

New supernova likely arose from massive Wolf-Rayet star

May 22 2014, by Elizabeth Howell



M1-67 is the youngest wind-nebula around a Wolf-Rayet star, called WR124, in our Galaxy. Credit: ESO

They've been identified as possible causes for supernovae for a while, but until now, there was a lack of evidence linking massive Wolf-Rayet

stars to these star explosions. A [new study](#) was able to find a "likely" link between this star type and a supernova called SN 2013cu, however.

"When the [supernova](#) exploded, it flash ionized its immediate surroundings, giving the astronomers a direct glimpse of the progenitor star's chemistry. This opportunity lasts only for a day before the supernovablast wave sweeps the ionization away. So it's crucial to rapidly respond to a young supernova discovery to get the flash spectrum in the nick of time," the Carnegie Institution for Science wrote in a statement.

"The observations found evidence of composition and shape that aligns with that of a nitrogen-rich Wolf-Rayet star. What's more, the [progenitor star](#) likely experienced an increased loss of mass shortly before the explosion, which is consistent with model predictions for Wolf-Rayet explosions."

The star type is known for lacking hydrogen (in comparison to other [stars](#))—which makes it easy to identify spectrally—and being large (upwards of 20 times more massive than our Sun), hot and breezy, with fierce stellar winds that can reach more than 1,000 kilometres per second. This particular supernova was spotted by the Palomar 48-inch telescope in California, and the "likely [progenitor](#)" was found about 15 hours after the explosion.



NGC 3199 – Credit: Ken Crawford

Researchers also noted that the new technique, called "flash spectroscopy", allows them to look at stars over a range of about 100 megaparsecs or more than 325 million light years—about five times further than what previous observations with the Hubble Space Telescope revealed.

The research was published in *Nature*. It was led by Avishay Gal-Yam of the Weizmann Institute of Science in Israel.

More information: phys.org/news/2014-05-stellar-...s-iib-supernova.html

Source: [Universe Today](#)

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