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How Planets Die at the End of the Stars' Lifetime?

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Editorial- Let us first explain what the end of stars' lifetime means. All newly created stars are very bright. They fuse hydrogen into helium and this is the source of their light energy. However, with time as more and more hydrogen is turned into helium their brightness decreases. The middle age stars are yellow in color, like our Sun, and for them more than half of the hydrogen has been already transformed into helium.

As the stars continue to age gradually they run out of hydrogen fuel. When this happen, they turn into red stars.[1] When a medium size red star (up to eight solar masses) runs out of hydrogen, it starts to collapse. The contracting star now generates heat by fusing helium into carbon and oxygen.[1] The next stage is fusing carbon and oxygen for energy (heat) production.[1] When this happen, the contracting red stars to sustain their heat production start attracting closer and closer the nearby planets containing carbon and oxygen, peal them layer by layer, and engulf the layers for fuel.

In the final stage of star evolution, the stars are white dwarfs that barely shine. Thus, observing white dwarfs and what is left from the planets orbiting them is the end of stars lifetime. The dwarf stars with carbon and oxygen cores continue to cool down for millions of years. Until recently, we didn't know much about the white dwarfs because they barely shine and they are difficult to observe. Even more difficult is to observe the remnants of planets orbiting them.[1]

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Editorial

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The planets orbiting stars are observed with the so-called transit method. Andrew Vanderburg and coworkers from Harvard University first uncovered in 2015 that the light from a white dwarf in constellation Virgo dipped and recovered in a complex pattern as if occulted by several small objects.[2] They concluded that planetary remnants orbit the white dwarf with a period 4.5 hours.

Since dwarfs are faint, the observations are limited to those parts of the sky, in which stars are scars and dim, and also the orbital plane around the dwarf needs to lie on the earth's line of sight to be observed. For that reason, the second reported observation of a planetary remnant orbiting a white dwarf was in 2019.[1]

In the already cited recent journal of Physics Today[1], a recent observation on a white dwarf 400 light years away was reported. Christopher Manser and Boris Gansicke, from the University of Warwick in the UK, have now developed a spectroscopic approach, which allowed them to identify a body orbiting the white dwarf.[3] They determined from the oscillation of the light in the spectral line of calcium that a remnant of a planet was orbiting around the white dwarf with a period of 2 hours.

Judging by the spectrum, this was metallic planetary core rich of iron. Manser considered two possibilities for the structure of the orbiting object: either a spherical body as small as tens of kilometers across consisting mostly of metal iron with density 8 g/cm^3 or higher or an iron-dominated larger body, hundred of kilometers across, with layered internal structure like the dwarf planet Ceres.

The remnants of planetary body orbiting the dwarf star could be the iron core of a former planet that once orbited much farther away from the star. When the star became a red star and started to collapse, it drew the planets orbiting it closer and closer, pealed them layer by layer, and used the pealed layers for fuel. As the remnants of planets became smaller and smaller, they orbited faster, which explains the observed short (hours) periods of orbiting around the dwarf star.

Thus, the stars at younger age gave birth of the planets orbiting them.[4] However, when the aging stars became low-energy red stars (toward the end of their lifetime), which fuse carbon and oxygen for energy production, they started drawing the planets orbiting them closer and closer. Pealing them layer by layer, the stars used the planetary pealed carbon and oxygen material for fuel to sustain their life. This is recycling of the planets at the end of stars' lifetime before the star would collapse into a white dwarf and then into a neutron star.

For that reason, when white dwarf are observed, which barely shine and are the last stage of star evolution, the observed periodic decreases of the dwarf's shining is caused by the passage of remnants of planets, which once orbited the star. These remnants of planets orbit close to the dwarf stars with higher speed and smaller periods (hours) obviously ready to be engulfed by the dwarf stars before the end of their lifetime.

When the last source of energy, the material of the planets orbiting the star has been used, the dwarf star will collapse into neutron star. The neutron stars merge and when the number of the collapsing together

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neutron stars reaches a critical mass, they will turn into a Black Hole. (Recent measurement of the neutron lifetime found that only a small percentage of the decaying neutrons turn into dark matter[5], which explains why the merging neutron stars need to reach a critical mass before to collapse into a Black Hole.) Then the Black Holes merge until they merge into the primary Black Hole that created the whole Universe.

Thus, a primary Black Hole created the Universe in perfect order.[6] According to ancient Hindu texts the cycle of creation lasts 4.32 billion years.[7] However, with time the Universe ages and following the entropy law, it becomes more and more disordered. This disordered Universe need to be recycled so that with time a new Universe in perfect order can be created. For this reason, the aged red stars start sucking back the planets they gave birth to and this continues then they are dwarf stars.

When all the planets are sucked back, the dwarf stars collapse into neutron stars. The neutron stars merge until the critical mass is reached which will allow them to collapse into a Black Hole. Then the Black Holes merge until they merge into the one single Black Hole that created the Universe. It is a recycling in the full sense of the word and it lasts another 4.32 billion years.[7]

When all the Black Holes have merged into the one primary Black Hole, the Black Hole is ready to create a new Universe in perfect order.[7] The Black Hole will create new stars forming Galaxies in perfect order, the stars will give birth to planets, etc. This cycle of creation will lasts 4.32 billion years and will be followed by a cycle of destruction of the already disordered Universe, which lasts another 4.32 billion years, etc. – the cycle repeats over and over again.

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