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# Low-Dimensional Materials: Design and Optoelectronic Properties

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## 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 [...]

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## Message from the Editor-in-Chief

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