



Outer Planet Assessment Group (OPAG) Recommended Exploration Strategy for the Outer Planets 2013-2022

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The Outer Solar System provides critical clues to how solar systems form and evolve, how planetary systems become habitable, and how life has evolved in our solar system. NASA's Outer Planets Assessment Group (OPAG) was established to identify scientific priorities and pathways for Outer Solar System exploration. Fundamental new discoveries are best made with a mixture of mission sizes that includes large (flagship) missions, and medium-sized and smaller-sized (as practical) missions, along with vigorous support for basic research, data analysis, and technology development — a balanced strategy most efficiently implemented as an Outer Planets Exploration Program. Missions to the Outer Solar System are major undertakings, requiring large and expensive launch vehicles, long mission durations, highly reliable (frequently radiation hard) and autonomous spacecraft, and radioisotope power sources in most cases. OPAG has recommended to the US National Research Council Planetary Science Decadal Survey to explore the possibilities for 'small flagship' class missions to be considered, providing a greater range of choice and capabilities in the mix to balance program size and science return. With the Galileo mission concluded, the Cassini equinox mission in progress, and Juno in development, OPAG has strongly endorsed the competitive selection by NASA of the Jupiter Europa Orbiter (JEO) as the next Outer Planets Flagship and as part of the Europa Jupiter System Mission (EJSM) with ESA, a collaboration that includes a Ganymede orbiter and an increased focus on Jupiter science; OPAG has strongly recommended support of JEO and EJSM in the Decadal Survey. In addition, OPAG has strongly endorsed approval by NASA of the Cassini Solstice Mission, including the Juno-like end-of-mission scenario, given the likely phenomenal return on investment. OPAG also advocates the need for a focused technology program for the next Outer Planet Flagship Mission after EJSM, in order to be ready for a launch in the mid-2020s. In this regard, a return to Titan and Enceladus is the highest priority. Technologies that require long-term investment for missions beyond the next decade should also be considered. Medium-sized, New Frontiers class missions that should be considered in the interim include (but not in priority order) probe missions to the giant planets, an Io observer, a Neptune/Triton/KBO rendezvous, a Titan in-situ explorer or probe, and a Uranus orbiter, and OPAG recommended to the Decadal Survey that these be studied, costed, and if deemed feasible added to the approved New Frontiers mission set. Full details can be accessed through the OPAG website at <http://www.lpi.usra.edu/decadal/opag/index.html>.