IEE-IEEE Exhibit

The Center is pleased to announce that it is helping to sponsor the American showing of an exhibit on the history of transatlantic communication, entitled “From Sailing Ship to Satellite”, curated by the archival staff of the Institution of Electrical Engineers and extended by the staff of the MIT Museum. The exhibit will be shown in spring and perhaps early summer of 1995 (exact dates had not yet been set as of the closing date for this newsletter) at the MIT Museum, which is located on the MIT campus at 77 Massachusetts Avenue, Cambridge, Massachusetts. Our Center provided some guidance and loaned a few artifacts from our Elmendorf Collection to the IEE exhibit, which showed at IEE headquarters in London from 15 August to 30 September, 1994. We are also providing most of the sponsorship for shipping and insuring the exhibit, so that it can be seen on the American side of the Atlantic.

The exhibit contains a number of important original artifacts never before seen in North America. The following description of the exhibit was prepared by the IEE staff.

Until the 1840s the speed of long distance message transmission was limited to the speed of a galloping horse or the fastest sailing ship, much as it had been for the previous 2,000 years. Electricity, in the form of the telegraph, changed all that. By 1840, the telegraph had been developed into a commercially viable instrument and within ten years telegraph lines covered most of Britain, Europe, and the settled regions of North America. However, it still stopped at the edge of the sea.

With the use of film, photographs, models, paintings, and display material, the IEE Summer Exhibition will trace the conquest of the barrier of the North Atlantic Ocean, from the laying of the first transatlantic cable — one of the most exciting projects in history — to the realization of satellite communication. Contemporary images and artifacts of all aspects of transatlantic communication will be on display, ranging from the earliest Victorian telegraph cables of 1858 and 1866 to the first modern communications satellites of the early 1960s and fiber optic cables.

For more information about the exhibit at the MIT Museum, please contact the museum at (617) 253-4422 or 253-4448.
Since September 1994, the Center has been ably assisted by four students of Rutgers' graduate program in history who have contributed to research for the Power and Control project (see newsletter #31). Their dissertations are all history departments, as well as other ongoing projects Center's here. A little bit about them:

• Jill Anderson has received a B.A. in history from Carleton College and an M.A. in American history from Vanderbilt University. She plans to write her dissertation on race, gender, and protest culture in U.S. labor activism of the 1960s and 1970s.
• Jim Sullivan received a B.A. and M.A. in history from the University of Florida (Summa Cum Laude, Phi Beta Kappa). He is currently writing a biography of Dr. Benjamin Spock which explores the popularization of Freudian psychiatry in America.
• Veronica Wilson graduated from Kansas State University with a B.A. in history and political science. She is planning a dissertation on spies, subversion, and gender in 1950s cold war America.

Grad Students

Since September 1994, the Center has been ably assisted by four students of Rutgers' graduate program in history who have contributed to research for the Power and Control project (see newsletter #31), editing the oral history department's own Center's archival collection, preparation of an upcoming guide to electrotechnology businesses and as well as other ongoing projects Center's here. A little bit about them:

• Jill Anderson has received a B.A. in history from Carleton College and an M.A. in American history from Vanderbilt University. She plans to write her dissertation on race, gender, and protest culture in U.S. labor activism of the 1960s and 1970s.
• Jim Sullivan received a B.A. and M.A. in history from the University of Florida (Summa Cum Laude, Phi Beta Kappa). He is currently writing a biography of Dr. Benjamin Spock which explores the popularization of Freudian psychiatry in America.
• Veronica Wilson graduated from Kansas State University with a B.A. in history and political science. She is planning a dissertation on spies, subversion, and gender in 1950s cold war America.

Secondont to IEE, London

The IEE and its British counterpart, the Institution of Electrical Engineers, agreed in 1994 to establish an exchange program so that staff from one organization would be seconded to the other for a short period of time. It is hoped that this program will enable the two organizations to better understand each other, as well as to share resources and activities that are readily available in both organizations. The Center’s director, William Aspray, will be among the people to participate in this exchange program.

Under this program, Dr. Aspray will spend approximately one month in the IEE’s London headquarters in 1995. His activities may include the following:

• Providing historical interpretation for the IEE summer exhibition for the IEE annual weekend history conference.

Staff Notes

Post Doc hired

We are pleased to announce the hiring of Jane Morley as the Center’s new postdoc- toral scholar. She will begin a three-year appointment at the Center beginning in the fall of 1995, where she will teach a partial course in the Center’s new history of technology, science, and construction. Gilbreth is better known as the inventor of time-and-motion studies and is the subject of the book and film The Great Race.

