

SPACE EXPLORATION SYMPOSIUM (A3)
Poster Session (P)

Author: Mr. Chrishma Singh-Derewa
National Aeronautics and Space Administration (NASA), Jet Propulsion Laboratory, United States,
starhunterceo@hotmail.com

Ms. Patricia Randazzo
International Space University (ISU), United States, patricia.randazzo@community.isunet.edu

MODELING THE MOON EUROPA

Abstract

Europa is a prime candidate in the search for present-day habitable environments in our solar system. It is probable that this planet-sized moon has a saltwater ocean today beneath a relatively thin and geodynamically active icy shell. Europa is unique among the large icy satellites because its ocean is believed to be in direct contact with its rocky mantle, where conditions could be similar to those on Earth's biologically rich sea floor. Hydrothermal zones on Earth's sea floor are known to be rich with life, powered by energy and nutrients that result from reactions between the seawater and the warm rocky ocean floor.

An orbital platform will permit uniform geological mapping. In comparison, observations to characterize the ice shell, understand the surface composition, and perform high-resolution targeted geological observations are quite data intensive and require high-mass, high-power instruments, so these are best carried out from a spacecraft that makes multiple flybys of Europa, broadcasting data back during long orbital petals.

A review of the mission architecture, orbiter design and concept of operations is presented along with primary launch vehicle candidates.