

Special Issue

Physics Theory of Low-Dimensional Nanomaterials: Topological Phase Transitions, Spin Effects and Quantum Transport

Message from the Guest Editor

The field of condensed matter physics and material physics is undergoing a profound transformation, driven by the synergistic convergence of low-dimensional materials, topological quantum phenomena, and spintronics. This serves as an invitation to contribute to a forthcoming Special Issue of *Nanomaterials*, titled “Physics Theory of Low-Dimensional Nanomaterials: Topological Phase Transitions, Spin Effects and Quantum Transport”. The aim of this Special Issue is to capture the cutting edge of this rapidly evolving field and provide a platform for the most significant advances. Our scope is to highlight research that leverages low-dimensional materials as ideal platforms to explore, control, and harness interconnected quantum degrees of freedom—namely charge, spin, valley, and layer. We seek to illuminate how the expanded toolbox of topological states is paving the way for a new generation of quantum electronic phenomena with transformative potential for information technology.

Guest Editor

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Message from the Editor-in-Chief

Nanoscience and nanotechnology are exciting fields of research and development, with wide applications to electronic, optical, and magnetic devices, biology, medicine, energy, and defense. At the heart of these fields are the synthesis, characterization, modeling, and applications of new materials with lower nanometer-scale dimensions, which we call “nanomaterials”. These materials can exhibit unusual mesoscopic properties and include nanoparticles, coatings and thin films, metal–organic frameworks, membranes, nano–alloys, quantum dots, self-assemblies, 2D materials such as graphene, and nanotubes. Our journal, *Nanomaterials*, has the goal of publishing the highest quality papers on all aspects of nanomaterial science to an interdisciplinary scientific audience. All of our articles are published with rigorous refereeing and open access. We are proud of our increasing impact factor and ability to provide rapid decisions to authors.

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