



A journey through time...varying materials

Date: April 26, 2023 (Wednesday)

Time: 5:00 p.m.

Zoom Online Lecture: <https://bit.ly/3KzkKes>

Meeting ID: 941 4010 6401

Password: 2859



Dr. Simon HORSLEY
University of Exeter



Abstract:

Physics students often leave university believing that classical physics is complete, and all new discoveries will be made in quantum mechanics. This is a shame.

In classical electromagnetism or acoustics for instance, there is a colossal space of possible materials that is largely unexplored. I will begin this talk by asking the question: if we could make all these different materials, what could we do? Invisibility cloaking, negative refractive indices, analogue gravity, 'synthetic gauge fields' for light, and some recent advances in antenna engineering have all come from asking this question.

Moreover, this is not just idle speculation: metamaterials - sub wavelength structured composites with 'designer' bulk properties - allow us to explore these exotic materials in the laboratory. Until very recently the focus was on static composites where their effective properties do not change in time. In the second half of the talk I will review new theory and experimental developments with time varying metamaterials, showing their counter intuitive effect on propagating waves, and their connection with space-time geometry.

Biography:

Simon Horsley is an Associate Professor and Royal Society Research Fellow at the University of Exeter in the UK, where he works on discovering new materials (metamaterials) for controlling waves. Recently he has worked on designing materials that are reflectionless and/or invisible, "topological" (where the wave can only propagate in one direction), and time varying. His interests range from classical electromagnetism and acoustics, to quantum field theory and general relativity.

Anyone interested is welcome to attend!

Phone: 28592360 Fax: 25599152