

Post-doc in the Environmental Fluid Mechanics

We are seeking a full-time post-doctoral researcher to join the Environmental Fluid Mechanics laboratory, led by Professor Pietro de Anna, at the Institute of Earth Science (University of Lausanne, Switzerland). This post is fully funded for 24 months (gross salary of about 83,000 CHF per year) by the Swiss National Science foundation.

Desired profile

PhD degree (or be near completion) in Physics, Mathematics, Mechanical Engineering or Civil & Environmental Engineering or related discipline. A strong background on numerical modeling for flow, transport of multi-phase fluid systems is required. Some experience on experimental fluid mechanics is desired, but not necessary (advanced training can be provided). Excellent written and spoken English is required, working knowledge of French (the local language in Lausanne) is not necessary. Interest in developing numerical schemes to model microfluidics based experiments to study flow and transport driven filtration and microbially-driven reactions in confined media. Commitment to research based on experimental, numerical and modeling approaches.

Description of responsibilities

The successful candidate will work on multi-phase flow (air-water and oil-water) and solute/colloidal transport within confined and heterogeneous (spatially variable) media. The research will focus on 3 main axes. First, understanding the coupling between phases organization (air-water or oil-water) and the overall hydraulic properties of a porous system. Second, use particle tracking methods to simulate bacterial transport within non-saturated pores, with particular attention to the finite-size effects associated to the cells size and shape. Third, develop novel image analysis and processing for experimental particle tracking in non-saturated media. In all cases, numerical results will be contrasted with microfluidics and time-lapse video-microscopy experiments. The candidate will have the opportunity to be trained in cutting-edge microfluidics and time-lapse video-microscopy techniques. The research work will involve collaborations with a suite of international colleagues across Europe and the US. Most of the successful candidate time will be dedicated to research, but contributing to some teaching activities can be discussed, including the additional possibility of supervising master and PhD students. Expected start date position: 01.01.2024 or upon mutual agreement. Contract duration 1 year renewable.

The host facility The Environmental Fluid Mechanics Laboratory is an established facility, located at the Institute of Earth Sciences (ISTE) at the University of Lausanne, equipped with state-of-the-art technology including fully automated microscopes (fluorescence and confocal microscopy), dedicated clean room for micro-fabrication, Z-sizer for colloids suspensions characterization and a microbiology laboratory. The University of Lausanne is sharing the campus with EPFL, making the local environment very dynamical and stimulating. More information about the Environmental Fluid Mechanics Laboratory can be found at www.pietrodeanna.org

Application documents: i) motivation letter (1 page describing your background, research interests and past experience); ii) Curriculum vitae; iii) Contact information for one or two professional references.

The application documents must be submitted as a single PDF file via email to Prof. Pietro de Anna (pietro.deanna@unil.ch). Candidatures will be considered as soon as they will be received. Any questions can be directed to Prof. Pietro de Anna.