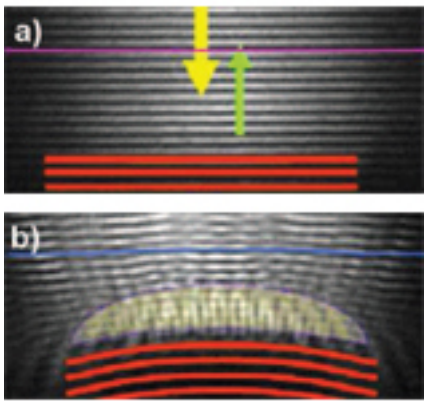
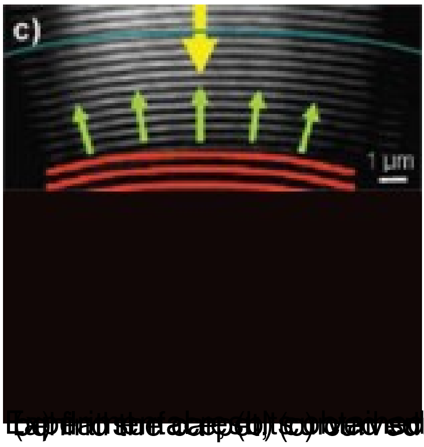
The group led by Prof. Romain Quidant reports new advances towards invisibility at optical frequencies.



Optics Express has recently published a theoretical and experimental demonstration of a carpet which can make objects invisible to the eye of an observer. The carpet is made of a metamaterial, an artificial nanopatterned material engineered to have optical properties nonexisting in natural materials. When placed in front of an object lying on a surface, these materials interact with incident light producing an optical response representative of the surface without the object, thus making the later invisible. This effect, previously observed at lower frequencies, has been achieved now over the unprecedented bandwidth of 650 to 900 nm, i.e., within the visible range.

The figure explains the idea of the research: light reflecting on a flat surface leads to straight interference fringes while curved objects leads to curved fringes. The authors show that covering a curved surface with the metamaterial carpet allows a curved reflector to mimic a flat mirror, thus producing the impression that the curved object is not there.

The research has been conducted at ICFO and the Institute Fresnel of the University of Marseille by PhD student Muamer Kadic, Dr. Guillaume Dupont, Dr. Sébastien Guenneau, and Dr. Stefan Enoch, from the Institute Fresnel, ICFO Research Fellow Dr. Jan Renger, ICFO PhD Student Srdjan S. Aćimović, a



(a) flat surface, (b) carpet, (c) curved surface