

Optical Communications- A View into the Future

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Abstract:

In spite of some setbacks, the last 10 years have seen phenomenal advances and growth in optical systems/networks. From a commercial viewpoint, deployed transmission systems have per fiber capacities roughly 100 times those 10 years ago with substantial reduction in per unit bandwidth cost. As importantly, wavelength routed networks, hardly more than a dream in most people's minds in 1998, are being deployed aggressively in metro areas, especially in the U.S.; national wavelength routed networks have existed for several years. Fiber-to-the-home is becoming a reality. Indeed, high-capacity, cost effective optical communication systems, by enabling the worldwide internet, have fundamentally changed people's lives. What will the next 10 years bring? Predicting the future, especially in technology, is a problematic but useful exercise. We explore the future from two perspectives: 1) the technological advances that might be expected to drive ever higher performance networks and 2) given likely network evolution, the expanded role that optics could play in the future. We explore those opportunities based upon 1) continued bandwidth demand growth driven by ubiquitous two-way video and converged wireline/wireless networks 2) optics playing an increasing role at higher levels in the network 3) optics moving ever closer to the end customer, including into the enterprise and home and 4) leveraging optical technology into non-communications applications. The future looks bright!

Biography:

Rod C. Alferness is currently the Chief Scientist, Bell Laboratories, Alcatel-Lucent. Previously, he was the Bell Labs Research Senior Vice President and has served as the SVP of Optical Research and the Chief Technical Officer for the Lucent Optical Networking Business. Rod joined Bell Labs in 1976 with a Ph.D. in physics from the University of Michigan. His early research included the invention of novel waveguide electro-optic devices and circuits and their applications in photonic transmission and switching systems. This research led to the early development of titanium diffused lithium niobate waveguide modulators now deployed in fiber optic transmission systems around the world. In the mid-90's, he was an originator and the Bell Labs Program Manager for the DARPA funded MONET project which demonstrated the feasibility of wavelength routed optical networks that are now being implemented for both backbone and metro networks. Dr. Alferness has authored over 100 papers, holds 35 patents and has authored five book chapters. Rod is a member of the National Academy of Engineering and is a Fellow of the OSA and the IEEE. Dr. Alferness received the 2005 IEEE Photonics Award. He serves on the ECOC EMC and is President of the OSA.