# Special Issue

# Synergizing Sustainable Materials with Energy Efficiency for Enhanced Thermal Comfort in Buildings

## Message from the Guest Editors

The interplay between sustainable building materials, energy-efficient design, and human well-being has become pivotal in redefining the built environment's role in addressing global climate and resource challenges. The traditional priorities of material durability, energy performance, and cost-effectiveness are now augmented by urgent demands for occupant-centric thermal, visual, and acoustic comfort; circular material lifecycles; and digital innovation. Emerging tools like building information modeling (BIM) and IoT-driven systems further transform how we design, construct, and operate buildings, enabling data-driven synergies between sustainability and human needs. Yet, critical gaps persist: How can material innovations balance low embodied carbon with adaptive thermal performance? How do energy-efficient systems seamlessly enable occupant comfort in diverse climates? What role do digital tools play in scaling solutions across global contexts? This Special Issue aims to advance interdisciplinary research on holistic sustainable design, where material science, energy efficiency, human comfort, and digital workflows converge to create resilient, equitable built environments.

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# About the Journal

### Message from the Editor-in-Chief

Current urban environments are home to multi-modal transit systems, extensive energy grids, a building stock, and integrated services. Sprawling neighborhoods are composed of buildings that accommodate living and working quarters. However, it is expected that the cities and communities of the future will face complex and enormous challenges, including maintenance, interconnectivity, resilience, energy efficiency, and sustainability issues, to name but a few. A smart city uses advanced technologies and a digital infrastructure to improve the outcomes in every aspect of a city's operations. A smart building optimizes the experience of occupants, staff, and management by using a modern and connected environment. Innovations in technology that can bring dramatic improvements to design, planning, and policy are critical in developing the cities and buildings of the future.

### Editor-in-Chief

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