

## Modelling and Simulation for Additive Manufacturing

Various additive manufacturing (AM) techniques including 4D printing have been developed to manufacture complex-shaped components with well-controlled precision. Sophisticated AM techniques often require systematic modelling and simulation efforts during the design stage and for the purpose of part qualification/certification. The objective of this minisymposium is to provide a platform to discuss recently developed modelling and simulation techniques for AM, including experimental calibration and validation efforts for the process. The topics include (but are not limited to):

Simulation and optimization of the manufacturing process to predict heat transfer, residual stress/distortion, surface topology, composition, and microstructure including defects at multiscale length and time scales.

- Process simulation and optimization at micro and macro scales
- Data-driven approaches for simulation acceleration
- Combined simulation and in-situ monitoring for rapid build qualification
- Effects of microstructure and defects on mechanical properties
- Feedback control for minimizing defects and residual stress in as-built structures

Computational modelling and simulation for any AM processes (e.g. laser power bed fusion, electron beam melting, form deposition modelling, stereolithography, binder jetting) and materials (e.g. metals, plastics, ceramics and their composites as well as biological materials) are welcome.