Modeling and Simulation of Advanced Manufacturing of Functional Materials

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Manufacturing and processing of functional materials, such as shape memory alloys (SMAs), high temperature shape memory alloys, magnetic shape memory alloys (MSMAs), magnetocaloric materials, magnetostrictive materials, functional ceramics, and so on, is heavily focused on traditional casting, thin film deposition and single crystal-growth-based techniques. With the rise of advanced manufacturing techniques such as additive manufacturing (AM, also known as 3D printing), advanced sputtering techniques and others, functional materials manufacturing, processing, characterization and modeling is changing in a similar way as for other materials now manufactured with new advanced techniques with all its advantageous and disadvantages.

This symposium seeks fundamental as well as application related contributions in the field of modeling and simulation of additive manufacturing for functional materials.

Areas of interest would especially include modeling and simulation:

- to predict the functional properties of the resulting alloys
- to simulate the fabrication and processing methods
- to assess the microstructural characteristics

Topics:

- Innovative application
- Material modeling
- Multi-physics and multi-scale simulation
- Simulation for different AM technologies
- Validation and verification