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Part B: Mechanical Engineering

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Special Issue on Uncertainty Quantification and Management in Additive Manufacturing

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ASCE-ASME *Journal of Risk and Uncertainty in Engineering Systems, Part B: Mechanical Engineering*

Special Issue on Uncertainty Quantification and Management in Additive Manufacturing (SI046B)

Additive Manufacturing (AM) represents a new paradigm of manufacturing where parts are manufactured using their 3D models (such as CAD models) by joining materials in a layer-by-layer manner. AM can have significant impact on the economies all over the world, as it tends to be more sustainable (in terms of material wastage) compared to traditional manufacturing processes. Widespread implementation of AM requires robust techniques for performance evaluation, quality control, and certification. In reality, manufacturing processes are impacted by heterogeneous uncertainty sources at various stages of a manufacturing process, such as raw materials, process equipment, process parameters, process simulation models, and sensors. Therefore, techniques of Uncertainty Quantification and Management (UQ&M) are essential for the quality control and certification of AM processes. With the development of advanced simulation techniques, artificial intelligence, and big data analytics, new UQ&M approaches are emerging to enable model-based quality control and certification, data-driven quality monitoring, and AI-based quality assurance in AM.

This Special Issue is dedicated to recent advances in the field of UQ&M with application in AM.

Topics of interest include but are not limited to the following:

- AM process design under uncertainty
- Model-based uncertainty quantification in AM
- Uncertainty quantification in AM with heterogeneous data sources
- Machine learning techniques (e.g., deep learning) for UQ&M in AM
- Validation and certification of AM process under uncertainty
- Reliability analysis in AM
- Health monitoring, diagnostics, prognostics, and control of AM processes under uncertainty
- Heterogeneous, multi-modal, and multi-scale data fusion under uncertainty for UQ&M in AM
- Sensitivity analysis in AM under uncertainty

Publication Target Dates
Paper submission opens	**November 1, 2020**
Paper submission deadline	**February 1, 2021**
First reviews completed	**June 1, 2021**
Second reviews completed	**September 30, 2021**
Special Issue finalized	**November 2021**

Submission Instructions
Papers should be submitted electronically to the journal at **journaltool.asme.org**. If you already have an account, log in as author and select **Submit Paper** at the bottom of the page. If you do not have an account, select **Submissions** and follow the steps. In either case, at the **Paper Submittal** page, select the **ASCE-ASME *Journal of Risk and Uncertainty in Engineering Systems, Part B: Mechanical Engineering*** and then in the Special Issue dropdown menu choose *Uncertainty Quantification and Management in Additive Manufacturing (SI046B)*.
Early submission before the deadline is strongly encouraged to promote early review and publication of this Special Issue.

Quality Assurance Standards
The Special Issue will include only high quality, original contributions that advance the state of the art. The standard review procedure of ASCE-ASME *Journal of Risk and Uncertainty in Engineering Systems* will guarantee the quality of the accepted manuscripts. From 2016 onward, all articles in the journal are included in Web of Science and in Scopus.

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