

Dr. Cyril C. Renaud

Abstract:

It is now well known that the electromagnetic waves at frequencies from 300 GHz to 10 THz, the THz gap, offers a wide range of possible applications such as spectroscopy, sensing or wireless communications. To date many technological solutions have been proposed to answer the lack of sources and detectors within the THz gap with different level of success. It is notable that for many applications where THz is actually used the technology is still either bulky, power hungry or using cryogenic systems. In this lecture we will argue that to reach its potential the technology to be developed for THz needs to be integrated and work at room temperature. We will concentrate in particular on photonic technologies and their potential for integration. This will be done through a thorough look at the different photonic technologies used for THz generation and detection. This will then be followed by a discussion on the different current photonic integration solutions with a particular interest on the compromises required for each. We will finish the lecture with a look at some state of the art published work on integrated photonic solutions that could be applied or have been applied to the THz gap.

Biography:

Dr Cyril C. Renaud Received the degree of engineering from the Ecole Supérieure d'Optique, Orsay, France, and the Diplôme d'Etudes Approfondies (D.E.A.) in Optics and Photonics from the University Paris XI, Orsay, France, both in 1996. He spent one year as a project engineer with Sfim-ODS, working on the development of microchips lasers and portable range finders. He, then, joined the Optoelectronics Research Centre, University of Southampton, Southampton UK, in 1998, to work on diode pumped high-power ytterbium-doped fibre-lasers, with particular interest on Q-switched system and 980-nm generation. This work led to the award of a PhD in 2001. He is currently a Reader (Associate Professor) in Photonics at University College London, leading research on THz photonics with a particular interest on photonic integration and sensor system. He is also the UCL site director for the UCL/Cambridge doctoral training centre in Integrated Photonic and Electronic Systems Development. His work has led to over 120 publications in peer reviewed journals and international conferences, attracting over 1250 citations, and 3 patents.