The Evolution of a Star

Introduction

Stars are formed by a chemical nuclear process, and spend their entire "lives" in the same state of chemical nuclear process. They begin as a giant stellar cloud of gas and dust and often end in a similar fashion. The end appears much like the second stage of a stars birth: a glowing nebula. I believe one of the reason educated people personify stars (which is a valid mode of expression in poetry,) is because nebulas look a great deal like a sonigram, and often, they look like a fetus, and/or the floating debris in the water of the womb. Also there is some proof that this world and everything on it, living or not, was formed from the dust of burned out stars. William Prout turned this hypothesis into a theory. It is probably fact.

Conception and Birth

When a star is born, it is usually born in the middle of a giant dust cloud. The distribution of interstellar debris is irregular and chaotic. The dust cloud, if large enough, begins to pull together because of gravitational forces. I'm sure that God/dess (whom is probably to blame for there being so much "dark matter" in the universe) begins this process deliberately Perhaps this stage could be considered stellar conception. Once the cloud reaches a critical mass, it begins to glow. I have an interesting hypothesis to share with my readers, perhaps the mass from the photons, or light particles, being produced by other main sequence stars is enough to cause a cloud to reach critical mass. If that were true, it would mean that light, itself, creates more light.

At this second stage, we have what is referred to as a pre-star. It looks like a flying saucer, or wok at this point. It is similar to ball lightning at this point, where cosmic dust (or heavy hydrogen) is burning. The temperature is usually around three to four million degrees. As heavy hydrogen, or deuterium, is destroyed, the pre star begins to produce lithium, beryllium and boron -- all unstable. These three elements break down into helium, which although light, still increases the mass, and thereby the gravity. Then it increases the temperature. By this time, the mass has coagulated into a ball of fire, having burned off the outer edges of its cloud like smouldering paper, and the star reaches main sequence status, or has achieved birth: i.e. this stage is like contractions. This part of the stars evolution is called the carbon cycle, or proton-proton reaction.

Perhaps sparks from this process start mini stars in the denser outer edges of this cloud of stuff as they combine with iron and other heavy atoms in the cloud (a small percentage of the byproduct of a burned out star, usually). Interstellar coagulation of matter could conceivably form planets by virtue of their individual accumulated gravity. This would be the birth of planets, which are theorized to form from the leftover debris in the pre-star cloud. Hydrogen and oxygen are common elements on planets, and they are lighter then iron. Jupiter, our sixth planet, has been referred to as a brown dwarf, or dead pre-star; Jupiter is too small to ever achieve critical mass, but is large enough, that if you were to include all the mass in our solar system, it could conceivably begin to burn. So in accordance with these laws, water is born from fire; in essence, interstellar dust is "powdered water" to quote Stephen Wright.

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Main Sequence Stars:

Main sequence stars with large mass and density burn very very hot. They have what is called a convection core. They burn at billions of degrees in their core. These are known as Blue Giants, or class B and O stars. The reason they are called blue giants is because the hottest part of a flame is blue in color. All main sequence stars burn helium at this point. Helium requires certain specific conditions to burn including a high temperature. Helium begins to burn at around 111,100 degrees. Blue giants essentially are a giant roaring inferno. Often stars with convection cores supernova after a couple of billion years. Convection cores are not able to burn the surface material of the star because the stars gravitational force is too great to let fire escape. Suddenly, one day the star has a lethal contraction when trying to pull more fuel inside, and it explodes brilliantly -- Goddess is a pyrotechnician and creates the biggest fireworks in the universe. There is considerable evidence that suggests that a star went supernova the day Jesus was born and caused the Star of Nazareth to shine brighter than a planet in the sky.

The death of a blue giant can be ugly. It is suggested that these stars form black and white holes, since the stars dead core begins to pull the cloud of dust back in because of its gravity. There is evidence to suggest that a single black hole can give birth to a galaxy, where all the stars rotate around a black hole. This galactic rotation is actually a very slow inward spiral, similar in proportion to the amount of time it takes glass to drip down and get thicker near the bottom. Black holes give off no light (a little like sunspots, which are hot but not illuminated, and like anti-photons or anti light.) and absorb everything (but angels) within their gravitational field; sunspots do not. The theory is that they are so dense, not even photons are "light" enough to escape.

