Largest swarm of giant stars is a 'supernova factory'

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The largest known swarm of red supergiant stars has been found near the central bulge of our galaxy. It offers a rare glimpse of massive stars on the verge of exploding.

Red supergiants are among the largest stars in the universe – and in fact are second in size only to rare 'hypergiant' stars such as Eta Carinae. Spanning several hundred times the diameter of the Sun, each could fit millions of Sun-like stars inside it.

These stellar titans are extremely rare. Only very massive stars, more than 10 times as heavy as the Sun, turn into red supergiants. And the red supergiant phase lasts just 100,000 years before ending in a supernova, a fleeting moment compared with the overall lifespan of the star.

Only about 200 red supergiants have been identified in our galaxy. In 2006, a team led by Don Figer of the Rochester Institute of Technology (RIT) in New York, US, reported finding a massive cluster of thousands of stars that included 14 red supergiants – the biggest collection of these rare stars then known.

Now Ben Davies, also at RIT, and a team that includes Figer have identified an even larger group of 26 red supergiants.

'Supernova factory'

The stars were revealed to have the characteristic light spectrum of red supergiants by the Keck II telescope atop Mauna Kea in Hawaii, US. The cluster has been named RSGC2 and contains about 50,000 stars in total, making it one of the most massive clusters of young stars in the galaxy. The team believes the cluster is less than 20 million years old.

The masses of the supergiants in the cluster are uncertain, but the brightest among them is 300,000 times as luminous as the Sun.

RSGC2 was found just a few hundred light years from the cluster found in 2006, called RSGC1, and the two are very similar in age.

The close proximity of the two massive clusters is probably not a coincidence, Davies says. He notes that there are other signs of copious star formation in their vicinity, a region where one of the galaxy's spiral arms, called Scutum-Crux, meets the central bulge of the galaxy.

"There might be something to do with the physical conditions there where they meet that makes it ripe for forming stars and forming massive clusters," Davies told **New Scientist**.

The two red supergiant clusters provide a rare opportunity to study the properties of stars that are very close to exploding.

"That's one reason why this cluster is so exciting," Davies says. "It's almost like a supernova factory." Although by astronomical standards the stars are at death's door, he adds, it could still be 50,000 years before one explodes.

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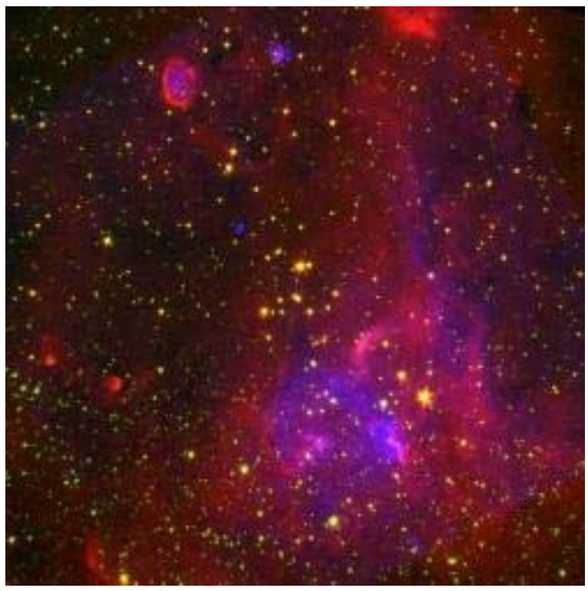

Enlarge image

About 40 stars near the centre of this image are red supergiants, appearing yellow in this infrared image from the Spitzer Space Telescope. Warm dust in the region glows red. The blue oval with a pink outline, top left, may be the result of an ancient supernova, and the larger blue patch, below centre, is a stellar nursery (Image: B Davies/RIT/NASA)

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