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Microstructural Aspects of Additive Manufacturing

Mechanical behavior, including both tensile and fatigue, of additively manufactured (AM) components are often different than their conventionally manufactured counterparts, owing to AM materials’ distinctive microstructural features (e.g. strong texture and columnar grains) and process induced defects (e.g. pores, lack of fusions, etc.). These microscopic characteristics arise because of processing conditions unique to additive manufacturing, such as layer-wise fabrication and exceptionally high cooling rates. It is therefore important to explore the various microstructural characteristics of AM materials.

This symposium welcomes all topics involving the microstructural aspects of additive manufacturing, including, but not limited to, the following:

– Processing and post-processing effects on microstructure
– Controlling microstructural evolution to derive location specific mechanical performance
– Importance of alloying elements in resulting microstructure of AM materials
– Characterization of microstructure evolution in duo- and multi-material processing
– Novel optimization of compositions to facilitate the AM process (rapid solidification, cyclic thermal excursions, etc.)
– Processing-microstructure/defects-mechanical property relationships of AM materials
– AM process modelling (microstructure, residual stress, etc.)

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