

New arm discovered in outer edge of the Milky Way Galaxy

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Barred Spiral Milky Way. Illustration Credit: R. Hurt (SSC), JPL-Caltech, NASA

(PhysOrg.com) -- In a surprising twist, if you will, Thomas Dame and Patrick Thaddeus, both of the Harvard-Smithsonian Center for Astrophysics, have put forth in a paper to be published in an upcoming issue of *Astrophysical Journal Letters*, the notion that a cluster of gas clouds they've discovered, that lies far from what is currently believed to be the center of the Milky Way Galaxy, is likely the extension of one of the great arms that form our galaxy.

The researchers made their discovery by thinking outside of the box, so to speak; most research on our galaxy starts with the assumption that the spiral that swirls out from the center, amounts to what most see as an almost a two dimensional plane. Dame and Thaddeus, looked beyond that plane, though not by much, and came upon a mass of giant molecular [gas clouds](#) that they believe is an extension of what is known as the Scutum-Centaurus arm; and thus have dubbed the new [cluster](#) the Outer Scutum-Centaurus arm.

Ever since Stephen Alexander first came up with the idea that our galaxy existed in the shape of a spiral way back in 1852, stargazers have been studying the vast gas clusters that fill the [night sky](#) around us, and since that time, have thus far concluded that there are six “arms” that make up the Milky Way galaxy, with a central core chock full of stars. The new arm extension would fill in a bit of a gap on one side that would make the entire [spiral](#) look more even around the edges.

Further research will have to be conducted, of course, before a true consensus is reached, but if what these two researchers have found is accepted by the astrophysics community, it will mean that our galaxy is actually two mirror images of itself, and that it’s a bit warped as well, seeing as how it’s not as flat as once thought; an interesting parallel, for those that recall how in the early days of science, the world as we knew it was thought to be flat as well, and we all know how that turned out. Thus, it does seem conceivable, what with our inability to see a lot of the [Milky Way galaxy](#) due to trying to look at it from an embedded position, that one day we’ll find the whole thing is actually not what we think it is at all, but something much more complex.

More information: A Molecular Spiral Arm in the Far Outer Galaxy, T. M. Dame, P. Thaddeus, *Astrophysical Journal Letters*, in press.
Available on ArXiv at [arXiv:1105.2523v1 \[astro-ph.GA\]](#)

Abstract

We have identified a spiral arm lying beyond the Outer Arm in the first Galactic quadrant ~ 15 kpc from the Galactic center. After tracing the arm in existing 21 cm surveys, we searched for molecular gas using the CfA 1.2 meter telescope and detected CO at 10 of 220 positions. The detections are distributed along the arm from $l = 13$ deg, $v = -21$ km/s to $l = 55$ deg, $v = -84$ km/s and coincide with most of the main H I concentrations. One of the detections was fully mapped to reveal a large molecular cloud with a radius of 47 pc and a molecular mass of $\sim 50,000$ Mo. At a mean distance of 21 kpc, the molecular gas in this arm is the most distant yet detected in the Milky Way. The new arm appears to be the continuation of the Scutum-Centaurus Arm in the outer Galaxy, as a symmetric counterpart of the nearby Perseus Arm.

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