A Review of Ages in Stellar Metamorphosis

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Abstract

Stellar Metamorphosis is the name given to a proposed alternative hypothesis for the origin and evolution of stars, planets, and all other celestial bodies. One of the most basic predictions of Stellar Metamorphosis is for the ages of celestial bodies. Since Stellar Metamorphosis rejects parts or even all knowledge of astronomical bodies as erroneous, this review focuses on internal checks of the hypothesis only. A number of internal inconsistencies are found. Contradictions in age results of up to 6,140% are found in Stellar Metamorphosis papers. Contradictions in Stellar Metamorphosis age measurement methods are also found, averaging 26,000% across all methods and surveyed objects.

1 Introduction

Stellar Metamorphosis is an idea where a fundamental principle is that "planets are the old, evolving and dead stars." [4] In Stellar Metamorphosis, white dwarfs become blue giants, then smaller stars, then large planets, and finally small planets, moons, and asteroids. This means that, in Stellar Metamorphosis, planets and other smaller bodies are typically much older than stars. Often discussed in Stellar Metamorphosis are the ages of a variety of objects, which differ greatly from ages accepted by the scientific community. New methods to determine these ages are also used. If Stellar Metamorphosis is to be seriously considered, then the quoted ages of celestial bodies—and the methods of determining those ages—must be internally consistent. It is this question of internal consistency that is the focus of this study.

2 Inconsistencies in Body Ages

Various values for the ages of a variety of objects are given in Stellar Metamorphosis. Many of these values are contradictory. In some cases, different values are given in the same paper. Table 1 shows a selection of objects and different values given for their ages in Stellar Metamorphosis. For the Earth and Brown Dwarfs, lower bounds for the age are given, but the same objects are then quoted as being younger elsewhere, contradicting these lower bounds. Large discrepancies are also found between claimed ages across Stellar Metamorphosis for a number of objects, such as the Earth and Venus. Differences of up to 5.5 Gyr for the Earth, and 1.5 Tyr for Venus are found—discrepancies of 82% and 6,140%, respectively.

Body	Book [7] (Gyr)	Gyrochronology paper [5] (Gyr)	WT diagram (Gyr)
Earth	> 10.004	4.5, 10	10
Sun		0.002, 0.02, 0.065, 0.09	0.09
Jupiter		0.55, 0.68	0.55
Venus	>11.48	25, 450, 1560	25
Brown Dwarfs	> 0.26, 0.263		> 0.23
Neptune		1.12, 2	2

Table 1: Ages of various celestial bodies as reported in different Stellar Metamorphosis sources. Different values given in the same work are separated by commas. A number of different values are given for the same objects. Contradictions in age results of up to 6,140% are found in Stellar Metamorphosis papers.

3 Inconsistencies in age measurement methods

In Stellar Metamorphosis, a variety of methods to estimate celestial objects' ages are detailed.

3.1 Mass method

One of the staples of Stellar Metamorphosis is the Wolinsky-Taylor (WT) diagram [7]; see Figure 1, which relates the ages of a variety of celestial bodies with their masses. The data from this graph were extracted and fitted to an exponential to give predictions of a body's age based on its mass, shown in Figure 2. Table 2 shows which objects were used to represent each class of objects to obtain the mass.

