

Baby Stars Found Jumbled In Galactic Center

At the center of our Milky Way galaxy is an area previously unseen by astronomers. Shrouded by clouds of swirling dusts and gases, before now our astronomers could only guess at what might lie behind this thick veil. But now, thanks to NASA's Spitzer Space Telescope, scientists have at last peeled away these layers and can see what's really happening at the center of our galaxy.

Hello, I'm Marc Helou

This Spitzer Space Telescope podcast is part of a series highlighting recent discoveries in infrared astronomy. It's produced by NASA's Spitzer Science Center at the California Institute of Technology in Pasadena. The Spitzer mission is managed by NASA's Jet Propulsion Laboratory.

At the heart of our galaxy, lies an area cluttered with stars, filled with dust and gases, and where conditions are extremely harsh. Fierce stellar winds and powerful shock waves cut through the our galactic core making it a tough place for new stars to form. Despite the core of our galaxy being only 600 light-years across, a mere fraction of the size of the 100,000 light-years stretch of our entire Milky Way, the core of our galaxy is stuffed with about 10 percent of all the gas in the galaxy along with millions of stars.

While scientists have known that stars can form in this hectic area, they have previously been baffled as to how these young stars have survived into maturity. And with the heavy dust and gas blocking their view, no one has been able to locate these baby stars in our galactic center, until now.

Before now, there were very few clues as to whether stars could form in the core of our galaxy. Astronomers had previously found clusters of massive adolescent stars, as well as signs that the stars were beginning to ignite and ionize the surrounding gas. However, previous attempts to find newborn stars had been unsuccessful.

Astronomers using the sharp infrared vision of NASA's Spitzer Space Telescope, have successfully been able to uncover newborn stars forming at the center of our galaxy. And at NASA's Exoplanet Science Institute, located at the California Institute of Technology, the principal investigator for the program, Solange Ramirez has likened the search for young stars in the galactic center to finding a needle in a haystack. [sound bite of quote?] "There's no way to find them using optical light, because dust gets in the way. We needed Spitzer's infrared instruments to cut through the dust and narrow in on the objects."

At the beginning of their quest, Ramirez and her colleagues started by searching through a large mosaic that Spitzer had photographed of the Milky Way's galactic center. After narrowing down the potential candidates of young stars to less than

100, the astronomers still needed more information before starting more focused imaging of these potential areas. Even from far away, old and young stars can be often confused, especially with the high amounts of dust in the area.

By using the spectrograph that Spitzer carries, an instrument that can break apart light to reveal its rainbow like array of infrared colors, Ramirez and her colleagues could determine the specific chemical makeup around certain stars. To find these young stars, the team was looking for certain warm gasses and dense gasses that are present when a star is still very young.

Once the results had come back, three young stars had been found in the galactic center. All three are less than 1 million years old. Surrounded by cocoons of gas and dust, these clouds will eventually flatten into disks, and according to theory, they will lump together forming planets in orbit of the stars.

The galactic center is a very interesting place. Populated with old and young stars, black holes, and many other stellar objects. And from a catalog of millions of stars in our galactic center, Solange Ramirez and her team at the Exoplanet Science Institute, with the help of NASA's Spitzer Space Telescope were able to find the stellar needles in the galactic haystack: three young stars.

For the Spitzer Science Center, I'm Marc Helou.

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