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Two-Dimensional Nanomaterial-Based Heterostructures

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Message from the Guest Editors

The unique physical, optical, and electronic properties of the atomically thin layers of semiconductors have made them promising hosts for the investigation of a wide range of innovative device applications and fundamental research activities. Currently, such materials are being used for the development of novel optical devices, ranging from photo-detectors, lasers, and photo-transistors, to memory cells and sensors. Heterostructures consisting of atomically thick materials have further expanded the horizon for higher degrees of control of the optical and electronic properties of two-dimensionally confined excitons and carriers, offering new possibilities for spin transport, valleytronic devices, and quantum materials. This Special Issue covers a wide range of applications, fundamental physics, fabrication, and the characterization of two-dimensional materials and their heterostructures. It also covers the hybridization of structures with plasmonic and photonic nanostructures and arrays, and their broader device applications, ranging from photonics and electronics devices to quantum control processes and sensors.



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Special Issue



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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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