

MM 38: Invited talk Maass

Time: Wednesday 15:00–15:30

Location: TC 006

Invited Talk

MM 38.1 Wed 15:00 TC 006

Spatiotemporal deformation dynamics in metals — ●ROBERT MAASS — Georg-August-Universität Göttingen, Göttingen, Germany

Plastic deformation in metals proceeds intermittently in both space and time. In crystals these discrete processes are facilitated by collective dislocation rearrangements (dislocation avalanches), and in amorphous metals shear banding is the underlying process. In both cases the spatiotemporal nature of plastic flow is difficult to assess due to its spatial confinement to the nano-scale and the short time scales.

In this talk we will present recent observations made during mechanical characterization that directly trace plastic instabilities, with the aim at approaching what ultimately controls the mechanical stability of structural metals. Both small scale crystals as well as amorphous metals are considered. We address slip size magnitude distributions, their involved time scales, and slip velocity distributions. We further discuss the appearance and disappearance of discrete plastic behavior, and combine the experimental results with insights from materials modeling to guide our micro structural understanding.