Special Issue

Low-Dimensional Materials: Design and Optoelectronic Properties

Message from the Guest Editor

Low-dimensional materials such as zero-dimensional quantum dots, one-dimensional carbon nanotubes, and two-dimensional materials show an electronic wavefunction confined in one or more of their dimensions. These spatial constraints lead to quantum size effects which strongly modify their electronic and optical properties with respect to their bulk counterparts. These remarkable optoelectronic properties make them integral to the advancement of optoelectronic devices. Quantum dots represent a milestone for the whole field of nanotechnology due to their exceptional photoluminescence and size-tunable electronic properties. Nowadays, their applications are numerous, including their use as quantum light sources, bio-imaging agents, ultra-sensitive photodetectors, and fourth-generation photovoltaics. Two-dimensional (2D) materials such as graphene, transition metal dichalcogenides, and hexagonal boron nitride offer strong light–matter interactions, many-body effects, tunable band gaps, and novel excitonic effects at room temperature. Moreover, they are the building blocks from which tailored van der Waals heterostructures are formed, with control at the monolayer level [...]

Guest Editor

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Message from the Editor-in-Chief

Materials (ISSN 1996-1944) was launched in 2008. The journal covers twenty-five comprehensive topics: biomaterials, energy materials, advanced composites, advanced materials characterization, porous materials, manufacturing processes and systems, advanced nanomaterials and nanotechnology, smart materials, thin films and interfaces, catalytic materials, carbon materials, materials chemistry, materials physics, optics and photonics, corrosion, construction and building materials, materials simulation and design, electronic materials, advanced and functional ceramics and glasses, metals and alloys, soft matter, polymeric materials, quantum materials, mechanics of materials, green materials, general. *Materials* provides a unique opportunity to contribute high quality articles and to take advantage of its large readership.

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