

Spring
2025

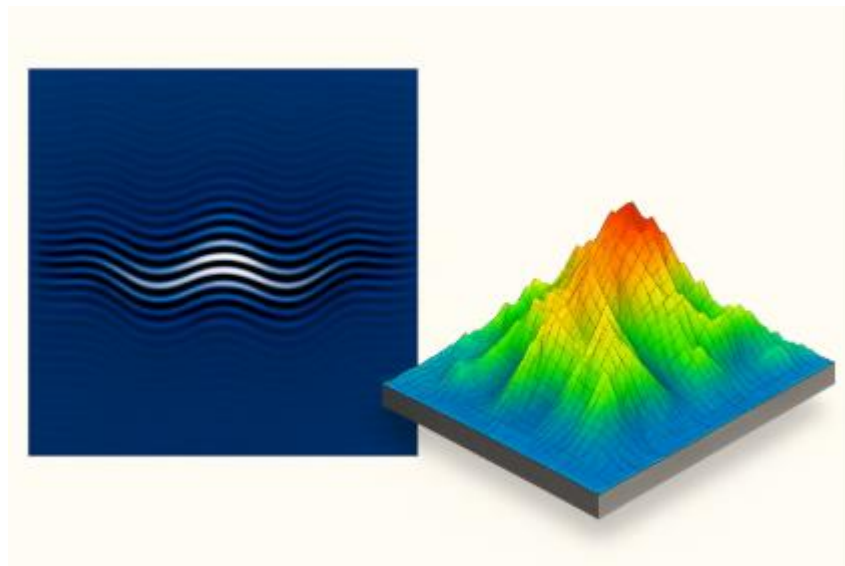
Optics & Photonics Group Lunchtime Seminar Series

University of Nottingham

Enhancing surface metrology through virtual optical instruments

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UoN



12:00 Wed 4 June 2025

Coates Road Auditorium



Dr Helia
Hooshmand

Enhancing surface metrology through virtual optical instruments

Abstract

Recent advancements in optical metrology have significantly enhanced the accuracy and versatility of surface texture characterisation—an essential capability in industries such as semiconductor manufacturing and biomedical engineering. Among the various techniques used for surface topography measurement, coherence scanning interferometry (CSI) has received substantial attention due to its non-contact operation and sub-nanometre repeatability. Its ability to provide precise, full-field surface topography measurements makes it particularly effective for high-precision characterisation of complex surface geometries. In parallel, the emergence of virtual optical instruments—designed to replicate the measurement behaviour of physical systems—has transformed surface analysis by offering flexible, customisable, and cost-efficient alternatives. Virtual Coherence Scanning Interferometry (VCSI), based on a physics-driven simulation of a real CSI system, extends these advantages further by enabling task-specific optimisation, real-time data processing, and tailored uncertainty evaluation. Collectively, these innovations are paving the way for the next generation of metrology systems that are smarter, more efficient, and precisely aligned with the demands of specific measurement applications.

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All are welcome



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