NORTHWESTERN UNIVERSITY

Ph.D. Positions in Geotechnical Engineering and Geomechanics

Research Topics: Adaptive Granular Systems and Geomechanics of Subsurface Storage

The Geomechanics Modeling group led by Prof. Buscarnera is seeking new Ph.D. students for two multi-disciplinary, highly collaborative research projects: (i) constitutive and numerical modeling of adaptive granular materials and geosystems; (ii) geomechanics of rock-fluid interactions in the context of subsurface storage applications (e.g., CO_2 sequestration, hydrogen storage). The former project is guided by the idea that granular systems possess an adaptive internal structure that can be engineered to accommodate engineering goals, including but not limited to the design of innovative geostructures and hazard protection systems. The latter is motivated by the need to understand the long-term implications and opportunities associated with the injection of fluids in the subsurface, including the interaction among mechanical, hydraulic, and chemical processes in the origin of heterogenous deformation zones (e.g., shear bands, fractures.).

Description of the two positions

Two Ph.D. positions are open in the frame of the abovementioned projects. The selected candidates will join the group of Geomechanical Modeling at Northwestern University, working under the supervision of Prof. Giuseppe Buscarnera. The projects will expose the participants to a multidisciplinary team involving collaborators in the areas of mechanical engineering, geosciences, and energy.

Selection Criteria and Application Process

The interested candidates should apply to the Geotechnical Engineering Ph.D. Program at Northwestern University. Information on the application processes is available at http://www.tgs.northwestern.edu/:

The selection will begin on December 15th, 2023, and the candidates will be assessed on the basis of their CV, prior academic performance, research interests and recommendation letters.

- MS degree in Civil Engineering, Mechanics or Applied Mathematics
- Computational and programming skills.
- Familiarity and/or interest with continuum mechanics and constitutive/numerical modeling.
- Excellent communication skills and ability to work in team.

How to Submit Your Application

Please, forward a single PDF consisting of a 1-page cover letter, a curriculum vitae and contacts of two references to Prof. Giuseppe Buscarnera (g-buscarnera(at)northwestern.edu). For additional information you can contact the above email address or visit the website http://www.civil.northwestern.edu/people/buscarnera/.

Selection Process

Review of candidates will begin on December 15th 2023.