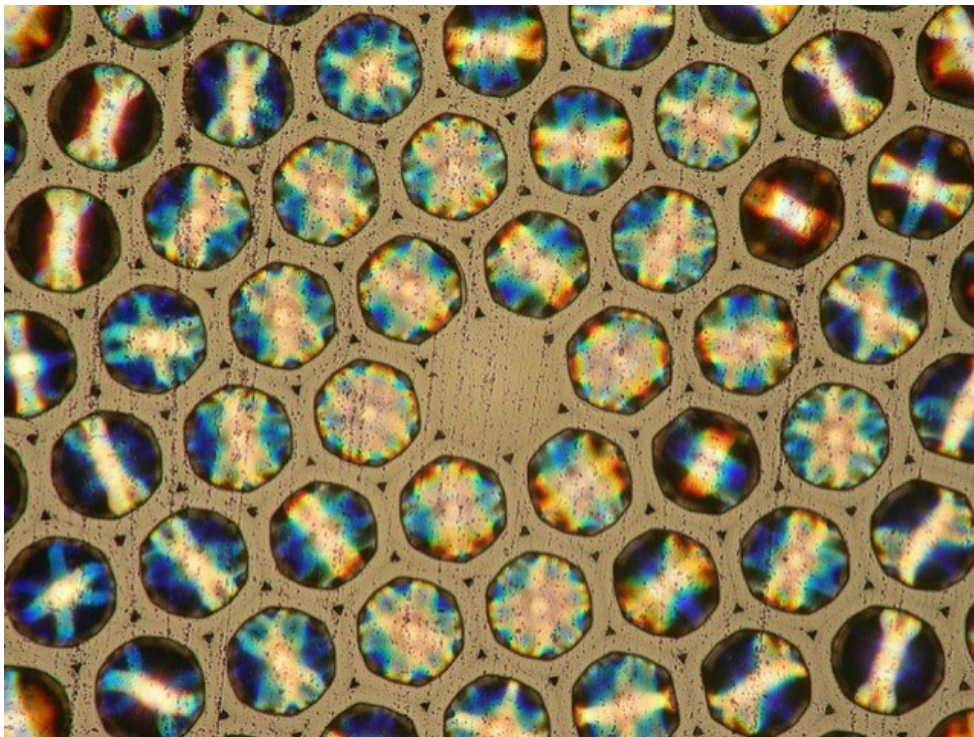




Optics and Photonics Group
Lunchtime Seminar
“Quantum photonics in
microstructured optical
fibre”

Dr Peter Mosley

University of Bath



13:30 Wednesday 15 February 2023
Coates Building - C24
All Welcome

http://optics.eee.nottingham.ac.uk/wiki/Seminars_2022-2023

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MS Teams link

Photonic crystal fibre (PCF), formed of a matrix of air holes running along the length of a strand of silica glass, has for the last 20 years enabled unprecedented control over the propagation of light. In PCF with a solid core, the size and distribution of micron-scale holes in the cladding controls the fibre dispersion, allowing precision engineering of nonlinear processes across brightness scales from photon-pair generation to supercontinuum sources. On the other hand, silica glass walls only hundreds of nanometres thick but many of metres long can confine light to a hollow core in which dispersion and nonlinearity are minimized to yield high-fidelity transport of both intense ultrashort laser pulses and quantum states of light.

In this talk, I will present developments in the application of PCF to quantum technologies, where its unique capabilities have potential in all-photonic as well as photonic-enabled architectures for computation, communication, and sensing. Our recent work has spanned photon-pair sources, wavelength conversion for universal quantum interfaces, and topological effects in PCF, as well as engineering hollow-core fibre for noise reduction in pulsed laser systems, for quantum memories in atomic vapour, and for enhancing light-matter interaction with nanoparticles.

Dr Peter Mosley is a Senior Lecturer in the Department of Physics at the University of Bath and leads a research group in fibre-based quantum optics. He is a member of the Centre for Photonics and Photonic Materials and served as its director from 2015 - 2021. Mosley is known for developing high-quality sources of heralded single photons across a range of platforms and his group works on engineering photon-pair sources in photonic crystal fibre enhanced with optical switch networks. Mosley is an active member of the UK Quantum Technology community as a co-investigator in the Quantum Computing and Simulation Hub within which his group is developing frequency-conversion interfaces to unify the operating wavelength of disparate network nodes. His broader research activities include hollow-core fibre for hosting light-matter interactions and topological modes in photonic crystal fibre.