

## IN MEMORY OF CHARLES KAO KUEN, THE FATHER OF OPTICAL FIBRE

BY VINCENT W. S. CHAN

Nobel Prize-winning physicist Professor Charles Kao Kuen, the father of optical fiber, passed away on Sunday morning September 23, 2018, in Hong Kong after battling Alzheimer's disease for years. He was 84. Known for his groundbreaking achievements involving the transmission of light in fibers for optical communication, Kao won the Nobel Prize in Physics in 2009, the Japan Prize in 1996, the Faraday Medal in 1989, and the Alexander Graham Bell Medal in 1985. Born in 1933 in Shanghai, his family left Shanghai when he was 14 for Hong Kong in 1948. He studied at St Joseph's College, a Catholic high school, for five years. He graduated in 1957 from Woolwich Polytechnic (now the University of Greenwich) in London with a bachelor of science in electrical engineering. He received his Ph.D. in electrical engineering at the University College, London in 1965. Kao worked in the private sector at the ITT Corporation. In 1987 Kao became the vice-chancellor (equivalent to the president) of the Chinese University of Hong Kong for nine years.

The optical fiber is the critical component for guided wave optical communications and networks, and its low manufacturing cost and high capacity led directly to the explosion of the Internet. The invention has greatly changed the mode of communications around the world, allowing a huge amount of information to be accessible to the masses. It has revolutionized business, scientific research, banking, health care, personal communications and many other applications. It also helped and continues to help in leveling the playing field among people of different economic strata by providing universal access to information. This consequence is one that Professor Kao would be extremely proud of. Arguably the fiber is one of



Charles Kao Kuen

the most important inventions in the last fifty years.

While most of us remember Charles Kao as a great scientist and inventor, and above all, a most influential educator, few are aware that he was also an entrepreneur, philanthropist and an artist. Throughout his adult life, Charles developed his taste on ceramics. He founded his own fiber optics company at the beginning of 2000, and donated his entire Nobel award to education. He and his wife Gwen established

the Foundation for Alzheimer's disease in 2010. Of all our interactions with Charles, he was kind and attentive to his students and colleagues in his field, and always willing to help. In 2014, the *Journal of Optical Communications and Networks* (JOCN), jointly owned by the IEEE Communication and Photonics Societies and the Optical Society of America, named its annual prize paper award after him.

Professor Kao made the selfless decision not to personally make money from his invention but have it available for the masses. This exemplifies his propensity for generous contributions for the common good. In the review committees he served, he never hesitated to speak his mind, knowing that honest opinions given, no matter how unpopular, are the only way to help the reviewees and the sponsors. Working with him had always been a joy and often a revelation. Professor Kao never pulled rank on anyone, willing to talk to and argue with whoever wanted to talk with him. When he was still attending conferences he often went out to dinners with the young researchers and had a great time chatting. Many benefitted from his insights and wit. All will remember him fondly with thankfulness for his inventions and warm and delightful personality.