

Special Issue

Advanced Laser Welding and Joining of Metallic Materials

Message from the Guest Editor

Laser welding and joining technologies are pivotal in advancing the manufacturing of high-performance metallic components across critical industries. This Special Issue prioritizes laser welding and joining of lightweight alloys, with a focus on resolving microstructural inhomogeneity, defect formation, residual stress, and distortion in welded structures. Research will emphasize multi-physics and multi-scale computational approaches to enable precise defect diagnosis, lifecycle prediction, and process–structure–performance optimization.

Research areas may include (but are not limited to) the following: laser welding with new types of laser power; hybrid laser welding of light alloys; microstructure evolution and enhanced mechanical properties; defect detection and suppression in laser-welded seams through optical/spectral sensing or machine learning; heat and mass transfer behavior; and extreme environmental applications. We look forward to receiving your contributions.

Guest Editor

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About the Journal

Message from the Editor-in-Chief

Metallic materials play a vital role in the economic life of modern societies; contributions are sought on fresh developments that enhance our understanding of the fundamental aspects related to the relationships between processing, properties and microstructure – disciplines in the metallurgical field ranging from processing, mechanical behavior, phase transitions and microstructural evolution, nanostructures, as well as unique metallic properties – inspire general and scholarly interest among the scientific community.

Editor-in-Chief

Prof. Dr. Yong Zhang

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