

Special Issue

Recent Discoveries of Novel Ablative Thermal Protection Nanocomposites and Nanostructures

Message from the Guest Editor

One of the most critical challenges in developing thermal protection systems (TPS) for aerospace vehicles lies in understanding and optimizing the ablative behavior of materials in extreme environments. Thermal protection materials must withstand ultra-high temperatures and intense aerodynamic–thermal–chemical coupling while maintaining structural integrity. Therefore, the preparation of novel thermally protective nanocomposites, the development of unique thermally protective nanostructures, and the in-depth investigation of the mechanism of the fine-scale ablative degradation behavior of nanocomposites have become the focus of future research in this field. This Special Issue is dedicated to presenting the latest advances in lightweight ablative thermally protective nanocomposites and nanostructures, bridging the gap between materials science, structural engineering, and performance simulation and prediction. We aim to highlight the current state-of-the-art in ablative materials design and synthesis, structural innovations, and high-fidelity simulations that capture the complex thermal–mechanical–chemical interactions during ablation.

Guest Editor

Dr. Xiangyu Jin

Center for Composite Materials and Structures, National Key Laboratory of Science and Technology on Advanced Composites in Special Environments, Harbin Institute of Technology, Harbin 150001, China

Deadline for manuscript submissions

30 September 2026



Nanomaterials

an Open Access Journal
by MDPI

Impact Factor 4.3
CiteScore 9.2
Indexed in PubMed



mdpi.com/si/249624

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

[mdpi.com/journal/
nanomaterials](https://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](https://mdpi.com/journal/nanomaterials)



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. We are proud of our increasing impact factor and ability to provide rapid decisions to authors.

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, CAPIus / SciFinder, Inspec, and other databases.

Journal Rank:

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