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Radioisotope-Powered Hopper Design for Europan Mission[1]
JUSTIN DEKANY, Utah State University, MELISSA GUZMAN, Davidson College, KARTHIKEYAN JAGADEVAN, University of Texas at Arlington, JONATHAN MCCULLEY, Utah State University, KEVIN SHIPLEY, University of Kansas, STEVEN HOWE, Center for Space Nuclear Research — NASA and ESA have prioritized an outer planet flagship mission to Jupiter and its four largest moons. The constant cycling of material from Europa's surface to the global ocean below allows the potential for organic life similar to the eco-systems surrounding geothermal vents on Earth. The Europa Hopper model utilizes a radioisotope core, in-situ materials and a subsurface ice probe in order to minimize mass and power needs. A hopping distance of 10km was chosen to maximize the surface area coverage of Europa and increasing the potential for organic sampling and geological imaging of Europa's surface. The hopper design has mid-range power and mass needs while maintaining a substantial instrumentation package in comparison to smaller, low-power competitive designs. This mission could provide vital information both on early solar system formation and the potential existence of organic life in the Jovian system.

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