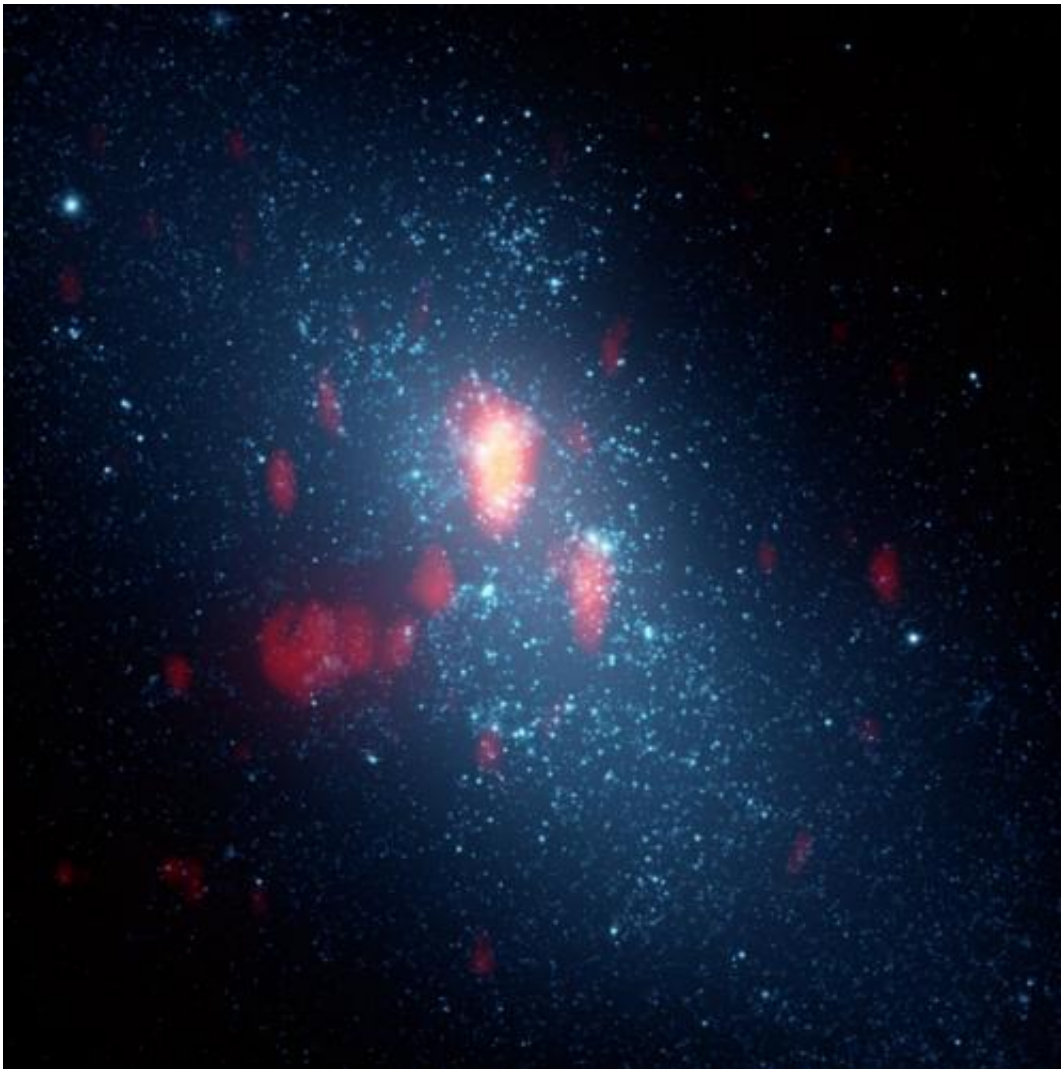


# More than a million stars are forming in a mysterious dusty gas cloud in a nearby galaxy

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Hubble Space Telescope image of galaxy NGC 5253. Superimposed is the gas (fuzzy red to yellow) as seen by the Submillimeter Array. The brightest part of the image is Cloud D. Credit: Jean Turner

More than a million young stars are forming in a hot, dusty cloud of molecular gases in a tiny galaxy near our own, an international team of astronomers has discovered.

The star cluster is buried within a supernebula in a dwarf galaxy known as NGC 5253, in the constellation Centaurus. The cluster has one billion times the luminosity of our sun, but is invisible in ordinary light, hidden by its own hot gases.

"We are stardust, and this cluster is a factory of [stars](#) and soot," said Jean Turner, a professor of physics and astronomy in the UCLA College and lead author of the research, which is published March 19 in the journal *Nature*. "We are seeing the dust that the stars have created. Normally when we look at a star cluster, the stars long ago dispersed all their gas and dust, but in this cluster, we see the dust.

"I've been searching for the gas cloud that is forming the supernebula and its star cluster for years," she said. "Now we have detected it."

The amount of dust surrounding the stars is extraordinary—approximately 15,000 times the mass of our sun in elements such as carbon and oxygen.

"We were stunned," said Turner, who is chair of the department of physics and astronomy.

The cluster is about 3 million years old, which in astronomical terms, is remarkably young. It is likely to live for more than a billion years, she said.

The Milky Way has not formed gigantic star clusters for billions of years, Turner said. It is still forming new stars, but not in nearly such large numbers, she said. Some astronomers had believed that such giant

star clusters could form only in the early universe.

The Milky Way has [gas clouds](#), but nothing comparable to this galaxy's Cloud D—see the bright white area in the photo—which houses the enormous star cluster enshrouded in thick gas and dust, Turner said.

How much of a gas cloud gets turned into stars varies in different parts of the universe. In the Milky Way, the rate for gas [clouds](#) the size of Cloud D is less than 5 percent. In Cloud D, the rate is at least 10 times higher, and perhaps much more.

Turner and her colleagues conducted the research with the Submillimeter Array, a joint project of the Smithsonian Astrophysical Observatory and the Academia Sinica Institute of Astronomy and Astrophysics, on Hawaii's Mauna Kea.

NGC 5253 has hundreds of large [star clusters](#), including at least several that are young, the astronomers report. The most spectacular is found within Cloud D.

"We're catching this cluster at a special time," Turner said. "With a cluster this large, we would expect several thousand stars that would have become supernovae and exploded by now. We found no evidence of a supernova yet."

The cluster contains more than 7,000 massive "O" stars—the most luminous of all known stars, each a million times brighter than our sun.

NGC 5253 has approximately nine times as much dark matter as visible matter—a much higher rate than the inner parts of the Milky Way, Turner said.

In coming years, the cloud could be destroyed by stars that become

supernovae, Turner said, "which would spin all of the gas and elements created by the stars into interstellar space."

**More information:** Highly efficient star formation in NGC 5253 possibly from stream-fed accretion, [dx.doi.org/10.1038/nature14218](https://doi.org/10.1038/nature14218)

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