

Astronomers discover 'defiant' new supernova

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(PhysOrg.com) -- An international team of astronomers has uncovered a supernova whose origin cannot be explained by any previously known mechanism and which promises exciting new insights into stellar explosions.

SN2005E was first spotted on January 13, 2005 in the nearby galaxy NGC1032. Since then, scientists have carried out various observations of it using different telescopes including the Keck, the world's largest, at Mauna Kea, Hawaii. Analysis of the collected data, theoretical modeling and interpretation led to the conclusion that SN2005E wasn't a typical supernova.

Supernovae result from the collapse of very [massive stars](#) or by thermonuclear detonation on the surface of white dwarf stars composed mainly of carbon and oxygen. "But this one, although it appears to be from a white dwarf system, is devoid of carbon and oxygen. Instead it's rich in [helium](#). It's surprisingly different," says Dae-Sik Moon of the University of Toronto's Department of Astronomy & Astrophysics, a member of the team publishing their findings in *Nature* on May 20.

"The supernova explosion is the most energetic and brilliant event that happens in the universe," says Moon. "It is rich with information, not only about how stars die, but to understanding the origin of life and the expansion of the universe." Most heavy elements are believed to be created in stars and spread through [supernova](#) explosions. Also, scientists use the brightness of supernovae to make estimates of the acceleration of

the universe.

The lead author of the paper is H. B. Perets at the Weizmann Institute in Israel. The paper stems from a collaboration that started in 2004 at California Institute of Technology when several young postdoctoral fellows, including Avishay Gal-Yam, now at Weizmann Institute, Moon and graduate students formed a group to study core-collapse supernovae. This is ninth paper Moon has published in Nature on similar topics.

Provided by University of Toronto

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