# Constructions of optical buffers

Speaker: 鄭傑教授
國立清華大學電機工程學系

**Abstract:** One of the bottlenecks toward an all-optical packet-switched network is the overheads caused by the so-called O-E-O conversion. Such a bottleneck is due to the lack of optical RAM as optical packets are composed of photons and cannot be easily stopped, stored, and forwarded. As such, the design of optical buffers has become one of the most critically sought after optical technologies in all-optical packet-switched networks. The only known way to ``store" optical packets without converting them into other media is to direct them via a set of optical switches through a set of fiber delay lines so that the optical packets come out at the right place and at the right time. As such, conflicts among packets competing for the same resources could be resolved. With recent advances in optical technologies, the constructions of compact and tunable optical buffers have been made feasible by using the so-called ``slow light" technique. As such, constructing optical buffers directly via optical Switches and fiber Delay Lines (SDL) has been recognized as one of the promising technologies for the design of optical buffers, and has received a lot of attention recently in the literature. In this talk, I will talk about our recent progress on the SDL constructions of optical buffers.

**Biograph:** Jay Cheng received the B.S. and M.S. degrees from National Tsing Hua University, Hsinchu, Taiwan, R.O.C., in 1993 and 1995, respectively, and the Ph.D. degree from Cornell University, Ithaca, NY, USA, in 2003, all in Electrical Engineering. In August 2003, he joined the Department of Electrical Engineering at National Tsing Hua University, Hsinchu, Taiwan, R.O.C. Since October 2004, he has been with the Department of Electrical Engineering and the Institute of Communications Engineering at National Tsing Hua University, Hsinchu, Taiwan, R.O.C., where he is currently an Assistant Professor. His current research interests include communications theory, optical queueing theory, information theory, and quantum information theory.