieee.org)

## ETHW UPDATE

The Engineering and Technology History Wiki (ETHW) has one of the largest online oral history collections related to engineering and technology. Spanning all disciplines of engineering, the ETHW's oral history collection houses more than 900 oral histories.

Recently added oral histories include:

Jiří Zlatuška, professor of informatics at the Faculty of Science of Masaryk University; Kavita Bala, Dean of Cornell Ann S. Bowers College of Computing and Information Science at Cornell University; John Cioffi, a pioneer in DSL technology; Alma Martinez Fallon, who managed steel fabrication and assembly planning for the USS George H.W. Bush and Gerald R. Ford air-

craft carriers, and past president of the Society of Women Engineers; Gunther Karger, who held several positions at Boeing, Bell Labs, and Eastern Airlines and was the former chair of the IEEE Canaveral Section; Ihor A. Kunasz, a mining engineer with Cypress Mineral Company and active volunteer in the Society for Mining, Metallurgy & Exploration; and John Proakis, Professor Emeritus and Research Professor at Northeastern University and author of the book *Digital Communications*.

To view these and other oral histories, visit the ETHW's oral history collection at:

[https://ethw.org/Oral-History:List\\_of\\_all\\_Oral\\_Histories](https://ethw.org/Oral-History:List_of_all_Oral_Histories)

## TECH HISTORY ON THE WEB: STAFF FAVORITES

### SURFING THE WEB FOR NOVEMBER 2021

*Talking Nets: an Oral History of Neural Networks* (1998), edited by James A. Anderson, Edward Rosenfeld, and Edward Rosenfeld, represents a rough draft and resource for scholars of neural networks in the future. Thanks to MIT Press's *MITCogNet*, it is available by chapter/interview:

<http://cognet.mit.edu/book/talking-nets>

Among the eighteen participants are Bernie Widrow, Carver Mead, and Geoffrey Hinton.

James L. Pelkey has updated his extraordinary website, *The History of Computer Communications*, covering the emergence of commercial digital networks from the 1960s to the 1980s: <https://historyofcomputercommunications.info/>. A participant in the industry during its nascent years, Pelkey interviewed some eighty "entrepreneurs, engineers, executives, and government regulators" as the foundation for a site containing narratives and documents that "chronicles the stories of early startups in the fields of data communications, local area networking, and internetworking." It is, to quote Pelkey, "an excellent source of information for students and professors of computer science, business, and history, as well as anyone interested in the compelling stories of the entrepreneurs that laid the foundations for our globally connected world." Andrew Russell, professor and dean at SUNY Polytechnic Institute, New York, is collaborating with Pelkey on the book version, *Circuits, Packets & Protocols: Entrepreneurship and Computer Communications* (ACM, forthcoming 2021).

Digital computers are the popular technology for information processing, but analog computers born out of slide rules, artillery rangefinders, and differential analyzers continue to perform in industrial and academic organizations. Bernd Ulmann, author of *Analog Computing* (2013), has assembled an expansive and well organized *Analog Museum*, [www.analogmuseum.org/english/](http://www.analogmuseum.org/english/). Its sections include his collection of analog computers, a library of related documents,

restoration and homebrew projects, and a network of other analog professionals and enthusiasts.

The United States' National Institute of Standards and Technology (NIST), formerly the National Bureau of Standards (NBS), offers PDFs of three researched histories of the institution that cover the years from 1901 through 1993, as well as scholarly and newsletter articles on NIST/NBS activities:

[www.nist.gov/nist-museum/nist-history/history-publications](http://www.nist.gov/nist-museum/nist-history/history-publications).

A full run of the U.S. National Security Agency's internal historical serial, *Cryptolog*, from August 1974 to Summer 1997, is available, albeit with redactions. It does include however author/keyword/title indexes for the first nine years, and each issue's contents listed by article title thereafter:

[http://vtda.org/pubs/NSA\\_Cryptolog/](http://vtda.org/pubs/NSA_Cryptolog/).

