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Advances in Shape Memory Alloys and Their Applications

Guest Editor:

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Deadline for manuscript submissions:
closed (30 June 2022)

Message from the Guest Editor

Shape memory alloys (SMAs) are unique class of metallic smart materials, that show the ability to recover large deformations. The phase transformation in SMA can be induced by the application of mechanical stress or temperature. The martensitic transformation and associated shape memory response in SMAs are highly affected by the chemical composition and microstructure of the alloy. The sensitivity of SMAs to these factors provides the opportunity to enhance and tailor their strength, recovery ratio, cyclic stability as well as adjusting their phase transformation temperatures for desired applications through a variety of pre and post-fabrication treatments.

This special issue is for the most recent advances in all aspects of traditional, high-temperature, and magnetic shape memory alloys. All advancers with contributions from manufacturing, post-processing treatments, alloying, experimental and theoretical mechanics, and physics are welcome. The novel applications of SMAs in all areas including bio-medical devices, thin films, robotics, aerospace engineering, and micro-electromechanical systems (MEMS) are also of interest to this special issue.

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Message from the Editor-in-Chief

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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Journal Rank: JCR - Q2 (Metallurgy and Metallurgical Engineering) / CiteScore - Q1 (Metals and Alloys)

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