



Discovering the Global Heliosphere: The Interstellar Boundary Explorer Mission Charts the Outer Boundaries of Our Solar System and Beyond

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The Interstellar Boundary Explorer (IBEX) has provided the first energy-resolved all-sky maps of energetic neutral atom (ENA) emissions from the heliosphere's boundary with the local interstellar medium (LISM). The IBEX maps reveal globally distributed ENA emissions with a superimposed narrow "ribbon" of enhanced ENA emission, an unpredicted feature requiring new models for the interaction of the heliosphere with the LISM. The ribbon appears to be ordered by the interstellar magnetic field, up to ~ 3 times brighter than the globally distributed ENA flux and spectrally distinct from it. Over half-a-dozen theories are currently competing to explain the ribbon's true origin. IBEX observations have revealed remarkably rapid time-dependence controlled by solar conditions in the protracted minimum. The separation of IBEX globally distributed emissions from the ribbon shows the deflection of the heliospheric tail toward the interstellar field direction. The line-of-sight integrated pressure of the globally distributed flux is used to infer the strength of the interstellar magnetic field and morphology of the termination shock. Thus, IBEX charts the remarkable outer boundaries of our solar system, opening new paradigms in understanding global interstellar interactions and their implications for the history and future of our solar system.