



**Center for Advanced Research in Photonics
Institute of Optical Science and Technology (IOSAT)
The Chinese University of Hong Kong
Seminar**

**Date : 29 June, 2005 (Wed.)
Time : 10:30am – 11:30am
Location : Rm 833, Ho Sin Hang Engineering Building,
The Chinese University of Hong Kong**

**Next Generation PLCs for Optical Communications
by
Professor Yung Jui (Ray) Chen
Department of Computer Science and Electrical Engineering
Director of Photonics Technology Laboratory
University of Maryland, Baltimore County
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Abstract:

A major paradigm shift in communication networks is that data has replaced voice as the dominant traffic content. Thus current and future networks have to be designed with data traffic in mind - which means the ability to handle burst and less-predictable (may be frequently changing) traffic patterns. In the world of WDM, optical cross connects (OXC) and optical add-drop multiplexers (OADM) are frequently mentioned as the important enabling components. In fact, OXCs operate at the wavelength level and thus are circuit-switching like components. They are mainly for wavelength provisioning. OADMs, on the other hand, can operate both as circuit-switching-like component by provisioning the wavelength (bandwidth) feed to a local node or as a packet-switching-like component by allowing packets from multiple channels (wavelengths) and different fibers to groom or redirect at an intermediate node (via a electronic switch or router). In fact the combination of OADM and electronic switch/router as a switching node can greatly improve the network efficiency in a dynamically managed data network over an all-optical-switching one.

Thus we view the challenge of the next generation of PLCs is to develop client reconfigurable optical add-drop multiplexers (cross-connects) with extended capability of add-drop ports and degrees of connectivity. We shall examine the pivot roles of advanced waveguide technologies and device/system architectures.

About the Speaker:

Professor Yung Jui (Ray) Chen received his BS in Physics from National Tsing Hua University in 1969 and Ph.D. in Physics at the University of Pennsylvania (1976). After a brief postdoctoral period at Penn, he joined the Advanced Microelectronic Laboratory at McDonnell Douglas Astronautics Co. in 1977. From 1980 to 1987, Professor Chen conducted fiber optical communications related research at GTE Laboratories. During the ten years in industry, he worked on MOS/MNOS VLSI technology, wafer scale integration, Ultra- fast optical spectroscopy, linear and nonlinear optics of semiconductors and organic polymers, integrated optics and optoelectronic devices. In 1987, he switched to academe and became one of the early founding faculty members of the Department of Electrical Engineering at University of Maryland, Baltimore County.

Professor Chen is currently a full professor of Computer Science and Electrical Engineering and the Director of Photonics Technology Laboratory. His group's current research interest covers photonic integrated device design and processing, material sciences and physics, WDM broadband optical communications and networking. Professor Chen is a fellow of Optical Society of America and Photonics Society of Chinese Americans, senior member of IEEE and member of American Physical Society. He is currently also the UMBC Presidential Research Professor.

ALL ARE WELCOME

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