"What have we caught today": Characterising the properties of optically trapped micro-particles.

Dr Andy Ward

STFC

12:00 Wed 26 March 2025

Pope – Room C14

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"What have we caught": Characterising the properties of optically trapped micro-particles

Abstract

Since the discovery of optical trapping or laser tweezers by Arthur Ashkin (Nobel prize 2018) the technique has often provided a unique platform where a single particle, droplet or cell can be captured by a focussed laser beam. As an introduction to various instruments and modalities that can be found in the Lasers for Science Facility Andy will present the capabilities and benefits of coupling laser trapping with spectroscopy and imaging techniques. The science areas are diverse from replicating droplet behaviour in clouds, sorting through bacteria, tearing apart oil emulsion droplets and measuring tiny forces acting on particles. Such research can be impactful in a world of climate change, increasing sustainability goals and the airborne transmission of virus.

Biography

Dr Andy Ward is the Division Head of the CLF's Lasers for Science Facility. After an MSc in Colloid and Surface Science he obtained his PhD a Bristol University studying polymerisation kinetics using light scattering. He worked for short periods on surfactant formulation at Unilever Research and DERA (now Dstl) before joining the Central Laser Facility in 2000. Here he developed the optical trapping facility which progressed from capturing polymer beads in solution to acquiring the Raman spectra of micro-droplets levitated in air. Laser capture is now routinely used in the Facility for biological, material and environmental research. Andy has also been keen to exploit this technology across the Harwell Campus performing experiments at Diamond Light Source, ISIS and RAL Space. Andy is a named author on 90 papers.

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All are welcome

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