Title:

Multi-scale plasticity, damage models & scale bridging

Organizers:

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Abstract:

Damage and plasticity are intrinsically multi-scale phenomena, in which the carriers of plasticity and damage at various small scales govern the overall engineering response. This invited session aims to discuss recent advances in this field, where the focus is put on scale bridging methodologies that specifically consider plasticity and damage mechanisms interacting across the scales. Computational methods, involving more than 1 spatial or temporal scale, are therefore key for this session

Topics of interest for this invited session are:

- Modeling of micro-scale-based failure processes in materials in relation to the resulting macroscopic properties
- Upscaling of phenomena in damage and plasticity leading to emergent properties
- Multi-scale methods for strain localization, crack initiation and propagation
- Coarse graining methods for plasticity and damage
- Spatial or temporal homogenization techniques, applicable to plasticity and/or damage
- Numerical methods to incorporate small scale kinematics in engineering computations
- Advanced scale transition techniques that can be used for complex phenomena involving plasticity and/or damage