



Housing and Building  
National Research Center



Housing & Building National Research Center International Conference  
Future Vision & Challenges for Urban Development  
"Green Smart Sustainable Building between Present & Future"  
Cairo, Egypt - 15<sup>th</sup> - 17<sup>th</sup> December 2024



Ministry of Housing, Utilities  
and Urban Communities



# Kamal H. Khayat

**Vice Chancellor for Research and Innovation at  
Missouri S&T, Rolla, MO.**

**Lecture Title: Keynote Presentation Optimizing Ultra-High-Performance Concrete Properties Through Advanced Rheological Design and Nanotechnology**

## Objective

Ultra-high-performance concrete (UHPC) is attracting increasing interest worldwide due to its superior mechanical properties and durability and ability to enhance the sustainability and resilience of concrete infrastructure. Proper rheological properties can enhance fiber dispersion and alignment with a marked effect on tensile and flexural strength and toughness. An overview of the rheological properties of UHPC and applicable flow models and measurement techniques are discussed. The design of non-proprietary UHPC and the effect of fiber geometry, internal curing, and nanomaterials on key properties of UHPC are highlighted

## Field of Experience:

Professor Khayat is the Vernon and Maralee Jones Professor of Civil Engineering and Vice-Chancellor for Research and Innovation at Missouri S&T, Rolla, MO. He served as Director of the Center for Transportation Infrastructure and Safety, a National University Transportation Center (UTC), and the Tier-1 UTC, Research on Concrete Applications for Sustainable Transportation. Currently, he serves as the Associate Director of the Center for Durable and Resilient Transportation Infrastructure Tier-1 UTC. He was Professor in the Department of Civil Engineering at the Université de Sherbrooke in Quebec, Canada. During his 21 years there, he served as Director of the Integrated Research Laboratory on Materials Valorization and Innovative and Durable Structures.

Dr. Khayat's conducted pioneering research rheology of cement-based materials, high-performance concrete with adapted rheology, self-consolidating concrete, and underwater concrete. He chaired/co-chaired several international conferences, including the 2020 Gordon Research Conference (Ventura Beach, CA), SCC2016 (Washington, DC), SCC2010 (Montreal), and other conferences in China, France, Poland, and the UAE.

Dr. Khayat has authored over 530 publications, 11 books and book chapters, and served as editor/co-editor of 19 books and conference proceedings. Based on research citations, quality, and impact, he was recognized in 2023 as a Top 2% Scientist by Stanford University rankings of global scientists and engineers (#22 in Building & Construction). Professor Khayat received his undergraduate and graduate degrees in Civil Engineering from the University of California at Berkeley.