Special Issue

Topological Photonic Structures and Their Symmetries

Message from the Guest Editors

Various symmetries, including time-reversal, chiral, particle-hole and spatial symmetries, largely determine the classification of topological insulators and topological semimetals in solid state physics. In comparison to their condensed matter counterparts, symmetries are exploited for engineering topological phases of classical waves and the design of topological photonic metamaterials. Two major classes are formed by Chern-type and Z2-type topological insulators, which support robust edge states at their boundaries. The discovery of higher-order topological phases has stimulated realizations of symmetry-protected photonic states of different dimensionalities in artificial photonic platforms. The main goal of this Special Issue is to disseminate the recent advancements in theory and applications of topological photonic structures, metamaterials and metasurfaces, with special focus on the role of symmetries imposed on them. We welcome original research papers of both fundamental and applied natures.

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Message from the Editor-in-Chief

Symmetry is ultimately the most important concept in natural sciences. It is not surprising then that very basic and fundamental research achievements are related to symmetry. For instance, the Nobel Prize in Physics 1979 (Glashow, Salam, Weinberg) was received for a unified symmetry description of electromagnetic and weak interactions, while the Nobel Prize in Physics 2008 (Nambu, Kobayashi, Maskawa) was received for the discovery of the mechanism of spontaneous breaking of symmetry, including CP symmetry. Our journal is named *Symmetry* and it manifests its fundamental role in nature.

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