Riddle Completes Survey

John Riddle, our project archivist (see newsletter #30), has completed work for the Center. The results of his survey, a archival study of selected electro technology companies around the world, will be published by the Center later this year.

The newsletter reports on the activities of the Center and on new resources and projects in the field of history. It is published three times each year by the Center for the History of Electrical Engineering.

The IEEE History Committee

IEEE History Committee

ITEC Collection Move

On January 25, 1995, a dinner was held in North Carolina to mark several major changes in the Engineering Societies Library, one of America’s foremost engineering libraries. This library, which has been operated jointly by the major American engineering societies for most of the twentieth century, is being disbanded. The bulk of the collection is being sold to the Engineering Societies Library in Kansas City, with certain duplicative materials returned to the engineering societies involved. The remaining holdings will be sold to the Smithsonian Institution by auction. The library collection lives on in the eleven centuries of over two thousand volumes covering both the early and modern history of the technology. Two other changes were marked at the same time. The Wheeler Collection, a valuable collection of books, journals, and pamphlets on the history of electrical engineering technology, is being donated to the Rare Books Collection of the New York Public Library, which has a wonderful new underground facility at its main branch on Fifth Avenue.

\[\text{New joint venture, called Linda Hall Library East, located in the United States Engineering Building where the Engineering Societies Library used to be housed, which will provide a \dots\]
Talking Archives

A conversation with Andrew Goldstein, the Center’s curator.

The Center has an archive for the history of electrical engineering?

Yes, we do. One of the Center’s most important responsibilities is to record, interpret, and preserve the history of the IEEE. To do that job, the Center collects copies of the IEEE’s important records and keeps them in an archive.

What sort of materials do you keep?

The Center’s collecting focuses on the unpublished records of the IEEE. This includes minutes to meetings of significant IEEE committees, the files of IEEE officers, documents revealing the priorities and operations of IEEE staff departments, such as Spectrum or Membership Services, and the like. Our goal is to be able to answer the questions “How was the IEEE run, what did it do, and why was it done that way?”

The archive also holds some of the treasures accumulated over the IEEE’s long history. We have membership files of some of the Institute’s most noteworthy members, including Thomas Edison, Nikola Tesla, and Guglielmo Marconi, which contain miscellaneous items such as membership applications and letters of rejection. We have also got artifacts that pertain to IEEE history, such as member pins and plaques given to the IEEE by other learned societies.

How can I find out what the archive contains?

Center staff is working on catalogs for each of the different collections that we keep in the archive. As these are completed we will make them available over the Internet. We also plan to publish newsletters periodically to keep our members informed, but neither rare nor permanent historical interest. We keep such material in our New Brunswick office.

How do I use the archive?

Researchers are welcome to visit the archive. Because there is no convenient space there, advanced arrangements are required. Just contact the Center and we will find a time when you can visit. You may also send us your questions concerning the history of the IEEE (and EE in general) and we will be happy to check our resources, both archival and nonarchival, for answers. We are always on the lookout and trying to move the collection of archival material.

One item found in the center’s archive.

How big an operation is the archive?

The principal storage site is a secure key in the Piscataway Operations Center that has been issued to the Center’s archives. Overtime items, and those items that are infrequently used, are kept in the IEEE Washington office. Although we have approximately 200 linear feet of paper records (the equivalent of about 7500 sheets of paper), we are able to maintain our holdings in the Piscataway Operations Center.

The greatest challenge connected with the archive is managing it with the limited resources we have available. Right now, we have only one person full-time in the archive. The job entails maintaining the collection, overseeing its growth, and providing access to members and staff. Our long-term ambition is to improve the organization of the holdings and develop finding aids to facilitate research more frequently take a back seat to these immediate responsibilities.

I’m surprised! I’ve heard that IEEE had far more historical material than that, and more staff to manage it.

It’s true. Although in the past the IEEE has had a few people to work on the archives, the Center’s archival staff is one of the only one part of the IEEE’s total historical record-keeping operation. The “archival” copies of much of what IEEE produces are not, in fact, held by the Center archive, but by other entity within IEEE’s walls. For example, back issues of major IEEE publications are kept by the IEEE Library, which works closely with the history center, but is managed independently. Outdated standing orders are kept by the IEEE’s Standards department, the Board of Directors’ meeting minutes are held by a staff department called the Corporate Services, IEEE’s Brokerage Services, IEEE’s Industry Information, and so on. The Center’s archival primary collects unpublished materials that relate to the operation of the Institute itself, not the technology and profession that the Institute exists to promote.

