

Massive star cluster found in Milky Way

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A massive cluster of red supergiants--super-sized stars on the verge of exploding--was recently discovered in the Milky Way by a group of astronomers using infrared technology to penetrate the thick dust that cloaks much of the galaxy.

Only a few hundred such stars are known to exist in the galaxy, with the previous largest collection of them containing only five. These are the biggest stars: a single red supergiant at the center of the solar system would reach the orbit of Jupiter. The 14 together imply a sea of smaller stars in the cluster having a total mass of at least 20,000 solar masses, according to astronomer Don Figer.

"It seems odd that here is a spectacularly bright cluster and that we are only seeing it now," says Figer, formerly at Space Telescope Science Institute and now at Rochester Institute of Technology. "We didn't have infrared technology until recently and so people are rescanning the whole galaxy."

He adds: "This gives us the richest sample of stars getting ready to explode. We still don't understand what they do in their last stage."

Figer presented his research at the American Astronomical Society meeting Jan. 9 in Washington, D.C.

Figer's finding may poke holes in some massive star formation models, which suggest that conditions are no longer favorable for this type of massive cluster formation. Ancient globular clusters, containing even

more stars, were thought to have been born only very early, at the time of the formation of the galaxy.

"But that's probably not true because we're starting to see more massive clusters," Figer notes, adding that further infrared observation will probably reveal more examples.

Of further interest to Figer and his colleagues are the X-rays and rare gamma rays that hang over the cluster, located 18,900 light-years from earth. This high-energy fallout follows a star's destruction, the remnants of which are only energetic for a short time, giving scientists a snapshot in time of these stars at different stages of life.

The NASA-funded, five-year study will focus on 130 potential star clusters altogether, with the cluster of 14 supergiants being the team's first study.

The study was made possible with the use of a unique spectrograph built by a team led by John MacKenty, also of the STScI. The instrument--containing a tiny matrix of mirrors similar to those in projection televisions, according to Figer--captures spectral data on 100 stars at one time, a novel approach that made the project possible.

Figer and his colleagues will conduct detailed studies of the 14 individual stars using multiple resources, including the Hubble Space Telescope and the Spitzer telescope.

In addition to Figer, the international team of scientists working on this project include Massimo Robberto and Kester Smith of STScI; Francisco Najarro of the Instituto de Estructura de la Materia in Madrid, Spain; Rolf Kudritzki of the University of Hawaii in Honolulu; and Artemio Herrero of the Universidad de La Laguna in Tenerife, Spain.

Source: Rochester Institute of Technology

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