

## MM 49: Invited talk Peterlechner

Time: Thursday 9:30–10:00

Location: TC 006

**Invited Talk**

MM 49.1 Thu 9:30 TC 006

**Analysis of amorphous structures by transmission electron microscopy** — ●MARTIN PETERLECHNER — Institute of Materials Physics, WWU Münster, Germany

Amorphous structures are of academic and technical interest due to a wide range of applications and remarkable physical properties. In particular metallic glasses attract attention in the last decades due to their high strength and hardness, connected with their deformation mechanisms. By definition, an amorphous solid does not show long range order which is typically analyzed using conventional transmission electron microscopy (TEM). Thus new methods as e.g. fluctuation electron microscopy (FEM) have been developed, able to detect

medium range order. Additionally, a correlative microscopy approach using high-angle annular dark field (HAADF) and electron energy loss spectroscopy (EELS) was developed in collaboration to quantify density changes within an amorphous phase. In this talk, the sensitivity and limitations of currently applied TEM based methods and their results are discussed with the help of image simulations. A custom built GPU-supported code was applied to shed light on the sensitivity and ability of TEM methods. TEM is an excellent tool to detect density changes and structural changes, occurring upon deformation and relaxation. New instrumental developments moreover facilitate time series, analyzing relaxation and related atomic mobility. This opens new possibilities to study the difference between differently processed amorphous phases.