John Kirk Wolf

JACK KEIL WOLF

1935–2011

Elected in 1993

*"For contributions to information theory, communication theory,
magnetic recording, and engineering education."*

BY ROBERTO PADOVANI AND PAUL H. SIEGEL

JACK KEIL WOLF, a pioneer and technical leader in information theory, coding theory, communication theory, and their applications in modern information technology, died on May 12, 2011, in San Diego, California, at age 76. He had amyloidosis.

Jack Wolf was born in Newark, New Jersey, on March 14, 1935. After "surviving" high school in Newark, as he would say with a smile, he received his BS in electrical engineering from the University of Pennsylvania in 1956. He completed his graduate studies at Princeton, where he received MSE, MA, and PhD degrees in 1957, 1958, and 1960, respectively.

Jack's first job was as a lieutenant in the US Air Force, working at the Rome Air Development Center in Rome, New York. At the same time, he was a part-time instructor at nearby Syracuse University, which offered graduate courses at the Griffiss Air Base where Jack was stationed.

After leaving the Air Force, Jack entered a long and illustrious academic career, beginning with a position at New York University, where he was a member of the Electrical Engineering Department from 1963 to 1965, when he joined the Polytechnic Institute of Brooklyn. In 1973 he left to chair (for two years) the Electrical and Computer Engineering Department at the University of Massachusetts, Amherst, where he stayed until 1984.

In 1984 he joined the faculty in the Department of Electrical and Computer Engineering at the University of California, San Diego (UCSD), in La Jolla. He was appointed to an endowed chair at the newly established Center for Magnetic Recording Research. In 1993, at Jack's suggestion, the chair was renamed the Stephen O. Rice Chair in Magnetic Recording Research in honor and memory of Stephen Rice, another pioneer in communication theory and a UCSD colleague. Jack was also vice president of technology at Qualcomm Incorporated; he joined as a consultant in 1985 and became a part-time employee in 1991.

Over the course of his career Jack published more than 100 journal papers and was granted patents on 23 inventions in communications and storage technology, many of which were embodied in commercial products.

Jack Wolf received many awards recognizing his technical contributions in the broad range of areas captured in the NAE citation: information theory, communication theory, magnetic recording, and engineering education. In 1975 he was co-recipient (with David Slepian) of the Information Theory Group Paper Award for the paper "Noiseless Coding for Correlated Information Sources." The main result of the paper, generally known as the Slepian-Wolf theorem, establishes fundamental limits on efficient distributed source coding and is considered one of the pillars of information theory. It has inspired numerous advances in both the theory and practice of data compression, with new and unforeseen applications—such as in sensor network design—that are still emerging.

In 1990, Jack was honored with the IEEE Communications Society E.H. Armstrong Achievement Award for "outstanding contributions over a period of years in the field of communications technology." He also shared (with Brian Marcus and Paul Siegel) the 1993 IEEE Communications Society Leonard G. Abraham Prize Paper Award for "Finite-State Modulation Codes for Data Storage." In 2001 he was awarded the highest technical honor bestowed by the IEEE Information Theory Society, the Claude E. Shannon Award, and in 2007 his long record of leadership and service to the

Information Theory Society was acknowledged with the Aaron D. Wyner Distinguished Service Award.

Jack Wolf's sustained contributions to the two engineering disciplines of digital communications and magnetic recording were recognized by major IEEE-level awards: the 1998 IEEE Koji Kobayashi Computers and Communications Technical Field Award, for "fundamental contributions to multi-user communications and applications of coding theory to magnetic data storage devices," and the 2004 IEEE Richard W. Hamming Medal, for "fundamental contributions to the theory and practice of information transmission and storage." In 2005, he was elected a fellow of the American Academy of Arts and Sciences.

In 1993 Jack was elected to membership in the National Academy of Engineering and in 2010 the National Academy of Sciences, earning him the rare distinction of membership in both. In 2011, he and Irwin M. Jacobs were named the winners of the Marconi Society Prize and Fellowship in recognition of "lasting scientific contributions to human progress in the field of information technology."

Jack Wolf dedicated time and energy to professional service on numerous committees of the IEEE, International Union of Radio Science (URSI), and NAE. He served on the board of governors of the IEEE Information Theory Society (then "Group") from 1970 to 1976 and 1980 to 1986, and was appointed president in 1974. He was international chairman of Committee C of URSI from 1980 to 1983. His service to the National Academies included participation in the Committee on Telecommunications Research and Development, the 2003 Nominating Committee, Electronics Engineering Section Liaison to the NRC, Section 7 Executive and Peer Committees, Committee on Tactical Battle Management, Committee on National Communications Systems Initiatives, and US National Committee for URSI.

Jack was not only an outstanding researcher but also a dedicated and wonderful educator. He was passionate about teaching, and he had a gift for expressing even the most difficult subjects in simple and clear terms. He brought

to the classroom a wealth of practical experience gained through his many years of consulting and employment in the telecommunications and storage industries. With his unique perspective, Jack inspired his students by successfully linking elegant theory with exciting technological applications. His excellence in teaching was recognized in 2000 with the UCSD Distinguished Teaching Award.

Jack maintained a close relationship with his alma mater, the University of Pennsylvania. In fact, studying at Penn is somewhat of a family tradition: 17 members of Jack's extended family—his father, two uncles, numerous cousins, and daughter Sarah—received degrees from Penn, and a grandson and granddaughter are carrying the torch for the next generation. Jack and his daughter have also made philanthropy at Penn a tradition: a number of endowed scholarships and student awards bear the Wolf family name, and two laboratories are named in honor of Jack Keil Wolf. In 2006, Jack received the D. Robert Yarnall Award from the University of Pennsylvania Engineering School, an award presented annually to a distinguished member of Penn Engineering's alumni for outstanding contributions to society in the field of engineering or technology.

Jack Wolf is deeply missed by his family, friends, and colleagues, including his many students, past and present, affectionately known as the "Wolf Pack." What Jack brought to the classroom and research advising was much more than his gift and passion for teaching: he inspired generations of students to excel, to work hard and with integrity, and most of all to have fun in the process. He will be remembered for the friendship and support he and his wife Toby offered so freely, his smile and sense of humor, his vision and wisdom, his words of encouragement, and his contagious optimism. He was a generous, thoughtful, and unpretentious man, an exceptional human being dedicated to bettering our world through progress in engineering.

A devoted husband, father, and grandfather, Jack is survived by his wife Toby; his children Joe, Jay, Jill, Sarah and her husband Charles; and his grandchildren Rachel, David, Rebecca, Aaron, and Julia.