

## MS 26

### Residual stresses in solids

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Residual stresses emerge on different scales, i.e. as macroscopic residual stresses in the component caused, for example, by the manufacturing process such as forming and welding, or as microscopic residual stresses caused, for instance, by plastic deformation or inhomogeneous microstructures in advanced materials such as composites. As residual stresses can significantly affect the structural performance of engineering parts, methods to analyze and predict residual stress fields and their consequences are a substantial part of today's research. While these methods allow suited process and material design to prevent unbeneficial residual stress generation, recent research focuses also on targeted residual stress modification to even increase the performance of structures, for instance by life extension.

This symposium is dedicated to discussing recent advances in the modeling and prediction of residual stresses and their consequences in solid materials. This includes the analysis and description of residual stress generation mechanisms on all scales. The consideration of residual stresses in modeling approaches as well as experimental calibration and validation of these approaches are of interest. This symposium is intended to bring together researchers from different fields connected to residual stresses using computational methods.

The topics addressed in this symposium will include, but are not limited to:

- Numerical simulation of residual stresses on different scales (macroscopic, microscopic, phase-specific, across the scales)
- Texture-based modeling of residual stresses
- Homogenization and localization relations
- Targeted modification of residual stresses
- Consequences of residual stresses (service life, stress-corrosion cracking, etc.)
- Validation and calibration of models with experimental studies
- Data-based approaches
- Advanced materials