JOIN US AT:

THE WORLD COMES HERE.

TMS 2017
146th Annual Meeting & Exhibition

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

# DEFORMATION AND TRANSITIONS AT INTERFACES

It is well established that interfaces (both single and bi-metal) can act as sources and sinks for both point and planar defects such as dislocations and twins and as such can play an important role in determining the overall mechanical response of a material. In general, due to differences in elastic properties and deformation response of specific interfaces with respect to an externally applied stress, deformation at the microstructural scale is heterogeneous. This can lead to differences in strain accumulation, cause structural changes and transformations within the interface, and generate additional gradients in neighboring grains. Due to these effects, the local stress and strain tensors can differ significantly from globally imposed stress states.

This symposium will examine how heterogeneous strains and transformations originating from interfaces can be characterized, analyzed, modeled, and used to account for and ultimately predict continuum scale properties, involving all aspects of material production and service, from initial solidification or consolidation to crack or void nucleation, and the processes by which damage coalescence becomes large enough to be modeled with continuum modeling strategies.

Topics anticipated include:

- Characterization of heterogeneous strains due to grain or phase boundaries
- Atomistic modeling of deformation that includes grain or phase boundaries
- Boundaries as dislocation or partial dislocation sources and sinks
- Slip transfer/slip penetration and deformation details at interfaces
- Meso-scale modeling of ensembles of grains
- Crystal plasticity and/or transformation modeling
- Damage and crack nucleation at grain or phase boundaries
- Influence of grain boundary structure or character on microstructure evolution
- Concurrent dislocation generation and recovery processes at grain boundaries
- Influence of grain boundary precipitates on plasticity and phase transformations
- Coupling between the local grain boundary structure and other properties of materials
- The composition, structure, stability and transition of grain boundary complexion (a.k.a., 2-D interfacial “phase”)
- Influence of alloy or impurity atoms on localized boundary deformation
- Formation of boundaries during deformation such as cell-wall structure, GNBs, IDBs, and cell-block boundaries

## ORGANIZERS

**Saryu Fensin,** Los Alamos National Laboratory, USA
**Thomas R. Bieler,** Michigan State University, USA
**Rozaliya Barabash,** Oak Ridge National Laboratory, USA
**Shen Dillon,** University of Illinois, USA
**Jian Luo,** University of California, San Diego, USA

## SYMPOSIUM SPONSORS

TMS Computational Materials Science and Engineering Committee
TMS Mechanical Behavior of Materials Committee
TMS Thin Films and Interfaces Committee