IEEE

IEEE History Center

IEEE HISTORY CENTER UNVEILS BOOK ON IEEE HISTORY

History of IEEE Since 1984

IEEE

The History of IEEE has been brought up to date in a new on-line book. See Signals from the Director, Page 2.

SIGNALS FROM THE DIRECTOR

Dr. Michael Geselowitz, Senior Director, IEEE History Center

Let me wish all of our readers a belated happy New Year. I hope everyone is well. As I write this column in early February, the staff of the IEEE History Center are still working from home. As with everyone, the pandemic has impacted our work in varied ways, but we continue to carry out our mission to preserve, research and promote the history of IEEE, its members, and their fields of interest. I will specifically return to the history of IEEE itself at the end of this note, but let me give a preview of our history of technology activities in 2021.

On the fully positive side, demand has increased for the IEEE REACH Program—our online pre-university educational resources—leading to a number of exciting opportunities (see page 6). Besides our REACH content, our materials can found on the Engineering & Technology History Wiki (ETHW, **www.ethw.org**), which we manage for a consortium of engineering associations. Traffic to the ETHW dropped off in the second and third quarters in response to the pandemic, but is rebound-

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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**

List of dedicated IEEE Milestones: **https://ethw.org/Milestones:List_of_Milestones**

How to Propose an IEEE Milestone: **http://ieeemilestones.ethw.org/Milestone_Guidelines_and_ How_to_Propose_a_Milestone**

Milestone proposals in process: **http://ieeemilestones.ethw.org/Milestones_Status_Report**

Oral History Collection: **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 **ieeemilestones.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**

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**. Articles and letters to the editor may be edited for style or length.

ing nicely. Oral histories now have to conducted my video call rather than in person. Although some intimacy is lost, we are getting quite good at this virtual interviewing, and it saves resources that would have been devoted to travel. A grant from the IEEE New Initiatives Committee will enable us to expand the Oral History Program this year, with a focus on peer-to-peer interviewing of IEEE Life Fellows. For the IEEE Milestones Program (see page 8), there was a large hiatus in dedications last year,

"Thanks to the leadership of former IEEE president John Vig, and with resources he raised from several IEEE Societies, we have redesigned how history of IEEE is covered on the ETHW. The 'History of IEEE Since 1984' is now a single narrative page with a set of appendices pulling all the background information into one location."

taway, NJ, U.S.A. This will enable us to interact more closely with other organizational units that are directly engaging members. It will also put us in proximity of the IEEE Archives—the unpublished institutional records of IEEE which we manage for the organization. IEEE has developed new records management procedures that better integrate the History Center, and will help us to insure that IEEE's institutional legacy is preserved.

but several virtual events were held in the late fall, and that trend is continuing into early this year. Other Milestone-sponsoring IEEE Organizational Units are still waiting to see when it may be possible to hold in-person celebrations. Meanwhile, the proposal pipeline continues to well. Hardest hit, perhaps, is our newest program, the IEEE Global History Museum (see page 7), which was launched last year to plan traveling exhibits that could be brought to IEEE members around the world. Such an activity is not possible right now, but we are working on a virtual exhibit on Edwin Armstrong to keep momentum going. This exhibit is made possible in part by a bequest from a member of the Armstrong family, which is also enabling us to expand the content on the REACH radio unit.

Finally, I would like to make you aware of two important developments. First, we have ended our partnership with Stevens Institute of Technology. When we are able to return to the office, it will be to the IEEE Operations Center in Pisca-

Speaking of our efforts to preserve and present the institutional history of IEEE, thanks to the leadership of former IEEE president John Vig, and with resources he raised from several IEEE Societies, we have redesigned how history of IEEE is covered on the ETHW. The "History of IEEE Since 1984" is now a single narrative page with a set of appendices pulling all the background information into one location. This makes it easier for histories of individual organizational units to interweave and interlink their story with that of the broader IEEE. You can find the page at: **https://ethw.org/History_of_IEEE_Since_1984**. Feel free to visit and to contribute. Remember, anyone can view the site, but you need an account to edit. The ETHW does not use the IEEE single login, because it is used by a consortium, not just IEEE. If you have not written on the site before, you can easily sign up for an account on the homepage.

