

ASTM INTERNATIONAL CONFERENCE ON ADDITIVE MANUFACTURING Research To Application Through Standardization

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JW Marriott Orlando Bonnet Creek Resort & Spa

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Microstructural Aspects of Additive Manufacturing

Key performance metrics and characteristics properties of components fabricated by additive manufacturing (AM) are often different from their conventionally manufactured counterparts. This is due to the distinctive microstructural features (e.g., strong texture, columnar grains, etc.) and possible process-induced defects (e.g., lack of fusion, pores, keyholes, cracks, surface features, etc.) found in AM materials. These characteristics arise because of processing conditions unique to AM, such as layer-wise fabrication and exceptionally high cooling and solidification rates. It is therefore important to explore the various microstructural characteristics of AM materials and their impact on properties via experiments, models, and simulations.

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

- Influence of processing and post-processing on microstructure and defect characteristics (e.g., thermal-mechanical treatment, surface modification, etc.)
- Microstructural and defect evolution and their relationship to location-specific performance
- Compositional effects and strategies to optimize composition for specific AM processes
- New characterization strategies for AM microstructure and defects
- Microstructure and defect development in graded and multi-material processed by AM
- Process - structure - property relationships of microstructure and defects in AM materials
- AM process modeling (e.g., microstructure, defects, and residual stresses, etc.)
- Microstructure and defect predictions using artificial intelligence and machine learning
- AM material microstructure and defect distribution as the base line for material properties datasets combinability
- Synergistic effects of defects and microstructure on mechanical properties



Symposium Organizers

- Jonathan Pegues, Sandia National Laboratories, USA
- Shuai Shao, Auburn University, USA
- Swee Leong Sing, National University of Singapore, Singapore
- Chantal Sudbrack, National Energy Technology Laboratory, USA



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