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## Scientific Rationale for Exploring Jovian Trojans

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Jovian Trojan asteroids have been considered as one of a few remaining final frontiers within our Solar System, which may hold fundamental clues of the solar system formation and evolution, as suggested by the discussion about their genesis between the classic model and the more recent Nice model. The former suggests that Trojan asteroids are mainly survivors of building blocks of the Jupiter system, while the latter claims that they must be intruders from outer regions after the planetary migration of gas planets settled. In the past, scientific investigations of these dark, distant asteroid reservoirs were largely dependent upon ground observations by large optical and spectroscopic telescopes and few definite D-type analog meteorites were collected on the earth. However, thanks to recent development of observational technologies such as AOs, statistical studies of asteroids in Jovian L4 and L5 regions have been made possible and raised new questions about their compositions far beyond snow lines and internal structures implied by binary systems. This paper discusses major scientific questions about such not-well-known Jovian Trojans and the potential of in-situ observations and explorations of such bodies to resolve some of them, together with possible instrumental and operational options.

Keywords: Jovian Trojans, Nice Model, Solar System Formation, D-type Asteroids, Binary Asteroids, Exploration Project