The Mary Pickford Foundation recently allied with the American Council of Learned Societies to revise and expand the online *Media History Digital Library*: <https://mediahistoryproject.org/>. The *MHDL*, part of the Wisconsin Center for Film and Theater Research at the University of Wisconsin-Madison, hosts millions of pages of magazines and books that are fully and freely viewable and searchable, thanks to public domain rules, generous licensing agreements with copyright owners and collectors, and more partnerships. The highlight is the U.S. film industry but the site also contains substantial collections for U.S. radio and sound recording industries, as well as for Global Cinema, with large runs of British and German periodicals among many other countries in Europe and Asia. IEEE readers should appreciate not only the Technical Journals Section, but the listings for *Books* (1873-1979), *Broadcasting and Recorded Sound*, and *Early Cinema* in particular demonstrate in the inextricable connections between the "black boxes" of technology and the many types of people that design, make, sell, operate, or are affected by them.

Do you still have a CRT television receiver, or three, that works perfectly well? Philip I. Nelson has an impressive assortment of analog-signal televisions dating back to the 1940s, and ranging in size from electronic hearth to handheld. Nelson provides a thorough discussion of how to transmit to them from inside your home without cables or wires, or writing any computer code: <https://antiqueradio.org/HomeTVTransmitter.htm>. Nelson has linked this page to useful high-resolution photos illustrating his work, and to other pages on his restorations of his receivers.

What's the harm in repeating a claim without confirming it? Consider a statement often attributed to Albert Einstein: "You see, wire telegraph is a kind of a very, very long cat. You pull his tail in New York and his head is meowing in Los Angeles. Do you understand this? And radio operates exactly the same way:

you send signals here, they receive them there. The only difference is that there is no cat." It's amusing, but there is no record that he ever said it. Authors of one of the first popular books on the Internet apparently found the alleged quote on the Internet, where it had appeared as early as 1985, or thirty years after Einstein's death. *The Quote Investigator*, citing sources for earlier versions, demonstrates that similar explanations appeared almost immediately following the debut of the second trans-Atlantic telegraph cable in 1866, and successive writers adapted it, sometimes to justify bigoted or racist characterizations, up through 1951: <https://quoteinvestigator.com/2012/02/24/telegraph-cat/#more-3387>. It is a great irony of middle-class cultural assumptions that an analogy used to make fun of non-white, non-native people three generations ago is now misattributed to one of the world's great thinkers.

## PROGRAMS OF SUPPORT FOR SCHOLARS OF TECHNICAL HISTORY

### CON DIAZ, FORMER IEEE LIFE MEMBERS' COMMITTEE FELLOW IN HISTORY, PUBLISHES BOOK ON SOFTWARE RIGHTS

Prof. Gerardo Con Diaz's book *Software Rights: How Patent Law Transformed Software Development in America*, has been published by Yale University Press. The book was developed from Con Diaz's dissertation, a year of which was underwritten by the 2015 IEEE Life Members' History Fellowship.

<https://yalebooks.yale.edu/book/9780300228397/software-rights>



Gerardo Con Diaz

### FELLOWSHIP AND INTERNSHIP SUPPORT FROM THE IEEE HISTORY CENTER

The IEEE History Center offers two programs of support annually for scholars pursuing the history of electrical engineering and computing: an internship for an advanced undergraduate, graduate student, or recent Ph.D., and a dissertation fellowship for an advanced graduate student or recent Ph.D. The internship and the dissertation fellowship are funded by the IEEE Life Members Committee. The internship requires residence at the IEEE History Center, in Piscataway, New Jersey, USA; there is no residency requirement for the dissertation fellowship.

#### The IEEE Life Member Fellowship in the History of Electrical and Computing Technology

The IEEE Life Members Fellowship in the History of Electrical and Computing Technology supports either one year of full-time graduate work in the history of electrical science and technology at a college or university of recognized standing, or up to one year of post-doctoral research for a scholar in this field who has received his or her Ph.D. within the past

three years. This award is supported by the IEEE Life Members Committee. The stipend is \$25,000 with a research budget of up to \$3,000.

