NEW YORK CITY COLLEGE OF TECHNOLOGY
Physics Department

Center for Theoretical Physics

Interstellar Probe - Humanity's Exploration of Interstellar Space Begins

Presented by:

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Thursday, February 11 at 12:00 noon

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During the course of its evolution, our Sun and its protective magnetic bubble have plowed through dramatically different interstellar environments throughout the galaxy. The vast range of conditions of interstellar plasma, gas, dust and high-energy cosmic rays on this solar journey have helped shape the solar system that we live in. Today, our protective bubble, or Heliosphere, is likely about to enter a completely new regime of interstellar space that will, yet again, change the entire heliospheric interaction and how it shields us from the interstellar environment.

An Interstellar Probe is a mission concept to explore the mechanisms upholding the heliospheric boundary and take the first step beyond our home, into the interstellar cloud to understand the evolutionary journey of our Sun, Heliosphere and Solar System. The idea of an Interstellar Probe dates back to the 1960's, when also the ideas of a probe to the Sun and its poles were formed. An international team of scientists and a team of engineers at the Johns Hopkins University Applied Physics Laboratory (APL) are funded by NASA to study pragmatic mission concepts that would make a launch in the 2030's a reality. The ground breaking science enabled by such a mission spans not only the discipline of Solar and Space Physics, but also Planetary Sciences and Astrophysics. Detailed analyses using the upcoming SLS Block 2 and powerful stages demonstrate that asymptotic speeds in excess if 8 Astronomical Units per Year are already possible with a Jupiter Gravity Assist. Here, we give an overview of the science discoveries that await along the journey, including the physics of the heliospheric boundary and interstellar medium, the potential for exploration of Kuiper Belt Objects, the circum-solar dust disk and the extra-galactic background light. We will discuss the details of the study, the example payloads, subsystems and mission architectures that would allow humanity to explore where no one has gone before.