

# Kolloquium



**RUHR-UNIVERSITÄT BOCHUM**

UNIVERSITÄT DORTMUND



# Mechanik

## Vortragsankündigung

- Referent:** **SERGIO CONTI**  
Max-Planck-Institute for Mathematics in the Sciences, Leipzig
- Thema:** **DISLOCATION MICROSTRUCTURES AND THE EFFECTIVE BEHAVIOR OF SINGLE CRYSTALS WITH LARGE LATENT HARDENING**
- Ort:** Ruhr-Universität Bochum  
Raum IA 3/21
- Zeit:** **Mittwoch, den 12.11.2003**  
**15:00 Uhr**

**Inhalt:**

We consider single-crystal plasticity in the limiting case of infinite latent hardening, which signifies that the crystal must deform in single slip at all material points. This requirement introduces a nonconvex constraint into the incremental variational problem, which induces the formation of fine-scale structures.

In a geometrically nonlinear framework, and with rigid elasticity, and explicit relaxation is obtained for the case that a single slip system is active (in the two directions). Our construction shows that laminates are formed, and that plastic deformation is present only in one of the two phases.

As a second example, the full set of fcc slip systems is considered, within linearized kinematics. We show that, by developing microstructures in the form of sequential laminates of finite depth, crystals can beat the single-slip constraint, i.e., the relaxed constitutive behavior is indistinguishable from multislip ideal plasticity. We find, however, that relaxation of the single-slip constraint requires the introduction of slip lines in the microstructure, i.e., lines of concentrated slip and discontinuous displacement.

**Veranstalter:**

O.T. Bruhns, K. Hackl, J.F. Kalthoff, S. Reese (Ruhr-Universität Bochum)  
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