Reimbursable research expenses include economy class travel to visit archives, libraries, historical sites, or academic conferences, either to hear papers or to present one's own work. Hotel stay, meals while travelling, copying costs, reprints of scholarly articles, and books directly pertaining to research are reimbursable. Any research trip expected to cost more than \$1,000 must be approved in advance by IEEE History Center Staff. Examples of non-reimbursable expenses include, but are not limited to: licensing fees for images for book version of thesis (book publisher should pay for those), computers or computer peripherals, digital cameras, clothing, and office supplies (paper, pens, printer cartridges, CDs, memory sticks, etc.).

Recipients are normally expected to take up the Fellowship in the July of the year that it is awarded. Fellowship checks are normally mailed to the Fellow quarterly in July, October,



January, and April. For Fellows in the southern hemisphere who follow the southern hemisphere academic year, arrangements can be made to mail the checks in December (two quarters worth), March, and June.

Candidates with undergraduate degrees in engineering, the sciences, or the humanities are eligible for the fellowship. For pre-doctoral applicants, however, the award is conditional upon acceptance of the candidate into an appropriate graduate program in history at a school of recognized standing. In addition, pre-doctoral recipients may not hold or subsequently receive other fellowships, but they may earn up to \$5,000 for work that is directly related to their graduate studies. Pre-doctoral fellows must pursue full-time graduate work and evidence of satisfactory academic performance is required. These restrictions do not apply to post-doctoral applicants.

The Fellow is selected on the basis of the candidate's potential for pursuing research in, and contributing to, electrical history. Application forms are available on-line at [http://www.ieee.org/about/history\\_center/fellowship.html](http://www.ieee.org/about/history_center/fellowship.html). The deadline for completed applications is 1 February. This completed application packet should be emailed to [ieee-history@ieee.org](mailto:ieee-history@ieee.org) or mailed to the Chair, IEEE Fellowship in the History of Electrical and Computing Technology Committee, IEEE History Center, 445 Hoes Lane, Piscataway NJ 08854. Applicants will be notified of the results by 1 June.

The IEEE Fellowship in Electrical Engineering History is administered by the IEEE History Committee and supported by the IEEE Life Members Committee.

## Elizabeth & Emerson Pugh Young Scholar in Residence

(Note: It is hoped that the Covid-19 pandemic will no longer be disrupting travel plans by Summer of 2022, and that residency at the Center will be possible as described below. If travel is still being disrupted, the History Center will consider other arrangements, which may include study in place at a reduced stipend, or not offering the Pugh scholarship during the pandemic should that be necessary.)

Scholars at the beginning of their career studying the his-

tory of electrical technology and computing are invited to contact the Center to be considered for the Elizabeth & Emerson Pugh Young Scholar in Residence at the Center's offices at the IEEE Operations Center, Piscataway, New Jersey, USA.

The residency seeks to provide research experience for graduate students in the history of electrical and computer technologies, while enlisting the help of promising young scholars for the Center's projects. The Young Scholar generally works full-time for two months at the History Center on a Center project that is connected to his or her own area of interest. This time is usually during the summer, but other arrangements will be considered. Interns are also encouraged to consult with the Center's staff and its associates, and guided to research resources in the area. The residency is designed for those near the beginning or middle of their graduate careers, but advanced undergraduates, advanced graduates, and, on rare occasions, recent Ph.D.s will also be considered. Special consideration is often given to scholars from outside the United States who might not otherwise have an opportunity to visit historical resources in the United States.

The stipend is US\$5,000, but additional funds may be available to defray travel costs, depending on the intern's circumstances.

There is no formal application form. To apply, please mail curriculum vitae showing your studies in electrical history, a three- to five-page page (single or double spaced) writing sample, along with a cover letter describing the sort of project you would be interested in doing (see contact information below). The deadline for contacting the IEEE History Center is 1 March.

IEEE is an AA/EO employer. Women and minorities are encouraged to apply for all positions. The IEEE History Center is cosponsored by the Institute of Electrical and Electronics Engineers, Inc. (IEEE)—the world's largest professional technical society—and Stevens Institute of Technology. The mission of the Center is to preserve, research, and promote the legacy of electrical engineering and computing. The Center can be contacted at: IEEE History Center, 445 Hoes Lane, Piscataway, NJ 08854, +1 732 562 5450, [ieee-history@ieee.org](mailto:ieee-history@ieee.org), [http://www.ieee.org/about/history\\_center/index.html](http://www.ieee.org/about/history_center/index.html).

