Special Issue

High-Performance Buildings for Health and Comfort: Indoor Environment, Thermal Design, and Structural Integrity

Message from the Guest Editors

In recent decades, the profound shift towards indoor living has heightened the critical need for improving the indoor environmental quality (IEQ) in buildings. As a core component of IEQ, the thermal environment—governed by a complex interplay of building design, systems, and external climate—exerts a pivotal influence on occupant well-being and building performance. It not only fundamentally determines human comfort but is also intrinsically linked to physical health, cognitive function, and overall productivity. Furthermore, innovative approaches to managing the thermal environment, such as high-performance building envelopes, smart HVAC system controls, and passive/low-carbon design strategies, have demonstrated significant potential for enhancing energy efficiency and reducing carbon emissions. This Special Issue aims to foster a deeper understanding of the multifaceted interactions between occupants and their thermal environment, with a particular focus on achieving an optimal balance between human-centric needs and building performance.

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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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