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Symmetries of Partial Differential Equations

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Message from the Guest Editors

Dear Colleagues,

This Special Issue of *Symmetry* is devoted to recent developments in the theory of symmetries and conservation laws for systems of partial differential equations and its applications. The study of symmetries of differential equations has a long history with several innovative landmarks, among the most important of which is the investigation carried out in the nineteenth century by Sophus Lie of continuous groups of transformations which leave differential equations invariant. The accumulated contributions of Lie and other pioneers is now usually referred to as “symmetry analysis of differential equations”. Symmetry analysis is one of the systematic and accurate ways to obtain solutions of differential equations. This powerful technique is commonly used to explore the properties of physical systems, their symmetry structure, invariants, and other qualitative and quantitative features. Conservation laws for differential equations can be found using symmetry analysis, which can also be used to find the exact solutions. Symmetries are also important in verifying and developing numerical schemes...

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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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