In closing, let me say thanks, as always, for your philanthropic support that enables these important programs. Please stay safe and continue to follow and participate in our activities.

HISTORY COMMITTEE ACTIVITIES

CHAIR'S MESSAGE

by Janina Mazierska, Chair

It gives me a great pleasure to welcome you all in 2021 as Chair of the IEEE History Committee.

The past year was very busy for the History Committee and definitely challenging, but we achieved more than planned, despite COVID-19! We approved nine Milestone proposals, introduced Milestone virtual dedications, and revised, updated & streamlined Milestone procedures of this iconic IEEE program. As usual we selected an IEEE Life Members Fellow and a winner for the Middleton Book Award in History of EE. We oversaw activities and projects of the History Center and were actively involved in two successful proposals funded by the New Initiatives Committee, as well as the IEEE Global Museum, funded by the Life Members Committee. Also, we evaluated the vision and purpose of the History Committee and examined best possible ways of it fitting into the IEEE structure (as a part of the Streamlining IEEE BoD Committee initiative).

The focus of the History Committee in 2021 will be on increasing the reach and the scope of our activities and a stronger involvement with History Chairs/Coordinators of Societies, Sections, Regions and Divisions.

And here are two requests to you, if I may!

1. Please email me your ideas how the History Committee can help you in your work. Would training be useful? E.g. on identifying and preparing Milestone nominations? Should the Committee be using social media and have a Webpage to provide an exchange of ideas, apart from the History Center Newsletter? Any suggestions and comments would be greatly appreciated.

2. A Call for Nominations for IEEE Committee positions will be sent soon. If you have been serving as a History Chair/Coordinator for an IEEE OU and have a solid record of achievements, I would like you to nominate yourself for membership on the History Committee. We are always in need of candidates who are passionate about the history of engineering and technology and of IEEE.

Looking forward to hearing from you,
Janina (**j.mazierska@ieee.org**)

MAJOR ACHIEVEMENTS WORTHY OF MILESTONES

In the years 2022-2024, some major achievements in IEEE's fields of interests will be approaching big anniversaries such as 400, 200, 150 years etc. The History Center has prepared the table below to stir interest by the relevant sections and societies in taking the opportunity to propose these achievements as IEEE Milestones. To find out more, please contact IEEE Milestones Program administrator Robert Colburn at **r.colburn@ieee.org**

LIST OF CANDIDATE MILESTONES APPROACHING MAJOR ANNIVERSARIES

Year	Invention or Discovery	Person	SECTION(S)	SOCIETY(S)	2022 Anniv.	2023 Anniv.	2024 Anniv.
1623	Mechanical Calculator	Schichard	Germany	Computer Society		400	
1822	Fresnel Lens (lighthouses)	Augustin Fresnel	France	Oceanic Engineering	200		
1822	Fresnel Lens (lighthouses)	Augustin Fresnel	France	Vehicular Technology	200		
1822	Transverse Theory of Light	Augustin Fresnel	France	Photonics Society	200		
1824	Electromagnet	Sturgeon	UKI	Magnetics			200
1824	Galvanometer	Ampere	France	Instrumentation & Measurement			200
1824	Thermocouple	Secbech	Germany	Power & Energy Society			200
1873	DC Generator/lighthouses	Gramme	Benelux	Oceanic Engineering		150	
1873	DC Generator/lighthouses	Gramme	Benelux	Vehicular Technology		150	
1874	Early Electric Car	Salomans	UKI	Vehicular Technology			150
1897	Discovery of Electron	Thomson	UKI		125		
1897	Cathode Ray Tube	Braun	Germany	Electron Devices	125		
1898	Theory of Radioactivity	Curie	France			125	
1899	Loading Coil	Pupin	New York	Communications			125
1899	Magnetic Recording	Poulsen	Denmark	Magnetics			125
1923	PNJ Interconnection	Numerous	Philadelphia	Power & Energy Society		100	
1924	Stereo Phonography	Keller	New York	Consumer Electronics			100
1948	Experimental Cable TV	Numerous	Oregon	Broadcast Technology		75	
1948	Experimental Cable TV	Numerous	Oregon	Communications		75	
1948	Experimental Cable TV	Numerous	Oregon	Consumer Electronics		75	
1948	LP Records	Goldmark	New York	Consumer Electronics		75	
1949	Electric Guitar	Fender	Orange County				75
1972	Cochlear Implant	Graeme/Clark	Victorian	Engineering in Medicine & Biology	50		
1973	Ethernet	Metcalfe	Santa Clara Valley	Communications		50	
1973	Ethernet	Metcalfe		Computer Society		50	

