

Editorial

AI Materials: A New Open Access Journal for Artificial Intelligence and Materials Science

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We stand at a transformative moment in scientific history, where artificial intelligence and materials science are engaged in a mutually reinforcing cycle of advancement. *AI Materials* is founded on the fundamental recognition that these two fields are not merely intersecting, but rather co-evolving in ways that promise to accelerate progress across both domains. This journal is dedicated to exploring this dual trajectory—how AI revolutionizes materials research, and equally importantly, how advanced materials enable the next generation of AI technologies.

The Imperative for AI-Driven Materials Innovation

Materials science has long been the backbone of technological progress, from the Bronze Age to the Silicon Revolution. However, traditional empirical approaches are increasingly constrained by their inherent limitations in speed, scalability, and predictive power. The advent of sophisticated AI methodologies presents nothing short of a renaissance for the field, offering:

- AI-driven material design and optimization, such as machine learning, deep learning, reinforcement learning, etc.;
- AI models and algorithms for material property prediction;
- Data-driven high-throughput screening and discovery of new materials;
- Integrated autonomous system for material design–synthesis–characterization–optimization;
- AI-assisted material informatics;
- AI-supported Materials Genome Initiative;
- AI-driven research and development of smart materials and green materials;
- Innovative practices of AI technology in the field of material applications, including energy, aerospace, manufacturing, etc.;
- Interpretability, credibility, and reproducibility in the application of artificial intelligence to material research and development.

Materials Science as the Foundation for AI Advancement

Just as AI transforms materials research, breakthroughs in materials science are proving equally vital for AI's continued evolution. This reciprocal relationship manifests in several critical dimensions:

- Materials and devices for artificial intelligence networks;
- Nanomaterials, quantum materials, energy materials, flexible materials, and other cutting-edge materials for enhancing AI applications such as, enhancing computing power, enabling diverse application scenarios, improving data processing efficiency, etc.



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Toward a Materials Intelligence Ecosystem

As this journal launches, we recognize that the ultimate measure of our success will be the degree to which we facilitate the emergence of a true materials intelligence ecosystem—one where AI not only accelerates discovery but inspires fundamentally new ways of conceptualizing material behavior.

The editorial team pledges to maintain rigorous scientific standards while fostering creative, interdisciplinary dialogue. We welcome researchers from all career stages and geographic regions to join us in shaping this exciting new chapter in materials research.

The time has come to reimagine materials science through the lens of artificial intelligence. Let the journey begin.

Conflicts of Interest: The author declares no conflicts of interest.

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