

# **MITIGATING THE MISSION RISKS OF UNCERTAIN NATURAL SURFACES: LESSONS FOR MARS AND ASTEROIDS**

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## **ABSTRACT**

Exploration involving direct physical contact with new solar system bodies or new sites on those bodies is scientifically exciting as well as fraught with engineering uncertainty, both for the same reason: we haven't been there before. The engineering uncertainty must be carefully characterized and quantified, and the resulting mission risks must be mitigated by the design and capabilities of the in situ exploration vehicle and systems. We will discuss examples of the issues and solutions from Mars Exploration Rover, Mars Science Laboratory, and the Galahad asteroid sample return mission.