

THE X IN THE MILKY WAY

Computer models, and observations of our galaxy and others, suggested a Milky Way X, made of stars at the centre. A careful analysis of data from the WISE space telescope reveals it.

Astronomers said earlier this week (July 19, 2016) that their work, which clearly reveals the X, comes from a re-analysis of data from the Wide-field Infrared Survey Explorer (WISE), a space telescope launched by NASA in 2009. Before ending its initial mission in 2011, WISE surveyed the entire sky in infrared; astronomers are still working with its data. A report on the new evidence for the Milky Way's central X Way is published in the July issue of the *Astronomical Journal*.

Melissa Ness at the Max Planck Institute for Astronomy in Heidelberg collaborated with **Dustin Lang** at the Dunlap Institute for Astronomy & Astrophysics at University of Toronto on the new work. Lang was working with the WISE data to aid his research in mapping the web of galaxies beyond the Milky Way. To help explore the maps he'd developed from the WISE data, he created an interactive map-browsing website and tweeted an image of the entire sky. Ness saw the tweet and immediately recognized the importance of the X-shaped structure.

That's the power of large surveys and open science!

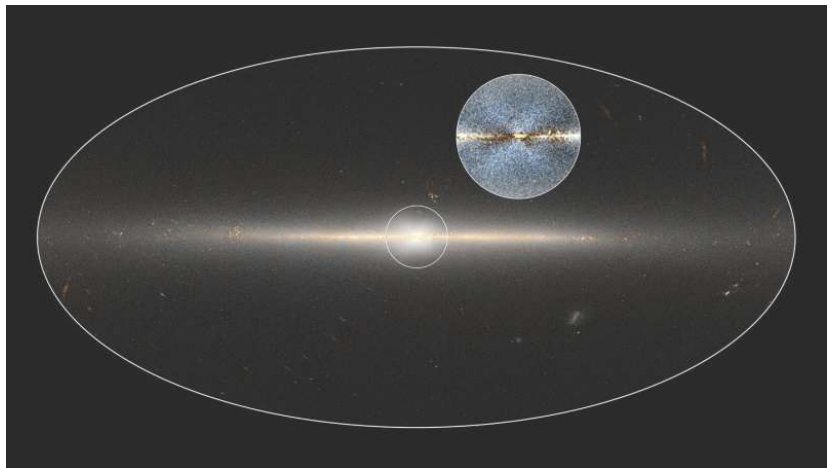
Previous computer models, observations of other galaxies, and observations of our own galaxy had suggested that the X-shaped structure existed. But no one had observed it directly before Ness and Lang's analysis of the WISE data.

The Milky Way galaxy is a barred spiral galaxy. It's an enormous disk-shaped collection of dust, gas and billions of stars, 100,000 light-years in diameter. It is far from a simple disk structure, being comprised of two spiral arms, a bar-shaped feature that runs through its centre, and a central bulge of stars. The central bulge, like other barred galaxy's bulges, resembles a rectangular box or peanut when viewed — as we view it — from within the plane of the galaxy. **The X-shaped structure seems to be an integral component of the bulge.**

Astronomers have given two possible reasons for the existence of the bulge, saying it may have formed either externally, when our Milky Way galaxy merged with other galaxies, or internally as the Milky Way formed and evolved. Ness and Lang's analysis of the WISE data supports the latter model, which predicts the box- or peanut-shaped bulge and the galactic X, forming as an outgrowth of the natural processes that created our Milky Way..

Just as any interactions with other galaxies would have disrupted its spiral shape, the X structure further confirms that our galaxy did not experience any major merging event in the past.

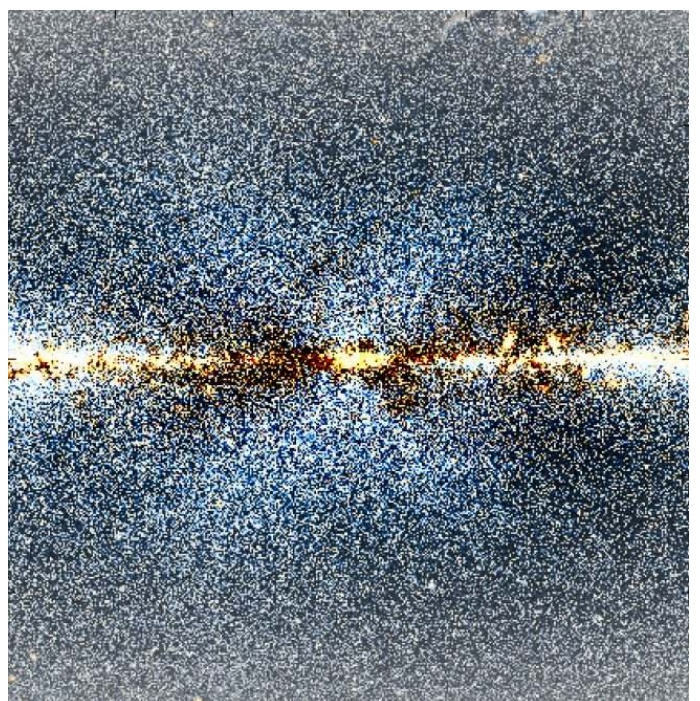
AK, with EarthSky Notes



WISE image of Milky Way galaxy. The inset is an enhanced version of the circled centre region that shows a clearer view of the X-shaped structure.



Artist's concept of The Wide-field Infrared Survey Explorer (WISE) spacecraft



An enhanced, close-up view centred on the galaxy's central bulge and the blueish-tinted X shape.