

Potential Strukturgeologie und Tektonik Student Projects @ Uni-Mainz

Bachelor

Project Title: Map the “Taunus Edge Fault” that juxtaposes Devonian Slate and greenschist adjacent to the B9 at Bingen

Types of work: Field mapping of low grade metamorphic rocks, map and cross section construction, possible 3D geological model construction

Skills needed: General fieldwork and map/cross section skills.

Relevant literature: TBA

Logistics: Transport by train possible. You will probably have to ask permission for access from local landowners.

Project Title: Mapping of folded Devonian quartzite in new road cuttings on the A61 between Daxweiler and Rheinböllen.

Types of work: Detailed outcrop mapping, structural measurements, sketching etc. Focus of project could be the geometric aspects of the folded quartzite layers, or application to engineering e.g. slope or rock mass stability.

Skills needed: Familiarity with descriptive terms for geological structures,

Relevant literature: TBA

Logistics: You probably need your own car. There could be two linked projects here. You will probably have to speak to local authorities to gain permission for the work so good communication skills/bravery to do that are required.

Project Title: Assessing the influence of fluid-related alteration on geomechanical properties of the locked segment of the North Anatolian Fault Zone

Types of work: Evaluation and interpretation of geochemical data and the implications of these results for (optical) thin section analysis.

Skills needed: Ability and patience to make careful observations.

Relevant literature: Grant, J.: The Isocon Diagram – a simple solution to Gresens’ equation for metasomatic alteration, *Econ. Geol.*, 81, 1976–1982, 1986.

Grant, J.: Isocon analysis: a brief review of the method and applications, *Phys. Chem. Earth*, 30, 997–1004, <https://doi.org/10.1016/j.pce.2004.11.003>, 2005.

Project Title: Quantifying brittle deformation at the locked segment of the North Anatolian Fault Zone

Types of work: Digital image analysis of optical and potentially SEM images.

Skills needed: Ability and patience to make careful observations.

Relevant literature: Heilbronner, R. and Barrett, S. (2014). Image analysis in earth sciences : microstructures and textures of earth materials. Heidelberg: Springer.

Berg, S., Kutra, D., Kroeger, T. et al. (2019): ilastik: interactive machine learning for (bio)image analysis. *Nat Methods* 16, 1226–1232. <https://doi.org/10.1038/s41592-019-0582-9>