The other stars on the H-R diagram do not have convection cores. Their gravity is not too strong to keep the star from burning anything on its surface. Helium is a dynamic fuel, being one of the hardest elements of all to light on fire. It creates, when burned, all elements up to iron, a key element in our bloodstream, including carbon. A, F, and G stars tend to nova after a while. A class stars tend to die after about three billion years, and G and M class stars after hundreds of billions of years. Our star, a class F star, is said to have a life span of about fifteen billion years (or about 40 years on God's clock) Apparently, good old Sol is approximately as old in years as there are people on this planet, about 6 billion years old. These stars are said to be the most likely to support life, along with K class stars. Some K class stars end their lives like this, others end like class M stars. A star twice the mass of Sol has a life span of about 3 billion years.

Death and Rebirth

In the last few billion years of these stars' "lives," they begin to cool down and expand after expiring all hydrogen fuel in their core. Gravity begins to decrease, as less and less helium is produced and hydrogen begins to dissapear altogether. Nuclear fission ceases, as the star exhausts its supply of helium as well. The star, still burning, expands more slowly then a supernova. These stars are said to nova. Sol, our star, is predicted to expand fully out to where

Jupiter is upon its death. The star burns off its fuel and cools on the outside first. The star shrinks (to about midway between Venus and Mercury) and retires as a red giant.

The smallest stars are theorized to just putter and die, like class M stars, and become little white dwarves or dense stellar objects. Apparently one teaspoon of white dwarf material weighs more than the whole Pyramid of Giza. Powdered water is extremely heavy. They give off little light, being no more than cooling stellar ash. For all practical purposes, they are invisible.

Red giants become dwarves too, but red ones, not white. They are like giant floating coals and do give off some light. There are some red dwarves visible through a telescope, but I don't think we can see any with our naked eye. The earth will be nothing more than charcoal, since it’s unlikely it will burn up entirely when the red giant contracts, and if it does, then Saturn will be little more than a giant floating charcoal briquette.

The reason we know all this information about the constitution of stars is because of spectral analysis. For example, everyone knows that white light produces a whole rainbow of visible colored light, in addition to infrared and ultraviolet. Because certain elements are missing from a star's light, lines show up in its visible spectrum. Based on comparing and matching these lines to the lines in the spectra recorded in a table drawn by experimenters who burned different samples elements to find each element's "fingerprints," or individual pattern of lines, the observers can determine elemental compositions of stars.

The magnitude or luminosity of a star is determined by compensating for the parallax effect (or apparent greater movement to each side with closer distance when you close one eye and then the other eye and observe something) and combining it with the stars apparent magnitude from the planet earth. Thus, a star's temperature can be determined. This figure, when combined with the determined chemical composition can help the observer determine the mass and age of a star. The parallax effect seems to play a part in our observations of others to, in other words, the inner eye is as likely to be deceived by it as our two other eyes. It affects recorded history, ethnocentrism, and other areas of civilization. Stars don't often respond visibly to the parallax effect, but if it is not taken into consideration you could aim a spaceship at Polaris, to the best of your ability, and end up somewhere near Sirius instead.

Conclusion

Perhaps this essay would be better titled the evolution of a galaxy, but theories are mostly unfinished when it comes to the formation of a galaxy and it would be a misnomer. This is a basic overview of astrophysics, and should give you a better conception of the universe we live in. There is so much more to it than this. If you have more questions, this paper is too basic or difficult, or not scientific enough, I would recommend trying other websites. Most in depth sites have H-R diagrams for you to look at with lots of somewhat uninteresting and unenlightening numbers.

The conflict between science and spirituality is completely unnecessary, as I hope I have illustrated in this essay.

Sincerely, Theresa M. Lennon
February 2, 2001.

Research from the entry "Stars" Encyclopedia Brittanica, William Benton publishing and University of Chicago press. 1971.