

PhD Project

Microplastic contamination of natural soils studied by computer simulation

Contamination by microscopic plastic particles (**microplastics**) has become one of the foremost issues for the global environment. The SFB Microplastics [1] at the University of Bayreuth involves more than 20 research groups to study the creation, the biological effects and the transport of microplastics in the environment. The PhD project is situated in this highly **collaborative environment**.

This **theoretical PhD project** deals with the transport of microplastic particles in natural soils. Its goal is to understand the physical mechanics which drive or hinder **infiltration and transport** through the porous **soil** matrix. It will heavily use methods of computational fluid dynamics such as Lattice-Boltzmann, Immersed-Boundary and Volume-of-Fluid. Due to the large separation of length scales, the project is very challenging from a numerical point of view.

Roughly one third of the project will be concerned with developing an appropriate simulation **code in C++/OpenCL**. In the remaining two thirds, the student will carry out large-scale simulations on local, national and European supercomputer facilities. He/she will collaborate closely with our experimental partners in Bayreuth and Cologne.

The successful candidate must possess a strong background in theoretical physics, computational mathematics/engineering, geosciences or a similar discipline. **Good programming skills** are required. A background in fluid mechanics is desirable, but not explicitly required. The position will be paid. Research will be conducted in the Biofluid Simulation and Modeling group at the University of Bayreuth, Germany. Extended home-office and **remote work is possible**. Bayreuth is a medium-sized town with a fairly large student population and is situated in a beautiful natural setting between the mountains of the "Fränkische Schweiz" and "Fichtelgebirge".

For applications or further information please contact stephan.gekle@uni-bayreuth.de or see our website biofluid.physik.uni-bayreuth.de

[1] www.sfb-mikroplastik.uni-bayreuth.de

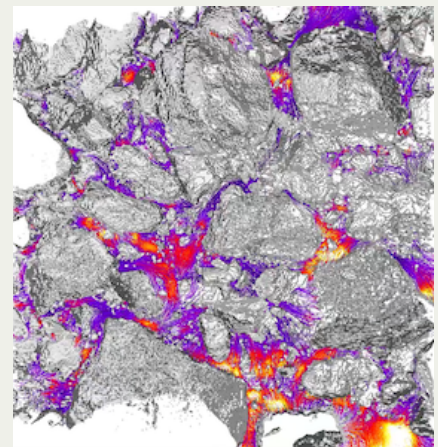


Fig. 1: Lattice-Boltzmann simulation of flow through a porous soil.