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
www.aspe.net

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