

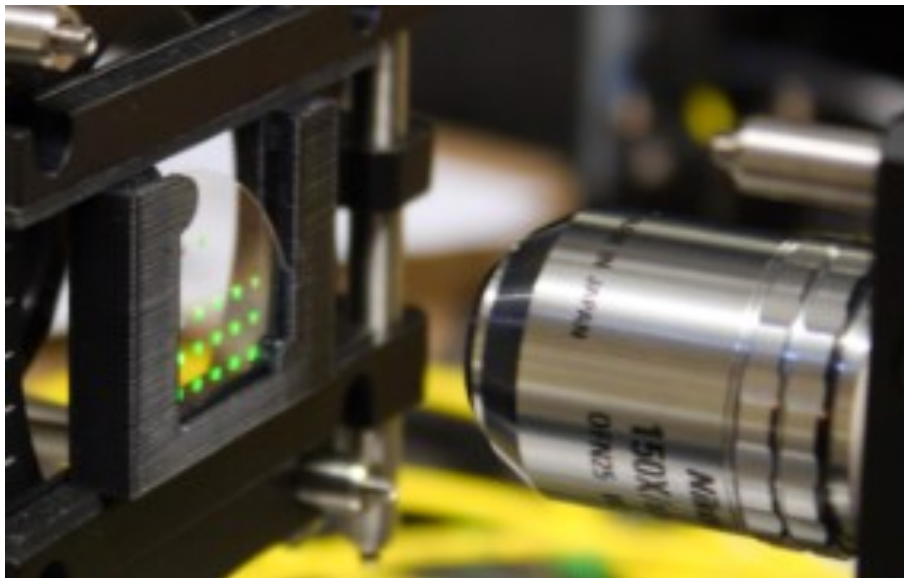
Spring
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Optics & Photonics Group Lunchtime Seminar Series

University of Nottingham

**Metasurfaces as a platform for the
development of miniature sensors to
underpin smart manufacturing processes**

Dr Andrew Henning
University of Huddersfield



13:30 Wednesday 21 February 2024
Pope Building - C16



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Andrew
Henning

Metasurfaces as a platform for the development of miniature sensors to underpin smart manufacturing processes

Manufacturing is looking to move towards the wider deployment of smart and autonomous manufacturing processes, achieving 'right first-time every-time' outcomes. This will, however, require sufficient real-time feedback to correct errors at the time of manufacture. To achieve this requires a wide proliferation of sensors integrated in a manner to provide 'on-machine', and ideally 'in-process', measurements. However, the current size, weight, and cost of current optical instrumentation a significant barrier to realising this approach as it would impede the manufacturing processes if used in this manner. While there are ongoing efforts to realise small and lightweight instrumentation using traditional approaches, recent developments in the areas of nanophotonics and metasurfaces offer a path by which a step change in these attributes can be achieved. Here, I will talk about our recent work in this area, considering how metasurfaces can be utilised to both miniaturise and simplify optical systems. The flexible control of optical wavefronts passing through metasurfaces also potentially provides a path to implement techniques that, if realised using conventional glass elements could only be achieved using complex and difficult to manufacture freeform optical surfaces.

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All are welcome



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