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Study of Structure Regulation and Physical Properties of Nano-Optoelectronic Materials

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Message from the Guest Editors

Nano-optoelectronic materials such as epitaxial 3D semiconductor quantum dots, 2D quantum wells/superlattices, and 2D monolayers are desired for information photonics and quantum photonics. To achieve suitable performances from these devices (e.g., high-speed lasers with low threshold, high working temperature and monolithic wavelength, photodetectors in high detectivity, definite biexciton–exciton photon-pair emission with small fine structure splitting, or efficient nonlinear optics on chip and fiber integrated instead of bulk material), a structure regulation of these nanomaterials is needed, e.g., adding modulated doping or tunneling barrier surrounding, controlling the nanomaterial size and orientation, using a strain-reducing layer or coupled layer for longer wavelength, using biaxial strain tuning to form light hole, controlling the flux sequence to form a sharp interface, or designing proper micro-resonator modes for nonlinear optics or integrated photonics. The structure optimization and its consequent improvement of device performance can be directly reflected in the characteristics of the material optical properties.

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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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