

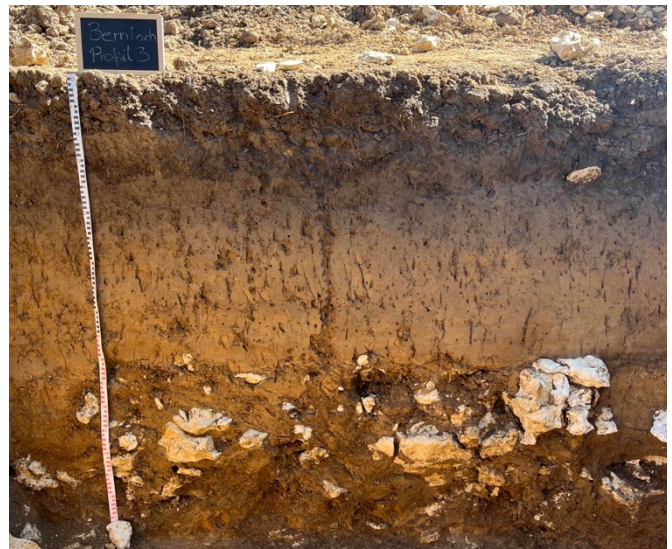


MSc thesis project:

Soil profiles as microbial landscapes

Microorganisms are intensively studied at the small scale in the laboratory, or at the field scale across distances of meters or more. This project will investigate whether these scales can be connected at the soil profile, where edaphic processes, roots and fauna interact to create specific microbial habitats at the scale of mm to cm.

Soil profiles result from multiple abiotic and biotic processes including mineral weathering, water flow, gas diffusion, plant growth and animal activity. Together, these establish the microhabitats where microbial communities develop, selected by the governing conditions of pH, redox, nutrient availability and more. These habitats are spatially variable in all dimensions (not only depth). This project hypothesizes that the distribution of microbes across a soil profile closely follows identifiable edaphic microhabitats, with strong evidence of environmental selection and little evidence of dispersal limitation at this scale. The relationship between these microhabitats and the locations of plant water uptake and rhizodeposition will be closely examined to understand how these habitats may influence and be influenced by plant growth. Functional gene analysis will provide insight into biogeochemical cycling by resident microbes.



This project is available for the **summer semester 2026**. Candidates should have knowledge of biology, biogeochemistry and/or environmental sciences. Self-motivation and independent work skills are essential. Working language is English. Students will be hosted in the Soil Microbial Interactions group in the Department of Geosciences (GUZ) in collaboration with Dr. Maria Májeková (Plant Ecology, EvE). For enquiries, please contact Jun.-Prof. Kyle Mason-Jones at k.mason-jones@uni-tuebingen.de.