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Special Issue Reprint

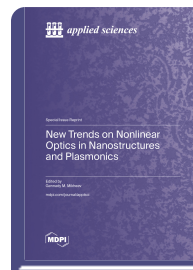
New Trends on Nonlinear Optics in Nanostructures and Plasmonics

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Edited by
Gennady M. Mikheev

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This Reprint presents an Editorial and ten original studies from different areas of nonlinear optics carried out in the last three years by research groups with high levels of expertise. The object of most of them is femtosecond (fs) nonlinear optical phenomena in nanostructures. In this Reprint, the results of a study on higher harmonics generation from fs and picosecond lasers in laser-induced plasma from various nanomaterials are presented; an example of the application of the generation of the second and third harmonics of fs laser radiation for the design of a unique microscope is presented; fs nonlinear-optical properties of aqueous suspensions of nanodiamonds are investigated; nonlinear up-conversion luminescence is found in aqueous suspensions of carbon dots; an example of the application of a thin-film topological insulator for the generation of THz radiation under the action of a fs laser is described; a new type of robust photonic topological insulator for laser array applications is designed; new algorithms for the theoretical study of laser pulse interactions with metals and nonlinear dielectric media interfaces are developed; the findings of a study on helicity-dependent photocurrents in thin nanostructured CuSe films due to the surface photogalvanic effect are presented; a kinetic theory of the edge photogalvanic effect for intraband electron transport in 2D materials is developed. In general, all the studies presented in this Reprint were performed at a high level and demonstrate the continuing interest of the world's scientific community in research in the field of nonlinear optics.



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