

Special Issue

Advanced Spin and Orbital Torques: Fundamentals, Materials, and Applications in Spintronics

Message from the Guest Editor

This Special Issue aims to showcase cutting-edge research and comprehensive reviews exploring the fundamental physics and emergent phenomena arising from spin dynamics and spin-orbit interactions (SOIs) within nanostructures. The goal is to advance our understanding of magnetization dynamics, spin transport, and their manipulation at the nanoscale. We invite original research and reviews covering topics including, but not limited to, the following:

- Ultrafast magnetization dynamics (precession, switching, damping) in nanostructures.
- Spin-orbit torque (SOT) and orbital torque generation, mechanisms, and efficiency enhancement.
- Chiral spin textures (skyrmions, domain walls) stabilized by interfacial SOIs and DMI.
- Spin pumping, spin Hall effect, and inverse spin Hall effect in nanoscale systems.
- Novel materials (altermagnets, topological insulators, 2D materials, Heusler alloys, oxides).
- Advanced experimental techniques (e.g., ST-FMR, time-resolved microscopy, XMCD, Lorentz TEM) and theoretical modeling of nanoscale spin phenomena.

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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