How do you use the collection?

Researchers are welcome to visit the archive. Because there is no convenient space there, arrangements are required in advance. Just contact the Center and we will find a time when you can visit. You may also send us your questions concerning the history of the IEEE (and EE in general) and we will be happy to check our resources, both archival and nonarchival, for answers. We are always on the lookout and trying to move the collection of archival material.

The Newsletter’s “Bibliography” section was prepared by Philip Johnson, Computer Science, University of Wisconsin-Madison.


This book is a new, much-enlarged edition of Big Ear, published in 1976. Big Ear is a radio telescope at the Ohio State University, that John Kraus planned and built in the mid-1950s. In the decades since then it has been one of the world’s most important radio telescopes. In 1970, astronomers there discovered a very strong source, named OH1471, which turned out to be the most distant object so far discovered. Big Ear has been used to search for extraterrestrial intelligence.

This autobiographical book is written in an informative, engaging way. Though much of the book deals with radio astronomy, a substantial part concerns the author’s experiences in amateur radio and in radar and physics research. Because of his radio hobby, he became an expert in antenna design; in the 1930s he designed a "flat top beam antenna" that was rapidly adopted by radio amateurs worldwide. At the time of World War II he worked both at the Naval Ordnance Laboratory on magnetic-countermeasures and at the Radio Research Laboratory at Harvard on radar countermeasures. Throughout the book, Kraus-though, both at the time of the events related and in the retelling, comes through clearly.


In The Rockefeller Effect: How One Man Made a Difference, Theodore Rockwell presents a provocative portrait of the Rockefeller achievements of Admiral Hyman Rickover, recognized as the father of the nuclear Navy. Rockwell joined Rickover’s Naval Nuclear Propulsion Program in 1949, and worked with him throughout the fifteen-year period; Rickover supervised the creation of the Navy’s fleet of nuclear submarines and carriers, an accomplishment that shaped not only the Navy but also the energy of America’s nuclear power industry.

The "Rockefeller Effect" of the title refers to the remarkably widespread influence that Rockwell’s life work had on the Navy and beyond, in part to the high standards to which Rockwell held himself and those who worked with him. Rockwell’s detailed and insightful account illustrates Rockwell’s remarkable personal qualities and achievements and—for perhaps the first time—demonstrates his influence on the development of the nuclear power industry. Rockwell goes beyond his own experiences to explore the factors that led to his success.
And Don't Miss . . .

- The journal Measurement & Control has recently published a golden jubilee issue celebrating the 50th anniversary of Great Britain’s Institute of Measurement and Control in London. In addition to a summary history of the Institute, originally known as the Society of Instrument Technology, Ltd., the issue features several interesting historical papers. Among these are Chris Bissell’s “Spreading the word: aspects of the evolution of the language of measurement and control” and “Early Recollections” by Don Tallantyne. For more information about the issue, which bears cover date June 1994 (volume 24, number 5), contact The Institute of Measurement and Control, 87 Gower Street, London WC1E 6AA, Tel: 071 387 4949, Fax: 071 834 4831.

- A recent issue of the journal Cientia (volume 16, cover date 1993) contains a lengthy essay by Oliver Darrigo on the electronics of moving bodies from Faraday to Hertz. Cientia (ISSN 0010-8894) is printed in Denmark. Darrigo’s address is CNRS, 83 rue Broca, 75013, Paris, France.

- Anthony Gandy has recently completed a doctoral disser-
tation in which he investigates the reasons why the large electronics firms in the U.S. and the U.K. did not, generally, succeed in the emerging computer market during the 1950s and 60s.

- The issue includes fine articles by such firms as RCA, General Electric, Ferranti, EMI, English Electric, IBM, Burroughs, NCR, Sperry Rand, Honeywell, CDC, Utica and LEC. For more information contact Anthony Gandy, 1, Gore Road, Raynes Park, London, SW20 8NJ, England.

- Sigfrido Lechtiotta has published several articles on the early history of electrical research in Italy. Among these are “Indagini Sorticeli sui Culturali Italiani in Discipline Elettriche tra il 1800 ed il 1850” and “I Premi Centro Annio Delle Misure Elettriche (calze di seta, pailine di sambuco, rane et simili),” both of which Lechtiotta presented at conferences sponsored by the Consiglio Nazionale delle Ricerche and the Gruppo Museo Elettrotica ed Elettronica. For more information, contact Sigfrido Lechtiotta, Dipartimento di Elettronica, Politecnico di Torino, Corso Duca degli Abruzzi, 24, 10129-Torino, Italy.

