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Nonlinear dynamics in fibre optics

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Day 1. 25 May 2021, 11am - 1 pm (UK time):

The nonlinear Schrödinger equation: nonlinear effects in fibre optics

Day 2-3. 26-27 May 2021, 11am - 1 pm (UK time):

Modulation instability and parametric amplification

Day 4. 28 May 2021, 11am – 1 pm (UK time):

Optical fibre resonators: mathematical modelling, cavity solitons and frequency combs

Abstract:

The general focus of these lectures is on the analytical theory of nonlinear phenomena in optical fibres and in passive driven fibre resonators.
An introduction to the nonlinear Schrödinger equation and an analysis of nonlinear effects on light pulses propagating in single mode fibres will be presented; the concept of modulation instability and its application in parametric amplification will be discussed in detail. A further topic covered will be the analytical modelling of light dynamics in passive fibre resonators with external injection where modulation instability, bistability, cavity solitons and frequency combs will be described.

Short Bio:

Auro M. Perego, obtained his PhD in Electrical Engineering from the Aston Institute of Photonic Technologies (AIPT), Aston University in 2018. He is currently a Royal Academy of Engineering Research Fellow at the AIPT and his research interests include: nonlinear fibre optics, instabilities in optical systems, laser physics, mode-locking and frequency combs generation in lasers and optical resonators.

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