

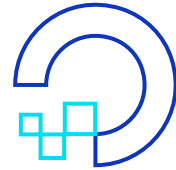


ICAM25

International Conference on Advanced Manufacturing Research to Application through Standardization

October 6-10 | Las Vegas, NV

Industry 4.0: Modeling, Simulation, and Digital Twins



This symposium focuses on recent advances in modeling, simulation, and digital twins that support qualification and certification of higher criticality parts built by an additive manufacturing (AM) process, e.g., powder-bed fusion, directed energy deposition, etc. Here, we will focus on state-of-the-art models and simulations that are firmly in the middle of the technical readiness level (TRL) scale. After further maturation, these technologies will enable industry and government to continue expanding their use for practical applications, including qualification and certification of AM components using model-based approaches. To build credibility for their models and simulations, researchers should invoke best practices, including verification, validation, uncertainty quantification, uncertainty reduction, sensitivity studies, and demonstration problems. Symposium topics include probabilistic methods, integrated computational materials engineering (ICME), digital twins, process modeling, machine learning (ML)/artificial intelligence (AI), surrogate modeling, and insights gained from physics-based and data-driven simulations.

TOPICS OF INTEREST INCLUDE BUT ARE NOT LIMITED TO:

- Development of validated uncertainty-quantified process-structure-property (UQ/PSP) relationships or elements thereof
- Microstructure engineering directly linked to material property prediction
- Methodologies that unlock insights in large statistical models, ML, and AI
- Advanced modeling to quantify performance and risk in higher-criticality parts and assemblies
- Certification approaches that demonstrate safe usage
- Rapid qualification/re-qualification procedures to reduce testing efforts and to maintain process stability
- Approaches, frameworks, standards, and interfaces to guide data transfer in digital twins
- Examples of modeling, simulation, and digital twins in the context of the Q&C environment
- Knowledge generated from physics-based process, properties, and/or performance simulations

Symposium Organizers

- **Takashi Maeshima**, Toyota Central R&D Labs, Japan
- **Nicholas Mulé**, The Boeing Company, USA
- **Christopher Robinson**, Ansys, USA
- **Shuai Shao**, Auburn University, USA
- **James Sobotka**, Southwest Research Institute, USA
- **Guglielmo Vastola**, A*STAR – IHPC, Singapore
- **Wei Xiong**, University of Pittsburgh, USA

Submit
an abstract
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