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Small Spacecraft for Deep-Space Exploration (8)

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LOCKHEED MARTIN DEEP SPACE SMALLSATS FOR SOLAR SYSTEM EXPLORATION

Abstract

Emerging capabilities and new architectures using small spacecraft can support the scientific exploration of our solar system. Lockheed Martin has developed a science-capable deep space small spacecraft architecture to support two SmallSat missions currently in development: Janus and Lunar Trailblazer. Janus is a two-spacecraft mission to fly by two different binary Near Earth Asteroids, led by the University of Colorado Boulder. Lunar Trailblazer is a lunar orbiter led by Caltech which will map water on the Moon. The scalable suite of hardware subsystems enables the same low-cost spacecraft architecture to support both missions with a high degree of commonality, despite their disparate mission designs, environments, and science operations. Using a scalable architecture will allow for increased collaboration with the international scientific community and expand the future mission set for low-cost solar system exploration. Key factors in the design of these missions include the need to tailor the complexity of science investigations to SmallSat spacecraft capabilities, the importance of evaluating component capabilities against the deep space mission environment, and the challenge of using rideshare launches to meet planetary launch opportunities.