

Postdoctoral Researcher at Northwestern University

Research Topic: Multi-scale analysis of porous media subjected to carbonate precipitation and dissolution

The purpose of this research project is to investigate chemical and mechanical processes in porous media subjected to reactive transport. The project will employ small scale flow experiments, X-ray microtomographic imaging, carbonate geochemistry, and classical geomechanical deformation tests to quantify the simultaneous evolution of chemical and structural attributes (e.g., pore size, particle size, mineral constituents, etc.) during reactive flow and/or loading. The experimental activities will be conducted at the Northwestern University and at the Advanced Photon Source (APS), located at the Argonne National Laboratory. The main goal of the project is to relate temporal and spatial changes in microstructural attributes to chemical and physical macroscopic quantities (e.g., permeability, stiffness, strength, precipitation/dissolution etc.).

Position Description

The successful candidate will join a multidisciplinary research group with expertise in the broad areas of Hydrology, Geomechanics and Geochemistry, working under the direction of Profs. Giuseppe Buscarnera, Andrew Jacobson and Aaron Packman. The successful candidate will be appointed for one year, with an option for a second year, during which he/she is expected to contribute to multi-scale/multi-physics laboratory experiments, tomographic imaging at the APS facility, advanced 3D image analyses, chemical characterization of precipitation and dissolution processes, and quantitative interpretation of the results. Salary will be competitive. Conditions will include standard benefits and support to attend national and international conferences.

Selection Criteria

- Ph.D. in Civil Engineering, Environmental Engineering, Geosciences or related disciplines
- Excellent experimental skills.
- Expertise in one or more of the following areas:
 - X-ray tomography and quantitative image analysis
 - Experimental study of flow and transport in porous media
 - Mechanical testing of geomaterials
 - Carbonate geochemistry
- Communication skills and ability to work in team.

How to Submit Your Application

Please, forward a complete CV, a letter of interest and a list of references to Prof. Giuseppe Buscarnera (g-buscarnera(at)northwestern.edu).

Selection Process

Review of candidates will begin January 15th 2014. Applications will be accepted until the position is filled.