

SYMPOSIUM ON TECHNOLOGICAL REQUIREMENTS FOR FUTURE SPACE ASTRONOMY AND
SOLAR-SYSTEM SCIENCE MISSIONS (A7)
Space-Agencies Long-Term Views (1)

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OCEAN WORLDS EXPLORATION

Abstract

Starting with Earth and the largely desiccated bodies Mars and Ceres, and extending to icy moons of Jupiter and Saturn and even dynamic liquid-mediated places like Triton and Pluto, our solar system appears to have over ten ocean worlds in various stages of geophysical evolution, which proffer varying degrees of potential habitability down through time and even into the present day. We are now entering an era of comparative exploration of these ocean worlds, a theme rapidly increasing in importance for mission planning. ESA is developing the JUICE mission, and NASA is developing the Europa Multiple Flyby Mission; both flagships will investigate potential habitability of the Jupiter system's ocean-world moons. Cassini has been investigating Enceladus and Titan, the two primary ocean worlds of the Saturn system; its mission ends in September 2017. NASA has added Enceladus and Titan into the New Frontiers-4 competition, under an ocean-worlds theme focused on the search for signs of extant life or characterizing potential habitability. And the US Congress has directed that NASA pursue a multi-opportunity Ocean Worlds Exploration Program. What are the strategic science linkages among these worlds and opportunities?