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Beltrami Room, Building 5, ground floor, Leonardo Campus
Monday 14 May, 11:00

"Performance of Fiber Reinforced Materials: Historical Perspective and Glance in the Future"

Prof. Surendra Shah
Northwestern University

Ideally, high performance fiber reinforced concrete should have enhanced modulus of elasticity, higher bend over point, and sustained strain hardening response characterized by sequential multiple cracking with controlled crack widths. Conventional fiber reinforced concrete primarily alters the post peak response and can constrain macro cracks. Strain hardening response can be obtained by controlling processing (extrusion, pultrusion, spraying chopped fiber and cement slurry), volume, type and geometry of fibers (e.g. textile) and rheology of the matrix (selfconsolidating concrete (SCC), ultra-high performance concrete (UHPC)). Use of nanofibers such as carbon nanotubes (CNT) and carbon nanofibers (CNF) fundamentally alters the nanostructure of calcium silicate hydrate (C-S-H) gel. Reinforcing concrete with CNT can enhance modulus of elasticity, enhance toughness, reduce autogenous shrinkage and delay corrosion of steel bar reinforcement. Modeling and characterizing interfaces at multiscale is critical in the development of high performance fiber reinforced concrete.

Reference: **Prof. Liberato Ferrara** (liberato.ferrara@polimi.it)

Bio-sketch

Surendra Shah is Walter P. Murphy Professor (Emeritus) at Northwestern University. He was the director of the NSF-funded Science and Technology Center of Advanced Cement Based Materials. He is an honorary member of ACI and RILEM and has published over 500 journal articles on various aspects of concrete technology.
Prof. Shah is a member of the U.S. National Academy of Engineering, the Chinese Academy of Engineering, and the Indian Academy of Engineering. Currently he is a distinguished professor at IIT Madras, Honorary Professor at Tongji University, Hongkong Poly and Jinan University, and a member of the Institute of Advanced Studies at HKUST.