Stellar Metamorphosis: Maximum Density and Mass of a Dead Star

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July 8, 2019
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Abstract: The purpose of this paper is to re-interpret stellar evolution from physical observations in accordance with the General Theory. The maximum density of a dead star is, 8.9 ± 2.1 g cm−3, and the maximum mass is 0.0082 ± 0.0014 Jupiter masses. This is important as it sets an upper bound for dead stars, for the maximum size object a star can make, and allows us to reinterpret the interiors of gas giants as they evolve into life hosting worlds.

According to the dogma, white dwarfs are dead stars. This is false. A white dwarf has a mass comparable to the Sun, is tens of thousands of degrees Kelvin, is extremely dense, rotates rapidly, and has a strong global magnetic field. Dead stars do not have those characteristics. Dead stars lack strong global magnetic fields, are much less dense and massive, are composed of the lowest enthalpies of matter, rotate extremely slowly, and are not extremely hot. Dead stars as well do not shine as do white dwarfs, they can only reflect large amounts of light, as does Venus. The only way dead stars can been seen is if they have a high enough albedo, they are large enough and they are close by astronomical standards. Dead stars cannot strongly be emissive, they can only reflect strongly.

This being said, the maximum measured mass of a dead star is 0.0082 ± 0.0014 Jupiter masses. This of course can change in the future, but it will only change with more mass added. When the Earth completely solidifies, losing its strong magnetic field, and its rotational momentum diminishes, it will be about the same mass it is now. This means it will have a maximum mass of 5.97237 * 10^24 Kg, but it hasn't happened yet. Earth still has a strong global magnetic field, is still spinning once every 24 hours, as well has life on it. Earth is not dead yet, so it cannot be labeled as a dead star.

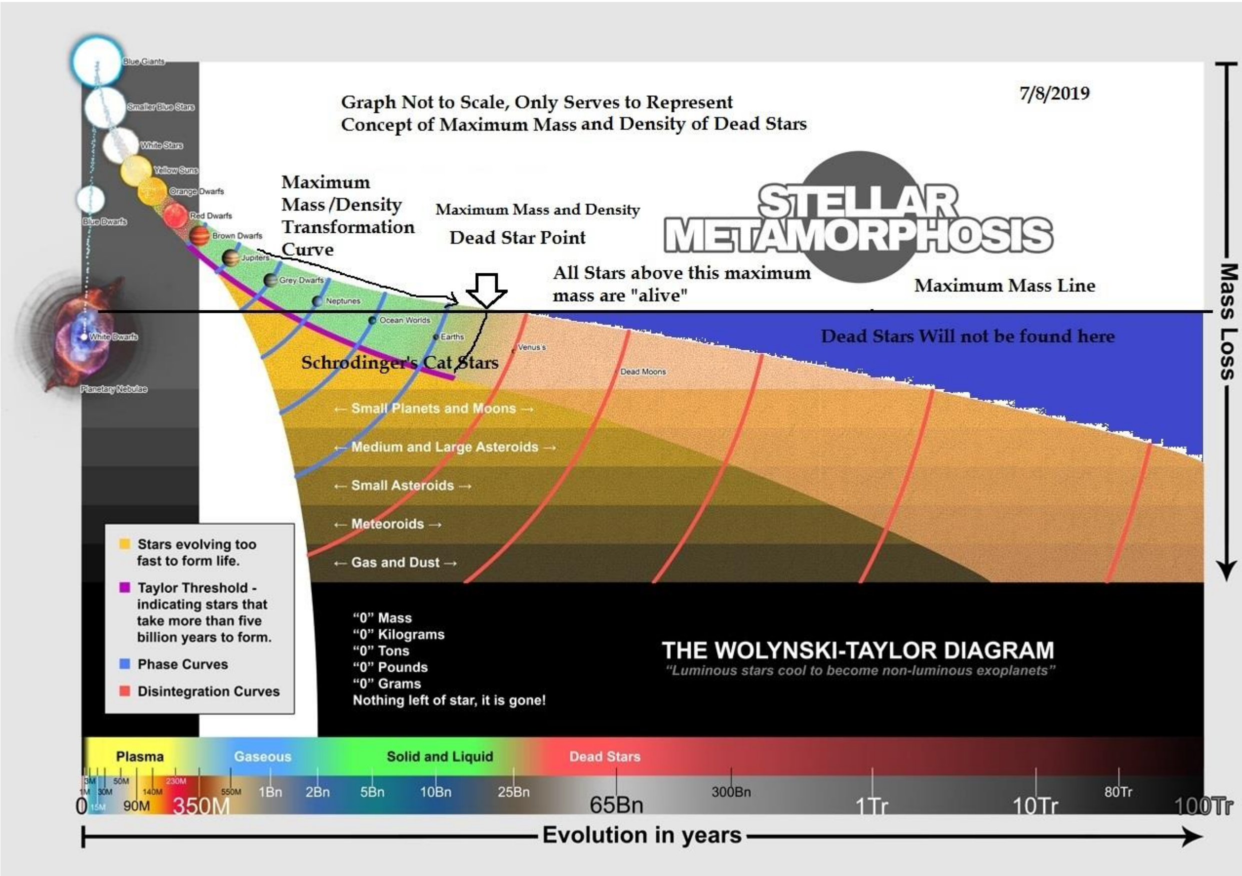
Looking at the actual observationally confirmed dead star, K2-229b, and the very old, post total-ocean world stage Earth, we can easily conclude on circumstantial evidence that the possible maximum mass of a dead star to be about 1.55 * 10^25 kg. In the future when stars are found that are rocky/metallic and denser than K2-229b, then we can adjust these findings. Until then, we can take the observational and circumstantial evidence and draw up an interesting conclusion. All "exoplanets" (evolved/evolving possibly dead stars), that are more massive than 1.55 * 10^25 Kg, are not dead, but active, and have features possessed by the Earth. This is due to the mass loss principle. The star only loses mass after blue giant stages, therefore a dead star cannot be more massive than its own dead "limit". As well, this does not apply in the reverse though.