HISTORY CENTER TOASTS 40 YEARS OF SERVICE VIRTUALLY

On 10 December 2020, the IEEE History Center celebrated forty years (and four months) of serving members, historians, and the public with an online virtual toast. Hosted by IEEE.tv and emceed by outreach historian Alexander Magoun, the one-hour event opened with remarks by IEEE President Toshio Fukuda, Past President and IEEE Foundation President John Treichler, IEEE Life Member Committee Chair T. Scott Atkinson, and IEEE History Committee Chair Janina Mazierska. They, among 350 registrants, then watched a smartly paced, 15-minute, video history of the Center directed by IEEE.tv's Stephen Esker, and researched and scripted by Magoun and Center historian Lisa Nocks. Remarks by founding Director Robert Friedel and former Director William Aspray followed, together with Center Director Michael Geselowitz's observations on the experiences of leading IEEE's history efforts over the last twenty-three years. All raised glasses and cups to salute forty years of accomplishments and in anticipation of forty more.

The Virtual Toast culminated five months of commemoration that began with Geselowitz's column in the last Newsletter; continued with articles and a timeline for the IEEE Foundation; and featured the Center staff's virtual appearances and a slideshow at the Board of Directors series in November. If you missed the Virtual Toast, watch it at **https://ieeetv.ieee.org/live-events/historycenter40**, or just the History Center documentary at **https://ieeetv.ieee.org/channels/ghn/40-years-of-the-ieee-history-center**.

NEW ORAL HISTORIES ON ETHW

The Engineering and Technology History Wiki (ETHW) has one of the largest oral history collections pertaining to the history of technology in the world. Four new oral histories are available on the site:

Clinton Gilliland worked at the Stanford RSL designing and building the antenna beam control for the 2.5 km long array of whip antennas built in the California central valley. In 1968, he went to Barry Research, and was involved with circuit design for the chirp sounder production designs. In 1968 and 1969 he spent several multi-month stays in Routhwesten, Germany, Aviano, Italy, and San Vito, Italy operating BR chirp-sounder receiving equipment at US military sites.

Arthur Pelton obtained his doctorate from the Department of Metallurgy and Materials Science of the University of Toronto in 1970. He has been a professor in the Materials Engineering program at Ecole Polytechnique (University of Montreal) since 1974 where he has devoted most of his career to the development of the FactSage system, particularly in the area of solution modeling and solution database development. He is the author of approximately 250 scientific articles and eleven book chapters; fellow of ASM and CIMM; fellow of the Royal Society of Canada; and recipient of the Hume-Rothery Prize of IMMM, the CODATA biennial award of the International Council for Science, the Gibbs Triangle Award of Calphad, and other prizes.

Anita Gale completed a master's degree in aeronautics and astronautics at the University of Washington in 1974. She began her career at Rockwell International, working in structural dynamics and later specializing in payload cargo integration on the Space Shuttle and Commercial Crew programs at both Rockwell and The Boeing Company. She retired in 2016 as a Boeing Associate Technical Fellow. She is an associate life Fellow of the American Institute of Aeronautics and Astronautics and a Fellow life member of the Society of Women Engineers, and a recipient of the SWE Distinguished Service Award. She also is co-founder of the Space Settlement Design Competitions for high school students.

