Special Issue

Advanced Technology in Heat Transfer, Ventilation, and Multiphysics Building Performance

Message from the Guest Editor

Modern buildings must balance energy efficiency, occupant comfort, and environmental sustainability. While heat transfer and ventilation are central to thermal regulation and indoor air quality, other factors—such as vibration control, acoustic performance, and water quality management—play a critical role in overall building functionality and user well-being. This Special Issue explores advanced technologies and integrated solutions for optimizing building performance across multiple physical domains. We invite contributions on innovative research and practical applications, including but not limited to: Core Topics: **Heat Transfer and Thermal Systems; Smart Ventilation and Air Quality; Vibration and Acoustics in Building Systems; Water Quality and Hydronic Systems; Cross-Disciplinary Approaches.** We welcome original research articles, reviews, and case studies that address these challenges through technological innovation, simulations, or experimental validations.

Guest Editor

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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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