



Contributed Talk, Tuesday, May 7, 4:30 p.m. - 5:00 p.m., ICAMS<sup>2</sup> session: **T4**

### **Understanding complex microstructure for various applications**

**S. Münstermann, U. Prah, W. Bleck**

*RWTH Aachen, Aachen, Germany*

Modern steel concepts aim at improved properties by tailoring the microstructure. Three trends are of major interest in nowadays material development activities: the decrease of the structural length of constituents towards nanosized quantities, the increase of alloying level and by this the interaction of different elements in enriched zones, more complex and adjusted robust processes activating several metallurgical mechanisms for controlled microstructure development.

This contribution provides examples for various industrial steels. These include the control of process kinetics for multiphase microstructures and the microstructure property relationship of advanced high strength sheet steels.. We will further discuss the forming capacity during quasistatic, dynamic and cyclic loading of multiphase steels taking into account real microstructures. Examples will be given by discussing some aspects of the nature of bainite in forging and bearing steels, the kinetics of damage in quasistatic and dynamically loaded 1<sup>st</sup> generation advanced high strength steels and the short crack growth in cyclically loaded gear steels.