Christopher Bale has a Joint-Honors B.Sc in Chemistry & Metallurgy from the University of Manchester (1968), and a Ph.D. in Chemical Metallurgy from the University of Toronto (1973). He has been a professor in the Materials Engineering program at Ecole Polytechnique (University of Montreal) since 1977 where he has devoted most of his career to the development of the FactSage system particularly in the area of software development, and to the research and development of other interactive interfaces, especially internet-based programs.
To read these and other oral histories, please visit:
https://ethw.org/Oral-History:List_of_all_Oral_Histories

REACH PROGRAM ADDRESSES IEEE'S 2020-2025 STRATEGIC VISION

One of the goals of IEEE's 2020-2025 strategic vision is to "be a trusted source of educational services and resources to support lifelong learning." This includes a pre-university focus, one that engages students in STEM. The IEEE REACH Program is one way IEEE meets this goal. The program also supports a second IEEE strategic goal, "inspire a worldwide audience...and expand knowledge for the benefit of humanity." One way to accomplish this second goal is through one of IEEE's six core values, specifically, the core value of *partnerships.*

In 2012, IEEE signed a Memorandum of Understanding (MOU) with the United Nations Educational, Scientific, and Cultural Organizations (UNESCO) to promote mutual collaboration, however, a specific program had never been put together...until now.

Supported by the IEEE Africa Council and the Uganda Section, and with the assistance of Kathy Weeks, Senior Corporate Development Manager with IEEE's Corporate Development team, IEEE REACH is being co-branded with UNESCO as an educational activity taking place in Uganda. REACH lesson plans, hands-on activities, and other REACH resources are the focus of this educational activity being put into practice by two Uganda non-profits, Silver Bolt and the Smart Girls Foundation. The educational activity is currently taking place over five weeks both in Uganda classrooms and via a classroom trailer that is taking the program to several under-served communities in rural locations throughout the region.

During the first week, IEEE volunteers and staff worked with UNESCO stakeholders and with executives from the two Uganda non-profits to adapt the REACH materials for their programs, and to meet Uganda's National Curriculum Development standards. In week two, IEEE History Center staff members Kelly McKenna and Michael Geselowitz held a webinar for twenty Uganda instructors who will train other educators. The webinar provided pertinent information about the resources and how to apply them in classroom instruction. Week two also consisted of four days during which the trained instructors shared the REACH concepts and resources with students in a classroom setting. Students also participated in the hands-on activities, formative performance tasks and in entrepreneurship discussions associated with the concepts learned.

The traveling classroom trailer will be used for weeks three and four, which will consist of one day of training and contextualization with teachers and the other four days with student sessions across the region. At the end of the student learning an assessment will be taken.

As of the writing of this article, the first two weeks of the program have been completed. The instructors reported that they found the resources to be very informative and that they provide a dynamic set of information from which the instructors may work with students of various ages. In order to keep all learners engaged, the instructors used inquiry and debates, and often posed questions to assess levels of student understanding and provided further explanations, when necessary, for students who lagged behind. Instructors expressed, "Many students who are not pursuing specific fields of Engineering showed a lot of interest and an urge to learn!" This was an encouragement for the instructors.

As the program continues in the region, we will learn more about potential challenges and successes and will work with all stakeholders to tweak the program where necessary to ensure it is effective. If successful, the program may be expanded within Africa with potential continued collaboration through the UNESCO MOU. Our hopes are that UNESCO will see the value in the program and expand to its global education market.

The IEEE History Center, the IEEE Africa Council, Uganda Section, and the IEEE Corporate Development team, through this UNESCO co-branding educational opportunity and the partnerships being developed with both internal and external stakeholders, by way of the IEEE REACH program, are significantly assisting IEEE with reaching its 2020-2025 strategic vision to be a trusted source of educational services and resources that support lifelong learning. The REACH program is providing a new lens and pathway to engage students in STEM, with the goal of improving technological and engineering literacy. Contact Kelly McKenna **k.mckenna@ieee.org**

