

13th December 2023 10:00 – 11:00 GMT (online)

Title: AI in metamaterials and nanophotonics

Speaker: Assoc Prof Mehdi Keshavarz Hedayati

Affiliation: Department of Engineering, Durham University, United Kingdom

Abstract: The quest for developing advanced optical materials and photonic devices has historically relied on time-consuming trial and error alongside resource-bound numerical simulations, often resulting in suboptimal designs at a high cost. However, the landscape has dramatically shifted with the emergence of artificial intelligence (AI) in materials discovery, particularly in the realm of nanophotonics and metamaterials. The transformative power of AI, especially through deep learning, has revolutionized this field.



In recent years, AI has captured significant attention as a ground-breaking tool in crafting photonic structures tailored to specific functionalities. The true strength lies in the capacity of deep learning models to swiftly process extensive data and decipher intricate patterns. Unlike traditional methods, AI mitigates the need for substantial domain expertise and vast computational resources.

In this talk, I will discuss the latest advancements in AI applied to metamaterials and nanophotonics, highlighting our team's recent ground-breaking discoveries and developments in Durham.

Biography:

Dr Hedayati is an Associate Professor in Engineering at Durham University. Prior to this role, he has been Marie-Curie Postdoctoral Fellow at Technical University of Denmark. As an experimentalist, he possesses extensive experience in the fabrication and processing of nanostructures. His current research interests encompass metamaterials design and fabrication, as well as AI-driven materials discovery. He obtained undergraduate and graduate degrees from Amirkabir University of Technology (Iran) and CAU of Kiel (Germany), respectively. He has been the recipient of several awards and honours, including the German Materials Society (DGM) Youth Prize and the Youth Prize from the Iranian Research Organization for Science and Technology.