Special Issue

Surface Microstructure Regulation of Low-Dimensional Nanomaterials Photocatalysts for Energy and Environmental Applications

Message from the Guest Editors

Semiconductor photocatalysis, which converts ubiquitous, inexhaustible, and clean solar power into high energy density chemical energy, is considered as one of the most promising technologies to solve these problems. Low-dimensional nanomaterial photocatalysts commonly have smaller sizes and larger specific surface areas, can expose more active sites, and contribute to the subsequent structural modifications and reactant absorption. More importantly, low-dimensional photocatalysts possess a shorter bulk diffusion distance compared to photoinduced carriers, which reduces electron–hole pair recombination. On the other hand, the surface microstructure of nanomaterials has an important effect on the physical and chemical properties of the materials. Optimizing the electronic band structure and surface properties of low-dimensional photocatalysts through surface microstructure regulation strategies such as crystal plane engineering, defect engineering, and surface modification, as well as morphology and size control is of great significance to further enhance their photocatalytic performance and promote their applications in the fields of energy and the environment.

Guest Editors

Prof. Dr. Wei Zhou

Shandong Provincial Key Laboratory of Molecular Engineering, School of Chemistry and Pharmaceutical Engineering, Qilu University of Technology, Jinan 250353, China

Prof. Dr. Zhenzi Li

Shandong Provincial Key Laboratory of Molecular Engineering, School of Chemistry and Pharmaceutical Engineering, Qilu University of Technology, Jinan 250353, China

Deadline for manuscript submissions

19 September 2025

Nanomaterials

an Open Access Journal by MDPI

Impact Factor 4.3
CiteScore 9.2
Indexed in PubMed

mdpi.com/si/230784

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

mdpi.com/journal/nanomaterials

Nanomaterials

an Open Access Journal by MDPI

Impact Factor 4.3
CiteScore 9.2
Indexed in PubMed

mdpi.com/journal/nanomaterials

MDPI

About the Journal

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.

Editor-in-Chief

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

Author Benefits

Open Access:

free for readers, with article processing charges (APC) paid by authors or their institutions.

High Visibility:

indexed within Scopus, SCIE (Web of Science), PubMed, PMC, CAPlus / SciFinder, Inspec, and other databases.

Journal Rank:

JCR - Q2 (Physics, Applied) / CiteScore - Q1 (General Chemical Engineering)