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Machine Learning Models in Metals

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Message from the Guest Editor

Dear Colleagues,

Computational methods and simulations have greatly contributed to our understanding of the properties and behavior of metals. The integration of machine learning models, particularly neural networks, into the simulation of metal processes represents a significant stride forward in the field. In manufacturing, machine learning algorithms can optimize production processes by analyzing vast datasets in real-time, leading to increased efficiency and cost savings. Moreover, machine learning-driven material discovery has yielded exciting results, with algorithms identifying novel metal alloys with tailored properties for specific applications, such as lightweight yet strong materials for the aerospace industry. Additionally, characterizing complex microstructures and grain boundaries in metals has become more precise and efficient with neural networks, enabling researchers to better understand the relationship between microstructure and material performance. Overall, machine learning is transforming metallurgy, materials design, and numerous industries that rely on metals by accelerating innovation and enabling data-driven decision-making.

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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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