# Editorial

## George Wardeh*

Civil Engineering Mechanics and Materials Laboratory (L2MGC),
CY Cergy-Paris University,
95031 Neuville-sur-Oise, France
Email: george.wardeh@cyu.fr
*Corresponding author

## Firas Al Mahmoud

Institut Jean Lamour, UMR 7198, CNRS,
Lorraine University,
Doyen Urion Street, 54601 Villers-lès-Nancy Cedex, France
Email: firas.al-mahmoud@univ-lorraine.fr

## Hala Hasan

Higher Institute of Earthquake Studies and Research (HIESR),
Damascus University,
Damascus P.O. Box 30621, Syria
Email: hala.hasan@damascusuniversity.edu.sy

**Biographical notes:** George Wardeh is a Full Professor of Materials and Structural Engineering at CY Cergy-Paris University, France, and joined the Laboratory of Materials and Mechanics of Civil Engineering (L2MGC) in 2007. The research he leads is structured around converging axes: the thermo-hydro-mechanical behaviour of construction materials within the framework of poromechanics, mix design and mechanical properties of concrete, post-cracking behaviour of brittle materials, and static and dynamic behaviour of masonry and reinforced concrete structures.

Firas Al Mahmoud holds a PhD in Strengthening Reinforced Concrete Structures INSA, Toulouse, France. He was the Head of the Civil Engineering Department at Lorraine University from 2017–2020. Furthermore, he has experience in education and research with an emphasis on sustainable materials and rehabilitation, modelling, structures, and structural strengthening. He also develops innovative strengthening techniques utilising fibre-reinforced polymers and cementations-based mortar. He is an author of dozens of research papers and the organiser of some international conferences. His research interests are structural analysis, structural strengthening and repairing, finite element method, and construction materials.

Hala Hasan is the Dean of the Higher Institute of Earthquake Studies and Research (HIESR) and a member of the Syrian Code Committee since 2016, served as the head of the Seismic Committee of the Syndicate of Engineers, Damascus Branch between 2021 and 2023. She has numerous research articles published in various journals and international conferences and is currently a senior academic researcher with over 70 technical scientific publications. Her

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research activities can be summarised in three axes: effect of soil-structure interaction on the seismic response of reinforced concrete and steel structures; effect of semi-active control on seismic response of high-rise buildings with magneto-rheological dampers and linear control; the behaviour of reinforced concrete beams using analytical and numerical approaches; and the application of IA in risk management and structural engineering.

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Welcome to this special issue focusing on *Sustainable Solutions for Earthquake-Resistant Materials and Structures: Balancing Environmental Impact and Structural Integrity*. Earthquakes, among the most devastating natural disasters, pose significant challenges to the built environment, leading to loss of lives, livelihoods, and infrastructure. Ensuring the resilience of structures against seismic events is paramount, but this must be achieved without exacerbating environmental degradation.

In recent years, there has been a growing recognition of the need to reconcile the imperative for structural safety with the goals of sustainability. This special issue brings together a collection of research papers, case studies, and critical analyses that explore innovative approaches to earthquake-resistant materials and structures while considering their environmental impact throughout their lifecycle.

The papers included in this issue cover a broad spectrum of topics, ranging from the development of novel construction materials with reduced carbon footprint to advanced structural designs that optimise resource utilisation. Additionally, considerations such as recyclability, energy efficiency, and life cycle assessment are central themes explored within the context of seismic resilience.

As guest editors, we are delighted to present this compilation of contributions from leading researchers, engineers, and practitioners in the field. Each paper offers valuable insights and contributes to the ongoing discourse on sustainable solutions for earthquake-resistant structures. By fostering interdisciplinary collaboration and knowledge exchange, we aim to advance the state-of-the-art in seismic engineering while promoting environmental stewardship.

We extend our gratitude to all the authors who have contributed their work to this special issue and to the reviewers who provided invaluable feedback to ensure the quality and rigor of the published papers. We hope that this collection will inspire further research, innovation, and implementation of sustainable practices in earthquake-resistant construction, ultimately enhancing the resilience of communities worldwide.

We invite readers to delve into the diverse array of contributions within this Special Issue and join us in the collective endeavour to create a safer, more sustainable built environment in the face of seismic challenges.