

Coupled Simulations for Additive Manufacturing

Organized by

F. Auricchio, University of Pavia, Italy

S. Morganti, University of Pavia, Italy

A. Reali, University of Pavia, Italy

Additive manufacturing (AM) is evolving as one of the most promising manufacturing technologies for creating solid structures of virtually any shape. Furthermore, AM allows to produce more complex shapes than those obtained through classical manufacturing techniques. As a consequence, applications for AM products range across many fields in engineering, from design models to lightweight components for automotive or aerospace industry, from patient-specific medical implants to civil engineering structural and/or architectural components.

All these aspects clearly raise new questions for the numerical simulations and computational models of the involved products and processes. AM processes involve multi-physics and multi-scale phenomena and are intrinsically very complex due to the underlying interactions between many different physical phenomena such as a strong thermomechanical coupling, as well as phase transitions, and microstructural changes.

Topics can include, but are not limited to:

- Mathematical formulation
- Numerical methods, implementation issues, and solution strategies
- Multi-physics and multi-scale techniques
- Large scale simulation
- Innovative industrial applications