



## **On to the Ice Giants**

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Voyager 2 mission flew by Uranus in 1986 and Neptune in 1989 resulting in stunning remote observations not previously accessible from the ground. There have been no follow-up space flight missions to examine ice giants and, as a result there are significant gaps in our understanding of planetary formation and evolution. This gap not only affects our understanding of our own solar system but also our understanding of exoplanets; the majority of planets discovered around other stars are thought to be ice giants. Ice Giants are likely to be far more abundant in our galaxy than previously thought.

The U.S. 2011 Planetary Science Decadal Survey committee recognized the importance of Uranus and Neptune, and prioritized the exploration of the Ice Giants. Following from this, NASA and ESA have recently completed a study of candidate missions to Uranus and Neptune, the so-called ice giant planets. The intent was to examine what could be accomplished within the budget realities of the predictable future. This "Pre-Decadal Study," focused on opportunities for missions launching in the 2020's and early 2030's.

This paper presents results from the Ice Giants study (science, architectures and technologies) and concludes that compelling and affordable missions to the Ice Giants are within our reach.