- Major A. Johnson has recently published “Prospects in Defense and Space: A History of the Aerospace Group of the General Electric Company.” This book is called a “splendid effort” by radar historian Lewis Brown, gives a detailed administrative history of this important organization. The 656-page volume costs US $25. For more information, contact A. Johnson, 14 Pray Street, Rochester NH 03868-903.

- The history of the linking of the enormous electric power grids of America’s west and east is told in “Western Power System Interconnection,” a booklet recently published by Elmer F. Kaprielian. A veteran of 41 years of service with Pacific Gas and Electric, Kaprielian fills his 68-page booklet with recollections about his diverse career in power engineering. To order copies, contact the PG&E, 121 Post Street, San Francisco CA 94104.

- The National Air and Space Museum has announced that a “virtual” tour of the museum will be available on the World Wide Web. Included will be the latest text and photos from “Beyond the Limits,” the gallery that showcases the history of aviation/space and computer technology. Moreover, at various times Capuzzi will point to things that are “very much under construction,” and he invites interested parties to check out what they have done. There is a form for leaving comments. The World Wide Web URL (address) is http://cups. nasm.edu/2020/NASMAP.html (note: the URL is case-sensitive.)

- Codebreakers

On September 14-15, 1995, the U.S. Air Force Museum and Carillon Historical Park are co-hosting a reunion of personnel assigned to the U.S. Naval Computing Machine Laboratory at the National Cash Register Company in Dayton, Ohio during World War II. While the focus will be on the WAVES in the group, the reunion will also include all naval personnel associated with OP-20-G in Dayton and in Washington DC. The purpose is to honor both WAVES and OP-20-G, because of the secret nature of the work, were never given any public recognition. Both facilities, the U.S. Air Force Museum and Carillon Historical Park will mount exhibits highlighting the innovative work done by the UNICOM.

Those who were assigned to the OP-20-G project who are interested in attending should contact Mary Mathews, Carillon Historical Park, 201 S. Patterson Blvd, Dayton OH 45409.

- SHOT Mercurians

The Mercurians organized in 1986 for the purpose of generating networks among people who share work and interests in the history of communication technologies, defining the IBMA and the ERIE, and helping to create a new view in which he discussed his career in high-speed and multiplexed optical fiber communications research. In 1991, he earned his Ph.D. in electrical engineering from the University of Tokyo, where he earned his B.S., M.S. and Ph.D. degrees in electrical and electronic engineering. He is currently a professor of electrical and electronic engineering at the University of Tokyo. After he moved to Japan, he renewed his interest in the history of Japanese electrical engineering to help launch the Journal of the History of Electrical Engineering in Japan, his Japan Academy Prize.

- Whitney Museum

The Eli Whitney Museum in Hamden, Connecticut has opened an exhibit entitled “Gilbert & The Radio.” The exhibit explains how Gilbert, an early-twentieth-century toy manufacturer, undertook a brief experiment with radio. Connecticut’s first broadcast station in 1920 and thereby discovered the new medium’s power to reach the masses. For more information, contact the Eli Whitney Museum, 915 Whitney Avenue, Hamden, CT 06517, tel 203-772-7278.

- Townes Oral History

The Regional Oral History Office of the Bancroft Library, University of California, Berkeley, has completed an oral history of Charles Townes. The oral histo-
ry, with a transcript of 691 pages, documents the invention of the maser and the laser; the history of physics since the beginning of World War II; and develops for the reader the remarkable personal qualities which underlie Townes’ success as a scientist, an academic leader, and an advisor to government and industry. For more information, contact the Regional Oral History Office, 486 Library, University of California, Berkeley CA 94720, tel: (510) 642-3700.
CONFERENCES

Democracy & Communications

An international symposium on democracy and the culture of communication will be held at Case Western Reserve University in Cleveland, Ohio on April 28-29, 1995. This symposium will examine the relations between democracy and communications technologies, including the computer, telegraph, and printing press. Discussion will be conducted by leading scholars in the fields of history, anthropology, cultural studies, computer science and engineering, law, management, and political theory. Scheduled speakers include Catherine Bertholet, Richard John, and Bryan Pfaffenberger and Mark Poster. For more information, contact Mark Bowles, tel.: (216) 368-5599, fax: (216) 368-4681, Email: mjb@napo.org, or write to Professor Miriam Levin, Department of History, Case Western Reserve University, Cleveland, OH 44106.

