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# ASTEROID SPACE RESOURCES MAPPING AND EXPLOITATION: A MISSION CONCEPT APPROACH

**Abstract**

As asteroid mining moves toward reality, it is of relevant importance to develop mission concepts to test new technologies aimed at the responsible use of the resources such as iron ore, nickel, precious metal, etc., from asteroid. This paper introduces a mission concept, focused on identifying valuable resources on asteroids, aiming to reduce material transportation from Earth and enhance space exploration sustainably. Focusing on the imminent reality of asteroid mining, the purpose is to develop and test mission scenarios that not only demonstrate technological feasibility but also emphasize ethical and sustainable resource utilization. Leveraging advanced remote sensing technologies and in-situ measurements, the methodology involves comprehensive mapping and analysis to identify asteroids rich in valuable resources. The results will showcase the identification of asteroids with significant concentrations of metals, water ice, and organic compounds, while also evaluating the feasibility of resource extraction technologies in microgravity environments. The conclusion drawn from this mission concept will contribute to the discourse on sustainable space exploration, identify asteroid resources and its possible use to enhance space exploration sustainably.