Special Issue

The Latest Progress of Nanoscale Materials for Photoelectric Detectors

Message from the Guest Editors

Photoelectric detectors are widely recognized as essential components in the optoelectronic information sector. In recent years, significant advancements have been made in the development of photoelectric detectors for various applications. However, a deeper understanding and further refinement of high-performance photoelectric detectors remain crucial for specific use cases. The recent integration of nanostructures and nanomaterials, driven by advancements in nanotechnology, presents promising opportunities to significantly enhance device performance by improving optical absorption efficiency along with carrier separation and transfer processes. Moreover, the introduction of new materials and configurations, such as thin films, organic–inorganic heterojunctions, nanophotonic systems, solar cells, and semiconductor-electrolyte interfaces, has further expanded the landscape of photoelectric detectors. The synergy between nanostructures, nanomaterials, and both innovative and traditional materials and configurations is expected to substantially elevate the performance of these detectors.

Guest Editors

Dr. Peiwen Lv

Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences, Fuzhou, China

Prof. Dr. Qinye Bao

School of Physics and Electronic Science, East China Normal University, Shanghai, China

Deadline for manuscript submissions

30 January 2026

Nanomaterials

an Open Access Journal by MDPI

Impact Factor 4.3
CiteScore 9.2
Indexed in PubMed

mdpi.com/si/221703

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

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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.

Editor-in-Chief

Prof. Dr. Eugenia Valsami-Jones
School of Geography, Earth and Environmental Science, University of Birmingham, Birmingham B15 2TT, UK

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