Newly discovered star one of hottest in Galaxy (w/ Video)
2 December 2009

Image of the Bug Nebula taken with the new Wide Field Camera 3 on the Hubble Space Telescope. Credit: Anthony Holloway, JBCA.

(PhysOrg.com) -- Astronomers at The University of Manchester's Jodrell Bank Centre for Astrophysics have discovered one of the hottest stars in the Galaxy with a surface temperature of around 200,000 degrees - 35 times hotter than the Sun.

Despite numerous attempts by astronomers across the world, the mysterious dying star at the heart of the Bug nebula - one of the brightest and most beautiful of the planetary nebulae - has never been seen before.

"This star was so hard to find because it is hidden behind a cloud of dust and ice in the middle of the nebula", explained Professor Albert Zijlstra from The University of Manchester.

"Planetary nebulae like the Bug form when a dying star ejects much of its gas back into space and are among the most beautiful objects in the night sky."

"Our own Sun will do this in about 5 billion years time. The Bug nebula, which is about 3500 light years away in the constellation Scorpius, is one of the most spectacular of all planetary nebulae."

Using the recently refurbished Hubble Space Telescope (HST), a team of astronomers led by Professor Zijlstra have shed new light on the nebula with a set of spectacular images.

The images were taken to show off the new improved HST after it began work again in September this year and will be published in the Astrophysical Journal next week.

The Manchester astronomers were amazed to find that the images unexpectedly revealed the missing central star.

Cezary Szyszka, lead author on the paper and a research student at the University of Manchester currently working at the European Southern Observatory, said: "We are extremely lucky that we had the opportunity to catch this star near its hottest point, from now on it will gradually cool as it dies. This is truly an exceptional object."

Professor Zijlstra added: "It's extremely important to understand planetary nebulae such as the Bug Nebula, as they are crucial to understanding our own existence on Earth."

That is because the elements necessary for life, especially carbon, are created inside stars, and ejected into space as part of these planetary nebulae.

Planets such as the Earth form from small dust particles, which also form within planetary nebulae. The cloud of dust and ice in the Bug Nebula contains the seeds of a future generation of planets.

Finding the star was made possible by the Space Shuttle's final servicing mission of the HST, earlier this year. During the mission, astronauts installed the new Wide Field Camera 3 which was used to
take these images.

"How a star ejects a nebula like this is still a mystery", added Dr Tim O'Brien from The University of Manchester.

"It seems most stars, including the Sun, will eject as much as 80 per cent of their mass when they finally run out of nuclear fuel at the end of their lives. Material that then goes on to help form the next generation of stars and planets.

"These observations have shown that the star at the heart of the Bug Nebula is only about 2/3 as heavy as the Sun, but was several times heavier before it threw off its outer layers to form the nebula which had previously hidden it from our view.

"Images like these are remarkable not only for their beauty but also for what they tell us about our own origins."


Provided by University of Manchester (news : web)