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

Special Issue on Uncertainty Quantification & Management in Nonlinear Dynamical Systems in Aerospace and Mechanical Engineering (SI058B)

The study of aerospace systems is becoming an increasingly critical challenge due to the presence of a wide range of nonlinearities (such as large structural deformations, joints, fluid-structure interaction, electro-mechanical interaction, etc.), and rigorous requirements of their efficiency and reliability to achieve net zero targets. Moreover, spacecraft dynamics also experience strong nonlinearities due to the perturbation forces (such as non-sphericity of Earth, atmospheric drag, solar radiation pressure, etc.), which make the spacecraft motion very sensitive to the initial state and these unmodeled forces. Therefore, it is important to characterize these uncertainties and quantify their influences on dynamical performance for improved design and analysis, and knowledge contributions in the identification of these nonlinear systems and their high sensitivity to dynamical behaviors.

This Special Issue seeks submissions related to the modeling, quantification, and management of uncertainties and nonlinearities for the design, navigation, control, and identification of aerospace systems.

Topic Areas

- Uncertainties analysis in guidance, navigation, and control systems for space vehicles
- Stochastic modeling and control for on-orbit manipulation using complex space mechanisms
- Uncertainty quantification for the kinematics and dynamics of space multibody systems
- Uncertainty modeling and quantification of multibody mechanical systems (e.g., joints, contact, etc.)
- Uncertainties modeling and quantification for advanced composite materials of aerospace systems
- Long-term and robust determination of space objects orbital and attitude status
- Large-scale spacecraft in-orbit assembly and control
- Development of advanced data driven techniques for nonlinear dynamical systems
- Development of advanced methods for the identification of uncertain systems
- Uncertainties in multi-physics and multi-scale problems such as fluid-structure coupled problems

Publication Target Dates

Paper submission deadline	**March 31, 2023**
Initial review completed	**July 31, 2023**
Special Issue publication date	**December 1, 2023**

Submission Instructions

Papers should be submitted electronically to the journal at journaltool.asme.org. If you already have an account, log in as an author to your ASME account. If you do not have an account, sign up for an account. 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 select the Special Issue **Uncertainty Quantification & Management in Nonlinear Dynamical Systems in Aerospace and Mechanical Engineering (SI058B).** Papers received after the deadline or papers not selected for inclusion in the Special Issue may be accepted for publication in a regular issue.

Guest Editors

Dr. Jie Yuan, Lecturer in Aerospace Structures, Aerospace Centre of Excellence, University of Strathclyde, United Kingdom, jie.yuan@strath.ac.uk
Dr. Jinglang Feng, Lecturer in Asteroids, Aerospace Centre of Excellence, University of Strathclyde, United Kingdom, jinglang.feng@strath.ac.uk
Dr. Enora Denimal, Researcher, INRIA Institut National de Recherche en Informatique et en Automatique, France, enora.denimal@inria.fr
Dr. Quan Hu, Associate Professor, School of Aerospace Engineering, Beijing Institute of Technology, China, huquan2690@bit.edu.cn
Dr. Sifeng Bi, Lecturer, Aerospace Centre of Excellence, University of Strathclyde, United Kingdom, sifeng.bi@strath.ac.uk
Dr. Alice Cicirello, Associate Professor, Faculty of Civil Engineering and Geosciences, Delft University of Technology, The Netherlands, A.Cicirello@tudelft.nl