

# Obituary

## James R. Wait

### Electromagnetic Scientist and Educator



(January 23, 1924–October 1, 1998)

**J**AMES R. WAIT, Regents Professor Emeritus, University of Arizona, died October 1, 1998, in Tucson, AZ. He was 74. He received the B.A.Sc. and M.A.Sc. degrees in engineering physics in 1948 and 1949, respectively, and the Ph.D. degree in electromagnetic theory in 1951, all from the University of Toronto, Ontario, Canada. His Ph.D. dissertation was based in part on research in electromagnetic methods in geophysics.

From 1942 to 1945, he served as a Radar Technician in the Canadian Army. He began his distinguished career with Newmont Exploration, Ltd., Jerome, AZ, in 1948. In 1952, he returned to Canada where he became a Section Leader at the Defense Research Telecommunications Establishment in Ottawa, Canada. One of the papers he had written during this period concerned scattering from an ionized cylinder. The paper is now a Citation Classic. In 1955 he joined the National Bureau of Standards in Boulder, CO, and subsequently served as a Senior Scientist at the National Oceanic and Atmospheric Administration, Professor Adjoint in the Electrical Engineering Department at the University of Colorado, Consultant to the Institute for Telecommunications, and founding member and Fellow of the Cooperative Institute for Research in Environmental Sciences. This was widely felt to be the golden age of telecommunications, radio wave propagation, and remote sensing at the government laboratories in Boulder. Dr. Wait made fundamental contributions in all these areas during this period. In addition, in 1975, he was instrumental in the creation of the journal *Radio Science*. He was the first editor of that journal, serving three successive terms. In 1980 he moved to Tucson, AZ, where he became a

Professor of Electrical and Computer Engineering with a joint appointment in the Department of Geosciences at the University of Arizona. During this period he was instrumental in the growth of the Electromagnetics Laboratory into a world-class facility. In addition to electromagnetic applications in geoscience, he was also very active in studies of lightning and atmospheric electricity. Some of his last papers were on the effects of “sprites” in the middle atmosphere, the electromagnetic fields produced by lightning, and the coupling of the lightning electromagnetic pulse (LEMP) to power lines. In recognition of his superior research and teaching influence, he was appointed to the prestigious position of Regents Professor in 1988. In 1989 he retired from the university to become a private consultant, specializing in electromagnetic methods and their use in subsurface probing. He was a pioneer in electromagnetic theory, with application to geophysical exploration. In particular, his writings on layered media and on induced polarization are well known and widely cited throughout the world. He was the author of eight books and more than 800 publications in archival journals. He was a frequent speaker at universities, companies, and government laboratories throughout the world.

Dr. Wait has received numerous awards for his research in electromagnetics and electrical geophysics, including the IEEE Centennial Medal in 1984, the IEEE Geoscience and Remote Sensing Achievement Award in 1985, the IEEE Antennas and Propagation Distinguished Achievement Award in 1990, and the IEEE Heinrich Hertz Medal in 1992. He was elected to the National Academy of Engineering in 1977 and received the Balh van der Pol Gold Medal from the International Union of Radio Science in 1978. In 1993 he was elected an honorary member of the Society of Exploration Geophysicists.

Dr. Wait's influence upon his colleagues and students is remarkable. Samples from the many tributes received honoring his life and demonstrating his influence include the following:

"Jim was one of the nicest people that I have ever met. His demise is such a great loss to the engineering community and to humankind in general."

"In spite of (the magnitude of) his contribution to electromagnetic science, he was a very modest man; a true scientist ..."

"He was truly one of the greats of his (our) time and one of the most prolific in substantive contributions. His consistent support and helping hand to those newly entering the field was also outstanding. Jim could be a tough critic, but he never bore down on a novice in a meeting, no matter how naive the presentation. I always admired that quality in him ..."

"He was a tremendous resource for those of us involved in electromagnetic geophysics ... Jim's work was revolutionary and laid the foundation for the development that occurred in mining geophysics ... much of this kind of mineral exploration is based on the theoretical studies that Jim did in the 1950's. He did very important work and it still has a great deal of impact on people's lives."

"We were not close, but he helped me unselfishly once and I've never forgotten his kindness."

"... I will undoubtedly fall short of expressing how much Jim meant to me, how much of an influence he has had in my life, and how I feel it is a privilege to, in some small way, carry on his legacy. I sincerely believe that our lives on earth continue in the lives of those we touch. I am very sorry I did not tell Jim this directly."

"... as a young researcher, ... I introduced myself to him ... I was very impressed by his interest in a young unknown person and his complete lack of pretentiousness."

"I still remember how nice he was to me the first time I met him at the 1973 Boulder meeting when I was still a grad student. I, of course, was in awe of him just from his reputation, but he never treated me as anything but an equal. He sought me out and

talked to me about the work I had presented. I still remember what a seemingly humble man he was ... he didn't seem to feel that it was necessary to act like the superstar that he clearly was."

"I first met him in the late 1950's when he was already recognized as a top expert in electromagnetics and radio wave propagation ... He was a true scholar and gentleman. He cared about people and gave us immeasurable help and encouragement. We will miss this giant."

"I was so sorry to hear of the death of Jim Wait. I have known Jim since my days in England in the mid-fifties and it was he who encouraged me to come to the United States. He was one of the first people I visited after I came here and I will miss him as a friend and as a scientist whose knowledge and productivity always amazed me."

In addition to his scientific pursuits, Professor Wait was an avid hiker, biker, swimmer, and expert skier. He was also very interested in the history of radio science. In particular he was fascinated with the practical applications of electromagnetics attributable to Guglielmo Marconi, having visited Marconi's house near Bologna, Italy, and the sites of Marconi's experiments in the United Kingdom and Canada. Surviving are his wife, Gertrude, his son, George, his daughter, Laura, and three grandchildren: James, Carolyn, and Connor. A memorial session is being planned in his honor at the National Radio Science Meeting in Boulder, CO, in the year 2000.

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