

Re: When a star become a dwarf

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- *From:* pausch@xxxxxxx (Paul Schlyter)
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In article <Xns983071946B82BKlazmonllurdiaxorbgo@xxxxxxxxxxxx>, Llanzlan Klazmon <Klazmon@xxxxxxxxxxxxxxxx> wrote:

brownshiverspark@xxxxxxx wrote in <news:1156974369.926437.137570@i42g2000cwa.googlegroups.com>:

Hello,

I was wondering.

What does a planet become when the star that is nearby (i.e Sun for the Earth) is becoming a white dwarf?

Well technically the Sun is already a dwarf. Namely a yellow dwarf of spectral type G2 V.

The Sun is a main-sequence dwarf, true. But there's a difference between main-sequence dwarfs and white dwarfs: the latter are **not** main sequence stars of spectral class A, they are its own class of stars, containing super-dense "degenerate" matter. Check out Sirius: Sirius A is a main sequence star of spectral class A (a normal dwarf star), while Sirius B is a white dwarf -- and there's quite a difference between the two!

A star becomes a white dwarf after having passed through the red giant stage, and if it's not massive enough to instead become a neutron star or a black hole. The Sun will end up as a white dwarf, billions of years from now. And any planet around the Sun which survived the Sun's red giant stage will of course still be a planet also when the Sun has become a white dwarf.

Can a planet still be here or is the amount of energy displayed by the desintegration of the star blowing everything on it's way?

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In short, it depends. On the way to changing into a white dwarf, the Sun will go through the red giant phase once it runs out of hydrogen in its' core. The inner planets Mercury and Venus will be engulfed by the Sun's atmosphere and will therefore eventually be destroyed. The Earth is in a marginal position as the detail depends on how much mass the Sun will lose as it puffs up into a red giant. The mass loss will cause the Earth's orbit to migrate out a little, possibly enough to escape being absorbed by the Sun. Mars and the planets further out will survive intact.

This is all moot anyway. Long before the Sun gets to the red giant phase the Earth's oceans would have long since boiled off. The Sun, like all main sequence stars is gradually increasing in luminosity and some time between five hundred million and a billion years, the earth will become uninhabitable unless we can move it further from the Sun ;-).

Your view is quite geocentric... :-)

The giant planets will most likely survive the Sun's red giant phase, and will remain as planets when the Sun has become a white dwarf.

Klazmon

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