

Space Physics Seminar

Thursday, September 17, 2015

Interstellar Mapping and Acceleration Probe (IMAP) – A New Mission Whose Time Has Come!

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Abstract:

Our piece of cosmic real-estate, the heliosphere, is the domain of all human existence -- an astrophysical case-history of the successful evolution of life in a habitable system. By exploring our global heliosphere and its myriad interactions, we develop key physical knowledge of the interstellar interactions that influence exoplanetary habitability as well as the distant history and destiny of our solar system and world. IBEX was the first mission to explore the global heliosphere and in concert with Voyager 1 and Voyager 2 is discovering a fundamentally new and uncharted physical domain of the outer heliosphere. The enigmatic IBEX ribbon is an unanticipated discovery demonstrating that much of what we know or think we understand about the outer heliosphere needs to be revised. The next quantum leap enabled by IMAP will open new windows on the frontier of Heliophysics at a time when the space environment is rapidly evolving and becoming increasingly hazardous due to rising levels of galactic cosmic ray fluxes. The remarkable synergy between IMAP, Voyager 1 and Voyager 2 will remain for at least the next decade as Voyager 1 pushes further into the interstellar domain and Voyager 2 moves through the heliosheath. Voyager 2 moves outward in the vicinity of the IBEX ribbon and its plasma measurements will create singular opportunities for discovery in the context of IMAP's global measurements. IMAP, like ACE before it, will be a keystone of the Heliophysics System Observatory by providing comprehensive cosmic ray, energetic particle, pickup ion, supra-thermal ion, neutral atom, solar wind, solar wind heavy ion, and magnetic field observations to diagnose the changing space environment and understand the fundamental origins of particle acceleration. Thus, IMAP is a mission whose time has come. IMAP is the highest ranked next Solar Terrestrial Probe in the Decadal Survey, is ready to be implemented and explores fundamental outstanding problems in Heliophysics concerning the outer boundaries of our solar system, the physics of interstellar interactions with the solar wind, the origin and physics of the IBEX ribbon, and the fundamental origins of particle acceleration throughout the heliosphere.

3:30 pm

Refreshments
CAS Room 500

4:00 pm

Seminar
CAS Room 502

Next Week

- Charles Swenson
Utah State University
- Sounding Rocket Experiment Making Multi-point Auroral Observations



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