Torres Quevedo Symposium

A symposium of the life, times, and work of Spanish computer pioneer Leonardo Torres Quevedo will be held on April 24-28, 1995. The language of the conference will be Castilian. For more information, contact Francisco A. Gonzalez Redondo, Edif. "Pablo Montesino", Facultad de Educacion (U.C.M.), c/Sanctis Trinidad, 37, 28010 Madrid, Spain, tel: 91 394 66 64, fax: 91 394 66 72.

FFOHEC '96

The next symposium of IFCHEC (International Federation of History of Technology) will take place in Budapest, Hungary, April 7-12, 1996, following the Society for the History of Technology meeting in London. The main theme will be “past, present, and future forms of communication,” dealing with media such as printing, printing press, film, radio, television, etc. There will be a session on national comparisons of microelectronics and the computer industry, with a special reference to Eastern Europe, including the influence of technology transfer. In addition, there will probably also be sessions on the relationship between communications and the role of comparison between different technological movements in various countries. For more information, contact Dr. Eva Viale, National Museum for Science and Technology, Kepirovića 13, H-Budapest P03111, Hungary.

IEE Summer Conference

The Institution of Electrical Engineers will hold its annual weekend history conference in Canterbury from July 7-9, 1995. For more information about the program, please contact Dr. Brian Bowers, Science Museum of London, South Kensington, London SW7 2DD, U.K.

IEEE History Conference

The principal target audience for most Center activities is the engineering commu- nity. However, the Center will sponsor a conference intended for all, those people who by training or employment professionally study the history of electrical technology. The conference will provide an opportunity for members of this professional community to get to know one another and to discuss methodological and historical issues at length.

The conference setting is informal, and to encourage that we have asked the conference to be held in a setting of vacation country in the Berkshire mountains of northwestern Massachusetts. The conference will be held on campus at Williams College, and all college facilities are open to participants who pay to stay in the dormitories, which are available at low cost.

If you are a professional historian interested in attending the conference, please contact the Center.

Telecommunications

The Third International Symposium on Telecommunications will be held in London on June 21-22, 1995 in Wilmington Delaware. Billed as a symposium “for those seriously interested in the history of telecommunications with an emphasis on telephony,” the meeting will include papers on topics such as telecommunications inventions, telephone engineering, biographies of telephone pioneers, economics, finance, competition, regulation, legal issues, or the effect of operating companies, long and local distance telephone companies, archives and museums, organization by technological material, and social changes brought about by advances in the art and science of telecommuni- cations. The registration fee will be under $100 per person. The symposium is being sponsored by the London Telephone Historical Information Centre Foundation and Telephone Collectors International, Inc. For more information, contact Russell A. Peir, 305 Cooper Road, North Blyton, NY 11703-4430, fax: 516 422-2324.

IEE Conference on 100 Years of Radio

The IEEE will hold a conference on 100 years of radio history on September 5-7, 1995 at the Institution’s headquarters in London. The conference will include seminars on the first steps in the application of the science of electromagnetic radiation and the development of components for practical radio communications. Since the 1890s there has been continued development in the complex field of radio engineering with a very wide variety of applications, along with the consequent developments in technology and in the impact of widespread and immediate availability of information on society and the world’s economies. A conference of this celebratory conference are to consider the development of radio, from the 1890s to the present day, with reference to the conditions (technical, financial, social, political and general) under which this development has taken place. Topics of the conference will include radio broadcast developments, broadcasting to the FAB, and other systems excluding television, HF communications (including SW beam systems), data radio systems, HF communications, satellite communications, microwave point-to-point communications, mobile and cellular radio, amateur radio, LF and VF communications, receiver and trans- mitter development, antennas and propa- gation, development in components (including miniaturization), social origins and social effects. For further information, contact HyB95 Secretariat, Conference Services, The Institution of Electrical Engineers, Savoy Place, London WC2R 0BL, tel: 071 344 5472, 5473, 5474, 5475, 5673, Email conference.ieee.org.uk.

