

Special Issue

Innovative Structures with High-Performance Materials

Message from the Guest Editors

This Special Issue presents the latest advancements in designing, analyzing, and applying innovative structures using high-performance materials. It highlights the intersection of advanced structural forms and new materials, demonstrating how innovative geometries and strategies unlock the potential of cutting-edge materials. Rapid developments in material science are enabling novel solutions that enhance efficiency, durability, and sustainability. Topics include high-strength steel, fibre-reinforced polymers, ultra-high-performance concrete, advanced composites, shape-memory alloys, and bio-inspired materials. The Issue features research on lightweight, resilient, and smart structures for various engineering applications. Key themes encompass optimization, additive manufacturing, multi-scale modelling, and experimental validation under extreme conditions. By integrating material innovation with structural engineering, this collection addresses challenges in load-bearing capacity, energy absorption, and durability while promoting eco-friendly solutions. The selected papers provide valuable insights for researchers and professionals seeking to advance modern structural design.

Guest Editors

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Deadline for manuscript submissions

31 December 2026



Buildings

an Open Access Journal
by MDPI

Impact Factor 3.1
CiteScore 4.4



mdpi.com/si/249531

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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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manuscripts are peer-reviewed and a first decision is provided to authors approximately 15.1 days after submission; acceptance to publication is undertaken in 2.9 days (median values for papers published in this journal in the second half of 2025).