Special Issue

Advances in Nanoscale Friction

Message from the Guest Editor

This Special Issue will showcase advances in nanoscale friction research, transforming tribological design and surface engineering. Techniques like atomic force microscopy (AFM) and friction force microscopy (FFM) enable direct single-asperity friction measurements, while molecular dynamics simulations reveal atomic mechanisms and predict behavior. Key progress spans graphene, 2D materials, nanostructured surfaces, carbon nanotube interfaces, and bio-inspired systems, with superlubricity—near-zero friction from incommensurate interfaces—representing a paradigm shift. Challenges include bridging atomic-to-macroscale phenomena, developing predictive environmental-effect models, and enabling practical applications. The Issue will cover atomic friction mechanisms, superlubricity, nanoscale surface modification, simulations, experimental techniques, friction in 2D materials, environmental effects, and scaling laws from nano to macroscale. Contributions advancing fundamental physics or demonstrating engineering solutions are encouraged.

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.

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