NASA

The discoveries of Carl Janovsky and Zdenek Reber, often cited as the starting point of radio astronomy, launched the modern era of telecommunications. In the past, the ionosphere defined the limits of radio com- munications by reflecting off the ionosphere and reflecting off satellites rather than the ionosphere, broadband telecommunications has entered a new age. "Beyond the ionosphere," a conference to be held October 17-18, 1995, at NASA head- quarters in Washington, DC, will deal with the first attempts to go outside of the ionosphere, including the earliest stages of the moon as a passive, natural relay satellite and project Echo, as well as current telecommunications using man-made meters in gooch atmosphere around earth. It will deal with both American and non-U.S. satellite telecommunications, his- tories of satellite communications and international telecommuni- cations, the role of government agencies such as NASA, the ESA, and the British Foreign Office, state-to-state communications (such as France Telecom), and research labora- tories. For more information, contact Roger Launus, Code KCH, NASA Headquarters, Washington DC 20546, tel: 202 358-0384, 202 358-2666, Email: retailus@kch.nasa.gov.

IUhP

The 200th International Congress of History of Science, Technology, and Industry, Union of History and Philosophy of Science, has already been scheduled to take place on July 26-31, 1997 in Buenos Aires, under the auspices of the University of Liége in Belgium. The theme of the conference will be Science, Technology, and Industry. For more information, contact Congress Office, Centre E-13, 03101 Rebecq-Corbonnel, University of Liége, Avenue de Tilleuls 13, B-4000 Liége, Belgium, tel: 32 41/69.49.79, fax: 32 41/69.49.47.

Computers in France

An international colloquium on history of computer science will be held in Rennes, France on November 14-15, 1995. The colloquium, which is the fourth in a series that includes previous meetings in Grenoble (May 1988), Paris (April 1989), and Sophia-Antipolis (October 1993), will focus on the themes of communications between persons, machines, and systems, and data processing and the military. Presentations will be made by historians as well as the scientists, engineers, and managers responsible for the development and application of computers in government, university, and private contexts. All papers will reflect rigorous historical methodology. The language of the colloquium will be French, but papers on computer history in other countries are encouraged by the review committee. For more information, contact Jacques André, IRISA/INRIA-Research, Campus Universitaire de Beaulieu, 35042 Rennes Cedex, France, tel: (33) 99 84 72 51, fax: (33) 99 84 71 71, Email: chir@irisa.fr.
Region 3 History Available

A history of Region 3 of the IEEE, covering the southeast United States, has been prepared by W.L. Sullivan, region director in 1974-75. Sullivan's manuscript covers the period from 1963, when the region was organized under the new IEEE, to the present day. The narrative history is over 65 single spaced pages, supplemented by several charts and appendices that give useful information in convenient tabular form. The manuscript has not yet been published, but it is available in hard copy or on disk. Plans are underway to post the document on an electronic bulletin board, allowing connected users to easily download the file. For more information, contact W.L. Sullivan, 2960 Green Valley Rd., Snellville GA 30078.

'95-'96 Fellowship Goes to Morton

The 1995-96 IEEE Fellowship in Electrical History has been awarded to David Morton. Mr. Morton is writing a doctoral dissertation at the Georgia Institute of Technology on the history of magnetic recording. His research, which investigates the magnetic recording industry in the American south, has resulted in a recent article, "The Rusty Ribbon: John Herbert Orr and the Making of Magnetic Recording Industry, 1943-1960," which Morton published in the Winter 1993 issue of Business History Review. The Fellowship is made possible by the generous support of the IEEE Life Member Fund.

Partnership Program

We are grateful to the organizations and individuals listed below who provide generous support to the Center in the form of operating, endowment, and project funding. If you or your organization are interested in joining our Partnership Program, please contact the Director, Dr. William Aspray.

Founding Partners:
- IEEE
- Rutgers University
- IBM Corporation
- IEEE Foundation - General Fund
- IEEE Foundation - Life Member Fund
- Andrew W. Mellon Foundation
- Alfred P. Sloan Foundation

Senior Partners:
- National Science Foundation

Partners:
- AT&T Foundation
- Electron Devices Society
- Magnetics Society
- Power Engineering Society
- Signal Processing Society

Colleagues
- Control Systems Society
- Microwave Theory and Techniques Society

Associates:
- Antennas and Propagation Society
- Laurence R. Avins
- Electro-Mechanics Company
- Environmental Research Institute of Michigan
- KBR Foundation
- Joseph F. Keithley
- Eiichi Ohno
- Sematech
- Takashi Sugiyama

We are also grateful to the thousands of individuals and institutions who make annual contributions to our Friends Fund.

New Associate

We welcome Eiichi Ohno of the Mitsubishi Electric Corporation as the newest member of our Partnership Program.