Analysis and Design of Energy Geostructures
Theoretical Essentials and Practical Application

An interdisciplinary introduction to key-concepts and project applications of energy geostructures

Key Features
- Proposes the theoretical and practical application essentials required to address the analysis and design of energy geostructures from energy, geotechnical and structural perspectives
- Presents a substantial amount of resolved exercises on key aspects governing the behavior and performance of energy geostructures to be considered in analysis and design
- Summarizes and discusses the most recent scientific and technical knowledge about energy geostructures, including energy piles, energy tunnels and energy walls

Description
Analysis and Design of Energy Geostructures gathers in a unified framework the theoretical and experimental competence available on energy geostructures: innovative multifunctional earth-contact structures that can provide renewable energy supply and structural support to any built environment. The book covers the broad, interdisciplinary and integrated knowledge required to address the analysis and design of energy geostructures from energy, geotechnical and structural perspectives. This knowledge includes (Part A) an introduction to the technology; (Part B) the fundamentals of heat and mass transfers as well as of the mechanics of geomaterials and structures required to address the unprecedented behavior of energy geostructures; (Part C) the experimental evidence characterizing the considered geostructures; (Part D) various analytical and numerical modeling approaches to capture the response of energy geostructures; and (Part E) the performance-based design and detailing essentials of energy geostructures.
Lyesse Laloui

Lyesse Laloui, PhD, is a Chaired Professor at the Swiss Federal Institute of Technology in Lausanne, EPFL, Switzerland. He is also an Adjunct Professor at Duke University, USA, and an Advisory Professor at Hohai University, China. His main research interests are in Geomechanics as well as Environmental and Energy Sustainability. Dr. Laloui has written and edited 12 books, authored over 300 refereed scientific papers and is the Editor in Chief of the international journal Geomechanics for Energy and the Environment. Over the past thirty years, he has served as a keynote speaker and honorary lecturer at more than 30 leading international scientific events and he has also delivered training courses for practitioners and scientists on various topics including the analysis and design of energy geostructures. Dr. Laloui has co-founded the GEOEG engineering company, providing integrated solutions for energy geostructures for prominent architectural and engineering projects around the world.

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Rota Loria, PhD, is an Assistant Professor at Northwestern University, USA, and a qualified Professional Civil and Environmental Engineer of the Italian Order of Engineers. His main research interests are at the interface of Geomechanics, Structural Mechanics and Energy. Dr. Rotta Loria is an Editorial Associate of the international journal Geomechanics for Energy and the Environment and is actively involved in many international scientific events as invited lecturer and presenter. Over the past five years, he has received various prizes and honors for excellence in scientific research and he has also delivered training courses for practitioners and scientists on the analysis and design of energy geostructures. Dr. Rotta Loria has co-founded the GEOEG engineering company, providing integrated solutions for energy geostructures for prominent architectural and engineering projects around the world.

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