



PERMEATION OF POLYMER FLUIDS IN SOILS (POPFS)

In EPSRC-funded project engineers with experience of working with polymer-based fluids in the laboratory and on construction sites will team up with engineers who are experts at studying the detail of fluid flow in porous materials to get a much better understanding of how polymer-fluid based support systems work. Members of this newly formed team have backgrounds in civil engineering, mechanical engineering, and petroleum engineering and are based at Imperial College London (ICL), the University of Cambridge (UoC) and the University of Oxford (Oxf). To deliver the research we will link advanced numerical modelling (at ICL) with detailed experimental measurements (at UoC and Oxf).

The planned research will be divided into 4 work packages (WPs). In **WP1**, researchers at ICL will simulate flow in the pore space using computer models that are created using high resolution 3D X-ray images of the actual pore space. These models will provide a lot of detailed information, but only small volumes can be considered as they use a lot of computer power. Therefore, in **WP2** ICL will use a simpler type of model, called a pore network model, to run larger scale simulations to look at the migration of the polymer front in a model of the soil. In **WP3**, UoC will use a specially developed laboratory apparatus called a permeameter to study the flow of the polymer fluids in real samples of soils; different types of polymer fluids will be considered. In **WP4**, Oxf will develop and carry out special 2D flow experiments so that we can see the polymer fluid as it flows through the pores in the soil. We will use the experimental data to confirm the computer models work and the computer models will generate data that can't be measured in the laboratory, such as the flow profiles in the 3D voids and the forces on the soil grains.

More details are at:

1. tinyurl.com/44kdhw57
2. <https://gow.epsrc.ukri.org/NGBOViewGrant.aspx?GrantRef=EP/X034305/1>

We are currently advertising for two positions:

1. At Imperial College London, we are recruiting a postdoctoral researcher with experience of simulating particle interactions and flow in the pore space of geomaterials. This researcher will focus on WP1 and WP2.
Contact: Prof. Catherine O'Sullivan (cath.osullivan@imperial.ac.uk).
An application link including role-specific information is at <https://www.imperial.ac.uk/jobs/description/ENG02714/research-associate>
2. At the University of Cambridge, we are recruiting a postdoctoral researcher with experience of laboratory element testing in soil mechanics. This researcher will focus on WP3.
Contact: Dr Brian Sheil (bbs24@cam.ac.uk).
Application link including role-specific information is at <https://www.jobs.cam.ac.uk/job/42174/>