

Abstract for GR-TR Conference on Statistical Mechanics and Dynamical Systems

Talk Invited

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Transformation Optics: Bending the light

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Transformation optics is a new field of optical and material science and engineering comprising metamaterials, plasmonics and nanophotonics. It deals with the transformation of permittivity and permeability tensors of a medium due to a desired transformation of the coordinate system, such that the Maxwell's equations preserve their form. By the common essence of all wave propagation phenomena, a sibling field has also emerged which is known as the transformation acoustics.

Metamaterials are artificially structured media that can respond with designed permittivity and permeability values at a particular frequency band of the electromagnetic spectrum. Their development eventually opened the way to the field of transformation optics.

This talk aims to provide a general view to the field of transformation optics by presenting several intriguing examples, such as optical cloaking, illusion optics, and superlenses. We also report the first experimental study of a particular electromagnetic cloak structure based on chiral resonant particles.