## GIVING AND SUPPORT FOR IEEE HISTORY CENTER PROGRAMS

### PIONEER DON HEIRMAN'S GENEROUS GIVING PAVES THE WAY FOR FUTURE INNOVATION

*Heirman's estate gifts honor his lifelong legacy and will indelibly support critical IEEE initiatives*

Although industry giant Donald (Don) N. Heirman sadly passed away in October 2020 at the age of 80, the pioneer in the field of electromagnetic compatibility (EMC) not only left an indelible legacy of innovation behind him, he provided for the field's future success and forward motion through his generous estate gifts to IEEE.

After receiving his BSEE and MSEE degrees from Purdue University (West Lafayette, IN, US) in 1962 and 1963, respectively, Heirman began a more-than-a-half-century-long career that would involve monumental contributions to the field of EMC. Among them, the industry leader widely known as "Mr. EMC Standards" spent more than 30 years at Bell Laboratories/Lucent Technologies, where he headed up the Corporation's



Donald N. Heirman

major EMC and regulatory test facility and its participation in The American National Standards Institute (ANSI) accredited standards and international EMC standardization committees. He chaired or was a principal contributor to the US and international EMC standards organizations, including ANSI, IEEE, and the International Electrotechnical Commission (IEC), and served as president of the IEEE Standards Association (SA), and as a member of the IEEE Board of Directors. A retired Commander in the US Navy, Heirman was an IEEE Life Fellow, a Life Member of the IEEE EMC Society (EMCS), and a member of its Board of Directors. In 2018, he received the prestigious IEEE Richard M. Emberson Award for Standardization of Electromagnetic Compatibility, reducing low and radio frequency noise in telephone circuits, and designing and operating compliance test facilities over the course of thirty years at Bell Labs. In his acceptance speech (<https://ieeetv.ieee.org/ieee-richard-m-emberson-award-donald-n-heirman-2018-ieee-honors-ceremony>), Heirman acknowledged the privilege and honor it has been to be part of IEEE for fifty-plus years.

Upon Heirman's retirement from Bell Labs in 1997, he started his own consulting business, Don Heirman Consultants, in which he specialized in standards education and training in the field of EMC, and remained active until his death.

A role model for young engineers and pre-engineers in all fields, Heirman was a champion of education, the preservation of the history of technology, and ongoing innovation in the engineering and EMC disciplines – a commitment that was reflected by his generous gifts to the various IEEE program, initiatives and activities he held dear upon his passing. Targets of his estate gifts include the following:

- The IEEE History Center, to advance its work to preserve the history of IEEE by supporting the cataloging of the history of IEEE Society contributions, including those of the IEEE EMC Society
- The IEEE Standards Association, to support the continuation of joint projects with the IEEE Educational Activities Board that expand, encourage, and promote IEEE's Standards Education Program
- The IEEE Electromagnetic Compatibility (EMC) Society, to provide for perpetual support that will enable those with limited travel funding to actively participate in EMC's standardization program
- IEEE-Eta Kappa Nu (HKN) Chapter at Purdue University, to support his beloved HKN (the honor society of IEEE) at his alma mater

- The IEEE Foundation, to support its broad range of IEEE initiatives.
- In his IEEE History Center oral history interview conducted in February 2015, Heirman reflected on his long, colorful and productive career, confiding that "I've been around a long time -- 50 years in the business -- and I wouldn't take anything back." [https://ethw.org/Oral-History:Don\\_Heirman](https://ethw.org/Oral-History:Don_Heirman)
- Don was a lifelong friend and donor to the IEEE History Center. His impact and dedication to its mission can not be understated. Michael N. Geselowitz, Ph.D., Senior Director of the IEEE History Center reflected on Heirman's legacy and what his gift means to the IEEE History Center.

"As the technical backbone of IEEE, the history of IEEE Societies is critical to understanding the history of IEEE and its members' profession. Don Heirman's collection of paper materials, photographs, and artifacts left posthumously to the IEEE Archives at the IEEE History Center provide a unique look at standards at IEEE, as well as the operations of the IEEE Electromagnetic Compatibility Society, over the course of the more than 30 years in which Don was active in both. Don's generous legacy gift will enable the History Center to assimilate this material as well as to manage acquisitions from other IEEE Societies moving forward."

