



*James L. Massy*

# JAMES L. MASSEY

1934–2013

Elected in 1991

*“For outstanding contributions to the theory and practice of communication engineering, and for excellence in education.”*

BY DANIEL J. COSTELLO

SUBMITTED BY THE NAE HOME SECRETARY

**J**AMES LEE MASSEY, internationally acclaimed pioneer in digital communications (information theory, coding theory, and cryptography), died of colon cancer on June 16, 2013, in Copenhagen, Denmark, where he had lived with his wife Lis Kofod Massey since his 1998 retirement from the Swiss Federal Institute of Technology (ETH) in Zürich. Funeral services were held June 22 in the Sondra Chapel in Copenhagen and his ashes were interred in Garnisons Kirkegård, a cemetery near the American Embassy in Copenhagen.

Jim was born in Wauseon, Ohio, on February 11, 1934, firstborn twin son of Ethel Pry Massey (later Ethel P. Sperry) and Charles Arnold Massey. After his father was killed in an automobile accident in December 1940, his mother moved the family (the twins and an older sister, Ethel Joan) to Mendota, Illinois, where they lived for seven years. They moved to Ottawa, Illinois, in 1948 when his mother married Russell C. Sperry, longtime proprietor of Ottawa Battery Supply.

Jim graduated in 1952 from St. Bede Academy in Peru, Illinois, and attended the University of Notre Dame on a Naval ROTC scholarship, graduating maxima cum laude in electrical engineering as the 1956 class valedictorian (his twin brother Jerry, also a 1956 Notre Dame maxima cum laude graduate, ranked second in the class). While at Notre Dame he

met Kathryn Kramper, a student at St. Mary's College in South Bend. They married in 1958 and had four sons.

After three years of active service as a communications officer in the US Marine Corps (1956–1959), Jim attended the Massachusetts Institute of Technology (MIT) on a National Science Foundation fellowship, earning MS (1960) and PhD (1962) degrees in electrical engineering. From 1962 to 1977 he served the University of Notre Dame as a professor in the College of Engineering, where he was appointed the Frank M. Freimann Professor of Electrical Engineering, acquiring the distinction of filling Notre Dame's first endowed chair.

After leaving Notre Dame in 1977, he taught briefly at MIT and UCLA before accepting in 1980 a professorship in digital techniques at ETH, Europe's leading technical university, where he worked until his 1998 retirement as professor emeritus.

Jim's scientific work focused on coding theory and cryptography, two branches of information theory. His work in coding theory included developing links between convolutional codes and linear systems, and codevelopment of the Berlekamp-Massey algorithm for decoding BCH codes. His work in cryptography includes the invention of the block ciphers IDEA and SAFER+, both of which have found widespread use and inspired other block cipher designs.

Jim was instrumental in founding Codex Corporation in 1962 to market error-correction equipment invented during his doctoral research. His "threshold decoders" were the company's principal product during its first five years. Codex was acquired by Motorola in 1977. He was also involved in the founding in 1984 of Cylink Corporation, which became a leading supplier of data encryption and e-commerce security products. Cylink was acquired by Safenet Corporation in 2003.

Jim received virtually every honor and award available to communications scientists and engineers. He was elected to the Swiss Academy of Engineering Sciences (1990), the US National Academy of Engineering (1991), the European Academy of Arts and Sciences (1991), the Hungarian Academy of Sciences honoris causa (1993), and the Royal Swedish

Academy of Sciences (1995). He was also elected a fellow of the Institute of Electrical and Electronics Engineers (IEEE) in 1969 and the American Academy of Arts and Sciences (2004). He was a member since 1971, and a fellow since 2009, of the International Association for Cryptologic Research.

He was the 1992 recipient of the IEEE Alexander Graham Bell Medal for “contributions to the theory and practical implementation of forward-error-correcting codes, multiuser communications, and cryptographic systems; and for excellence in engineering education.” He also received the two most prestigious awards given by the IEEE Information Theory Society: the Claude E. Shannon Award in 1988 for “consistent and profound contributions to the field of information theory” and the Aaron D. Wyner Distinguished Service Award in 2004. In 1998 he also received the Jubilee Tesla Medal from the Nikola Tesla Society for “outstanding contributions to the field of information theory,” and in 1999 he was awarded the Marconi Prize (which includes a \$100,000 honorarium and an original work of sculpture) for “theoretical and practical contributions to cryptography and related coding problems.” In addition, he received four awards from the University of Notre Dame related to distinguished teaching, service, and research.

For his published work, he received the 1964 IEEE Information Theory Society Paper Award for the MIT Press monograph *Threshold Decoding*; the W.R.G. Baker Prize in 1987, awarded for “the most outstanding paper reporting original work” in any IEEE publication, for “The Collision Channel Without Feedback” (coauthored with Peter Mathys; *IEEE Transactions on Information Theory* 31(2):192–204); and a 1998 IEEE Information Theory Society Golden Jubilee Paper Award for his 1969 article “Shift-Register Synthesis and BCH Decoding” (*IEEE Transactions on Information Theory* 15(1):122–127).

He was awarded honorary doctoral degrees by Xidian University (China; 1985), the Beijing University of Posts and Telecommunications (1988), Lund University (Sweden; 1990), the Russian Academy of Sciences (1998), and the Technical University of Munich (2006). Until his death, he held adjunct

research appointments at Lund University (from 1998) and the Technical University of Denmark (from 2004). He remained an active and productive researcher, scholar, and sought-after lecturer to the end of his life.

Jim particularly liked to tackle challenging problems brought to him by research institutes and companies whose own scientists and engineers had been unable to solve them; he would say that there must be something interesting about such problems that made them resist solution and fight back. Revered and honored as a teacher, he became mentor to an entire generation of communication engineers and scientists.

Jim was survived by his wife of 36 years, Lis Kofod Massey of Copenhagen, a Danish lawyer who died on June 3, 2015. Other survivors include his former wife Kathryn, in Evansville, IN; twin brother Gerald J. Massey, Distinguished Service Professor of Philosophy Emeritus at the University of Pittsburgh; sister Joan Massey Kramer of Sylvania, Ohio; sons Thomas Aquinas Massey, Robert Bellarmine Massey, Peter Canisius Massey, and John Damascene Massey; stepsons Flemming Kofod Bonde and Jesper Kofod Bonde; grandchildren Rachel, Brianna, Scott, Robert, Elizabeth, and Brittney; step-grandchildren Regitse, Christine, Mille, Matilde, Mikkel, Katinka, and Sebastian; and step-great-granddaughter Caya.

