Special Issue

Ultrafast Laser Micro-Nano Welding: From Principles to Applications

Message from the Guest Editors

In this Special Issue, we seek to present the current state of the art in ultrafast laser micro-/nanowelding technology from principles to applications. We aim to show that tuning transient electron activation processes, high-rate laser energy deposition, and the dynamic evolution of plasma morphology at the nanoscale via temporal/spatial shaping methods is able to facilitate the transition from conventional homogeneous transparent material welding to the more intricate realm of transparent/metal heterogeneous material welding. Moreover, the implementation of novel, real-time, in situ monitoring techniques and the prompt diagnosis of welding defects can further be used to improve the strength and stability of welds at the micron scale. We welcome a wide range of topics, such as the principles of ultrafast laser micro-/nanowelding, bottleneck problems in the welding process, novel welding methods, advances in welding performance, in situ monitoring and diagnosis, image processing and machine learning, and various other applications, to be discussed and presented in this Special Issue.

Guest Editors

Dr. Xianshi Jia

Prof. Dr. Cong Wang

Dr. Li Kai

Deadline for manuscript submissions

20 January 2026

Nanomaterials

an Open Access Journal by MDPI

Impact Factor 4.3
CiteScore 9.2
Indexed in PubMed

mdpi.com/si/220146

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)