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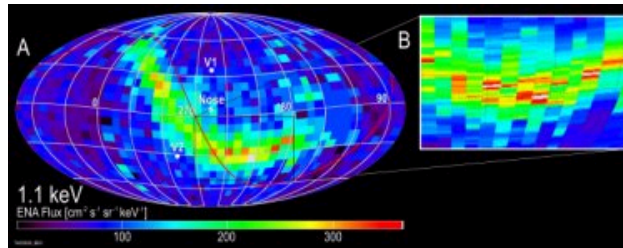
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IBEX spies a ribbon at the edge of the solar system

Oct 15, 2009 [8 comments](#)

Ribbon in the sky

A "bright narrow ribbon snaking its way through the sky" is just one of the puzzling features of the first all-sky maps of the edge of the solar system made by NASA's [Interstellar Boundary Explorer \(IBEX\)](#) – according to one of the scientists working on the project.

Launched one year ago into very high altitude Earth orbit, IBEX has been busy measuring how ions in the solar wind interact with the plasma from interstellar space. IBEX will tell us more about the shape of the solar system's protective "bubble" – called the heliosphere – which is created by the solar wind and shields us from harmful galactic cosmic rays.

'Truly remarkable'

"The IBEX results are truly remarkable, with emissions not resembling any of the current theories or models of this never-before-seen region," said [David McComas](#) of the Southwest Research Institute and IBEX principal investigator. "We expected to see small, gradual spatial variations at the interstellar boundary," he explained.

The ribbon is the source of intense emissions of energetic neutral atoms (ENAs), which IBEX specializes in detecting. Its presence appears to be at odds with the current model of the heliosphere, which scientists believed is shaped like a comet by the collision of the outgoing solar wind and the galactic wind, which blows outside the heliosphere.

Origins a mystery

According to McComas, the ribbon seems to be full of charged particles, which seem to have been concentrated along its length – but how they got there is a mystery.

IBEX data suggest the alignment of the ribbon is related to the local interstellar magnetic field, which could mean that its origins lie outside of the solar system. The ribbon also appears to have a fine structure, suggesting that the ion concentrations vary along its length.

The results are published in a series of five papers in [Science](#)

About the author

[Hamish Johnston](#) is editor of [physicsworld.com](#)

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Outer Edge of the SN that Made the Solar System?

Oliver K. Manuel
Oct 16, 2009 4:06 AM
United States

The intriguing "ribbon" at the "interstellar boundary" is only the "edge of the Solar System" in the equatorial plane.

An axial supernova explosion of the Sun gave birth to the solar system [Transactions Missouri Academy Sciences 9, 104-122 (1975); Nature 262, 28-32 (1976); Science 195, 208-209 (1977); Robert Welch Foundation Conference on Chemical Research XII. Cosmochemistry, pp 263-272 (1978); Nature 277, 615-620 (1979); Meteoritics 15, 117-138 (1980)] - like the axial explosion of SN1987A.

That is why the ribbon exists only be in the equatorial plane, not in the polar region where material was ejected much further from the Sun. That is also why comets from the supernova explosion have elongated elliptical orbits in the equatorial plane - not in polar orbits - about the Sun.

With kind regards,
Oliver K. Manuel

Edited by Oliver K. Manuel on Oct 16, 2009 4:10 AM. Reason: spelling

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2 **s501100kross**
Oct 16, 2009 5:44 AM
santa barbara, United States

Quote:

*Originally posted by **Oliver K. Manuel***
...
An axial supernova explosion of the Sun gave birth to the solar system .
...
With kind regards,
Oliver K. Manuel

What are you talking about? The Sun went supernova to produce the solar system?

I don't think so. Maybe I slept through it!

Edited by s501100kross on Oct 16, 2009 6:24 AM.

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3 **Oliver K. Manuel**
Oct 16, 2009 12:10 PM
United States

An axial supernova explosion of the Sun?

Quote:

*Originally posted by **s501100kross***
Quote:
*Originally posted by **Oliver K. Manuel***
...
An axial supernova explosion of the Sun gave birth to the solar system .
...
With kind regards,
Oliver K. Manuel

What are you talking about? The Sun went supernova to produce the solar system?

I don't think so. Maybe I slept through it!

You weren't alone!

Othere were sleeping with you while riding on a ball of dirt made of elements [Fe, O, Si, Ni, S] with high nuclear stability from near the supernova core.

The initial discoveries were made and published in 1975-1980.

With kind regards,
Oliver K. Manuel

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4 **gunslinger**
Oct 16, 2009 1:38 PM
United States

Quote:

*Originally posted by **Oliver K. Manuel***
Quote:
*Originally posted by **s501100kross***
Quote:
*Originally posted by **Oliver K. Manuel***
...
An axial supernova explosion of the Sun gave birth to the solar system .

...
With kind regards,
Oliver K. Manuel

What are you talking about? The Sun went supernova to produce the solar system?

I don't think so. Maybe I slept through it!

You weren't alone!

Others were sleeping with you while riding on a ball of dirt made of elements [Fe, O, Si, Ni, S] with high nuclear stability from near the supernova core.

The initial discoveries were made and published in 1975-1980.

With kind regards,
Oliver K. Manuel

No No. The sun didn't go supernova, a near by star did during the early formation of the sun. This produced the heavy materials we are made of today. Our sun is predicted to never go supernova, it's not the right size nor temperature. A regular Nova is still possible I believe.

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5

James Watson

Oct 16, 2009 2:38 PM

Let's call it Quetzalcoatl. Meaning "plumed serpent"

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6

gardenova

Oct 16, 2009 9:37 PM
United States

Dr. Manuel's Comments

If you could restrain your skepticism for a short time and read the references cited by Dr. Manuel, you will find that they have some well thought out and scientifically plausible explanations as to why the solar system has the structure and composition that it has. I too had always been puzzled with why the solar system appeared to have been "distilled", with the heavier and radioactive elements close to the center and the light elements in the gas planets further out. I'm not sure I totally agree with all the claims, but they certainly are worthy of serious consideration, even though they may seem heretical to the usual "gravity-only, accretion, collapse" paradigm.

Best Regards,
R. Haynes

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7

Polestar101

Oct 16, 2009 9:50 PM

Directions please.

The author of the article was unspecific about the exact location of the ribbon. Is it in the general direction of the winter solstice where the Voyager data indicates the heliosphere has a bow wake - indicating our solar system is likely more bullet shaped than spherical? This would be nice to know. Is the "ribbon" mostly on plane with the plane of the solar system or? Does the general location correspond with theories concerning the assumed direction of the solar system?

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8

thoughtful

Oct 20, 2009 7:23 AM

Quote:

*Originally posted by **Polestar101***

Does the general location correspond with theories concerning the assumed direction of the solar system?

See the `_second_` diagram in the article located at:

www.universetoday.co...

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