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In Memoriam—Werner E. L. Haas

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Werner E. L. Haas, senior research fellow (retired) at Xerox Corporation, pioneer in LCD technology, and prolific inventor died suddenly of a heart attack on March 30, 2008. He was 79.

Haas was born September 14, 1928, in Germany. In the mid-1930s, he fled with his family to Austria, Czechoslovakia, and Italy, before finally settling in Portugal, where he lived for 20 years. While there, he earned a Masters degree in Physics—with a specialization in Mineralogy—from the University of Lisbon and met his wife, Maria, a graduate student in Romance Languages.

In 1958, the Haases immigrated to the United States and Werner worked at Philco, conducting research in the burgeoning area of semiconductors. In 1966, he took a job with Xerox Corporation in Webster, New York, lured there by Gary Lucovsky, a former Philco colleague. It was in Webster that Werner and Marie raised their three sons, George, Rene, and John.

At Xerox, Haas began research in the new field of liquid crystal display (LCD) technology, long before LCDs were introduced commercially via the 1973 Casio watch twisted nematic, and when the field was looking for creative solutions to new liquid crystal effects and to the practical problems of making commercially viable displays.

From 1966-1972, Haas and his collaborator, the late Jim Adams, created a substantial portfolio of LCD technology patents; by the end of his career at Xerox, Haas had been awarded 60 US patents, most of which were related to this technology. Among his many contributions to LCD technology was the development of one of the early liquid crystal light valves.

Although his initial work on display technology ended in 1972, Haas' research returned to this theme several more times during his career. In 1979, the Webster Research Center established the Large Area Electronics Facility (LAEF), in part to work on display technologies and Haas contributed to efforts to integrate LCDs with thin film transistors. In 1983, he published a review article "Liquid Crystal Display Technology, the First Fifteen Years" in the journal *Molecular Crystals and Liquid Crystals*. And, in the three years prior to his retirement, he worked on the development of light valves for color projection displays. Haas was elected a Fellow of the Society for Information Display (SID) for his pioneering work in this arena.

During the 1970s, Haas' research moved toward non-impact printing technologies. In 1971, Haas published a review of these technologies that received an "outstanding paper" award from SID and in 1973, he became involved in large development programs for high-speed continuous ink jet printers. He later moved to a management position, eventually becoming a laboratory manager within the Webster Research Center. In this capacity he managed a number of programs in various printing technologies including the first printer prototypes within Xerox that used the semiconductor lasers that are now ubiquitous in laser printers. Haas also managed projects in electro-optic light valve technologies and was an early advocate of the development of highlight color printing.

In the 1980s, Haas managed the research team that completed the technology demonstration project that led to the Xerox 4850 and 4890 highlight color printers that were introduced to the market in 1991 and 1993, respectively. His review "Non-Impact Printing Technologies" published in 1989 as a book chapter was widely referenced.

In the years immediately following his retirement in 1994, Haas was a technical advisor and expert witness in a patent infringement suit regarding LCD technology in which one of his patents was referenced.

Haas joined SPSE (now IS&T) in 1969, became a Fellow in 1985, a Senior Member in 1991, and later an Emeritus Member. His service to IS&T was extensive. He served as General Chair for the Second Non-Impact Printing Conference (NIP 2) in 1984, was Chair of the Advisory Board for NIP 3 and NIP 4, and an Advisory Committee member for NIP 6. Haas served in a variety of IS&T Board positions including Engineering Vice President (1985-1988), Conference Vice President (1988-1990), and Vice President (1990-1992).

He also served on the editorial board of *Applied Physics Communications*.

Haas was valued for his perspective and keen insights into the strengths and weaknesses of various printing technologies. He valued analytical rigor in project development and practical solutions, serving as a mentor, supporter, and advocate for a number of technologists who worked with him. Haas was noted for his wry humor and sense of timing. When discussions stalled or tension was in the air, a few humorous comments regarding the situation from him could bring a team beyond the stalled discussion to a flood of new ideas. He will be greatly missed by his family, friends, and colleagues.

—John R. Andrews, principal scientist, Xerox Corporation