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Media Relations

New Map Of Sun's Protective "Bubble" Unveiled By IBEX Team, UNH Researcher

September 30, 2010



DURHAM, N.H. -- At a noon Eastern Time media teleconference today at the National Aeronautics and Space Administration (NASA) headquarters in Washington, D.C., University of New Hampshire space scientist Nathan Schwadron will participate in the unveiling of the second maps of the heliosphere produced by the Interstellar Boundary Explorer Mission (IBEX). The maps, produced by the IBEX Science Team in coordination with the UNH-based IBEX Science Operations Center (ISOC), show surprisingly rapid changes in the protective boundaries surrounding our solar system.

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The IBEX global maps of the heliosphere show rapid changes in the protective boundaries surrounding our solar system. At the top is the first six-month IBEX map while the bottom image shows the second, most recent map. Clearly visible and circled is a bright "knot" of emission from the IBEX ribbon. This knot appears to expand and soften in the second map and signifies the surprisingly rapid changes in the heliosphere in a mere six-month period. Credit: IBEX Science Team and NASA Goddard Space Flight Center.

After a year and a half of active measurements in space, the IBEX Science Team is publishing the second set of global images generated by the IBEX mission. The UNH operations center is responsible for leading the on-orbit science operations of the IBEX spacecraft as well as generating the maps from the raw telemetry sent down from space. The heliosphere is the huge, magnetic bubble that surrounds the Sun.

"These boundaries, which are created by the solar wind that continually streams out from the Sun, protect our entire solar system from most of the harmful particle radiation that pervades the galaxy," says Schwadron, UNH associate professor of physics and lead scientist

for the ISOC.

Describing the mission, IBEX principal investigator David McComas of the Southwest Research Institute says, "IBEX images the solar system's boundaries from a very high-altitude orbit around Earth extending almost to the Moon. The images themselves are not composed of light but, rather, of neutral atomic hydrogen that emanate from the collision between solar wind and the matter that fills the galaxy."

The first set of images from IBEX, revealed in October of 2009, showed an entirely unexpected feature: a narrow ribbon that extends across much of the sky. Now, the second set of images from IBEX show that the ribbon continues to persist and is largely unchanged.

However, some features, such as a bright knot of intense emission from the ribbon, appear to spread out in the new maps, revealing rapid changes in these protective boundaries. "Such rapid changes in the emissions over only six months are another stunning surprise from this mission of discovery and exploration," McComas adds.

More than half a dozen different theories are now vying to explain the origin of the mysterious ribbon. Schwadron elaborates, "The second maps now increase the difficulty in explaining the ribbon itself and how it can change so quickly. While the second images provide some insights into the possible source of the ribbon, none of the ideas so far proposed can fully account for the surprising new observations from IBEX."

The new IBEX results, titled "Evolving outer heliosphere: Large-scale stability and time variations observed by the Interstellar Boundary Explorer" by McComas et al, were published in the Sept. 29, 2010 edition of the Journal of Geophysical Research – Space Physics.

The University of New Hampshire, founded in 1866, is a world-class public research university with the feel of a New England liberal arts college. A land, sea, and space-grant university, UNH is the state's flagship public institution, enrolling 12,200 undergraduate and 2,200 graduate students.

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Image to download: http://www.eos.unh.edu/newsimage/IBEX_maps_lg.jpg.

Caption: The IBEX global maps of the heliosphere show rapid changes in the protective boundaries surrounding our solar system. At the top is the first six-month IBEX map while the bottom image shows the second, most recent map. Clearly visible and circled is a bright "knot" of emission from the IBEX ribbon. This knot appears to expand and soften in the second map and signifies the surprisingly rapid changes in the heliosphere in a mere six-month period. Credit: IBEX Science Team and NASA Goddard Space Flight Center.

To participate in the teleconference, reporters should e-mail JD Harrington at:

j.d.harrington@nasa.gov

Audio of the teleconference will be streamed live at:

<http://www.nasa.gov/newsaudio>

At the beginning of the briefing, related images will be available online at:

<http://www.nasa.gov/ibex>

Editors and reporters: Nathan Schwadron can be reached by cell phone at 210-632-6451 and N.Schwadron@unh.edu.

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