Special Issue

High-Performance Lightweight Alloy Materials and Their Advanced Forming Technologies

Message from the Guest Editors

Lightweight alloys, including magnesium, aluminum, and titanium alloys, have demonstrated significant potential in advancing energy-efficient engineering systems. Their unique combination of density, strength, ductility, and formability makes them valuable for applications in aerospace, transportation, and renewable energy. However, persistent challenges—such as balancing mechanical performance with processability, tailoring microstructures for high-performance demands, and scaling up advanced forming techniques—require systematic scientific exploration. This Special Issue addresses these critical gaps by promoting interdisciplinary research on high-performance alloy design and innovative manufacturing approaches, which are essential to unlocking the next generation of lightweight solutions

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