

**UNIVERSITY OF MACAU**  
**FACULTY OF SCIENCE AND TECHNOLOGY**  
**DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING**

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**Modulation and Detection Techniques for Long Haul and  
Short Reach Optical Transmission Systems**

by

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**Date** : 24 February 2014 (Monday)  
**Time** : 15:00 – 16:00  
**Venue** : J316

**ABSTRACT**

The ever increasing internet traffic has created the need for increasing the transmission capacity of optical communication systems. The use of advanced modulation formats and coherent detection as well as high speed signal processing techniques have significantly changed the design of optical communication systems. Many of the signal process functions previously carried out in optical domain such as dispersion compensation, PMD compensation, polarization demultiplexing are now routinely realized electrically. In addition, adaptive signal processing, which was very difficult to be implemented in optical domain is now possible. In the presentation, some of the recent progress in digital signal processing techniques for high capacity long haul optical communication systems as well as its application to short reach optical communication systems will be discussed. Some of the key challenges and future perspectives will be highlighted.

**BIOGRAPHY**

Prof. Chao LU obtained his BEng in Electronic Engineering from Tsinghua University, China in 1985, and his MSc and PhD from University of Manchester in 1987 and 1990 respectively. He joined the School of Electrical and Electronic Engineering, Nanyang Technological University(NTU), Singapore in 1991 and has been there as a Lecturer, Senior Lecturer and Associate Professor until 2006. From June 2002 to December 2005, he was seconded to the Institute for Infocomm Research, Agency for Science, Technology and Research (A\*STAR), Singapore, as Program Director and Department Manager leading a research group in the area of optical communication and fibre devices. He has been a principal investigator for a number of projects while in Singapore. Since April 2006, he has been a Professor in the Department of Electronic and Information Engineering, The Hong Kong Polytechnic University. He has served as adjunct Professors of Huazhong University of Science and Technology, Dalian Polytechnic University, Beijing Jiaotong University, University of Science and Technology of China, Nankai University, China Jiliang University and University of Northumbria of UK. Over the years, he has published more than 200 papers in major international journals such as Optics Express, Optics Letters, IEEE Photonic Technology Letters and IEEE/OSA Journal of Lightwave Technology. He has presented more than 100 papers and has given a number of invited talks in major international conferences. He serves as associate editor for Optics Express and Chinese Optics Letters. His research interests are in the

area of optical communication systems and networks, fibre devices for optical communication and sensor systems. In addition to academic research work, he has had many industrial collaborative research projects and has a number of awarded patents.

**ALL ARE WELCOME!**