

## MM 39 Invited Talk Molodov

Time: Friday 10:15–10:45

Room: IFW A

**Invited Talk**

MM 39.1 Fri 10:15 IFW A

**Effect of High Magnetic Field on Crystallographic Texture and Grain Microstructure Evolution in Non-Ferromagnetic Metals**

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The current research on grain boundary dynamics, texture and grain structure development in high magnetic fields will be reviewed. Grain boundary motion can be affected by a magnetic field, if the anisotropy of the magnetic susceptibility generates a gradient of the magnetic free energy density across the boundary. If a magnetic energy density gradient as a driving force is superimposed to a curvature driving force during grain growth, this biases the microstructure evolution with regard to grain size and crystallographic texture, as it is demonstrated on polycrystalline zinc and titanium. Analysis of individual orientation data reveals that the observed asymmetrical texture is to a large extent due to a difference in grain numbers of the individual texture components. A theoretical analysis of the grain growth kinetics in the presence of an external magnetic field reveals that magnetically affected grain growth may result in a skew distribution of grains in favour of those with a lower magnetic free energy density. The results of computer simulations of magnetically affected grain growth in 2-D polycrystals are in a good agreement with experimental findings and confirm theoretical predictions concerning the effect of magnetic field on grain topology during grain growth.