FROM LOCAL TO GLOBAL – EXHIBITING THE HISTORY OF TECHNOLOGY

During its forty-year history, the IEEE History Center staff has produced exhibits on the history of technology. Some of these, such as "Lines and Waves," on the contributions of Maxwell and Faraday, were travelling exhibits with online or digital components. Others were installed at the Center's most recent host institution, Stevens Institute of Technology, as well as at the IEEE operations Center in Piscataway, and at IEEE headquarters at 3 Park Avenue, New York. Among them were "Holland Tunnel," "Still Spinning after all these Years: RCA Victor's Fabulous 45s" (2015-16), and "Radio Days/Radio Craze: The Simkin Collection of Wireless/Radio Memorabilia," (2017-2018). In 2018, we presented, "Monstrous!" on the social and technological events that inspired Mary Shelley's *Frankenstein* at Stevens, and "Moon Dreams," on the popular culture and history of space exploration for the anniversary of the Apollo Moon Landing at 3 Park Avenue. During 2019, the Center presented a slide show on member contributions and patents related to the Apollo Mission at the United States Patent and Trademark Office's Apollo moon landing anniversary event. Several exhibits have been installed in IEEE offices, among them those focusing on the Apollo anniversary, IEEE Medal of Honor Recipients, IEEE Milestones, and a semi-permanent exhibit on the history of technology in the reception center at 445 Hoes Lane.

In 2019, the Global Museum initiative was sparked by conversations resulting from a generous donation from Senior Life Member John Impagliazzo to install exhibits in IEEE corporate offices in each region. The question was how to make the contributions of IEEE members and medal winners familiar to the general public. This idea grew into a mission to expand the History Center staff's service to IEEE members by partnering with member volunteers and public-facing institutions such as museums, libraries, and other publicly accessible spaces in every region to install curated historical exhibits showcasing member contributions to the history of technology. During that year, the Center staff and members of the History Committee worked with Dr. Impagliazzo to develop a proposal for a Global Museum program, which was ultimately endorsed by the History Committee in 2019, and funded by the Life Members Committee with a seed grant for 2020.

The Global Museum program sub-committee had included a virtual facet in its proposal for the program. During 2020, during early plans to locate a publicly accessible venue for its first exhibit, the restrictive circumstances surrounding COVID-19 pandemic made it necessary to focus on the virtual component of the program. We used the time to begin researching resources and methods for virtual and digital exhibits, while continuing to work on placing exhibits in physical spaces. Subjects of some of the first exhibits include Bell Labs, Edwin Howard Armstrong, and robotics in imagination and reality. Send queries about this program or venue suggestions to Dr. Lisa Nocks at **l.nocks@iee.org**.

STAFF NOTES

DAVION HUTCHINSON JOINS HISTORY CENTER STAFF

Davion Hutchinson is the Digital Marketing Specialist for the IEEE REACH program and is responsible for handling all digital promotional efforts for the program. Davion has a passion for digital marketing and social media marketing which has led him to this role with us at IEEE REACH. Davion studied Communications with a minor in Business at the University at Albany, where he received his Bachelor's Degree. In Davion's free time you can catch him writing his blog or watching football, soccer, and basketball. He is thrilled to be a part of this team and is looking forward to spreading the word about IEEE REACH digitally!

IEEE REGIONS CELEBRATE MILESTONE TOGETHER

GRAVITATIONAL-WAVE ANTENNA DEDICATED AS IEEE MILESTONE, FIRST THREE-REGION DEDICATION

By Will Robinson, Proposer for the IEEE Gravitational Wave Antenna Milestone and Brian Berg, Region 6 History Chair

Visualize for a moment the forces involved when two binary black holes, each containing approximately thirty solar masses, that are orbiting each other at velocities approaching half the speed of light, coalesce into one black hole, with an emitted energy pulse equivalent to 5% of their combined masses radiated in the form of gravitational waves over the period of a few hundred milliseconds.

That energy pulse, occurring approximately 1.3 billion light years away, and greater than the combined power output of all the stars in the observable universe, was actually detected on 14 September 2015 by two gravitational-wave antennas. The antennas detected the pulse by monitoring length differences in between two orthogonally-placed interferometers approaching one-thousandth the width of a proton. A subsequent detection in 2017 involved a binary neutron star merger.

