Spitzer Harvests Dozens of New Stars

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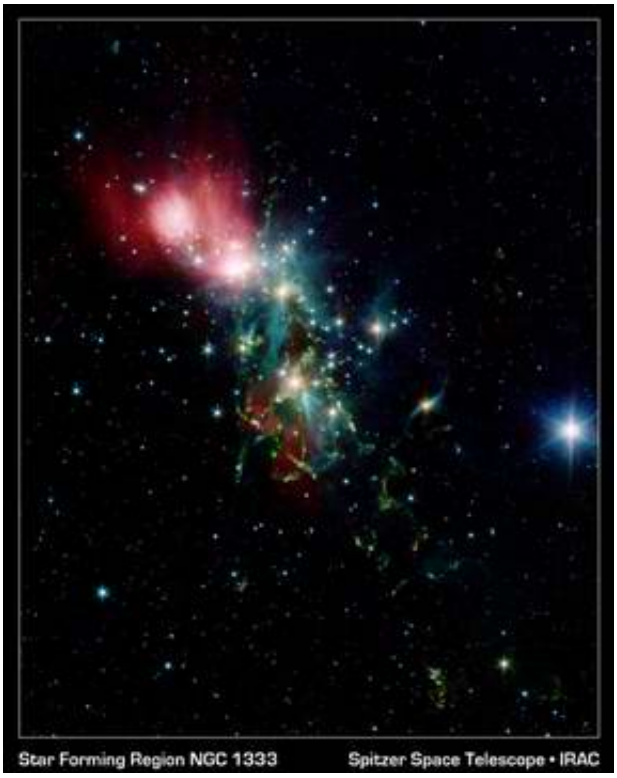

Just in time for Thanksgiving, NASA's Spitzer Space Telescope has harvested a bounty of young stars. A new infrared image of the reflection nebula NGC 1333, located about 1,000 light-years from Earth in the constellation Perseus, reveals dozens of stars like the Sun but much younger.

Image: The star-forming region NGC 1333 contains dozens of new stars

like the Sun but less than 1 million years old. Spitzer's IRAC camera reveals those stars, as well as warm dust glowing red and bright green shock fronts in this color-coded infrared image. Credit: NASA/JPL-Caltech/R. Gutermuth & A. Porras (CfA)

"These newborns are less than a million years old - babies by astronomical standards," said Rob Gutermuth of the Harvard-Smithsonian Center for Astrophysics (CfA). "Our Sun may have formed in a similar environment 4.5 billion years ago."

Most of the visible light from the region's young stars is obscured by the dusty cloud in which they formed. With Spitzer, astronomers can detect infrared light from these objects, allowing them to peer through the dust and gain a more detailed understanding of how stars like our Sun are born.

Spitzer's infrared view of NGC 1333 uncovered streaks and splotches of nebulosity that appear green in this color-coded image. These features are glowing shock fronts where jets of material spewed from the youngest protostars have rammed into the cold natal gas cloud. By stirring up the cold gas, these jets may eventually clear away the gas, shutting down future star formation.

"The sheer number of separate jets that appear in this region is unprecedented," said Alicia Porras of CfA. "Sorting through them and untangling them will prove quite a challenge as we try to identify which protostar is the source of each jet."

In contrast, the upper portion of NGC 1333 is dominated by infrared light from warm dust, shown as red in this image. In this area, young stars have already dispersed the surrounding material, opening up a cavity in the side of the cloud. Ultraviolet light from the more massive stars located there is heating the dust along the edge of the cavity and

causing it to glow.

In addition to the nebulosity, detailed analysis of the infrared light from the young stars in NGC 1333 reveals that about 80 are surrounded by discs of dusty material where new planets may be forming. The entire group of objects spans only 4 light-years. In contrast, only one star system (containing three stars) lies within 4 light-years of the Sun.

"If our solar system were located inside NGC 1333, our night sky would look very different," said Gutermuth. "We would see fewer stars since any distant stars would be hidden by the nearby dust. We would need an instrument like Spitzer to see out of the nebula."

The newborn stars within NGC 1333 don't reside in a single cluster, but instead are split between two sub-groups: one group to the north, near the red nebulosity, and the other to the south, near the green shocks.

"With the sharp infrared eyes of Spitzer, we can look for differences between these two groups of stars," said Porras. "The results could reveal hints of the star-forming history of this region."

Source: Harvard-Smithsonian Center for Astrophysics