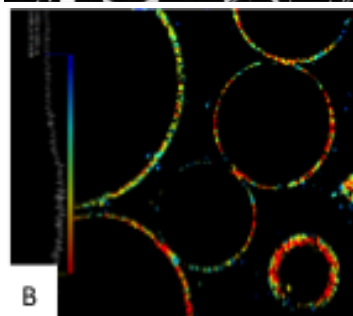
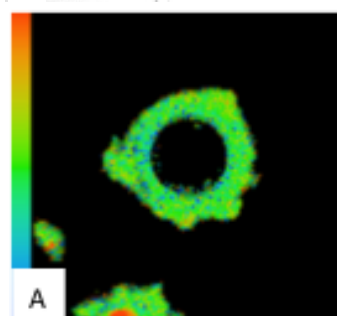
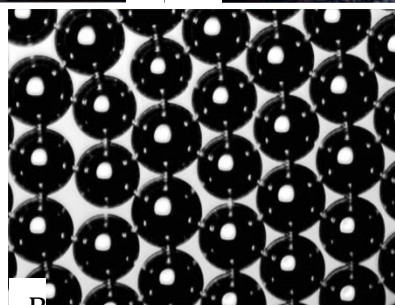
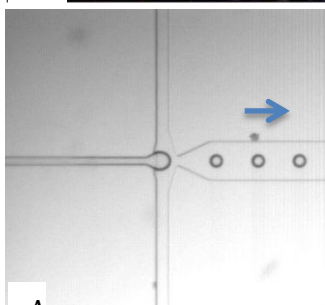
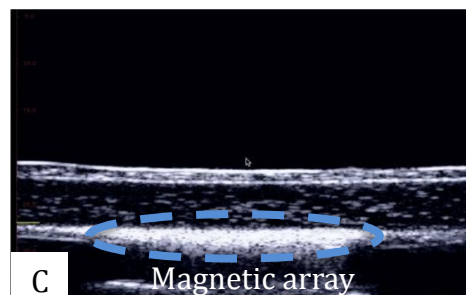
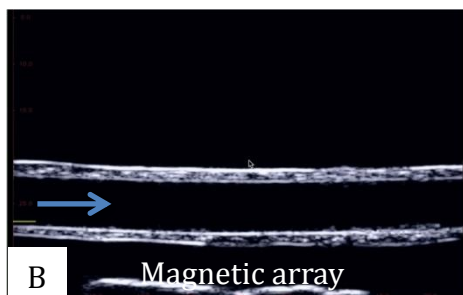


The Electrical Systems & Optics Research Division invites you to:
Applied Optics Group Lunchtime Seminar

Microbubble Engineering for Ultrasound Imaging and Therapy

**Dr. Eleanor Stride
(University of Oxford)**



1.00pm Wednesday 30th April 2014

2nd Floor Lecture Theatre

Tower Building. All welcome

Applied Optics Group Lunchtime Seminar:

Microbubble Engineering for Ultrasound Imaging and Therapy

Gas microbubbles coated with a surfactant or polymer shell have become well established as effective contrast agents for ultrasound imaging due to their high compressibility and their ability to scatter ultrasound nonlinearly. More recently, their use as vehicles in therapeutic applications such as targeted drug delivery and gene therapy has also been widely investigated. This type of application poses a number of significant challenges including the detection of microbubbles at low ultrasound intensities to avoid premature destruction and localisation of microbubbles at a target site in vivo.

Strategies for addressing these challenges include modifying the structure and composition of the microbubble coating to provide additional functionality. This talk will examine the use of solid nanoparticles incorporated into the coating to achieve this. The first example will demonstrate the use of gold nanoparticles to modify the symmetry of the microbubble oscillations and enhance their nonlinear character and hence detectability. The presence of the nanoparticles also improves bubble stability and both effects thus improve the lifetime of microbubbles in the circulation.

Different types of nanoparticle can impart other properties including visibility under other imaging modalities such as magnetic resonance imaging and, with the use of magnetic nanoparticles, the ability to target microbubbles to a specific tissue volume using an externally applied magnetic field. For this latter application results will be presented demonstrating the use of magnetic microbubbles for ultrasound mediated gene delivery in vitro and in vivo.

Dr. Eleanor Stride obtained her BEng and PhD in Mechanical Engineering from University College London. Her final-year project on non-destructive testing using ultrasound and a serendipitous meeting with a radiologist led her to studying the use of microbubble agents in medical ultrasound imaging and ultimately to designing and engineering new types of agent for both imaging and therapy.

Following the completion of her PhD in the UCL Ultrasonics Group, she was appointed to a lectureship and a Royal Academy of Engineering and Engineering and Physical Sciences Research Council (EPSRC) Research Fellowship during which she started working in the complementary area of micro-encapsulation, developing new methods for fabricating bubbles, capsules and other nano and microscale layered structures for a range of biomedical and other applications.

In 2011 she was appointed to a University Lectureship and Non-Tutorial Fellowship at St Catherine's College Oxford and joined the Biomedical Ultrasonics, Biotherapy and Biopharmaceutical Laboratory (BUBBL) in the Institute of Biomedical Engineering; where she continues her research in encapsulation and ultrasonics in particular, combining these themes for the development of systems which integrate medical imaging and therapy.