University of Stuttgart
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University of Stuttgart ● IWS/VEGAS
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Institute for Modelling Hydraulic and Environmental Systems (IWS)

VEGAS – Research Facility for Subsurface Remediation

Directors
PD Dr.-Ing. Claus Haslauer
Dr.-Ing. Simon Kleinknecht

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M.Sc. Thesis Topic

Soil Properties in the Unsaturated Zone

The unsaturated zone in the subsurface above the water table plays an important role for water infiltration and contaminant transport ("contaminants of emerging concern" such as PFAS).

The key soil property of a soil responsible for transmitting water is the capillary pressure – saturation relationship. The goal of this M.Sc. thesis is to establish a set of parameters and associated uncertainty estimates for a number of typical porous media used in our laboratory.

These parameters will then be improved input parameters for estimating contaminant mass fluxes to the groundwater and potentially to drinking water wells.

Prospective Tasks

- Familiarize yourself with water flow processes in the unsaturated zone, as well as the concepts and methodology of our measurement setup.
- Perform a set of experiments to measure capillary pressure – saturation relationships of soil samples.
- Analyze those experiments and fit models for the capillary pressure – relationships in order to obtain a set of parameters including uncertainty estimates.

General Information

- Advisors: PD Dr.-Ing. Claus Haslauer, Dr.-Ing. Simon Kleinknecht, Hue Nguyen, M.Sc.
- Possible for the following degree courses: Environmental Engineering, Civil Engineering, WAREM, COMMAS, Simtech.
- Language: English or German.
- At VEGAS (research facility for subsurface remediation), we explore solute and heat transport properties in the subsurface and develop remediation technologies. We are an open inclusive team of curious engineers.

Desireable Skills

- Experiences in laboratory work is a plus. We are looking for a person with the ambition to work in a soil laboratory.
- Ideally some python or other data wrangling skills.
- Keywords: Geohydrology, Hydrology, Statistics, Data Analysis, Groundwater Modelling.

Apply now!

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