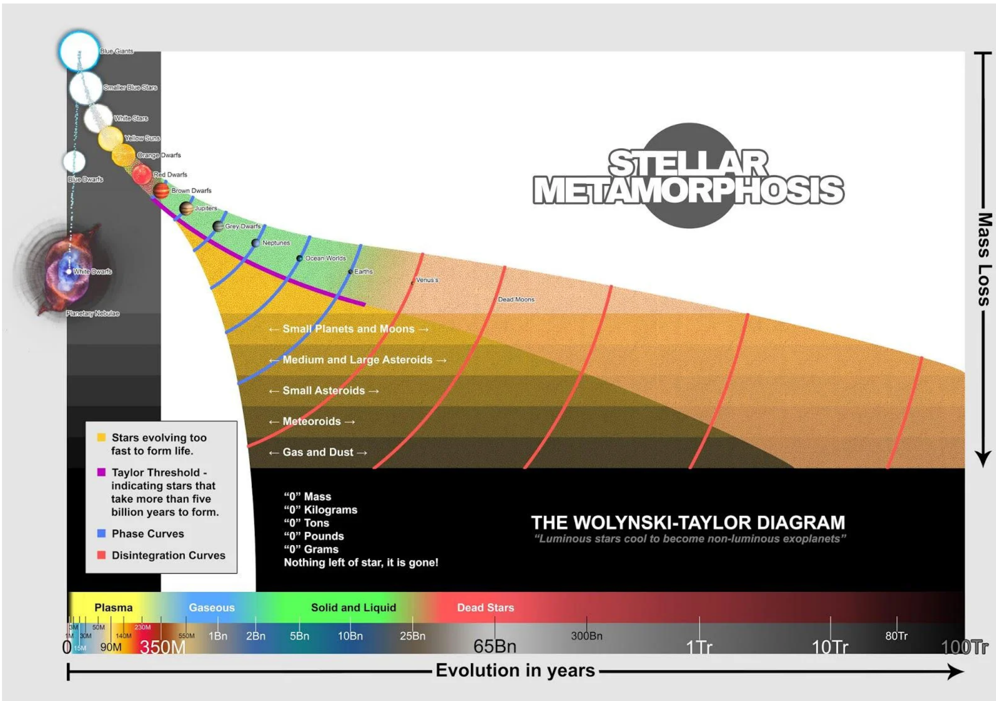

Figure 1: Diagram relating masses of celestial objects to their ages in Stellar Metamorphosis.

3.2 Deuterium-to-hydrogen ratio method

In Stellar Metamorphosis, it is claimed that the deuterium-to-hydrogen ratio (D/H) found on a celestial body is directly proportional to its age [6]. No specifics are given as to which sample is to be used to calculate the D/H ratio. The Sun is chosen as the object of reference.

3.3 Angular momentum method

In Stellar Metamorphosis, it is claimed that the conventional astronomical concept of gyrochronology [1] can be applied to low-mass objects, such as Mercury or Venus [5]. An approximation of the line fit proposed in Stellar Metamorphosis is used here to predict a body's age based on its angular momentum. The age is thus given by

$$T = \left(\frac{10^{73}}{|\ell|}\right)^{\frac{1}{4}} + \left(\frac{10^{40.25}}{|\ell|}\right)^{\frac{4}{3}}, \tag{1}$$

where ℓ is the angular momentum of the object. The fitted data are shown in Figure 3.

Stellar Metamorphosis class	Representative object
Blue Giants	Rigel
Small Blue Stars	B star
White Stars	A star
Yellow Stars	Sun
Orange Dwarfs	K star
Red Dwarfs	M star
Brown Dwarfs	Smallest M star
Jupiters	Jupiter
Grey Dwarfs	*interpolated*
Neptunes	Neptune
Ocean Worlds	*interpolated*
Earths	Earth
Venuses	Venus
Dead Moons	Moon

Table 2: Translation between Stellar Metamorphosis classes and representative objects to obtain mass estimates of Stellar Metamorphosis classes. Values marked *interpolated* indicate a value which has been calculated from the mean of the value before and after it.

