Special Issue

Advanced Manufacturing, Assembly, and Testing Technologies for Spacecraft

Message from the Guest Editor

The increasing complexity of spacecraft systems and the demand for high-precision, high-reliability manufacturing have highlighted the need for advanced manufacturing, assembly and testing technologies. Spacecraft undergo a complex lifecycle, including ground-based manufacturing, structural assembly, performance testing, fault detection, and increasingly, in-orbit assembly and in-space manufacturing. Each phase is crucial to ensuring mission success and system reliability. To meet these demands, a variety of intelligent technologies are being developed and integrated throughout the spacecraft manufacturing chain. These include intelligent spacecraft assembly, flexible grasping and fixture design, automated sealant and adhesive dispensing, and precision measurement and inspection technologies that enhance accuracy and repeatability. Moreover, ground-based simulation systems, such as micro-/low-gravity environment simulation systems, have become essential tools for validating spacecraft performance. Additionally, advanced fault detection and diagnosis technologies ensure robust performance during ground tests and in-orbit operation, improving the overall resilience of space systems.

Guest Editor

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