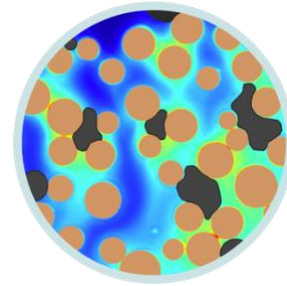


## A doctoral position on “Surface reactions in unsaturated porous media”

The **Subsurface Environmental Processes Group** (<https://www.sepgroup.ethz.ch/>) (Eawag and ETH Zurich) is seeking a **dynamic and motivated doctoral student** to study the physics of surface reactions in porous media. The position is funded by a recently awarded Swiss National Science Foundation project.



**Porous media**, such as soils, often present liquid- or gas-filled voids (pores) between solid grains. Our current understanding of the microscale coupling between flow dynamics and associated reactive processes in porous media is very limited, owing to both the complexities associated with the presence of multiple phases and the difficulty of experimentally (in particular, optically) accessing these systems. Improving our knowledge of the intricate interplay between fluid dynamics and surface phenomena at the microscale is fundamental to understanding and predicting the dynamics of contaminants and geochemical cycles, among others. **The focus of this PhD project will be on quantifying the control exerted by unsaturated and multiphase flow on surface reactions (adsorption/desorption).** The student will have the unique opportunity to learn, develop, and apply a range of cutting-edge experimental techniques, including microfluidic technology, image analysis, and state-of-the-art microscopy. Measurements will be guided by and compared with the modeling developed in this project. Findings will help advance our knowledge of microscale processes and dynamics and will carry fundamental implications for our ability to predict large-scale observations.

**The successful candidate** will have a background in physics, engineering, or related areas, with a strong quantitative inclination. They should have a desire to work experimentally at the interface between physics, chemistry, and engineering, and to combine experimental research with mathematical modeling. The student will have the opportunity to work in a highly interdisciplinary, fast-paced research environment, to gain skills in a number of technologies (microfluidics or optical microscopy, among others), to learn about fundamental physical and processes in porous media and subsurface environmental processes in general, and to interact with world-class collaborators in fluid mechanics and microfluidics. The ability to work independently, but also to interact and collaborate within a team, will be great assets. The project will be supervised by Prof. Dr. Joaquin Jimenez-Martinez (Eawag and ETH Zurich).

**We look forward** to receiving your online (by email) application, including a CV, full transcripts from undergraduate studies (both Bachelor and Masters), a brief (1-2 page) statement of research interests, and at least 2 (preferably 3) letters of reference. **All this information as a single \*.pdf file.** For questions regarding the position, please contact Prof. Dr. Joaquin Jimenez-Martinez by email at [joaquin.jimenez@eawag.ch](mailto:joaquin.jimenez@eawag.ch) or [jjimenez@ethz.ch](mailto:jjimenez@ethz.ch).