

Symposium at the DPG Spring Meeting 2017

Interface-Controlled Microstructures: Mechanical Properties and Mechano-Chemical Coupling

Materials with a large specific interface area, which is tantamount to a small (nanoscale) microstructural geometry, exhibit many interesting phenomena. Nanocrystalline or nanoporous structures, microcomposites or nano-lamellar alloys exemplify this class of materials architectures. Interfacial phenomena may be derived from energy functions that depend strongly on deformation variables or stresses as well as local chemical composition. Furthermore, mechanical and chemical phenomena are typically strongly coupled. This affords opportunities for tuning the mechanical properties through manipulation of interface type or chemistry, and of microstructural scale or geometry. Moreover, the mechano-chemical coupling has important implications for materials properties such as toughness, deformability, compliance, and it enables novel functionalization schemes, for instance for sensing and actuation.

With this workshop, we aim at presenting and discussing the state of the art in experiment, modeling and theory of interfacial properties – mechanical, chemical, and coupling-related – and of how they feed into interface-controlled mechanical and functional materials behavior. The symposium will bring together experts on, among others, the following topics:

- Chemo-mechanical coupling at interfaces and in materials functionalization schemes
- Segregation and embrittlement
- Local deformation at interfaces and the conjugated interfacial stresses
- Dislocation interaction with interfaces, size effects
- Crack initiation and propagation at interfaces, grain boundary engineering

Confirmed invited and topical speakers are

- David Srolovitz, University of Pennsylvania
- Nadiia Mameka, Helmholtz-Zentrum Geesthacht
- Erik Bitzek, Friedrich-Alexander Universität Erlangen-Nürnberg
- Petr Šesták, Brno University of Technology
- Stefan Zaefferer, MPI-E Düsseldorf

We welcome your submissions, for oral or poster contributions on characterization of interface controlled microstructures by simulation or experiment, the development of thermodynamic and micromechanical models with an emphasis on interfacial effects, including capillary effects such as segregation and embrittlement, or creep, and related topics.

Join us in Dresden!

Symposium Organisers

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Submission of abstracts

The Symposium is part of the Condensed Matter Section of the German Physical Society (DPG) Spring Meeting in Dresden from 19 to 24 March 2017. Abstract submission via the website of the DPG is open until December 1st, 2016. Please look for the symposium as part of the Subsection "Metal and Material Physics"

<https://www.dpg-tagung.de/dd17/submission.html?language=en>

