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Half a dozen stars born in Milky Way every year

By Robert Roy Britt, Space.com

Astronomers have the best evidence yet pinning down how just many stars form in our galaxy every year: about half a dozen.

The supernova remnant Cassiopeia A.

NASA/JPL-Caltech/STScI/CXC/SAO

The research also indicates that a massive star explodes as a supernova in the Milky Way every 50 years on average. We're overdue, the scientists say.

"Our galaxy isn't the biggest producer of stars and supernovae in the universe, but there's still plenty of activity," said lead researcher Roland Diehl of Max Planck Institute for Extraterrestrial Physics in Germany.

The work, based on data from the European Space Agency's INTEGRAL satellite, was reported this week in the journal *Nature*. Diehl's team based the conclusions on an examination of the remnants of stars that have exploded over the past few million years.

Specifically, INTEGRAL recorded gamma rays coming from regions of the galaxy shining brightly from the radioactive decay of aluminum-26, an isotope of aluminum produced in massive stars and in their explosions.

The research was funded in part by NASA's Goddard Space Flight Center.

About 90% of the gas our Milky Way started with several billion years ago has now been converted into stars, the researchers said.

"Determining star formation rates in our galaxy can be difficult because gas and dust in the Milky Way's spiral arms obscure star formation taking place all around us," said Bonnard Teegarden, INTEGRAL U.S. Project Scientist at Goddard. "Gamma rays, more so than other forms of light, can penetrate this dust. This approach based on gamma rays is the most direct method available to determine the recent history of stellar activity."

Understanding supernovas is important because they re-seed the galaxy with ever-heavier elements that form new generations of stars. Everything on and in the Earth, at least beyond hydrogen and helium, is the result of stellar explosions.

"Life depends on stars creating elements we so desperately need," said Clemson University astrophysicist Dieter Hartmann, a co-author of the paper. "It's these elements that support life here on Earth and probably elsewhere."
