

Symposium | A. Advances in Materials Theory for Multiscale Modeling

[SY-A7]Symposium A-7

Chair: Michael Zaiser (FAU University of Erlangen-Nuremberg, Germany)

Wed. Oct 31, 2018 2:00 PM - 3:30 PM Room6

[SY-A7]Continuum dislocation dynamics for finite deformation mesoscale plasticity

○Anter El-Azab (Purdue University, United States of America)

Many dislocation dynamics simulation models were developed to understand plastic deformation of metals most of which are based on small deformation kinematics. In this talk, I will present a density-based dislocation dynamics model within the framework of finite deformation of crystals, focusing on crystal mechanics and the dislocation transport equations at finite deformation. The geometric coupling and non-linearity of the dislocation transport on various slip systems will be explained. The relevant crystal mechanics, thermodynamics, and constitutive closure questions will also be discussed. Collaboration: Giacomo Po, University of California-Los Angeles; Grethe Winther, Technical University of Denmark.