On 3 February 2021, IEEE recognized these achievements as attained by the gravitational-wave antennas in Livingston, LA, U.S.A, Richland, WA, U.S.A., and Pisa, Italy with an IEEE Milestone.

https://ethw.org/Milestones:Gravitational-Wave_Antenna

Although IEEE has dedicated Milestones in multiple sections, and even regions, before, this was the first dedication in three regions (5, 6, and 8). Because the COVID pandemic prevented there being a live dedication, a single online virtual dedication was held. This single online event enabled the inclusion of participants who would otherwise not have been able to attend because of scheduling conflicts and travel restrictions. Scientists, engineers, government officials, and IEEE officers from around the world were thus able to participate, and there was a panel discussion by four Nobel laureates. The IEEE-USA Communications and Public Awareness group made this look seamless by having Jonathon Choe and Corey Ruth schedule and record videos of the participants from around the world, and to render a professional presentation which was viewed by a worldwide audience in excess of a thousand. The full dedication event, and extensive support information, is available at **www.GWAMilestone.com**

Because of the importance of this achievement and the virtual aspect of the Milestone dedication, this event turned out to be the largest IEEE Milestone dedication ever.

TECHNOLOGY UNEXPECTANS

JAGADISH CHANDRA BOSE'S SCIENCE FICTION

From the earliest forms of architecture, numerous people have explored the intersection between engineering and art. One of these people, Sir Jagadish Chandra Bose, a pioneer in radio communication whose work is an IEEE Milestone, also had a brief foray into the literary world by writing a science fiction story, initially published in 1896 as "Niruddesher Kahini", and later republished in 1921 as "Palatak Tufan (Runaway Cyclone)". Bose's literary work represents an entry in a small, but measurable, group of Bengali authors writing speculative fiction in the late 19th century.

Written in Bengali, the 1921 version of the story was translated into English by Bodhisattva Chattopadhyay in 2013, and is readily available online. Combining Bose's humor with an interest in weather science, the narrator of the story recounts an incident where his daughter, pointing out his baldness, presents him with a bottle of oil, or "Kuntal Keshari", which had been advertised to regrow one's hair, touting the success on a lion. Not really giving it much thought, the narrator forgets about the bottle of oil until later at sea when his ship is about to be encroached upon by an incoming cyclone. He briefly muses on the nature of oils and waters not mixing, and as a last ditch effort, throws the bottle of oil in the storm, which dispels it. This incident is recalled later in the narrator's life, when a similarly behaving storm is observed.

While the story is brief and it does not particularly encompass a scientific realism, it highlights a lighter side of Bose, and is a fascinating example of an engineering trying to solve a problem, not to accomplish or build something in the real world, but with the goal of entertaining the reader. Themes and tropes revolving around weather manipulation in science fiction are commonplace today, but were quite uncommon in 19th century speculative fiction, the majority of which consisted of adventure stories, or utopias and satires providing some form of social commentary. Bose's storm-abating hair gel is charming, irreverent and funny, and offers a more human glimpse into the life of the engineer.

Bose was certainly not the only engineer exploring the literary world. Prior to the 20th century, a number of other scientists and engineers had written speculative fiction. In addition to Bose, the literary works of three of these, Johannes Kepler, Eduardo Ladislao Holmberg and Konstantin Tsiolkovsky will be explored in IEEE History Center's Archival & Digital Content Specialist Nathan Brewer's upcoming Lunch and Learn talk "Engineers and Scientists as Science Fiction Authors: From Kepler to Bose", which will be held on June 16th at 12:00 PM EST. You can attend the talk by going to the following Webex meeting link at the appointed time: **https://ieee.webex.com/ieee/j.php? MTID=m189603bb47b78e66940767483ce01d41**

SURFING THE WEB, MARCH 2021

Two engineer/collectors from Ohio, USA, have been documenting their collections of unusual solid-state and electron tube devices at Industrial Alchemy (Vintage Technology: Electronics Esoterica): **http://www.industrialalchemy.org/index.php**. Professionally photographed and accompanied by thoughtful, brief commentaries, a large array of indicator, display, imaging, and counting tubes and LED circuits fill a Museum section, while the Articles feature a variety of related do-it-yourself projects and esoteric discussions.

Satoshi Tomokiyo is a prolific cryptographic historian when he is not working in a patent office. A member of the Physical Society of Japan, he posts his articles on codes and ciphers from the 16th to the early 20th centuries in western Europe, Russia, the United States, Japan, and China: **http://cryptiana.web.fc2.com/code/crypto.htm**.

