



Guest Lecture **Surviving Jupiter: A Reduced-Radiation Alternative Tour for the Europa Clipper Mission**

Tuesday, August 25th 10:30am-11:30am

MSEE B012

Shortly before the launch of NASA's Europa Clipper mission, unexpected vulnerabilities in the spacecraft's MOSFET components prompted an urgent investigation into radiation mitigation strategies. This paper details a rapid, contingency tour redesign that successfully accommodated all Level 1 science requirements while achieving a 30% reduction in Total Ionizing Dose (TID) compared to the baseline 21F31 reference tour. Although this reduced-radiation tour was ultimately not adopted—as other operational mitigations proved sufficient to guarantee mission success—it serves as a compelling case study in agile astrodynamics and contingency design, demonstrating how to quickly translate complex science requirements into safe, resource-minimal trajectories when faced with late-stage hardware anomalies.



Stefano Campagnola

Europa Clipper Mission Design Manager

NASA Jet Propulsion Laboratory

Stefano Campagnola is mission designer at Jet Propulsion Laboratory, and orbital mechanics instructor at Caltech. He has worked at ESA/ESOC and JAXA/ISAS for a decade prior to moving to JPL in 2016. He was mission design manager for Europa Clipper and contributed to the trajectory design of BepiColombo, JUICE (ESA); MMX, Destiny, EQUULEUS (JAXA); Europa Clipper, Lunar Trailblazer, Lunar Flashlight (NASA); among other missions. His research interests include space mission design, optimal control, astrodynamics, and non-linear dynamical systems.

