Special Issue

Welding Metallurgy and Processes of Dissimilar Materials

Message from the Guest Editor

The welding of dissimilar materials is one of the most dynamic and evolving areas in modern manufacturing and materials engineering, presenting unique challenges and opportunities across many industrial sectors. As industries increasingly demand innovative solutions for fabricating complex structures involving different material combinations—such as metals with different properties, metal–composite, metal–polymer, and polymer–composite—the need for a comprehensive understanding of the welding of dissimilar materials has never been more crucial. This Special Issue aims to address the complexities and technological advancements associated with welding dissimilar materials. In fact, joining dissimilar metals often involves managing contrasting thermal, mechanical, and chemical properties, including varying melting points, differing thermal expansion rates, and the potential formation of detrimental intermetallic phases. By addressing these topics, this Special Issue aims to deepen the understanding of the physical metallurgy, welding techniques, microstructural evolution, and mechanical behavior of joints between dissimilar materials.

Guest Editor

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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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