Tobias V. Langhoff has written an 8-bit HTML-5 version of Joseph Weisbecker's Think-A-Dot logic game (1965) that Weisbecker converted into Flip (1977) using his CHIP-8 programming language (1977): **https://tobiasvl.itch.io/flip-8**.

The Hagley Museum and Library's Center for Business and Labor History has posted videos of its archivists discussing selected collections and interviews with the scholars who use them on its History Hangout. Of particular interest are Salem Elzway's explanation of his dissertation research on industrial robots in the U.S. since World War II; Bernardo Batiz-Lazo's talk on how ATMs and computing changed banking; and Joanne Yates and Craig N. Murphy's interview on their new book on global standard setting since 1880: **www.hagley.org/research/history-hangout-0**.

The Antique Wireless Association has a YouTube page with recordings of presentations from its annual conference. For 2020, this featured researched talks on early electronic espionage technologies, early electrical meters, and 126 years of innovations in high-frequency amateur radio technologies and techniques: **www.youtube.com/playlist?list=PLLTogcYJemH-767GmCRNo5n4mryV1Ssg0c**.

Learn how to involve all of the family in mending a fuse at home in this newsreel from England in the autumn of 1946, just before the terrible winter of 1947: **https://youtu.be/JFcndAQLWo0**.

Historian Jahnavi Phalkey and physicist Shiraz Minwalla collaborated on an hour-long documentary about the preservation, maintenance, and operation of the world's oldest cyclotron, built at the University of Rochester, NY, USA, in 1936, and transferred to Panjab University, Chandigarh, India, in 1967: **https://bangaloreinternationalcentre.org/event/cyclotron/**.

THINGS TO SEE AND DO

HISTELCON 2021 PRELIMINARY CALL FOR PAPERS

HISTELCON is an IEEE Region 8 conference covering topics in the area of Technology History, held about every two years. HISTELCON 2021 will be in Moscow, Russia. Because of the COVID-19 Pandemic it is not yet certain whether the conference will operate as a virtual on-line event or whether it will be held in the traditional manner as an on-site event in Moscow. The language of the conference will be English (including lectures and printed material). Sponsorship is by the Higher School of Economics, the IEEE Russia Section Computer Chapter and IEEE Region 8. The theme for HISTELCON 2021 is "The evolution of computer architectures and system software, the influence of social aspects on the development of computers".

However, papers on all other aspects of the History of Technology relevant to IEEE scope will be welcomed. Abstract submission deadline: 2021 June 12th; Full paper submission deadline: 2012 July 3rd; Paper acceptance notification: 2012 July 17th; Final paper acceptance notification: 2012 July 31st. Papers should be submitted via the website, (URL not yet decided.) Papers accepted and presented by an author at HISTELCON 2021 may be submitted for inclusion in IEEE Xplore, and in some cases, the author(s) may be invited to prepare a revised or extended version for IEEE Xplore. For more information, contact Sergei Prokhorov **sergei.prokhorov@computer.org**

The History Center salutes all the essential power grid workers who keep the electricity on during the pandemic

GIVING AND SUPPORT FOR IEEE HISTORY CENTER PROGRAMS

IEEE FOUNDATION SURPASSES $30 MILLION CAMPAIGN TARGET

Hard work, time, talent and treasure contributed by dedicated donors, volunteers and staff enable the *Realize the Full Potential of IEEE* Campaign to surpass its fundraising target.

The IEEE Foundation has 30 million bold new reasons to be proud after reaching its ambitious $30 million fundraising goal through its *Realize the Full Potential of IEEE* Campaign. Initiated in November 2015 and publicly launched in February 2018, the campaign is driving new levels of technological access, innovation and engagement through a variety of far-reaching global initiatives designed to transform lives through the power of technology and education.

"I'm so pleased to report our success in achieving our $30 million goal," confirmed IEEE Foundation President John Treichler. "I'm even happier to report the depth of the philanthropic support the campaign garnered – from individual IEEE members, IEEE members working through their IEEE 'organizational units,' companies who rely on our members' talents, and other individuals who see the educational and humanitarian value in the work our members are doing."

