

Coherent Control in Metamaterials for Device and System Applications

By

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Host: Asst. Prof. Cesare Soci



Abstract

Harnessing the coherent interaction of optical waves on photonic metamaterial nanostructures provides for ultrafast all-optical control, at arbitrarily low intensity, of a wide variety of optical phenomena, from absorption and refraction to optical activity and anisotropy. This presentation introduces the coherent control concept and explores device and systems application potential in spectroscopy and all-optical data processing through a number of experimental demonstrations

Short Biography

Dr. MacDonald is a Principal Research Fellow with the Optoelectronics Research Centre's Nanophotonics & Metamaterials Group, Manager of the University's interdisciplinary EPSRC Programme on Nanostructured Photonic Metamaterials, and of the ORC's focused ion beam nanofabrication facility.

He received MPhys and PhD degrees from the University of Southampton's School of Physics and Astronomy and joined the school as a research fellow in 2001, before moving to the ORC in 2006. His research interests lie in the fields of ultrafast, electron-beam, and phase-change nanophotonics, plasmonics, and metamaterials.

Dr. MacDonald sits on the steering committee of the Institute of Physics' Quantum Electronics & Photonics Group. He is co-chair of the Metamaterials conference at SPIE Photonics Europe, and of Metamaterials, Nanophotonics, and Plasmonics at the Photon14 conference. He is a member of the Editorial Board for the Nature Publishing Group journal Scientific Reports, and is a member of the Optical Society of America, the SPIE, and the European Physical Society.