Special Issue

Laser Powder Bed Fusion: Alloy Design and Material Quality Optimisation

Message from the Guest Editor

LPBF has emerged as a transformative technology in sectors such as aerospace, biomedical, and energy. However, its full potential hinges on the development of alloys tailored for AM and the refinement of process parameters to ensure consistency, reliability, and performance. We seek submissions that explore this critical intersection—where materials science meets process engineering. Topics of interest include, but are not limited to, the following:

- Design and development of novel alloys for LPBF;
- Microstructural evolution and phase transformations during printing;
- Powder characteristics and their influence on build quality;
- Process parameter optimisation and defect mitigation;
- In situ monitoring, modelling, and control strategies;
- Post-processing techniques and their impact on mechanical properties;
- Data-driven approaches and machine learning in LPBF.

Contributions should aim to deepen understanding, improve manufacturability, and accelerate industrial adoption of LPBF technologies. Join us in shaping the next chapter of LPBF innovation. Submit your manuscript and be part of a collection that will inform, inspire, and advance the field.

Guest Editor

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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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