

Design and Engineering of Metamaterials and Metasurfaces: from Fundamentals to Applications

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Study of structure-function-property relationships is always a central issue of mechanics. Recent advances in micro/nanofabrication technology enable researchers to design and fabricate materials and surfaces with desired structures. These micro/nanostructured materials and surfaces can achieve superior and even unprecedented properties and/or functions. For instance, artificially structured metamaterials present negative refractive index, mass density and dynamic modulus under certain circumstances; hierarchical micro/nanostructured metasurfaces appear as superoleophobicity which does not exist in nature. Nowadays these micro/nanostructured materials have been extensively used for energy, environmental, information technology (IT) and biomedical applications. In addition to applied research, micro/nanofabrication also acts as powerful approaches for fundamental studies. This presentation will review and discuss recent advances in micro/nanofabrication techniques and their applications in making functional metamaterials and metasurfaces.