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

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STELLA SCIENCE FOR INTERSTELLAR PROBE

Abstract

Stella is a proposed European contribution to NASA's Interstellar Probe (ISP), a large-strategic mission candidate. Traveling at a speed of 7 au/year ISP will reach 350 au during its nominal 50-year life-time. ISP's main goal is to understand our habitable astrosphere and its home in the galaxy. Stella contributes to achieving the ISP goal by answering five Stella-specific science questions:
• Q1: What is the composition of the local interstellar medium?
• Q2: How is our dynamical heliosphere upheld and how does it change from the Sun to the local interstellar medium?
• Q3: What is the origin and role of galactic cosmic rays in the solar system and beyond?
• Q4: How does the local interstellar medium become structured when it meets the heliosphere?
• Q5: Are there any deviations from the 1/r gravity law on the interstellar scale?
Stella assumes a model European ISP payload: a neutral gas mass spectrometer, plasma package, cosmic

ray spectrometer, UV spectrograph, and radio science (utilizing the S/C radio for the fundamental physics question). We will review the science case for this potential European payload complement.