Special Issue

Next-Generation Metal Additive Manufacturing: Intelligent Microstructure Design, Mechanical Reliability, and Advanced Material Systems for Industrial Applications

Message from the Guest Editors

We would like to invite original research articles, reviews, and perspectives in (but not limited to) the following areas:

1. Intelligent Microstructure Design: process–structure–property modeling, data-driven/AI-assisted alloy and process development, and grain/texture engineering strategies.
2. Mechanical Reliability: Fatigue, fracture, creep, and environmental performance of additively manufactured alloys along with defect-tolerant design approaches and residual stress mitigation and qualification methodologies.
3. Advanced Material Systems: Novel high temperature or high entropy alloys tailored for AM, high-temperature and extreme-environment materials, multi-material/graded structures, and sustainable feedstock solutions.
4. Cross-Cutting Enablers: Real-time sensing and feedback control, digital twins, qualification/standardization strategies, in-situ monitoring and process control and design-for-AM frameworks.

We hope you will consider submitting your latest work to this Special Issue. Thank you for your consideration.

Guest Editors

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Materials

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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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