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# NASA's Planetary Portfolio: Present Status and Future Plans

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## Abstract

The National Aeronautic and Space Administration's (NASA's) current portfolio of operating planetary missions includes exciting missions to several small bodies, Jupiter, Mercury, the Moon, and Mars. Recent milestones include InSight's landing on Mars, OSIRIS-REx orbit insertion at Bennu, and New Horizons' fly-by of Ultima Thule.

Missions in development include the Mars 2020 rover, which will collect rock cores from a geologically diverse landing sight. Studies are being conducting in collaboration with the European Space Agency (ESA) for potential future return of those samples to Earth. NASA is also collaborating with ESA on the ExoMars Rover and the Japan Aerospace Exploration Agency's (JAXA's) Mars Moons Explorer (MMX) mission. The exploration of the outer Solar System has recently revealed remarkable information regarding "ocean moons" such as Europa and Enceladus, which have oceans or seas of liquid water beneath their icy surfaces. NASA's Europa Clipper will conduct detailed reconnaissance of Jupiter's moon Europa and investigate whether the icy moon could harbor conditions suitable for life, and NASA is collaborating with ESA on the JUPITER ICy moons Explorer (JUICE) mission.

Exploration of at least one ice giant system is critical to advance our understanding of the Solar System, exoplanetary systems, and planetary formation and evolution. An Ice Giants Study was commissioned by NASA to take a fresh look at science priorities and concepts for missions to the Uranus and Neptune systems in preparation for the third Planetary Science Decadal Survey. The study identified 12 priority science objectives for ice giant exploration that are consistent with the Planetary Science Decadal Survey as reported in the Vision & Voyages document (released in 2011). The study also finds that Uranus and Neptune are equally compelling as a scientific target and that exploration of both ice giants is highly desirable. Moreover, to address all science objectives, an orbiter and an atmospheric probe would be required at one of the ice giants.

Partnering with other space agencies has the potential to significantly increase science return while limiting the cost to each partner. International partnerships are an excellent, proven way of amplifying the scope and sharing the science results of missions. NASA has always encouraged international participation on its strategic missions (i.e., Mars 2020) and competitive missions (i.e. Discovery and New Frontiers) and other Space Agencies have reciprocated with NASA-led investigations on their missions. NASA's Planetary Science Division (PSD) and space agencies around the world are collaborating on an extensive array of missions exploring our solar system and efforts are underway to continue those collaborations going forward.

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