



La Fédération de Physique André Marie Ampère de l'Université de Lyon
et la Société Française de Physique invitent

Eric Mazur

Balkanski Professor of Physics and Applied Physics,
University of Harvard, US
Former president of the Optical Society (OSA, US)

Extreme optics with zero refractive index

Nanotechnology has enabled the development of nanostructured composite materials (metamaterials) with exotic optical properties not found in nature. In the most extreme case, we can create materials which support light waves that propagate with infinite phase velocity, corresponding to a refractive index of zero. This zero index can only be achieved by simultaneously controlling the electric and magnetic resonances of the nanostructure. We present an in-plane metamaterial design consisting of silicon pillar arrays, embedded within a polymer matrix and sandwiched between gold layers. Using an integrated nano-scale prism constructed of the proposed material, we demonstrate unambiguously a refractive index of zero in the optical regime. This design serves as a novel on-chip platform to explore the exotic physics of zero-index metamaterials, with applications to super-coupling, integrated quantum optics, and phase matching.

Lundi 27 mai 2019

16h30

Amphithéâtre Dirac/ Bâtiment Dirac / Campus de la Doua

 T1 Université Lyon 1