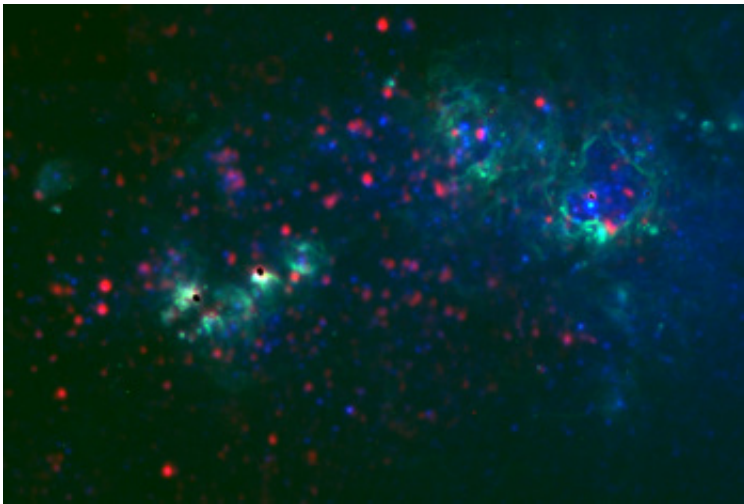


Astronomers report mysterious giant star clusters

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Super star clusters and super nebulae in the nearby galaxy NGC 4214. A Keck Telescope infrared image is superimposed on a Hubble Space Telescope image, with visible star clusters shown in blue. The black dots, revealed in radiographs, are young super star clusters in the process of forming.

An international team of astronomers reported evidence for the formation of mysterious "super star clusters" Jan. 9 at the annual meeting of the American Astronomical Society in Washington, D.C. These star clusters are the likely precursors to the familiar globular clusters of the Milky Way; however in our galaxy, globular clusters are all believed to be older than 10 billion years -- close to the age of the universe itself -- and none are forming.

Using the Very Large Array Telescope, the astronomers detected radio-infrared "super nebulae" around giant star clusters in the process of formation in a dozen nearby galaxies.

"The super nebulae are gas clouds heated by intense ultraviolet light from young super star clusters," said Chao-Wei Tsai, UCLA astronomy graduate student and leader of the team. "The star clusters are young and still hidden within their birth clouds. Although we cannot see the clusters directly, we can clearly detect the infrared and radio emissions from the hot gas surrounding them."

"The super star clusters hidden within these super nebulae are probably a lot like globular clusters in our own Milky Way, only younger, and they can contain up to a million young stars," said Jean Turner, UCLA professor of physics and astronomy, and a member of the team, along with Sara C. Beck of Tel Aviv University. "The mystery is why our own Milky Way no longer forms globular star clusters and hasn't for 10 billion years. These galaxies still can. We want to know why. This is star formation on steroids."

Super star clusters pack a huge number of bright and blue stars into a very small volume of space, with a density of stars up to a million times higher than near the sun. The radiant power emitted by these clusters can be up to a billion times the sun's wattage, in a region only a few light years across.

"The brightest of even one of these stars at the distance of the sun could charge a solar powered car in one second with enough energy to drive from Los Angeles to San Francisco!" Turner said.

The researchers obtained their radio and infrared images of the super nebulae using the Very Large Array of the National Radio Astronomy Observatory, a facility of the National Science Foundation, and the W.

M. Keck Observatory in Hawaii, operated jointly by the University of California and the California Institute of Technology, with support from NASA.

The discovery of young super nebulae around these potential proto-globular clusters was made by a team led by Beck and Turner several years ago. This latest result shows just how common young super clusters outside the Milky Way are.

"Life on a planet orbiting a star in a young super star cluster would be very different," mused Beck. "There would be light coming from every direction, and no darkness or night -- sunlight would be very blue -- it would be a strange place to live."

Source: University of California - Los Angeles

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