Special Issue

Advances in Directed Energy Deposition Technology for Metallic Materials

Message from the Guest Editors

Directed Energy Deposition (DED) is a rapidly evolving class of additive manufacturing technologies that enables the fabrication, repair, and functionalization of metallic components with a high freedom of design and material efficiency. Among its various implementations, technologies such as Laser-Directed Energy Deposition (L-DED) and Wire Arc Additive Manufacturing (WAAM) are receiving growing attention in both research and industrial contexts, due to their scalability, deposition rates, and flexibility.

This Special Issue invites original contributions and comprehensive reviews that explore recent advances in DED applied to metallic materials. Topics of interest include, but are not limited to, the following:

- In-situ monitoring and sensing techniques for process stability and quality control;
- Thermomechanical modeling and simulation of DED processes;
- Process parameter optimization and control strategies;
- Analysis of thermal history, residual stresses, and resulting microstructure.

Guest Editors

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About the Journal

Message from the Editorial Board

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.

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manuscripts are peer-reviewed and a first decision is provided to authors approximately 18 days after submission; acceptance to publication is undertaken in 2.6 days (median values for papers published in this journal in the first half of 2025).

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