

Craft “ready” to map outer solar system

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Courtesy NASA and World Science staff

The first NASA satellite to image and map the dynamic interactions at the outer solar system—where the hot wind from the Sun slam into cold, outer space—is ready for launch Oct. 19, agency officials say.

The two-year mission is to begin from the Kwajalein Atoll, a part of the Marshall Islands in the Pacific Ocean. Called the Interstellar Boundary Explorer or IBEX, the craft is to orbit unusually far above Earth to investigate and capture images of processes at the farthest reaches of the solar system. Known as the interstellar boundary, this is where the solar system meets interstellar space.

This boundary shields Earth “from the vast majority of dangerous galactic cosmic rays, which otherwise would penetrate into Earth’s orbit and make human spaceflight much more dangerous,” said IBEX principal investigator David J. McComas, of the Southwest Research Institute in San Antonio, Texas. The outer solar system began to be revealed when the Voyager 1 and Voyager 2 spacecrafts left the inner solar system and headed toward the interstellar boundary.

These crafts “are making fascinating observations of the local conditions at two points beyond the termination shock that show totally unexpected results and challenge many of our notions,” said McComas.

The termination shock is where the solar wind, the torrent of high-energy particles cast outward from the sun, slows down as it hits the gas and dust floating in the galaxy.

Other spacecraft have continued the exploration of the interstellar boundary. Recently, a pair of the agency’s sun-focused satellites, the Solar Terrestrial Relations Observatory mission, detected a higher-energy version of the particles IBEX will observe in the heliosphere. The heliosphere is an area that contains the solar wind. It stretches from the sun to a distance several times the orbit of Pluto.

Images from the new craft are expected to let scientists understand the global interaction between our sun and the galaxy for the first time.

“What makes the IBEX mission unique is that it has an extra kick during launch” to push it into a high orbit, said Willis Jenkins, program executive for the craft at NASA Headquarters in Washington. “An extra solid-state motor pushes the spacecraft further out of low-Earth orbit where the Pegasus launch vehicle leaves it.”

Image; Artist's concept of a moment in the complex and unusual launch sequence for IBEX. The plan is to put the craft in to an extremely high orbit using a rocket known as Pegasus. This will deliver IBEX to an altitude of about 120 miles. IBEX would then use an internal hydrazine fuel system over several orbits go to to about 4,400 miles up.

