# Special Issue

# Fundamentals and Applications of Light-Matter Interactions in Laser Metal Additive Manufacturing

### Message from the Guest Editor

Additive manufacturing (AM) has largely fueled the next industrial revolution by redefining how objects are fabricated and manufactured. In particular, laser metal AM allows for rapid prototyping and printing complex geometries with tailored microstructures and mechanical properties, beyond the realm of conventional manufacturing. The aim of this Special Issue is to show some research focusing on fundamental phenomena that govern laser metal AM techniques across broad spatiotemporal regimes, and applications involving novel metals and alloys, as well as complex geometries. Topics of interest include optical and thermal engineering strategies (such as laser beam shaping, multibeam processing and in situ annealing), advanced diagnostic techniques combined with correlative and predictive (including machine learning and AI) approaches, and physics-based modeling approaches to capture complex process dynamics at multiple length scales. The potential of metal AM for several current and future applications is highlighted. It is my pleasure to invite you to submit articles, communications, or reviews to this Special Issue.

### Guest Editor

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### Deadline for manuscript submissions

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## Editor-in-Chief

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