

## MM 1: Invited talk Kirchlechner

Time: Monday 9:30–10:00

Location: TC 006

**Invited Talk**

MM 1.1 Mon 9:30 TC 006

**Beyond Hall-Petch: Mechanism based description of dislocation grain-boundary interactions** — •CHRISTOPH KIRCHLECHNER<sup>1</sup>, NATALIYA Malyar<sup>1</sup>, JUAN LI<sup>1</sup>, NICOLAS PETER<sup>1</sup>, CHRISTIAN LIEBSCHER<sup>1</sup>, JEAN-SEBASTIEN MICH<sup>2</sup>, and GERHARD DEHM<sup>1</sup> — <sup>1</sup>Max-Planck-Institut für Eisenforschung GmbH — <sup>2</sup>CEA Grenoble

The important role of grain boundaries as an obstacle for dislocation slip has long been recognized. However, until today, there are no quantitative, mechanism based models describing the interaction of a lattice dislocation with one particular grain boundary.

The unique possibilities offered by micro pillar compression complemented by advanced in situ characterization (SEM, TEM, microLaue) is well able to quantitatively answer fundamental questions in dislocation grain boundary interaction: What is the impact of one grain boundary on (i) the observed yield stress and (ii) the measured apparent hardening? (iii) Can we define a meaningful \*transmission stress\*? (iv) Is the dislocation slip transfer process strain-rate dependent and (v) what is the strain rate dependence quantitatively? Within the talk, these question will be answered for various grain boundaries in copper. The talk will mainly focus on two different high angle grain boundaries one permitting and one preventing dislocation slip transfer and finally a coherent Sigma3 twin boundary.