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Coordinatore del Dottorato: prof. ing. Andrea Papola

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Seminar no.14
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10:30-12:00
Aula Arrigo Croce – ed. C8 – DICEA

Seismic response of ground and ground-structure systems:

Insights from earthquake records, large scale testing, and computational simulation

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Abstract

Recorded earthquake motions provide key insights into the seismic response of ground and ground-structure systems. Complemented by experimental data, the underlying salient mechanisms are further elucidated. In this presentation, a number of such seismically-induced ground deformation mechanisms will be presented. In liquefaction scenarios, stratified-ground soil permeability variations will be shown to play a major role.

Calibrated by these seismic response insights, 3-dimensional computational frameworks are developed to explore the associated Soil-Structure-Interaction (SSI) mechanisms. Using these frameworks, large multi-span highway-bridge ground-foundation-structure configurations are modeled, to highlight the importance and significance of system response, to explore mitigation strategies and techniques, and to conduct sustainability and resilience assessments.

Ahmed Elgamal holds the title of Distinguished Professor at the University of California, San Diego (UCSD). Earlier, he served as the UCSD School of Engineering Associate Dean for Faculty Affairs, and he chaired the Department of Structural Engineering. He received his PhD in 1985 from Princeton University. In 1997, he joined UCSD after a Post-doctoral appointment at the California Institute of Technology (CalTech), and Faculty positions at RPI and Columbia University in New York City.

His areas of research interest include large-scale soil-structure experimental and computational simulation, sustainability in Geomechanics, Information Technology (IT) applications, and system-identification procedures. He is author and co-author of over 300 Technical Publications. During 2010-2020, he served as Editor-in-Chief of the Journal Soil Dynamics and Earthquake Engineering. Over the years, has consulted and provided professional services in the general areas of Geomechanics and Geotechnical Engineering for a number of national and international organizations. Recently, he is honored to receive the 2025 American Society of Civil Engineers (ASCE) H. Bolton Seed Medal.