Special Issue

Data-Driven Approaches in Materials Research: Design, Discovery, Testing, and Applications

Message from the Guest Editor

The convergence of machine learning, artificial intelligence, and computational modeling is reshaping the landscape of materials science. From accelerating the discovery of next-generation battery materials to enabling autonomous experimentation in electron microscopy, these technologies are unlocking new levels of precision, scalability, and insight.

This Special Issue invites contributions that explore how data-driven approaches are transforming materials design, characterization, and optimization. Topics include AI-guided multiscale simulations, intelligent manufacturing workflows, and the automation of complex instrumentation such as scanning and transmission electron microscopy. We are particularly interested in research that bridge theory and experiment, leveraging computational models to guide synthesis, and using AI to interpret high-dimensional data from advanced characterization tools.

We welcome original research articles, reviews, and case studies that demonstrate the practical impact of AI and computational methods across the materials lifecycle.

Guest Editor

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Message from the Editor-in-Chief

As the world of science becomes ever more specialized, researchers may lose themselves in the deep forest of the ever increasing number of subfields being created. This open access journal *Applied Sciences* has been started to link these subfields, so researchers can cut through the forest and see the surrounding, or quite distant fields and subfields to help develop his/her own research even further with the aid of this multi-dimensional network.

Editor-in-Chief

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