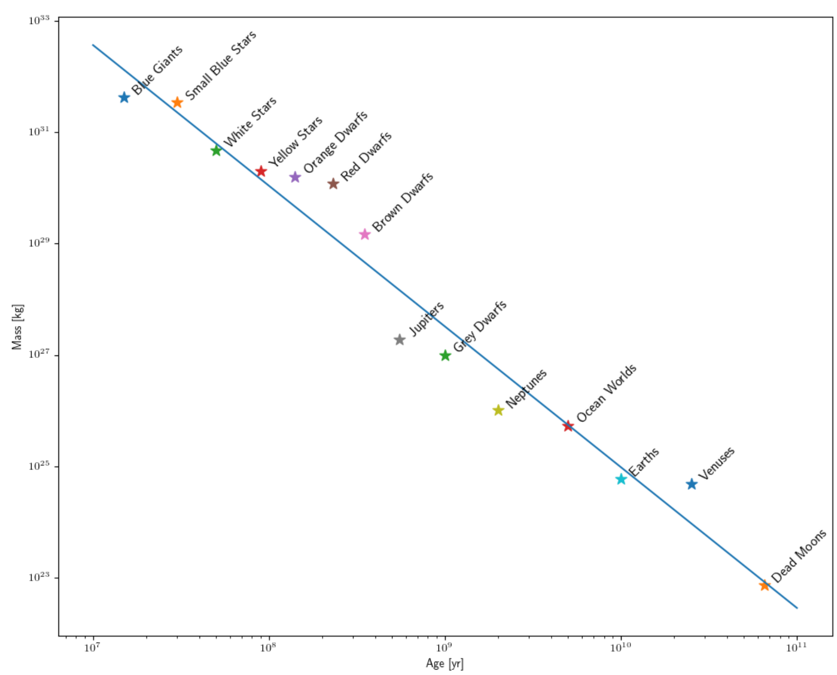

Figure 2: Exponential fit of the WT diagram.

3.4 Luminosity method

In Stellar Metamorphosis, it is claimed that stars' luminosities exponentially decay. The Sun is assumed to be "65 million years old," and Epsilon Eridani to have "∼1/3 the luminosity of the Sun, and [to be] 98 million years old." From this, it is concluded that "for every 33 million years, a star's bolometric luminosity

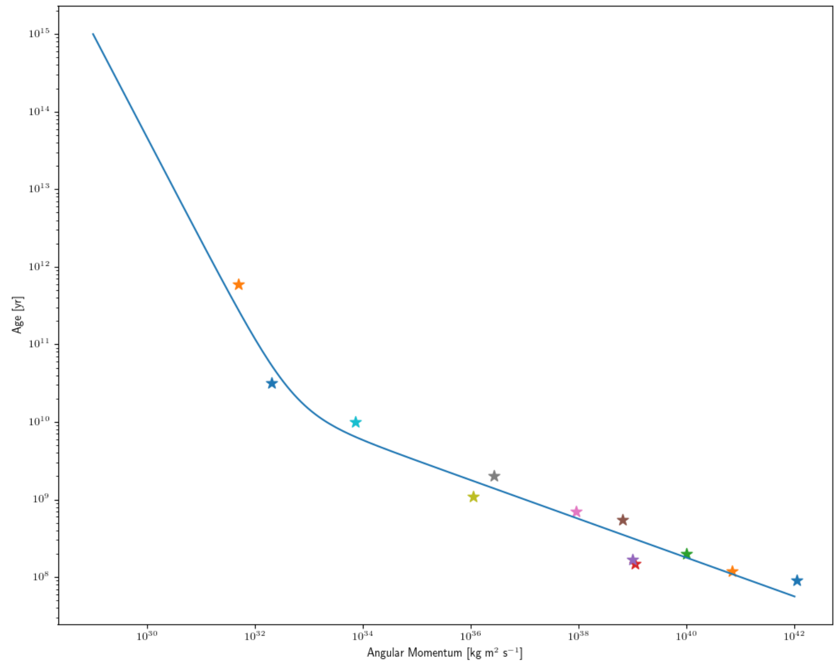

Figure 3: Angular momenta and ages of celestial bodies, as given by Stellar Metamorphosis, with reproduced fit. [5]

drops off by 1/3 *[sic]*." [3] This relation can be written as

$$L = L_0 \left(\frac{1}{3}\right)^{(T-T_0)/(33\times 10^6)}$$

Where L_0 is some reference star's luminosity, T_0 its age, and T is the star of interests' age. Inverting the relation to obtain the estimated age of the object of interest from its luminosity,

$$T = T_0 + 33 \times 10^6 \frac{\log \frac{L}{L_0}}{\log \frac{1}{3}} \tag{2}$$

The Sun has been chosen as the star of reference. The author notes that bolometric luminosity is to be used, and that any paper that separates the concept of "planet" and "star" is wrong. For this reason, it is safe to assume that this method should also apply to planets. As bolometric luminosity measurements are not typically available for planets, heat loss and heat flow are used as a proxy instead. Given that heat for planets is mainly lost through radiation [2], these quantities are interchangeable with the emitted power in photons.

