



ICAMS Seminar

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Monday, July 4, 4:30 p.m. ICAMS Seminar room UHW 11/1102

Plasticity on the micro and nano scale: Structural refinement and the size effect of plasticity

The presentation will cover 2 subjects, which seem to be very different. However, it will be shown that there are several common features. The first part will be devoted to the structural refinement during severe plastic deformation. The heavy plastic deformation at low homologous temperature results in a formation of dislocation substructure and finally in a sub-micron or nanocrystalline grain structure. At strains between 10 (1000%) and 30 a saturation of this refinement process is usually observed. The parameter, which influences the limitation in refinement and the underlying mechanism will be discussed. The second part will be focused to specimen size effects in plasticity. Nanoindentation, micro-compression, micro-tension and micro-bending experiments will be used to demonstrate the different phenomena controlling the plasticity in constrained volumes. Finally, the similarity between the limitation in structural refinement and some features in the micro-mechanic experiments will be discussed.

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