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Strategies for Rapid Implementation of Interstellar Missions: Precursors and Beyond (4)

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UPDATE ON THE CHINA'S HELIOSPHERIC BOUNDARY EXPLORATION MISSION:  
INTERSTELLAR EXPRESS

**Abstract**

A specialized designed mission with well-chosen modern instruments is needed to unveil the mysteries of the outer heliosphere, nearby interstellar space, and interactions. The concept of the first Chinese outer heliospheric exploring mission focusing on the heliospheric boundary region, namely Interstellar Express, was proposed in 2015. China National Space Administration (CNSA) kicked off the pre-study to investigate the scientific objectives, technique readiness, and economic affordability etc. in 2021. With aiming to perceive the deep space environment of our Earth's homeland and explore typical celestial bodies in the outer solar system, this mission designs four scientific objectives: 1) directly measuring the unexplored heliosphere; 2) panoramic imaging the heliosphere; 3) fly-by detecting the giant planet system; 4) archaeological investigation of the solar system. The mission contains two spacecraft in opposite directions, one heading for the heliospheric nose region, the other for the tail region. The preliminary mission profile of payload configuration, trajectory design, and related engineering issues will be reported as well.