



INVITED SESSION

Computational Modeling of Manufacturing Processes Using Particle and Meshless Methods

ORGANIZERS

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ABSTRACT

This Invited Organized Session aims at bringing together researchers and scientists to present and discuss state of the art mathematical formulations, numerical methods, computational techniques and industrial applications on Computational Modeling of Manufacturing and Large Deformation Processes based on particle and/or meshless methods. The goal is to make a step forward in the formulation and solution of both fundamental and real life problems with a multidisciplinary vision accounting for all the complex phenomena involved in the physical description of the problem.

Topics of the invited session on Computational Modeling of Manufacturing and Large Deformation Processes in the broad sense will include, but will not be limited to:

- ✓ PFEM, DEM, SPH, MPM, LBM, FCM, EFG... i.e. any particle or meshless discretization methods
- ✓ Simulation of manufacturing processes, such as additive manufacturing, solidification, forging, rolling, stamping, extrusion, deep-drawing, cold rolling, leveling, superplastic forming, thixoforming, casting, welding, friction stir welding, friction melt bonding, high speed forming, metal deposition, etc.
- ✓ Mathematical formulations
- ✓ Numerical methods
- ✓ Solution strategies and numerical implementation issues
- ✓ Multiscale and stabilization techniques
- ✓ Nonlinear constitutive modeling: macroscale, mesoscale, microscale and/or multiscale, including also high strain rate and high temperature
- ✓ Contact, friction and lubrication
- ✓ Damage models and crack propagation
- ✓ Coupled thermomechanical and metallurgical models
- ✓ Simulation of chain manufacturing processes
- ✓ Large scale simulation and high performance computing