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Topological Graph Theory and Discrete Geometry II

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Message from the Guest Editor

Dear Colleagues,

Symmetry is one of the most basic and important notions in all fields of science, technology, and art. The notion of symmetry can be traced down through the entire history of human creative endeavors. The scope of this Special Issue encompasses common issues regarding combinatorial symmetries (automorphisms) of an abstract combinatorial structure and the geometric symmetries of geometric realizations of that structure.

For instance, a two-dimensional polyhedron can be regarded as a geometric realization of the corresponding topological graph embedding. A "combinatorial symmetry", aka "automorphism", of the topological embedding is defined as a permutation of the vertices that maps edges to edges and faces to faces. Combinatorial symmetry may be realized (but not necessarily) by some geometric symmetry of the original polyhedron; otherwise, the combinatorial symmetry is called a hidden symmetry of the polyhedron. Is the absence of hidden symmetries a sign of perfection of the polyhedron? Well, the five Platonic polyhedra have no hidden symmetries...

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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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