



Steve + Chiffon

STEVEN F. CLIFFORD

1943–2007

Elected in 1997

“For contributions to the understanding of electromagnetic and acoustic propagation in random media, leading to the development of new sensing techniques.”

BY RICHARD G. STRAUCH

STEVEN F. CLIFFORD, Research Scientist Emeritus, University of Colorado Cooperative Institute for Research in Environmental Sciences (CIRES), died on September 18, 2007, at the age of 64. He was the former director of the National Oceanic and Atmospheric Administration (NOAA) Environmental Technology Laboratory (ETL) and a distinguished scientist in the field of electromagnetic and acoustic wave propagation in random media. He was elected to the NAE in 1997.

Steve was born in Boston, Massachusetts, on January 4, 1943. He graduated from Boston College High School, and in 1965 he received a B.S. in electrical engineering from Northeastern University. He received his Ph.D. in engineering science (theoretical physics) from Dartmouth College in 1969. His dissertation, “Wave Propagation in a Turbulent Medium,” written under the supervision of Professor John Strohbehm, marked his entrance into the field in which he would earn his scientific credentials and an international reputation.

Steve began his career in 1969 as a National Science Foundation postdoctoral research associate with the Wave Propagation Laboratory (WPL) of the Environmental Science Services Administration, the precursor of NOAA. For more than three decades he published widely on topics related to the physics of wave propagation and scattering in random media and the remote sensing of the atmosphere and oceans. Five of

his publications received NOAA's Outstanding Paper Award.

His publications on theoretical subjects and their applications to ground-based remote-sensing techniques and instrumentation numbered more than 130 and appeared in optical, acoustic, and radio journals. They include work on optical scintillation that led to laser wind-measurement devices and laser weather identifiers; the development of the theoretical limitations for Radio Acoustic Sounding Systems (RASS) that led to the implementation of RASS on radar wind profilers; studies of acoustic propagation in the ocean and acoustic scintillation that led to ocean current measurement instrumentation; and work in atmospheric acoustics that contributed to the understanding and interpretation of acoustic echo sounder records. His three patents relate to applications of propagation in turbulent media to acoustic and optical remote sensors.

From 1969 to 1982, he was a physicist with WPL, and from 1982 to 1986, he was chief of the Propagation Studies Program Area in WPL. In 1986, he succeeded C. Gordon Little, founding director of WPL; he was director of ETL (formerly WPL) until his retirement from NOAA in 2001. He was appointed Research Scientist Emeritus at CIRES in 2001.

The breadth and depth of Steve's scientific achievements earned him many honors and awards. He was elected a fellow of the Optical Society of America at age 31, a fellow of the Acoustical Society of America at age 40, and an NAE member at age 54. He was also a Senior Member of IEEE and a member of the American Physical Society, American Meteorological Society, and American Geophysical Union.

Steve was a 1986 graduate of the Program for Senior Managers in Government at the Harvard University John F. Kennedy School of Government. In 1998, he received the Meritorious Presidential Rank Award for exceptional long-term service as a senior executive. In January 2000, he was appointed to the National Research Council/National Academy of Sciences (NRC/NAS) Board on Atmospheric Sciences and Climate (BASC), and he was chair of the NRC/NAS workshop on Weather Forecasting Accuracy for Federal Aviation Administration Traffic Flow Management, a member of the

NRC/NAS Panel on Tools for Tracking Chemical/Biological/Nuclear Releases in the Atmosphere, and a member of the NRC/NAS Committee on Future Directions in Weather Modification Research.

In 1989, he led the first American delegation to visit the closed city of Tomsk, Siberia, and he organized exchange agreements with the Institute of Atmospheric Optics in Tomsk, the Main Geophysical Observatory in Leningrad, and the Institute for Atmospheric Physics in Moscow. He was particularly gratified when, through his efforts, a team of scientists headed by Academician Valeryan Tatarskii relocated to Boulder, Colorado, to collaborate with ETL scientists on fundamental studies of propagation and scattering phenomena.

Sports were always an integral part of Steve's life. As a younger man, he excelled at baseball and enjoyed basketball and skiing. As many colleagues can attest, he remained a formidable opponent at the dart board. As years passed and he no longer actively participated in team sports, he continued to be an enthusiastic fan of his favorite teams. He was also an avid world traveler and crossword puzzler.

Steve Clifford had a profound influence upon, and was integral to the success of many family members, friends, and colleagues. A brilliant mentor in all areas of life and a perfect companion to his wife Terri, he will be missed immensely. His brilliant mind, sense of humor, work ethic, gentle and unassuming manner, and kindness will live on in the memories of everyone who knew him. He will be remembered by all as a significant and wonderful person in their lives.

Steven is survived by his wife, Theresa Kavanagh (Terri), children, Cheryl Clifford Rapoza (Jim), of Weymouth, Massachusetts; David Clifford (Elisabeth), of Los Angeles, California; Michelle Clifford, (Bill Held), of Boulder, Colorado; grandchildren, Zachary, 4, and Alyssa, 2; and stepchildren, Alison Collins of Boulder and Kristopher Collins of Denver. Steven will also be remembered by his brother, Robert Clifford and his wife Betsy of Hingham, Massachusetts; his 92 year old father, J. Nelson Clifford, who resides in San Diego, California; and his former wife, Jane Parks, of Thornton, Colorado. He was preceded in death by his mother, M. Dorothy Clifford, in 1998.