Special Issue

Next-Generation Low-Dimensional Semiconductor Materials: Synthesis and Applications for Photocatalysis and Photodetection

Message from the Guest Editors

Low-dimensional semiconductors (0D, 1D, 2D) exhibit quantum confinement effects and tunable optoelectronic properties, enabling breakthroughs in energy conversion, environmental remediation, and high-sensitivity photodetection. This Special Issue seeks to advance the synthesis, characterization, and application of low-dimensional semiconductors, emphasizing scalable fabrication, stability enhancement, and device integration for sustainable energy and sensing technologies. We invite contributions addressing, but not limited to, the following:

- Synthesis: Novel methods (CVD, solution-phase epitaxy) for low-dimensional materials (quantum dots, nanowires, 2D perovskites).
- Characterization: Advanced techniques (in situ TEM, low-wave Raman spectroscopy) to probe atomic-scale structure–property relationships.
- Applications: Photocatalysis (H2 generation, pollutant degradation), photodetectors (UV-IR range), and integrated systems (e.g., perovskite/organic tandems).

Guest Editors

Prof. Dr. Lijun Wu

Dr. Jagadeesh Suriyaprakash

Dr. Lianwei Shan

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Materials
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
materials@mdpi.com

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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.

Editor-in-Chief

Prof. Dr. Maryam Tabrizian
1. Department of Biomedical Engineering, Faculty of Medicine and Health Sciences, McGill University, Montreal, QC H3A 2B6, Canada
2. Faculty of Dentistry and Oral Health Sciences, McGill University, 3640 Rue University, Montreal, QC H3A 0C7, Canada

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