



Optics for the Cloud

A new public lecture series

#OpticsForTheCloud

The *Optics for the Cloud* series features leading researchers giving public talks on cutting edge topics...

Antennas for light and their applications in classical optics

Dr Rupert Oulton
Imperial College London

Thursday July 18
4.00-5.30pm

Followed by refreshments

Microsoft Research
21 Station Road
Cambridge CB1 2FB



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Gold particles with dimensions of about a hundred nanometres are resonant at visible wavelengths and thus serve as antennas for light. Over the past two decades, nanofabrication technology has advanced to the point where a wide range of applications for optical antennas are now possible. Individually, they may be exploited for sensing at the sensitivity of single molecules. Within arrays, they can be deployed to realise thin and planar optical elements, such as lenses and polarisers.

The talk will address some contemporary themes in this diverse field, and their applications in classical optics. Each example highlights a key advantage of optical antennas: for example, using their nanometric scale to quantify lens aberration, or using their tightly focussed optical field to realise strong nonlinear optical effects for optical pulse characterisation. The talk will also cover Rupert's work on hot electrons: remarkably, electrons excited by light in metals can be over 1000°C hotter than their surroundings! This could enable new and potentially inexpensive infrared detectors.

Rupert Oulton is Reader in Physics at Imperial College London. He graduated with a PhD in Physics from Imperial on optoelectronic microcavity devices and went on to research plasmonics and metamaterials at the University of California at Berkeley, in particular nano-lasers. He returned to the UK and Imperial as an EPSRC Fellow and Leverhulme Lecturer in 2010. His current research interests include the linear and nonlinear optics of metallic nanostructures, nanoscale lasers and quantum optics.