"The successful completion of the Campaign extends the impact of IEEE programs in technical education, humanitarian impact, history of technology, and an unlimited range of global

grassroots programs," noted 2018 IEEE President Jim Jefferies of such groundbreaking initiatives as IEEE Smart Village, EPICS in IEEE, IEEE Power & Energy Scholarship Plus Initiative, REACH and many more. According to Jefferies, "every contributor and ultimately every recipient will be elevated as part of this major leap forward for the IEEE Foundation."

Among the many key contributors to the campaign's success were Emerson and Betsy Pugh, esteemed members of both IEEE's Heritage Circle and the IEEE Goldsmith Legacy League. Following their establishment of 'The Elizabeth & Emerson Pugh Young Scholar in Residence' at the IEEE History Center in 2018, the Pughs' generous gift in celebration of the History Center's 40th anniversary in 2020 ultimately helped propel the IEEE Foundation across the finish line of the *Realize the Full Potential* of IEEE Campaign.

Amid celebration of this milestone achievement, the IEEE Foundation team confirms that it only marks the beginning, not the end, of an important journey. "We encourage everyone to stay involved as we continue to illuminate, educate, engage and energize," Treichler said of the work to come. "Together we realize the impact IEEE has on our members, future engineers, and the billions of people around the world who benefit from technology that improves lives and addresses global challenges."
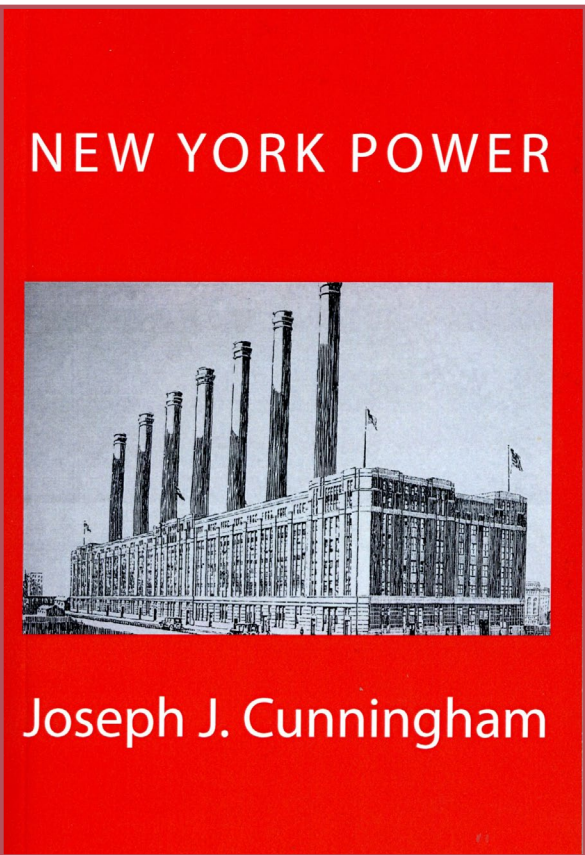
Your contributions to the IEEE History Center Fund preserve the heritage of the profession and its contributions to humanity. We invite you to find out more about the Center and its programs at **http://www.ieee.org/web/aboutus/history_center** and more about the Engineering & Technology History Wiki (**www.ethw.org**)

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** or by mail at:
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NEW YORK POWER
by Joseph J. Cunningham, published by the IEEE History Center

New York City's density placed unique constraints on its electric light and power supply. Electrification began during the 1880s, but many innovations were required to supply urban service at a cost that would make possible large-scale consumption.

New York Power tells the story of the electrification of the one of the densest electrical load areas in the world, it was also where alternating current challenged and then ultimately vanquished the original direct-current system.

Author Joseph J. Cunningham has consulted a variety of historical sources to bring us the story of the massive and sustained effort to develop New York City's electric utility system. He has researched and authored numerous articles and books on topics such as industrial electrification and electric rail transportation, and has taught widely on the history of electric power systems and consulted on numerous electro-technology projects and television productions. Lionel Trains has consulted him on the historical details of its model trains.

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