

Call for Papers

2020 Summer Topical Meeting

Advancing Precision in Additive Manufacturing

Oak Ridge National Laboratory
Manufacturing Demonstration Facility
Knoxville, Tennessee, USA
July 13-17, 2020

Topics

- **Dimensional accuracy and surface finish in additive manufacturing (AM)**
 - State of the art: What level of precision is achievable?
 - Functional specifications for form and finish
 - Prediction and modeling of dimensional errors and surface topography
 - Developments in fabricating lattice structures with high integrity
 - Diversity in scale of features: large-scale → micro-nano
- **Design for manufacturing**
 - Design rules and tolerancing for AM
 - Topology optimization in the context of AM and achieving precision
 - Novel designs for flexures and kinematic couplings
 - Metallurgy and fatigue issues in high-cycle precision applications
- **Characterizing the performance of AM machines**
 - In situ process monitoring, e.g. melt zone temperature, powder bed
 - In-process measurement of workpiece shape and topography
 - Using artifacts to assess machine performance; round-robin testing
 - Holistic views of the control system, process feedback, correction
 - Machine learning to conquer the complex AM parameter space
- **Standards**
 - Certifying AM equipment capabilities and material properties
 - Industrial demands for ASTM & ISO standards
- **Integrating AM into a holistic manufacturing process**
 - Cost-benefit trade-offs of using AM within a complex process chain
 - Engineered partnerships between AM and secondary finishing
 - Kinematic tooling or pallets for repeatable part handling
- **Metrology**
 - Surface topography measurements on rough as-built surfaces
 - Dimensional metrology of internal features using computed tomography
 - Multi-sensor approaches, data fusion, and machine learning
 - Complex form measurement, registration, and fitting of point clouds
 - Measurement of 3D lattice strut dimensional accuracy and integrity
 - Characterization of internal defects and voids

Tutorials on July 13th & Tours on July 17th

Short abstracts due April 3, 2020

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