

Special Issue

Symmetry and Asymmetry in Power Electronics and Grid Integration

Message from the Guest Editor

This Special Issue explores the fundamental role of symmetry principles in advancing power electronics theory, design, control, and application in modern grid integration. We seek rigorous, reproducible research that demonstrates how symmetry—whether in topologies, control strategies, or system operation—enables the development of more efficient, stable, and resilient power systems. Key areas of focus include symmetrical power converter topologies that enhance performance and reliability, symmetrical control strategies ensuring balanced operation, and balanced grid-forming control techniques critical for inverter-dominated grids. This Special Issue also highlights the potential of symmetrical harmonic cancellation methods to improve power quality and the application of symmetry in symmetrical renewable energy integration for the seamless connection of distributed resources.

Guest Editor

Dr. Pedro Javier García-Ramírez

Institute of Engineering, Universidad Veracruzana, Boca del Río, Veracruz, Mexico

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Symmetry
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
symmetry@mdpi.com

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About the Journal

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.

Editor-in-Chief

Prof. Dr. Sergei Odintsov
ICREA, 08010 Barcelona and Institute of Space Sciences (IEEC-CSIC),
C. Can Magrans s/n, 08193 Barcelona, Spain

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