Special Issue

Spacecraft Close-Proximity Operations

Message from the Guest Editor

Robust trajectory optimization, uncertainty modeling, non-cooperative targets: In recent years, uncertainties and robust trajectory optimization have gradually become core research topics in close-proximity spacecraft operations. In particular, missions involving non-cooperative space targets are characterized by incomplete information and complex constraints, where safety remains the primary objective. Uncertainties mainly arise from dynamic model errors, inertia parameter identification errors, external disturbances such as aerodynamic effects, non-spherical gravity perturbations, solar radiation pressure, and actuator errors, as well as relative navigation and attitude estimation errors. These uncertainties significantly degrade the safety and success rate of close-proximity operations and, if not properly accounted for during trajectory optimization, may lead to collision risks or even mission failure.

Guest Editor

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Deadline for manuscript submissions

31 August 2026

Aerospace

an Open Access Journal by MDPI

Impact Factor 2.2
CiteScore 4.0

mdpi.com/si/266332

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