A star can be lower in mass than 1.55 * 10^25 Kg, but that does not signal that it is "dead". It is only stars that are more massive than the limit cannot be dead, in this case Mars is a good example. It was less massive than Venus when it was hosting life, and was more active. The dead star mass limit is more of a rule of thumb at the moment, but is important to determine the qualities of evolving stars at a distance, with just "1" variable, its mass. So in terms of Jupiter mass, we can use this idea to determine what the qualities of exoplanets (evolved stars) are.

The maximum density/mass limit for dead stars also tells us the maximum size of the rocky/metal interiors that gas giants (intermediate aged stars) can possess. Using this in real terms means the majority of Neptune's mass, as 17.15 Earth masses, is in gaseous form. Using subtraction, if the maximum sized final product made of rocks/minerals and metal Neptune can make is 2.59 Earth masses, then you subtract 2.59 from 17.15, to get 14.56 Earth masses worth of gas that will never form rocks, minerals or solid metal that stays with the final crustal product after ocean world stages of evolution. The same goes for Jupiter. It is 317.8 times as massive as Earth, so you take 317.8 and subtract 2.59, you get, 315.21 Earth masses of stuff that Jupiter will dissipate/ablate away. That is a lot of material to not get trapped inside/underneath the crust or become the crust.

As well, this sets an upper limit to the size of all stellar interiors that have formed rocks/mineral and a large core. If you see the dogmatists claiming Jupiter's core is 100 Earth masses in size, then you know better. The majority of that material will be ablated away, as is observationally confirmed by the exoplanet (evolved star) K2-229b. Sure, some differentiation can exist, and there can be different layers with one of the layers being that many Earth masses, but it is not going to stay there as Jupiter evolves into a life hosting world.

This understanding also sets a limit on stars' masses to determine if they are alive. No star above this density and/or mass is dead. Dead being no magnetic field, no surface activity, no weather, no liquid interior, no gaseous atmosphere and a lot more features. This feature is up for revision in the future as more information is gathered.



Graph Not to Scale, Only Serves to Represent
Concept of Maximum Mass and Density of Dead Stars
7/8/2019
STELLAR METAMORPHOSIS
Maximum Mass/Density Transformation Curve
Maximum Mass and Density
Dead Star Point
All Stars above this maximum mass are "alive"
Maximum Mass Line
Dead Stars Will not be found here
Schrodinger's Cat Stars
Mass Loss
Blue Giants
Smaller Blue Stars
White Stars
Yellow Suns
Orange Dwarfs
Red Dwarfs
Brown Dwarfs
Jupiters
Grey Dwarfs
Neptunes
Ocean Worlds
Earths
Venus's
Dead Moons
Blue Dwarfs
White Dwarfs
Planetary Nebulae
← Small Planets and Moons →
← Medium and Large Asteroids →
← Small Asteroids →
← Meteroids →
← Gas and Dust →
Stars evolving too fast to form life.
Taylor Threshold - indicating stars that take more than five billion years to form.
Phase Curves
Disintegration Curves
"0" Mass
"0" Kilograms
"0" Tons
"0" Pounds
"0" Grams
Nothing left of star, it is gone!
THE WOLYNSKI-TAYLOR DIAGRAM
"Luminous stars cool to become non-luminous exoplanets"
Plasma
Gaseous
Solid and Liquid
Dead Stars
0
1M
3M
15M
30M
50M
90M
140M
230M
350M
550M
1Bn
2Bn
5Bn
10Bn
25Bn
65Bn
300Bn
1Tr
10Tr
80Tr
100Tr
Evolution in years