

Stellar Metamorphosis: Some Thoughts on White Dwarf Stars

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Abstract: I agree with Daniel Archer that pinching and magnetic constriction of interstellar material are what birth stars from the interstellar medium. This being said, gravitation, at first, has little effect during the very beginnings of a star's birthing process as gas in outer space would expand, not contract with gravity alone forming a star. Some ideas and reasoning is included in this paper about the nature of white dwarfs.

In vacuum you cannot compress a gas, as by definition a vacuum is a gas-less, pressure-less, environment. That would be like saying you can grab air with your hands. No matter how hard you try and grab air with your hands, the gas will escape because it is not only composed of very small particles that are moving extremely fast, but your hand is a very leaky container. There are no containers available in vacuum to hold onto such a leaky substance while compressing it. This means the compressed material itself has to self-compress on the atomic level, meaning a star's material has to have a property that allows it to self-compress in some type of feedback mechanism.

If I were to take a stab at stellar birth, I would say a large percentage of hydrogen and/or helium gas in outer space has its electrons removed somehow, allowing for it to become super compressed, (become electron degenerate matter). As well, the super compressed state would cause the material to clump together, because of its mass. What this means is that white dwarfs are built up over a long period of time until they reach a threshold where they start expanding. During this super compression state, it can take up a form that resembles condensed matter, and appear stable, like a chunk of obsidian found on Earth. This being said, the beginnings of stellar birth include the stars being in a super compressed, semi-stable, condensed matter form, which is continuously layered by some process that is removing electrons from random interstellar gas. So to clarify,

1. **High energy condensed** matter (stellar birthing) due to contraction caused by some type of **electromagnetic** pinching effect that removes electrons, which are white dwarfs (mostly composed of electron degenerate matter). This material that is having its electrons stripped away becomes super dense and layers onto the star. The white dwarfs mass then continues to grow because the material is so dense, it can attract other material

gravitationally that has had its electrons ripped away as well. So there are three stages:

A. The molecular cloud has electrons removed somehow to become ionized greatly, due to some type of pinching effect

B. That ionized material loses its ability to repel itself and clumps together due to its high density (electron degenerate matter (condensed) gravitationally attracting itself)

C. The process that is causing the loss of electrons continues until the star reaches a certain mass, probably about 1.4 Sun masses, and then starts expanding into early blue dwarf stages.

2. **Low energy condensed** matter (old age) due to contraction caused by **gravitational collapse** during the star's evolution (stellar metamorphosis, the aging of the star into a life hosting star mis-labeled "planet" and/or "gas giant").

What this separation shows is that the star has two stages which it is composed of condensed matter. When it is born, and when it ages considerably to become mostly composed of rocks/minerals/ice. So what happens is that it is born in a condensed matter period, expands greatly to move out of a condensed state (and novas every now and then when objects slam into it), retains a plasma state for some time, then condenses slowly and gravitationally collapses into a gaseous state, and then that gas further compresses gravitationally (as it loses mass) into solid and liquid material, and further mostly solid condensed matter known as rocks/minerals/ice... and us.

This paper is up for revision as time goes on, but as the reader can see, it is much more reasonable to consider that white dwarfs are not dead stars, they are babies. The dead stars are also condensed matter though, it is unfortunate that astronomers still call them "exoplanets/planets".