



INTERDISCIPLINARY CENTRE FOR
ADVANCED MATERIALS SIMULATION

Special Seminar

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ICAMS Special Seminar room UHW 11/1102

Flow and shear banding: Insight from colloidal glasses

Shear banding, i.e. the localization of shear flow, occurs in a manifold of materials in response to applied strain, ranging from metallic and polymer glasses to soft glasses such as clays, shaving cream or mayonnaise. Shear banding can have fatal consequences for material stability. Prominent examples are material failure in materials science or landslides in geology. We investigate shear banding in a colloidal glass using confocal microscopy that allows us to track the individual constituent particles in 3D space and time. We observe that similar to hard glasses, the colloidal glass exhibits a critical shear rate at which it goes over from homogeneous flow to localized flow. We elucidate this transition using spatial correlations in the displacements of the particles. I will show that the formation of shear bands is associated with a symmetry change of the correlation function, which changes from solid like to liquid like.