ABC News

Star caught eating its offspring

By Stuart Gary

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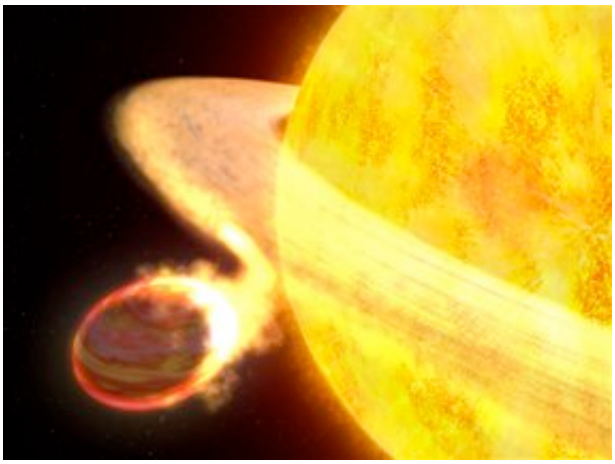
For the first time, scientists are seeing a distant planet being slowly eaten by its parent star.



An artists concept of the exoplanet WASP 12b, a gas giant bigger than Jupiter, which is being destroyed by its parent star (NASA/ESA/G.Bacon)

Researchers from Britain's Open University are watching as the doomed planet WASP-12b is torn apart by a star very similar to Earth's sun.

Reporting in the Astrophysical Journal Letters, lead researcher Dr Carole Haswell describes this gas giant as "the hottest known planet in the Milky Way galaxy".

It may also be one of the shortest lived, with only about 10 million Earth years left before it is completely devoured.

"At the moment we see a huge cloud of material around the planet escaping and being captured by the star," Dr Haswell said.

"This exchange of matter is commonly seen in close binary star systems, but it's the first time it has been seen so clearly for a planet."

WASP-12 is a yellow dwarf star 600 light years away in the constellation Auriga.

The planet orbits so close to its parent star that a year lasts just over one Earth day and it is superheated to nearly 1,600 degrees Celsius.

Gravitational tidal forces make the interior so hot it greatly expands the planet's outer atmosphere.

This creates an exosphere that balloons to nearly three times Jupiter's radius, even though the planet's only 40 per cent bigger than Jupiter.

The star's gravity is also distorting the planet's surface, stretching it into a football shape.

Findings predicted

Both these finding were predicted in a theoretical paper published in the science journal Nature last February by Professor Shu-lin Li from Peking University. The new work confirms these predictions.

The researchers used the Hubble Space Telescope's Cosmic Origins Spectrograph (COS) to identify chemical elements never before seen in planets outside our solar system.

The COS's ultraviolet sensor detected absorption lines from a number of elements including aluminium, tin and manganese.

These became more pronounced as the planet moved in front of the star, meaning that these elements exist in the planet's atmosphere as well as the star's.

Planetary scientist Simon O'Toole from the Anglo Australian Observatory says it is the first time scientists have seen such a vast array of chemicals in the atmosphere of a planet outside Earth's solar system.

"The new COS has double the sensitivity of earlier Hubble instruments," he said.

"This is allowing scientists to better study the building blocks of planets, stars and even galaxies."

Dr O'Toole says the next big step will be to work out the proportions of the elements detected so as to better understand the planet itself.

"But that's going to be far more difficult because the spectrum is so heavily contaminated by WASP-12's starlight," he said.

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