IEEE & the IEEE History Center sincerely thank Don Heirman for his renowned contributions to the industry throughout his life and for all that he continues to give to future generations through his generous legacy estate gifts, all of which will pave the way for continued innovation, growth, and success in the engineering field. The IEEE Foundation proudly recognizes Donald N. Heirman as a *Forever Generous* member of the IEEE Goldsmith Legacy League <https://www.ieeefoundation.org/who-we-are/ieee-goldsmith-legacy-league>.

Your contributions to the IEEE History Center Fund preserve the heritage of the profession and its contributions to humanity. We invite you to find out more about the Center and its programs at [http://www.ieee.org/web/aboutus/history\\_center](http://www.ieee.org/web/aboutus/history_center) and more about the Engineering & Technology History Wiki ([www.ethw.org](http://www.ethw.org))

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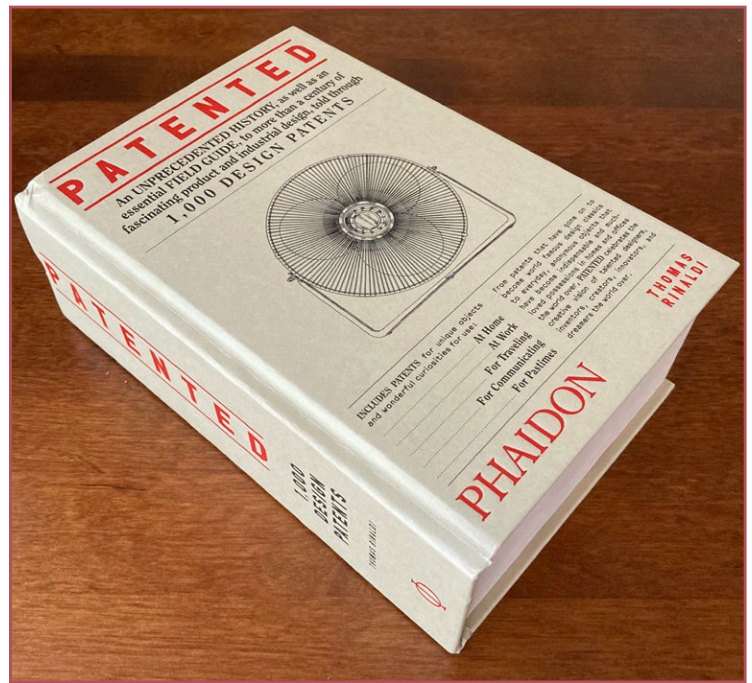
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**RINALDI, THOMAS**  
*Patented: 1,000 Design Patents*  
 Phaidon, 2021

By Alexander B. Magoun, Ph.D., Outreach Historian

Regularly overlooked in the obsession over “utility” or inventive patents are those for design, or how an invention should look. This is regrettable because, in the 21st century when the global commodification of products has accelerated the value of brand identity and style, the U.S. Patent and Trademark Office (USPTO) has granted more design patents in twenty years than it did in the preceding 157. The author, an architectural designer and historian (see his *New York Neon*), discovered the USPTO’s repository of more than 900,000 design patents while extending his search beyond the architects of historic buildings to the designers of the iconic mass-produced items. The absence of national residency requirements, the consistency of illustrations, and the importance of the U.S. market for multinational firms make it a global trove of influential designs from people around the world: hello, Eero Saarinen, Ettore Sottsass, Yoichi Hisano, Jun Zhou, and many more.

While the bulk of the book is composed of one patent illustration for each of the 1,000 patents in chronological order, Rinaldi adds “Evolutionary Case Studies” of eighteen design patents for certain articles including irons, tabletop clocks, stoves, electric fans, mobile phones, and television receivers. These, along with the indexes for designers and assignees and the value of browsing, offer avenues into exploring the evolution of appearances that complemented the evolution of the technologies. Whether those technological changes always represented “improvement”—not quite the same as the utility that the USPTO requires of an invention—is a matter for useful debate among inventors, engineers, and the scholars who study them and their work.



