

Special Issue

New Processes and Technologies in Alloy Materials: Focus on Additive Manufacturing, HEAs, and Welding

Message from the Guest Editors

This Special Issue focuses on three key areas: additive manufacturing (AM), high-entropy alloys (HEAs), and welding technologies. AM offers exceptional design freedom and material efficiency, yet challenges remain in process optimization, defect mitigation, and property consistency. HEAs, known for their complex chemistries and outstanding mechanical properties, are being explored for high-temperature stability and corrosion resistance. Welding technologies are advancing via friction stir welding, hybrid techniques, and laser-based methods to improve the joining of dissimilar or hard-to-weld alloys. Recent studies have sought highlight microstructure–property relationships, in situ monitoring, phase transformation behavior, and the integration of AM with tailored heat treatments. In addition, machine learning-driven alloy design and process control are accelerating the discovery of new alloys and optimizing processing routes.

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Message from the Editorial Board

Materials (ISSN 1996-1944) was launched in 2008. The journal covers twenty-five comprehensive topics: biomaterials, energy materials, advanced composites, advanced materials characterization, porous materials, manufacturing processes and systems, advanced nanomaterials and nanotechnology, smart materials, thin films and interfaces, catalytic materials, carbon materials, materials chemistry, materials physics, optics and photonics, corrosion, construction and building materials, materials simulation and design, electronic materials, advanced and functional ceramics and glasses, metals and alloys, soft matter, polymeric materials, quantum materials, mechanics of materials, green materials, general. *Materials* provides a unique opportunity to contribute high quality articles and to take advantage of its large readership.

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