

IN MEMORIAM

HERBERT H. WOODSON

Herbert Woodson was born in Stamford, Texas, in 1925. After graduating from Lubbock High School in 1942, he enlisted in the United States Navy where he served as a radio operator in the Pacific during World War II. After being honorably discharged as an Electronic Technician's Mate First Class in 1946, he enrolled at the Massachusetts Institute of Technology (MIT) in 1947 and received his bachelor's and master's degrees simultaneously in 1952. He then spent two years at the Naval Ordnance Laboratory, before returning to MIT in 1954 and receiving his Doctor of Science degree in electrical engineering. Herb joined the electrical engineering faculty at MIT in 1956.

Herb worked on magnetohydrodynamics and electromagnetic power generation, including novel systems such as the use of superconductors in the field windings of large synchronous machines (*IEEE Transactions on Power Apparatus and Systems*, March 1971, p.620). He also wrote the three-volume book *Electromechanical Dynamics* with his graduate student James Melcher (Wiley, 1968), which is still used in MIT's OpenCourseWare. Herb was the first Director of MIT's Electric Power Systems Laboratory, an interdepartmental lab in the School of Engineering. He was also the first Phillip Sporn Professor, a position named for the president of the American Gas and Electric Company.

Joining the faculty of The University of Texas at Austin in 1971, Herb served as a Professor and the Chairman of the Department of Electrical Engineering from 1971 to 1981. He continued his development of research programs in the fields of energy and electric power, receiving funding from the Electric Power Research Institute (EPRI) and other sources in government and industry.

He served as founding Director of the Center for Energy Studies (CES) from 1982 to 1988 and was also Director of the Center for Fusion Engineering (CFE) from 1982 to 1988.

In the early 1970s, Herb met with Bill Drummond (Professor of Physics and Director of the Fusion Research Center [FRC]) and suggested the use of a homopolar generator as a pulsed power supply for the toroidal magnets of a tokamak reactor. The original funding came from the Texas Atomic Energy Research Foundation (TAERF), a group of Texas electric utilities that funded fusion research. Professor Grady Rylander (Department of Mechanical Engineering) became involved when they decided to build a small pulsed homopolar machine. Bill Weldon joined the homopolar group as a graduate student in 1973. The growing team travelled together to raise funding for the effort, mainly from TAERF and the Department of Energy ([DOE], which was at that time the Energy Research and Development Administration [ERDA]). Their funding doubled each year from the original \$50k TAERF grant, and the Energy Storage Group became the Center for Electromechanics (CEM) in 1977, with Grady Rylander as Director, Herb as Associate Director, and Weldon as Technical Director. It was Herb's idea to form CEM, and he came up with the name. Grady was made Director because Herb was already Director of the Center for Energy Studies. Weldon became Director in 1985. A leader in the creation of CEM, Herb remained technically involved even after becoming Dean. He also was CEM's primary link with the UT Austin administration through Provost Gerry Fonken. Herb and Grady were the ones who got the CEM/CES building approved, again working with Dean Gloyna and Provost Fonken.

In the early 1980s, Herb formed the Center for Fusion Engineering (CFE). This center formed a triad with the two existing UT Austin fusion centers: the Institute for Fusion Studies (IFS), a theory group, and the Fusion Research Center (FRC), an experimental group. Herb served as Interim Director of the CFE from 1982 to 1988. One major result was the IGNITEX concept,

proposed by Marshall Rosenbluth (IFS), William Weldon (CFE), and Herb. This was a compact thermonuclear fusion device, with the potential to produce and control ignited plasmas with relative simplicity and low cost. It used the tokamak toroidal geometry, still the leading contender for a fusion machine today. The most novel feature of their concept was a single-turn main toroidal field coil, powered by homopolar generators. Herb also pioneered high performance, practical, homopolar generators. The low impedance of the magnetic field coils and generator output was a perfect combination, providing simplicity and low cost. Funding was obtained from the Texas Higher Education Coordinating Board Advanced Technology Program and other sources, and several prototype devices were built and tested.

Herb served as Interim Dean of the College of Engineering for the academic year 1987-88, and was then appointed the sixth Dean of the college, serving for eight years, from 1988 to 1996.

Herb's years as Dean were marked by growth and innovation. Outstanding faculty were recruited and promoted, and new scholarships and fellowships were established for undergraduate and graduate students. The University's Thrust 2000 program added more than 120 graduate student fellowships, with an original endowment of about \$12-13 million. Recognizing that all students benefit from having a cadre of very well prepared and hard-working peers in every class, Herb used the endowed scholarships to recruit National Merit Scholars and other top students, particularly from Texas high schools. He convinced members of the college's Engineering Advisory Board to host such students at their company facilities for an evening of food and learning about UT Austin's academic programs. Herb and his staff from the Student Affairs Office, department chairs, and faculty regaled the students with information and inspiration about the College of Engineering (now the Cockrell School of Engineering). This program was highly effective in recruiting top-quality students.

Also, new programs were established to enable students to succeed. In 1991, a group of female faculty and staff members proposed to Dean Woodson the establishment of a Women in Engineering Program (WEP). They were prepared with logical reasons for such a program, but Herb surprised them with a quick, “let’s do it!” He also agreed to fund the program. The WEP quickly became an important feature of the college’s outreach to female students, with many programs to help them succeed.

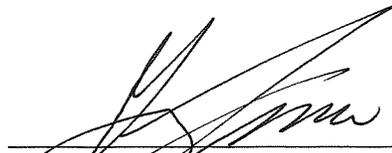
Herb also played an important role in establishing a new Department of Biomedical Engineering. The College of Engineering had a biomedical engineering graduate program dating back to 1963, but as that program developed it became clear that a department was needed. About 1996, Herb asked Ken Diller, Rebecca Richards-Kortum, and Grady Rylander (son of Rylander mentioned above) to write a white paper, which ultimately evolved into a proposal to the Whitaker Foundation, which provided seed money for a new biomedical engineering department. Dean Woodson’s efforts to establish this department were forwarded by his successor, Dean Ben Streetman. With the support of the Whitaker grant and the UT System, the Department of Biomedical Engineering and the undergraduate biomedical engineering program were established in 2001, and a new biomedical engineering building was built in 2008.

During his distinguished career, Herb authored multiple textbooks and registered numerous patents. He represented the U.S. at the US-USSR Joint Commission on Technological and Scientific Cooperation in 1972. In 1970, he was elevated to Institute of Electrical and Electronics Engineers (IEEE) Fellow “for contributions to teaching and research in the areas of energy conversion, electric machinery, and power systems technology.”

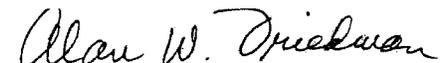
He served as President of the IEEE Power and Energy Society in 1978 to 1979. In 1984, he was the recipient of the IEEE Nikola Tesla Award “for contributions to power generation

technology, particularly in superconducting generators and magnetohydrodynamic generators.” He received the Engineer of the Year Award from the National Society of Professional Engineers in 1990. In 1998, he received the IEEE Lamme Medal “for leadership in research and technology in the field of pulsed power and energy conversion systems.” He was elected to the National Academy of Engineering in 1975 with the citation “for contributions to education in electromechanics and power systems, and to advancing rotating machinery technology.”

Herb Woodson died in Fort Worth, Texas, on November 30, 2018.



Gregory L. Fenves, President
The University of Texas at Austin



Alan W. Friedman, Secretary
The General Faculty

This memorial resolution was prepared by a special committee consisting of Dean Emeritus Ben Streetman (Chair), and Professors Jacob Abraham, Alan Bovik, Gary Hallock, and Dean Neikirk.