Special Issue

Dissimilar Material Welding and Joining

Message from the Guest Editor

Multi-material structures, combining various materials with different functions or properties, are significantly effective for manufacturing high-performance parts and products at low production and operational costs in modern industrial applications. To build multi-material structures, dissimilar-material welding and joining is required. However, the production of highly reliable multi-material structures is still difficult because many problems arising from metallurgical reactions (the formation of brittle phases), large differences in melting temperature or thermal expansion coefficient between the materials, galvanic corrosion, and so on are inevitable during the dissimilar-material welding and joining. Recently, a large number of academic studies on the welding and joining of several combinations of dissimilar materials using various low-heat-input or solid-state welding and joining processes have been contributing to the development of dissimilar-material welding and joining to create highly reliable multi-material structures, but a vast amount of research and development activities are still needed.

Guest Editor

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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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