

# Optical communications as a social infrastructure and its enabling technologies

H.Kuwahara,  
Fellow,  
Fujitsu Laboratories Ltd.  
Japan



## ***Abstract:***

The optical fiber communications community experienced 30 years of rapid growth from 1970 to 2000, and a severe downturn lasting several years after 2000, but has been rising up again in recent years. During this time, optical communications technology has established itself as the underlying basis of a new social infrastructure, supporting, for example, key industrial, financial, educational and medical activities. The recent globalization of the world would not have been feasible without our optical technology breakthroughs. In recent years optical communications have allowed the feasibility of IPTV applications, including broadcast TV, on-demand, and interactive streaming services, which have increased traffic by orders of magnitude, but not perhaps with a parallel established business model. This exploding traffic growth rate is exceeding that of Moore's Law, which has meant the power consumption of our technology area is also forming an ever larger proportion of overall CO<sub>2</sub> emissions, following that of the car industry. Our quest in the coming 10 years of further technical progress must be to find solutions, like the EDFA or ROADM in the past, which increase the flexibility and efficiency of photonic networks, as well as develop business model solutions underpinning the optical technology area, so as to continue supporting the social infrastructure of our society.

## ***Biography:***

Hideo Kuwahara received his bachelor, master and PhD degrees of electronics engineering all from University of Tokyo in 1972, 1974, and 1984 respectively. In 1974, he joined Fujitsu Laboratories Ltd, and started research on optical communications technology including laser module, TDM, submarine, coherent, optical amplifier, and WDM systems. He was assigned as a Senior VP of Fujitsu Network Communications Inc., in Texas, USA in 2000, where he founded a new branch laboratory in photonics networking. He returned to Japan in 2003, and served as a Member of the Board of Fujitsu Labs during 2004 - 2006. He became a Fellow of Fujitsu Labs in photonics technologies in 2006. Dr Kuwahara is a Fellow of IEEE, serves on the Board of Governors of LEOS, and is a guest editor in the Optical Communications Series in IEEE Communications Magazine. He is a member of the OSA and serves on the Steering Committee Chair of CLEO Pacific Rim. He is a Fellow of IEICE in Japan, and is involved in several activities of IEICE, including co-chairing the 12th Opto-Electronics and Communications Conference in Yokohama, Japan in 2007. He received the Sakurai Memorial Award in 1990 from the Optoelectronic Industry and Technology Development Association in Japan in coherent optical communication technology, and received the Achievement Award in 1998 from IEICE for the world-first terabit transmission experiment.