



## **Interstellar Heliopause Probe, an ESA Technology Reference Study**

**M.L. van den Berg** (1), A. Lyngvi (1), P. Falkner (1), S. Kemble (2), M. Leipold (3), S. Kraft (4), A. Peacock (1)

(1) Science Payload and Advanced Concepts Office, European Space Agency, ESTEC, Noordwijk, The Netherlands, (2) EADS Astrium, Stevenage, United Kingdom, (3) Kaiser-Threde GmbH, Munich, Germany, (4) Cosine Research B.V., Leiden, The Netherlands

The Interstellar Heliopause Probe approaches for in-situ exploration of the interface between the local interstellar medium and the heliosphere. As there exist only a few direct remote-sensing observational methods today, little is known about the boundary region between the local interstellar medium and the heliosphere, the nature of the local interstellar medium and the influence of the interstellar medium on the heliosphere and vice versa.

Many technological challenges have to be overcome for any mission to travel in a timely manner beyond the heliopause (~150 AU). In order to reach a distance of 200 AU within 25 years, new propulsion techniques, such as solar sailing or NEP will need to be developed and demonstrated. Additionally, long lifetime components and non-solar power sources, in particular radioisotopic power sources, are required to enable this mission.

The Interstellar Heliopause Probe (IHP) is one of ESA's Technology Reference Studies (TRS). TRSs are model science-driven missions that are, although not part of the ESA science programme, able to provide focus to future technology requirements. This is accomplished through the study of several technologically demanding and scientifically meaningful mission concepts, which are strategically chosen to address diverse technological issues. The TRSs complement ESA's current mission specific development programme and allow the ESA Science Directorate to strategically plan the development of technologies that will enable potential future scientific missions.

This presentation will focus on the mission objectives as well as the design study of

a solar sail Interstellar Heliopause Probe. It will conclude with the identification of a variety of mission-enabling technologies.