

**Institut für Geophysik**  
**Geophysikalisches Kolloquium**  
**Wintersemester 2024/2025**

Montag, 02.12.2024

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## **Strain localization across the scales**

The localization of deformation in narrow zones within the Earth's crust and lithosphere is a ubiquitous phenomenon that has a profound impact on tectonic processes on all scales. Without localized shear zones in the lithosphere, plate tectonics would not be possible. They are a prerequisite for plate boundaries and exert strong controls on the long-term dynamics of subduction zones, mid-oceanic ridges, transform faults and mountain belts, but also short-term phenomena such as earthquakes. Despite its importance, the process of strain localisation is still insufficiently understood and represents one of the major challenges in geodynamics. This shortcoming is e.g. reflected in current numerical models that are not yet fully capable of predicting deformation at plate boundaries both on long and short time scales.

The reasons for our still incomplete understanding of strain localization processes in the Earth range from an incomplete understanding of the rheology of the Earth's crust, lithosphere and mantle. This rheology is a result from processes acting a variety of scales, ranging from microscale processes to lithosphere- and crustal scale processes. Numerical models thus need to include processes on different scales, which is a non-trivial task. Due to changes in pressure and temperature, different - potentially transient - deformation mechanisms are activated. Here I will show some of the advances in understanding these issues that my group has been and is working on.

Das Kolloquium findet um 16:00 Uhr im Seminarraum GEO 315, Corrensstr. 24, 48149 Münster statt. Alle an dem Thema Interessierten sind hierzu herzlich eingeladen.

**Die Dozenten des Instituts für Geophysik**