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## Symmetry and Asymmetry in Materials and Mechanical Engineering: Properties and Applications

Guest Editors:

**Dr. Xiuli Zhang**

Associate Professor, School of Mechanical Engineering, Shandong University of Technology, Zibo, China

**Dr. Gengyuan Gao**

Associate Research Fellow, School of Design, Shanghai Jiao Tong University, Shanghai 200240, China

**Dr. Jun Cao**

School of Mechanical and Electrical Engineering, Wenzhou University, Wenzhou 325035, China

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### Message from the Guest Editors

Dear Colleagues,

The symmetric and asymmetric characteristics of materials or mechanical design affect the operational performance of mechanical systems. The symmetric and asymmetric properties of materials include symmetry/asymmetry at the atomic, nano-, and micrometer scales, as well as isotropic/anisotropic macroscopic properties. In structural engineering, symmetrical shapes and arrangements are easier to design and manufacture, reducing costs. The performance of mechanical systems is easier to calculate and predict by using symmetrical materials. On the other hand, asymmetry exists extensively in materials and mechanical engineering. For example, the asymmetry of forces can cause stress concentration, posing higher requirements for mechanical design. However, the directed transport of microfluids and heat can be achieved by introducing asymmetry through changing material properties or geometric structures. This Special Issue studies the symmetry and asymmetry characteristics of material and mechanical structure design, as well as related applications. The research method can involve modeling, simulation, machine learning, or experiments.



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**Special** Issue



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## Editor-in-Chief

### Prof. Dr. Sergei D. Odintsov

1. Institució Catalana de Recerca i Estudis Avançats (ICREA),  
Passeig Luis Companys, 23,  
08010 Barcelona, Spain  
2. Institute of Space Sciences  
(ICE-CSIC), C. Can Magrans s/n,  
08193 Barcelona, Spain

## 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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Symmetry Editorial Office  
MDPI, St. Alban-Anlage 66  
4052 Basel, Switzerland

Tel: +41 61 683 77 34  
www.mdpi.com

mdpi.com/journal/symmetry  
symmetry@mdpi.com  
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