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COMPUTATIONAL DESIGN FOR ADDITIVE MANUFACTURING

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ABSTRACT

The large design freedom and the local control of material properties that additive manufacturing (AM) offers are key advantages over conventional manufacturing processes. To fully exploit these advantages is a complex task, that challenges intuition-based design approaches. To systematically address this challenge, increasing efforts are made to develop AM-oriented computational design approaches that can assist designers. This includes techniques such as topology optimization and generative design, where specific aspects of AM are integrated into the design process through process simulations.

This session aims to provide a forum to exchange ideas and the latest developments regarding computational design techniques for AM. The topic is meant in a broad sense and includes contributions focusing on new aspects of:

- Computational design in combination with geometric AM design rules,
- Development and integration of computationally efficient physics-based AM process simulations into the computational design process,
- Part optimization under AM process considerations,
- Optimization of support structure layout for AM parts,
- Computational design of lattice structures including AM considerations,
- AM part orientation optimization,
- Deposition or laser trajectory optimization,
- Industrial case studies including a discussion of identified design/simulation challenges.