

Transformation Optics at Optical Frequencies

JB Pendry

Department of Physics, Imperial College, London, SW7 2AZ, UK
j.pendry@imperial.ac.uk

When designing macroscopic optical components such as camera lenses the ray approximation is an excellent design tool. However plasmonic systems function on a scale smaller than the wavelength of light and the ray approximation is of no use to us. In this talk I shall show that the new technology of transformation optics, exact at the level of Maxwell's equations, offers the same intuitive understanding as the ray approximation. The power of the method will be illustrated by showing how to construct 'light harvesting' devices. Starting from a simple well understood system comprising slabs of silver, transformation optics is deployed to generate a whole family of structures that inherit the intrinsic electromagnetic structure of the original but whose geometry is radically transformed from the original.