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Symmetries and Integrability of Difference Equations

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Deadline for manuscript submissions:
closed (31 July 2019)

Message from the Guest Editors

The aim is, on one hand, to obtain powerful methods for solving integrable difference equations and to establish practical integrability criteria, telling us when the methods are applicable. On the other hand, Lie group methods can be adapted to solve difference equations analytically. Finally, integrability and symmetry methods can be combined with numerical methods to obtain improved numerical solutions of differential equations.

Keywords

- Discrete, continuous and ultra-discrete Painlevé equations
- Orthogonal polynomials, special functions and their relation to discrete integrable systems
- Integrability criteria for single and multivariable difference equations and differential difference equations
- Discrete differential geometry
- Discrete integrable systems and isomonodromy transformations
- Yang-Baxter maps and quantum discrete integrable systems
- Continuous symmetries of discrete equations
- Structure preserving dis-cretization of differential equations and numerical methods
- Cluster algebras and discrete integrable systems
- Dynamics on graphs and combinatorics
- Difference Galois theory
- Lattices and Symmetries in Physical Applications

mdpi.com/si/17446

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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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