

The Photonics Institute

The perfect lens and manipulating light on the nanoscale

By

Prof Sir John Pendry

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Date: 01 December 2015 (Tuesday)
Time: 2.30pm - 3.30pm
Venue: SPMS Lecture Theatre 2 (SPMS-03-03)
Host: Prof N. Zheludev

Abstract

Increasingly we need to control light on a scale much less than the wavelength where concepts such as ray optics are of no assistance. This is particularly true for plasmonic systems where the surface plasmons excited on the surfaces of metals can be compressed into less than a square nanometre. I shall show how transformation optics can be deployed to design sub wavelength optical elements and bring new understanding to the structures that create huge enhancements to the energy density of radiation.



Short Biography

Prof Sir John Pendry has worked at the Blackett Laboratory, Imperial College London, since 1981 and he is the Chair in theoretical solid-state physics at Imperial College London. He began his career in the Cavendish Laboratory, Cambridge, followed by six years at the Daresbury Laboratory where he headed the theoretical group. He has worked extensively on electronic and structural properties of surfaces developing the theory of low energy diffraction and of electronic surface states. His present research concerns the remarkable electromagnetic properties of materials where the normal response to electromagnetic fields is reversed leading to negative values for the refractive index. In collaboration with scientists at The Marconi Company he designed a series of 'metamaterials' whose properties owed more to their micro-structure than to the constituent materials. These made accessible completely novel materials with properties not found in nature. The simplicity of the new concepts together with their radical consequences have caught the imagination of the world's media.

Prof Sir John Pendry is the Fellow of the Royal Society, Fellow of the Institute of Physics, Fellow of American Academy of Arts and Sciences, and Foreign Associate of the US National Academy of Sciences, etc. In 2004, he was knighted in the British Honours for his services to science. Prof Pendry has won several awards, including the Dirac Medal in 1996, the Royal Medal in 2006, the UNESCO Niels Bohr gold medal in 2009, the Isaac Newton Medal in 2013, and the Kavli Prize in Nanoscience 2014, etc.