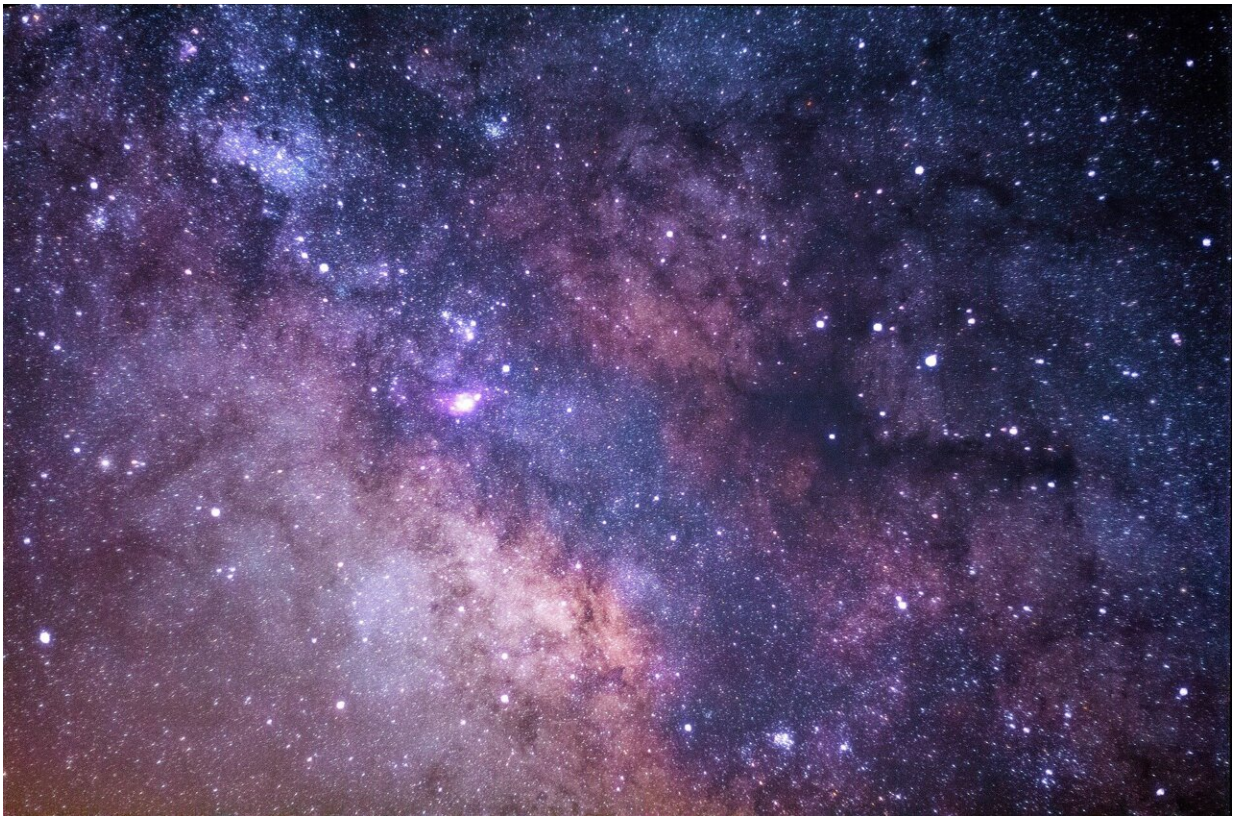


# 'Stripped, pulsating core of a massive star' spotted for the first time

November 1 2022, by Bob Yirka

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Credit: Pixabay/CC0 Public Domain

A trio of researchers from Friedrich-Alexander University Erlangen-Nuremberg, Universität Innsbruck and the University of Geneva, respectively, has discovered a "stripped, pulsating core of a massive star"

for the first time. In their paper published in the journal *Nature Astronomy*, Andreas Irrgang, Norbert Przybilla and Georges Meynet, describe the unique object and the work that they did in verifying its makeup.

Stellar cores, as their name suggests, are the innermost parts of stars. Most often, such cores are covered by what space scientists call their "opaque envelope." Theory has suggested that such cores can appear without their envelope if conditions arise that lead to its removal. But until now, this had never been observed.

In their paper, the researchers write that their discovery of what was believed to be an average, normal star, called  $\gamma$  Columbae, was purely "serendipitous." They were looking at a group of stars and found that their data suggested that one of them was unusual. That led them to take a closer look at the light spectrum emitted by the star, and in the process, discovering evidence of a missing envelope.

For such an object to exist, the researchers note, something must have stripped the envelope from a normal star, leaving behind its core. That would have left the object considerably smaller. They estimate that star  $\gamma$  Columbae was likely approximately 12 times the mass of the sun before losing its envelope—it is now just five times the size of the sun.

The researchers also note that spotting the unique object was truly a matter of chance—they point out that such an object would not remain as a stripped core for very long—perhaps just 10,000 years or so, a veritable blink of the eye in astronomical terms. They also note that prior research suggests that before it was stripped,  $\gamma$  Columbae was likely a run-of-the-mill massive star that had likely run out of [hydrogen](#).

That would have forced its envelope to expand, possibly pulling in a [companion star](#), which could have led to the ejection of the envelope.

They note that as of right now, the object is burning helium, but at some point, it will begin fusing [heavier elements](#) until it explodes as a stripped core supernova, and then it will become a neutron star.

**More information:** Andreas Irrgang et al,  $\gamma$  Columbae as a recently stripped pulsating core of a massive star, *Nature Astronomy* (2022). [DOI: 10.1038/s41550-022-01809-6](#)

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