



## IN MEMORIAM

Robert Stratman Elliott  
Professor of Electrical Engineering  
UC Los Angeles  
1921- 2009

Prof. Robert S. Elliott was born on March 9, 1921, in Brooklyn, NY, and died on September 24, 2009, in Los Angeles, California, at the age of 88. He is survived by his loving wife Barbara, daughters Paula and Laura, sons Jeff and Greg, and four grandchildren.

Bob Elliott graduated from Columbia University with an A.B. in English literature in 1942 and a B.S. in electrical engineering in 1943. The following three years he was with the Naval Ordnance Laboratory and the Johns Hopkins Applied Physics Laboratory, working on acoustic mines, the proximity fuze, and radar. After the end of World War II, he entered graduate school at the University of Illinois at Urbana- Champaign and earned M.S. and Ph.D. degrees in electrical engineering. The members of his class were recruited to help teach the enormous influx of returning G.I.'s into the university. His Ph.D. dissertation completed in 1952 "On the Maximum Frequency of Coherent Oscillations", though a mere 12 pages long, was considered by him as one of his most important research accomplishments. Its conclusion that electron beam oscillators are inherently incapable of generating coherent oscillations at optical frequencies has been considered as a major incentive for the subsequent development of the laser.

During the Korean War Bob returned to the Naval Ordnance Laboratory for a while as Lt. Elliott, but he was already thinking of an academic career and simultaneously took the opportunity to teach part- time at the University of Maryland. After his discharge from the Navy in 1953, he accepted an offer to work for the Hughes Aircraft Company's Microwave Laboratory in Los Angeles on Antenna Research. There, under Lester Van Atta, and in the stimulating company of Tom Taylor, Sam Sensiper, Ken Kelly, Lou Kurtz and others, he headed antenna research for 3 years, obtaining fundamental results on surface wave propagation that led to a beacon antenna, and also initiated his work on slot arrays. This experience was extremely gratifying, and he remained in contact with the Hughes Aircraft Company throughout much of his life - his book *Antenna Theory and Design*, published in 1981, was dedicated to Hughes. He started teaching graduate classes on antennas at UCLA, and in 1957, a year after he had left Hughes to help set up Rantec Corporation, he joined the UCLA School of Engineering as Associate Professor. By 1959 he had been promoted to Full Professor, and in 1968 he became the first Chair of the newly created Electrical Engineering Department. Over the years, his success as an educator received recognition from UCLA students and alumni in the form of a dozen Best Instructor, Most Stimulating Instructor, Teacher of the Year, Distinguished Teaching, and Distinguished Professor awards. Outside UCLA he was the first IEEE member, the premier professional Society of Electrical Engineers to be appointed Distinguished Lecturer on two occasions, and in 1988 his citations upon receipt of the IEEE Antenna and Propagation Society Distinguished Achievement Award and upon election to the National Academy of Engineering emphasized his skill and outstanding leadership in engineering education. His philosophy of learning is reflected in the preface of his classic 1966 textbook *Electromagnetics: History, Theory and Applications*, a work that achieved the apparent paradox of being both

unfashionably historical and also ahead of its time (in spite of notable precedents) in using special relativity to develop the subject from the very beginning:

Without the historical background, the reader of a technical exposition often is left with a bland reaction to his first encounter with a new physical concept. Yet, more often than not, there is behind this concept a rich heritage of thought, as outstanding human minds have struggled to identify the concept and clarify it. Awareness of this heritage instills added respect for each new principle and reveals an important lesson which all scientific history teaches - that complete understanding is rarely attained and that the struggle for clarity is still going on.

This deeply humanist attitude clearly displays the broad curiosity and intelligence that was exemplified by his acquisition of an M.A. in economics from the University of California, Santa Barbara, in 1971, and was manifest in his continuing love of literature, the object of his first academic studies.

After joining UCLA, Bob's main research interests continued in the field of microwave slot antennas, microstrip array antennas, and antenna array pattern synthesis in general, though he also made incursions into plasma physics and the thermo- therapeutic possibilities of radiofrequency radiation. Together with his students and colleagues, Bob contributed analyses that are fundamental for taking mutual coupling into account in the design of properly matched antennas; and in pattern synthesis he published papers that clarified the mathematical structure of pattern synthesis problems while exploiting that structure to obtain optimal solutions with detailed control over pattern characteristics (shape, ripple, sidelobe level). These efforts led to IEEE prize paper awards in 1981 (with George Stern), 1983, and 1991 (with Shahrokh Hashemi- Yeganeh), and were incorporated in his textbooks *Antenna Theory and Design* (1981) and *An Introduction to Guided Waves and Microwave Circuits* (1993). As interests in the antenna world widened from ground and airborne antennas to embrace satellite- borne systems, and as the manual desktop calculator gave way to the modern computer, he maintained a clear vision of the essential problems and the need to exploit the available computational resources as efficiently as possible in their solution. Shortly before his retirement in 1991, he was honored by UCLA by election to the newly created Hughes Distinguished Chair in Electromagnetics.

His success as an academic leader helped enormously to create at UCLA a premier engineering school and he also contributed to the formation and growth of the Electrical Engineering Department at UCLA. He was the first Chair of the Department. He was also a very effective leader and was the role model for the junior faculty and staff. He served UCLA as an academic administrator and as an effective Academic Senate member in numerous ways. He had high standards and expected the faculty and students to maintain a very high standard of performance. He was known for his integrity and ethical standards.

An IEEE Fellow since 1961, he helped organize the AP/ URSI International Symposia held in Los Angeles in 1971 and 1981 (heading the 1981 Coordinating Committee); Chair of the Los Angeles APS Chapter and served on the APS Administrative Committee (1980-1983); gave talks all over the world as Distinguished Lecturer; and from 1987 to 1990 was Chair of USNC- URSI Commission B. His service and accomplishments were recognized with an APS Distinguished Achievement Award (1988) and an IEEE Third Millennium Medal (2000).

Professor Elliott will be remembered by dozens of his former M.S. and Ph.D. students, thousands of former undergraduate students, and numerous colleagues; there is sadness for the loss of a man of unfailing good cheer, a trusty source of sound advice and inspiring encouragement, a friend indeed: Bob Elliott.

Paula Elliott (daughter)

Greg S Elliott (Son)

Jeff Elliott (Son)

Francisco Ares (Professor in Spain)

Sembiam R. Rengarajan (Professor at CSUN)

Chand Viswanathan (Professor at UCLA)

Yahya Rahmat- Samii (Professor at UCLA and Chair of the Committee)