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**TMS 2017**  
146<sup>th</sup> Annual Meeting & Exhibition



**February 26 – March 2, 2017**  
**San Diego, California, USA**

## **ADVANCED HIGH-STRENGTH STEELS**

Advanced high-strength steels aim at improved properties by tailoring microstructures and processing. Currently, three trends are of major interest in materials development activities: the decrease of structural length-scales of microstructural constituents like precipitates toward nanosized dimensions, the increase in alloying and consequently the interaction of different elements in localized zones, and finally, more complex and adjusted robust processes activating several metallurgical mechanisms for adaptive microstructure development.

This symposium invites studies on the control of process thermodynamics and kinetics for multiphase microstructures and the microstructure-property relationships of advanced high-strength steels. New design methods, including both advanced simulation methods and novel experimental strategies, are welcome. On the theoretical side, the various steps required for integrated computational materials engineering (ICME), with a particular focus on ab initio methods, computational thermodynamics, and constitutive laws, will be discussed. The focus on the experimental side will be on characterization tools that support these approaches on all length- and time-scales, with a particular focus on the nanoscale.

The symposium aims at an improved understanding of

- Hardening mechanisms, such as transformation and twinning induced plasticity, shear-band formation, solid solution, and precipitation hardening
- Interface dominated processes, such as complexions at phase boundaries and segregation processes to grain boundaries
- Failure mechanisms, such as crack formation and hydrogen embrittlement

New design concepts, like damage tolerance and self-healing behaviour, will be covered as well.

### **ORGANIZERS**

**Tilmann Hickel**, Max-Planck-Institut fuer Eisenforschung GmbH, Germany

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### **SYMPOSIUM SPONSOR**

TMS Phase Transformations Committee



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