



Jerome J. Tiemann

JEROME J. TIEMANN

1932–2006

Elected in 1984

“For his creativity and leadership in developing advanced electronics for communications, medical diagnostics, radar, and video information processing.”

WRITTEN BY JAMES B. COMLY
SUBMITTED BY THE NAE HOME SECRETARY

JEROME J. TIEMANN, retired physicist at General Electric (GE) Global Research for more than 44 years, died of a heart attack at his home in Schenectady, New York, on April 25, 2006. He was 74 years old.

Born on February 21, 1932, in Yonkers, New York, Jerry grew up in Hastings on Hudson, New York. He graduated from the Fieldston School in Riverdale, New York (1949), the Massachusetts Institute of Technology (B.Sc., 1953), and earned his Ph.D. in theoretical nuclear physics from Stanford University. While at Stanford, he was invited to work at Los Alamos Scientific Laboratory and the University of California Lawrence Radiation Laboratory.

Jerry came to the GE Corporate Research Laboratory (now GE Global Research) in 1957, the year the integrated circuit was patented. That was also the year he married Adrian Rooke, his wife of 49 years. Jerry was an inspired scientist and engineer who lived and worked during a golden age of scientific advancement, brought about in part by competition after the launch of Sputnik by the Soviet Union.

His early fundamental studies on interband electron tunneling (1959–1964) led to the first practical method of manufacturing commercial tunneling diode devices. This work was cited by Leo Esaki in his 1973 Nobel Lecture for physics. Jerry then helped design circuits incorporating these devices, including the

first “vest-pocket transmitter” (1959). He did pioneering work on piezo-optics, and, in the mid-1960s, turned his attention to the optical properties of semiconductors and developed new experimental techniques for studying piezo-reflectivity. His work on thin-film magnetic heads anticipated the application of semiconductor manufacturing processes to hard disk head design (1966).

In 1970, Jerry and colleagues co-invented the surface-charge transistor, which Bell Labs had independently invented as the charge coupled device (CCD). Jerry’s patents contributed to the subsequent development of the CCD. He was also a leader in the early program at GE Global Research on a real-time ultrasonic imaging system for medical diagnostics. In February 1971, Intel co-founder Gordon Moore wrote to Jerry commending his work. “Your paper at the Solid State Circuits Conference was far and away the best of [those] relating to charge coupled devices,” Moore wrote.

In 1972, Jerry published an important paper on random access memory (RAM). In 1974, he co-developed and demonstrated the surface-charge correlator, which was 100 times faster than existing processors. In 1979, Nobel Laureate Leo Esaki honored Jerry by inviting him to give a series of lectures in Japan. Jerry won many industry awards, including IR-100 Awards in 1971 and 1974, and became a Coolidge Fellow in 1975 (GE’s highest honor for research and development). In 1976, he was elected a fellow of the American Physical Society and the Institute of Electrical and Electronic Engineers (for clarifying the understanding of interband tunneling and surface-charge transport and for their application to new devices). In 1984, he was elected to the National Academy of Engineering; his citation reads, “For his creativity and leadership in developing advanced electronics for communications, medical diagnostics, radar, and video information processing.” He joined the Whitney Gallery of Technical Achievers at General Electric in 1990.

Jerry was a natural problem solver. His 135 patents ranged from a super-pure laboratory-made diamond to a mirror that reflected without the “mirror image,” from a fail-safe circuit breaker to an automatic ice maker that produced ice cubes that

would not freeze together. But perhaps more important, he was a patient teacher and an enthusiastic mentor who paid special attention to younger scientists and used his uncanny ability to simplify complex ideas to make them accessible to novices and laypeople.

At home and among his many friends, Jerry's talents were varied. He played jazz piano with a style of chord voicing that earned him the nickname "mittens." His knowledge of chemistry translated seamlessly to candy and fudge-making. With his artistic design and craft skills, he produced elegant silver jewelry of his own design, often featuring stones he had found at locations across the country that had been cut and polished with tools of his own making. He designed and made furniture for his family out of wood from trees he felled on his own property. Captain of the 1953 MIT varsity cross-country team, Jerry won a track medal for GE's corporate relay team (in the 50-to 59-year-age category) in 1990.

He also loved the outdoors. When his boys Michael and Bruce were young, he and Adrian organized overnight hikes in the Adirondack Mountains, where they had a summer residence. With his love of science and prodigious memory, Jerry could identify and discuss plants along the way with a botanist's exactitude and depth. The rich diversity of mountains and streams tapped into his equally impressive knowledge of geology and mineralogy.

Jerry is survived by his wife, Adrian Rooke Tiemann, Ph.D.; his brother, Karl Tiemann, of Owego, New York; his sister, Lydia Lynn, of Big Flats, New York; two sons, Michael Damian Tiemann, and wife Amy Page Tiemann, Ph.D., of Chapel Hill, North Carolina, and Bruce Gregory Tiemann, Ph.D., and wife Valeria Bassi Damiao, Ph.D., of Longmont, Colorado; three grandchildren, Miranda Page Tiemann of Chapel Hill and Jai Damian Tiemann and Shay Julian Tiemann of Longmont. Jerry is also survived by several nieces and nephews.

He was preceded in death by his parents, Ruth Darling Johnson Tiemann, aged 94, and Roland Wilfrid Tiemann, aged 96, and by his father-in-law, Denis Morley Rooke, aged 86, and mother-in-law, Velma Howell Rooke, who died at age 100 in 2005.

Jerry's *joie de vivre* was apparent in everything he did, and his personal charm endeared him to his many friends and associates. One always came away with different, interesting, and clearer insights into the world when Jerry was around. His scientific and technical expertise, his creativity in all matters, his enthusiasm and buoyancy, and his warm and active friendship will be missed by everyone who knew him.

