Title: Parametric All-optical Signal Processing on the Silicon Platform

Speaker: Dr. Christophe Peucheret
FOTON Laboratory
University of Rennes 1
Lannion, France

Date: Friday, 12 June 2015
Time: 2:00 pm
Venue: Room 603, Chow Yei Ching Building

Abstract:
The field of all-optical signal processing is currently experiencing a renewed interest, in part triggered by the relative difficulty to perform transmission nonlinearity compensation in the digital domain in modern systems making use of coherent detection. Optical techniques such as optical phase conjugation can, to some extent, relieve some of these limitations. The potential for integration is an important criterion in view of the future deployment of such techniques. To this respect, silicon is a key platform for integration, and its suitability for parametric all-optical signal processing should be assessed. It is of course also naturally a key platform for future on-chip networks.

In this talk, we will present an overview of some of our recent results on parametric all-optical signal processing on the silicon platform. We will demonstrate functionalities that are compatible with advanced optical modulation formats, in particular the phase regeneration of phase-modulated signals. We will show how the introduction of polarization-diversity in silicon devices enables processing of modern polarization-multiplexed signals, resulting in possible optical phase conjugation of such signals. We will also briefly show some results on the use of silicon waveguides for the demonstration of signal processing functionalities that are compatible with space-division multiplexed systems.

Biography of the speaker:
Christophe Peucheret received the graduate engineering degree from Télécom Bretagne,
Brest, France, the M.Sc. degree in microwaves and optoelectronics from University College London, London, U.K., and the Ph.D. degree from the Technical University of Denmark (DTU), Copenhagen, Denmark. He has been with the Department of Photonics Engineering at the Technical University of Denmark between 1997 and 2013. Since September 2013 he is with the FOTON Laboratory (CNRS UMR 6082), University of Rennes 1.

His research interests are in the field of optical fibre communication systems and currently include optical signal processing, parametric processes in nonlinear fibres and waveguides, silicon photonics, applications of micro-resonators and applications of nanophotonic components.

Organizer: Dr. K.K.Y. Wong