ZEPLER INSTITUTE

UNIVERSITY OF Southampton

Quantum Technology Lecture Series

Quantum technologies and artificial intelligence for new frontiers in imaging

Prof Daniele Faccio, University of Glasgow, UK

Abstract

Recent developments in two fields, single photon counting and neural networks, have opened a series of opportunities that are pushing the boundaries of imaging capabilities.

Single photon counting provides not only the ultimate sensitivity to low light levels but also gives us a way to very precisely time the arrival time of the photons on the detector. This in turn adds a third dimension to our image data, the photon arrival time, that can be used to image around corners or through very high density and very thick scattering media.

Recent years have also seen an explosion of activity the development and use of neural networks that can be used to train a system to analyse data in situations where forward modelling would be extremely challenging.

We will provide examples such as the identification of people hidden behind a wall or imaging though long, multimode optical fibres.

All staff and students welcome, refreshments provided.

www.zeplerinstitute.com/events

Short biography

Daniele Faccio is Professor in Quantum Technologies at the University of Glasgow since Dec. 2017. He was previously at Heriot-Watt University since 2010 where he was Professor in Physics. he is also adjunct professor at the University of Arizona, Tucson (USA) and was elected Fellow of the Royal Society of Edinburgh in 2017. He has been visiting scientist at MIT (USA), Marie-Curie fellow at ICFO, Barcelona (Spain) and ERC fellow 2012-2017. He was awarded the Philip Leverhulme Prize in Physics (2015), the Royal Society of Edinburgh Senior Public Engagement medal (2017) and the Royal Society Wolfson award (2017). His research interests currently involve nonlinear optics, quantum sensing, single photon detection and imaging technologies.

Tuesday 17 April 2018, 11:30 - 12:30, B53 4025, Highfield