



**Department of Electronic Engineering
The Chinese University of Hong Kong**

Seminar

Time: Friday 10 September 2004; 3:00 – 4:00 pm
Venue: Room 418, Ho Sin Hang Engineering Building,
The Chinese University of Hong Kong

**Fiber to the Premises (FTTP):
Evolution of the Broad Networks for Converged Voice,
Data, and Video**

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The tremendous growth in broadband access services has propelled the development and deployment of photonics technology to a new frontier for which the efficient and cost-effective delivery of optical bandwidth to the end user (residential homes and the business premises) has become the focus of intensive research and development. While asymmetrical digital subscriber line and cable modem technologies are limited in the access bandwidth for end users, fiber-based solutions provide practically unlimited bandwidth. Fiber to the home (FTTH) and fiber to the business (FTTB) will enable not only converged voice, data, and video applications, but also a range of other value-added services. Despite the recent slowdown in the deployment of long-haul fiber optic networks, there has been strong and rapid growth in market demand and technology development in the areas of local access networks, often referred to as “the last or the first mile”. Among the various optical access technologies being developed and evaluated, passive optical networks (PONs) based on ATM (referred to as APON, BPON or GPON) and Ethernet (EPON) appear to be the most promising scheme in terms of overall performance and cost-effectiveness. The xPON access networks are capable of providing up- and down-stream transmission rates in the range 155 Mb/s to 2.5 Gb/s. Frequently upstream transmission uses a wavelength of 1310 nm and downstream transmission uses a wavelength of 1310 nm or 1490 nm. Video transmission uses sub-carrier modulation and analog lasers with a wavelength of 1550 nm. A key barrier to the widespread deployment of E-PONs and G-PONs has been cost.

In this presentation, I will give a general review about the status and trend in market demand and technology development for optical access networks, especially fiber-to-the-premises (FTTP), mainly from a North America perspective. Recent development and applications of the optical access technologies in Asian, especially in Japan and China will be mentioned briefly, in hope for stimulating more discussions on this subject. Also, I will report some of the recent research and development on integrated FTTP transceivers at McMaster University, Canada.

*** All are welcome to attend ***

Brief Biography of Dr. Wei-Ping Huang

Wei-Ping Huang received his bachelor's degree in electrical engineering from Shandong University, China in 1982 with provincial and national honors. He obtained master's degree in 1984 from University of Science and Technology of China and Ph.D degree in 1989 from Massachusetts Institute of Technology, researching on fiber and integrated optics.

Dr. Huang has held faculty positions in the electrical and computer engineering department of the University of Waterloo and McMaster University, Canada, including assistant professor (89-92), associate professor with tenure (92-96) and full professor (96-present). Dr. Huang has had visiting, adjunct, consulting and/or managerial positions with several academic and industrial institutions in North America and Asia. He was a visiting researcher at Nortel from January to August and May to August in 1992 and 1993, respectively and a visiting professor at NTT Optoelectronics Lab from September of 1995 to August of 1996. As the leader of the photonic research group at Waterloo and later at McMaster, Dr. Huang has carried out a number of major research projects in a wide range of areas of fiber and integrated optics, sponsored by Canadian federal/provincial governments and private companies. He has also founded and took executive and advisory roles in several venture companies in the areas of photonics CAD, integrated photonic circuits and optical communication transceivers.

Dr. Huang is internationally known for his contributions and expertise for photonic devices and integrated circuits. He has authored and co-authored over one hundred (100) journal papers and seventy (70) conference papers and holds seven (7) US patents. He is a senior member of IEEE, a member of OSA and SPIE. Dr. Huang was elected to the MIT Electromagnetics Academy. He was elected as a Cheung Kong Scholars by Ministry of Education, People's Republic of China, and Li Ka Shing Foundation, Hong Kong in 2000.

Dr. Huang was the founding president of Shandong University Oversea Alumni Association and is the founding president of Jinan Oversea Chinese Scholars and Professional Association.

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