The one regret about this volume’s design, whose cover is graced by Noel Thomas Patton’s floor fan (1976, D240,231) is the use of a cheaper, non-archival paper that appears fated to begin oxidizing in less time than the life of a patent. This is an unfortunate if inevitable choice when competitively pricing a book two to three times the size of a standard volume. Design partisans can cavil over Rinaldi’s choices, but John Vassos never obtained design patents on RCA’s 1939 televisions and 1949 45-rpm record changer, leaving us with his telephone for Bell Telephone Laboratories (1930, D81,510, D81,511) and accordion for Hohner (1938, D111,555). Rinaldi has done an exemplary job with the resource he chose, however, and he offers historians of lone and corporate designers a new avenue into studying how they and the companies they worked for have contributed to a global design culture.

Available from: Phaidon Press, London and New York,  
[www.phaidon.com/store/design/patented-9781838662561/](http://www.phaidon.com/store/design/patented-9781838662561/),  
 US\$39.95 hardcover, ISBN 9781838662561, 1,055 pp, indexes.

## FROM THE IEEE HISTORY CENTER PRESS

*SPRAGUE ELECTRIC: AN ELECTRONIC GIANT'S RISE, FALL, AND LIFE AFTER DEATH*

by John L. Sprague

The rise of the Sprague Electric Company from a high-tech kitchen-table startup is representative of much of the U.S. electronics industry. Sprague Electric began in 1926 in the Quincy, Massachusetts kitchen of a young naval officer, Ensign Robert C. Sprague, and became a thriving manufacturer employing thousands of workers. Its broad product line of electronic components achieved international sales and a reputation for the highest quality. There were more than 50,000 Sprague components on every Apollo mission, and more than 25,000 aboard every Space Shuttle. The company later declined, went through a series of acquisitions, and eventually dissolved.

*Sprague Electric* provides a valuable business and technological history, a story of corporate success, and a cautionary tale of what to avoid. Told by company insider John Sprague, Sprague Electric gives the reader a front-row seat.

The Sprague Electric story reveals the value of investment in research and development, and also the effects of raw material supply chains on product lines. It is a story of a company's relations with the small New England mill town of North Adams, Massachusetts where its factories were located, and how labor relations — initially cordial— later soured. It is a story of how a vulnerable company weathered the stresses of the Great Depression and triumphed, only to be brought down by the recessions of the 1970s and 1980s.

It is a history of acquisitions, mergers, and spin-offs— some of them botched— and of the strategic and tactical mistakes that eventually caused the company to vanish. Yet, Sprague Electric's successor companies continue its legacy in the electronic components industry. Corporations formed from its different business units and operations are now located around the world. The principal manufacturing plant of Sprague Electric is now an acclaimed art museum.

Available from Amazon.com in hard copy and on Kindle.

[http://www.amazon.com/Sprague-Electric-Electronics-Giants-after/dp/150338781X/ref=sr\\_1\\_2?ie=UTF8&qid=1429202871&sr=8-2&keywords=sprague+electric](http://www.amazon.com/Sprague-Electric-Electronics-Giants-after/dp/150338781X/ref=sr_1_2?ie=UTF8&qid=1429202871&sr=8-2&keywords=sprague+electric)

## SPRAGUE ELECTRIC



An Electronic Giant's Rise, Fall, and Life after Death

John L. Sprague



IEEE Foundation

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The world's most daunting challenges require innovations in engineering, and IEEE is committed to finding the solutions.

The IEEE Foundation is leading a special campaign to raise awareness, create partnerships, and generate financial resources needed to combat these global challenges.

## DONATE NOW

[https://www.ieeefoundation.org/donate\\_history](https://www.ieeefoundation.org/donate_history)



Donations to the IEEE History Center Fund may be designated for general use to support IEEE history activities, to support collection and posting of Oral History interviews of important innovators, and to build the History Center endowment.

You may donate online at [https://www.ieeefoundation.org/donate\\_history](https://www.ieeefoundation.org/donate_history) or by mail at:

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