

Editorial

# Laser Welding

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## 1. Introduction and Scope

Welding technologies are critical to most relevant engineering applications. Laser welding is a key joining technology characterized by small heat affected and fusion zones, as well as minimal or non-existent distortions. As a result, laser welding is often used for joining advanced metallic alloys.

The metallurgical alterations that occur as a result of the welding process determine the mechanical properties of the welded part. As such, a fundamental understanding of process-microstructure-properties relationships is necessary. Given the non-equilibrium solidification conditions found in laser welding, a thorough understanding of the associated welding metallurgy is even more important. This knowledge can then be used to optimize the joining process, aiming at improving the properties of the welded joints.

## 2. Contributions

The present special issue on “Laser Welding” was a success with a total of 16 original research works published after peer- review. Different topics were discussed within this special issue: modelling and simulation of laser welding were presented in [1–4]; porosity control by means of high speed imaging and microscopy techniques was studied and discussed [5]; the effect of processing parameters on the microstructure and mechanical properties of laser-welded joints was evaluated for different metallic systems such as AZ31 alloy [6], steels [7–10], Ti-based alloys [11–13], and Al-based alloys [14]; and finally, dissimilar laser welding of aluminum to steel was presented [15,16].

## 3. Conclusions and Outlook

Laser welding is one of the most important and versatile welding techniques for joining advanced materials. Exciting developments in this field are continuously being presented, pushing the boundaries of the application of the technique. The need to develop modelling and simulation tools and understanding the welding metallurgy associated with the process and process control, among other features, will require a continuous effort by researchers in this field.

As guest editors, we would like to express our gratitude to all the authors who submitted their contributions, making this special issue a success. Furthermore, we gratefully acknowledge and the peer-reviewers who contributed to improving the quality of the manuscripts. Finally, special thanks to Natalie Sun and the remaining Metals editorial team for their support and assistant during the call period of this special issue.

**Conflicts of Interest:** The authors declare no conflict of interest.

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