

Special Issue

Diffusion Phenomena in the Joining of Advanced Metallic Materials

Message from the Guest Editor

Advanced materials generally require the development of novel joining techniques, as this is crucial to integrate them into functional structures and to widen their application field. Additionally, joining constitutes a technology which influences all the industrial sectors, playing a key role in the economic and social development of a country. For instance, diffusion bonding and brazing are two straightforward techniques for producing sound and reliable joints, since these processes are capable of joining a wide range of materials for the aerospace industry, as well as in many other industrial applications, offering remarkable advantages over conventional fusion welding processes. In these joining processes and in others, diffusion phenomena play an important role. Understanding these different transport phenomena at many levels, from atomistic to macro, is crucial for the characterization of the joints interfaces. The diffusion can be the principal mechanism for joint formation as in a solid-state diffusion bonding process or can only play a role in a specific state to ensure bonding.

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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