Special Issue

Multifunctional Materials for Energy-Efficient and Sustainable Buildings

Message from the Guest Editors

Multifunctional building materials—capable of thermal regulation, energy harvesting, moisture buffering, self-sensing, self-healing, and enhanced durability—are reshaping how we design envelopes and load-bearing systems for low-carbon, climate-resilient buildings. We welcome studies covering the following:

- Synthesis, processing, and microstructural tailoring of multifunctional materials;
- Comprehensive characterisation using destructive (e.g., mechanical/fracture, fire, durability) and non-destructive methods (e.g., ultrasonics, impact-echo, impedance spectroscopy, acoustic emission, SHM);
- Multi-physics and multi-scale models (heat–moisture–mechanics–electrical), digital twins, and data-driven/AI frameworks;
- Hygrothermal and thermo-mechanical simulations at component and whole-building levels;
- Life-cycle/embodied-carbon, techno-economic, and circularity assessments, including retrofit case studies.

Original research articles, reviews, and short communications are invited. The scope aligns with current progress in PCMs, BIPV, self-sensing cementitious materials, and LCA/hygrothermal modelling. I look forward to receiving your contributions.

Guest Editors

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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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