The Mass Modeling Principle of Stellar Evolution

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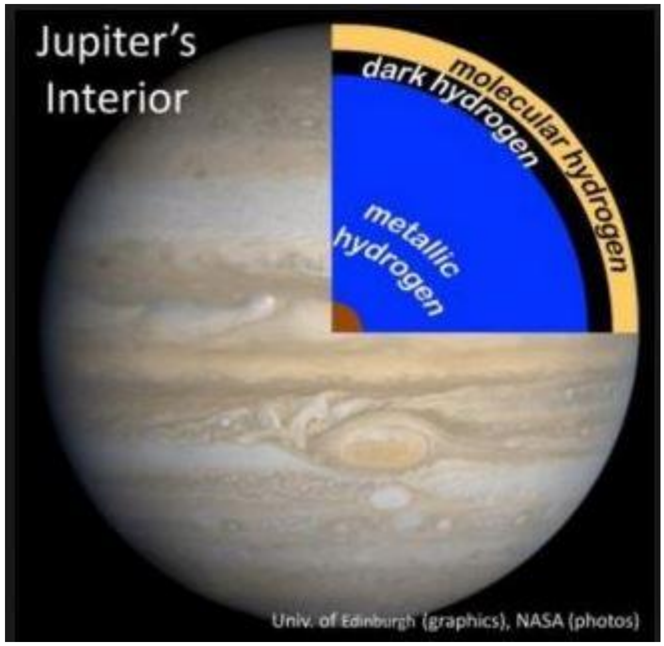
Abstract: In stellar metamorphosis stars lose and gain mass as they evolve, therefore a simple principle can be drawn up regarding their mass loss/gain and modeling for future scientists. Both ablation and accretion are important. It is similar to Newton's third law, for every action there is an equal and opposite reaction. For every amount of mass accreted, that same mass can be ablated. No matter how large an object you work with, it if was built with accretion, it can be destroyed with ablation.

In order to correctly model stars' evolution into life hosting stars such as the Earth, or others, the variable of mass loss and gain needs to be included. Any model of the internal structure of a star is not sufficient to determine its future, as mass loss and gain will change all the other variables over time. This is observed in the different structures and compositions of stars in various stages of evolution found by Kepler and even the classical "planets" in the solar system. Trying to determine what the future of a star's physical and chemical structure without significant mass loss and gain as a variable will lead to wildly inaccurate assessments of the star's evolution at most stages of evolution. A star's current structure, elemental/molecular composition, radiance, phase of matter, etc. cannot be used to determine its history unless mass loss and gain is taken into account.

This mass loss principle diminishes in importance as the star stabilizes and loses mass slower, thus older stars such as Earth will not change in mass considerably, so can be modelled much easier as the mass loss and rate of mass loss will diminish. The more massive the star, the more possibilities for its structure to change in different ways. For instance, you could have two sun like stars, and both lose mass at about the same rate, but then they could have their orbits interrupted and one orbit a hotter host losing mass faster, therefore not allowing for more material to be deposited in the interior (forming the planet). So two stars that started with the same properties mostly, but one losing mass faster due to evaporation caused by a hotter host will lead to two different sized "planets" far into their evolutionary timelines, because it has less material to work with. This is why all planets will be different sizes and are observed to be different sizes as they evolve.

This principle has direct implications for the assumptions made, or even the observations of the interior of objects such as Jupiter or Saturn. It is perfectly fine for those objects to have extremely thick metallic hydrogen interiors.



Jupiter's Interior

Let us not get carried away with modelling though. The vast majority of that mass (hydrogen in many different forms) will dissipate eventually. We know this because the maximum mass of a dead star is a fraction of Jupiter's total mass. K2-229b is a good example, it is ~.0082 Jupiter masses.[1] That is less than 1% of Jupiter's current mass. In fact, reasonably, it is best to have the majority of Jupiter's mass as hydrogen. It is a very light element and can (and does) escape in large quantities over the course of the star's history.

The reason why scientists cannot get carried away with modelling is because their models cannot possibly suit the facts discovered in the 21st century. Since Jupiter will lose 99% of its atmosphere, how does modelling what it is now suit what it will become? Do modellers take the observations that older stars lose the vast majority of their mass to interstellar space into consideration? No, they do not. In fact, modellers do not have Jupiter as an evolutionary structure at all. To them, it formed "as is", and will remain permanently "as is". Their ideas of Jupiter are surrounded by it not being able to become as massive as the Sun in its future, which is a perplexing and myopic a stance. Why could it not have had the mass of the Sun in its past, when in fact the vast majority of the observations of galaxies have objects that are even more massive than the Sun? It is odd how they never consider this.

So the modelling they do does not consider the fact that it will lose 99% of its mass, and that it has already lost 99% of its mass. An easy to reason fact due to overwhelming direct observations of hundreds of millions of stars in tens of thousands of galaxies, or more less direct observations of an infinity of stars in an infinity of galaxies. The direct observations of stars that are more massive and less evolved than

Jupiter make it absolutely absurd that Jupiter could never have been one of those objects earlier in its evolutionary history. This being said, it is clear, Jupiter was like the Sun, the observations are too overwhelming to counter this fact. So realistically (not theoretically), the Sun also cannot be modelled without the information provided by discovering the mechanisms of Jupiter. One will become like the other, and one was like the other. They are both snapshots of two independent timelines, similar in mechanisms, but one more evolved than the other.

Even more perplexing, the modellers force the objects to be similar in age, ~4.5 billion years old. This assumption stonewalls discovering the mechanisms of nature, esp. in objects that are evolutionary. If you have two objects that are roughly the same age, and form them with the mass they currently have, the idea that one can lose mass to become the other is not even, in the modellers term's, "motivated". They have no reason to include mass loss if they both started off with the mass they currently have. If you will notice though, that is an assumption not grounded in any observation. The observations tell us that all fully formed stars are massive, and lose their mass as they evolve over many hundreds of millions of years, not, they form with the masses they currently have. The modellers simply skipped over the anti-thesis of mass accretion, it not only can gain mass to form, it can ablate it away. Both mass ablation and accretion play equal roles in the process of stellar metamorphosis. This is just the way nature works. We can easily imagine a human being accreting mass in the womb, to be born and then grow up, to eventually grow old and die, to one day be cremated and released back into nature in atomic form.

Stars accrete and then ablate, the same as humans, and all life itself. It is best to model the direct observations, or else be stuck modelling what does not exist. What is ablated can be accreted, and what is accreted can be ablated. I guess that is a suitable statement for the mass modelling principle. It is similar to Newton's third law, for every action there is an equal and opposite reaction. For every amount of mass accreted, that same mass can be ablated. What this essentially means is that no matter how large an object you work with, it if was built with accretion, it can be destroyed with ablation. This is not to signal the time variable though, the amount of time required to ablate might not be the same as accrete, but you get the point. It takes time to accrete all the liquid oxygen and liquid hydrogen for rockets and the rockets just burn it up real fast. But with stars it is different. The accretion of the internal planetary core can take only a few hundred million years, but ablating it away from natural processes once it is formed takes hundreds of billions if not trillions of years.

References

[1] http://vixra.org/pdf/1906.0572v2.pdf Stellar Metamorphosis: Maximum Mass and Density of a Dead Star, July 8, 2019