3.5 Comparing methods

The ages of each object featured in the WT diagram, see Figure 1, are calculated using every method listed above. Some objects lack measurements for certain methods, and are therefore left out. The *factor difference* is calculated for every method, which is defined as the ratio of the age prediction for the method in question by the WT diagram predictions (or the reciprocal if the WT diagram prediction is the larger of the two values). For example, if two methods have a factor difference of 2, it means that one method predicts an age that is twice, or 200%, the age predicted by the other method. The ages obtained are compared in Figure 4.

Method	Mean factor difference
Deuterium-to-Hydrogen ratio method	106
Angular Momentum method	487
Luminosity method	19
All methods	260

Table 3: Mean factor differences for each age estimation method for all objects. For the luminosity method, any negative age estimates were ignored. A factor difference close to 1 is expected for a consistent method of age estimation. On average, these methods give factor differences of 260, indicative of discrepancies of 26,000% in age estimates.

- The D/H ratio method is in strong disagreement with the WT diagram across the board, with both large underestimates and overestimates. The worst disagreement is for the Moon, with a factor of 699 discrepancy.
- The angular momentum method is in disagreement with the WT diagram across the board. While it is expected to work for smaller objects, it is there where it fails the most spectacularly, reaching discrepancies of a factor of over 4,000. For larger stars, the method underestimates ages compared to the WT diagram, with discrepancies up to a factor of over 1,000.
- The luminosity method only shows small deviations from the WT diagram for small stars. For smaller objects, the predictions are in strong disagreement with the WT diagram, with a factor of more than 50 disagreement in the worst cases. For large stars, the method yields unphysical negative ages.

A histogram of all factor differences are shown in Figure 5. In this histogram, it is clear that the large majority of predictions made by Stellar Metamorphosis are contradictory, often by enormous margins. The mean factor differences obtained for each method across all objects are reported in Table 3.

4 Conclusions

Two simple tests of Stellar Metamorphosis were conducted, checking for consistency in 1) the claimed values for the ages of various objects, and 2) the methods for calculating ages. Stellar Metamorphosis failed both tests. Values obtained directly from materials of Stellar Metamorphosis and obtained using methods used in Stellar Metamorphosis are both self-contradictory, often by enormous margins. At times, the results are unphysical and even nonsensical (e.g., the negative ages predicted for stars that are measured to be very bright). Without having to perform any cross checks with other age measuring methods, Stellar Metamorphosis already discards itself as an internally inconsistent, broken hypothesis.

References

[1] Sydney A. Barnes. "Ages for Illustrative Field Stars Using Gyrochronology: Viability, Limitations, and Errors". In: *The Astrophysical Journal* 669.2 (Nov. 2007), pp. 1167–1189. DOI: `10.1086/519295`. URL: `https://doi.org/10.1086%5C%2F519295`.

[2] Wei Li and Shanhui Fan. "Radiative Cooling: Harvesting the Coldness of the Universe". In: *Opt. Photon. News* 30.11 (Nov. 2019), pp. 32–39. DOI: `10.1364/OPN.30.11.000032`. URL: `http://www.osa-opn.org/abstract.cfm?URI=opn-30-11-32`.

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[4] Jeffrey Wolinsky. "Hit Piece on Stellar Metamorphosis, Deception and Misunderstanding". In: (2020). URL: `https://stellar-metamorphosis.blogspot.com/2020/09/hit-piece-on-stellar-metamorphosis.html`.

[5] Jeffrey Wolinsky. "Stellar Metamorphosis: The New Gyrochronology, Version 4". In: *Vixra* (2019). URL: `https://vixra.org/pdf/1906.0146v3.pdf`.

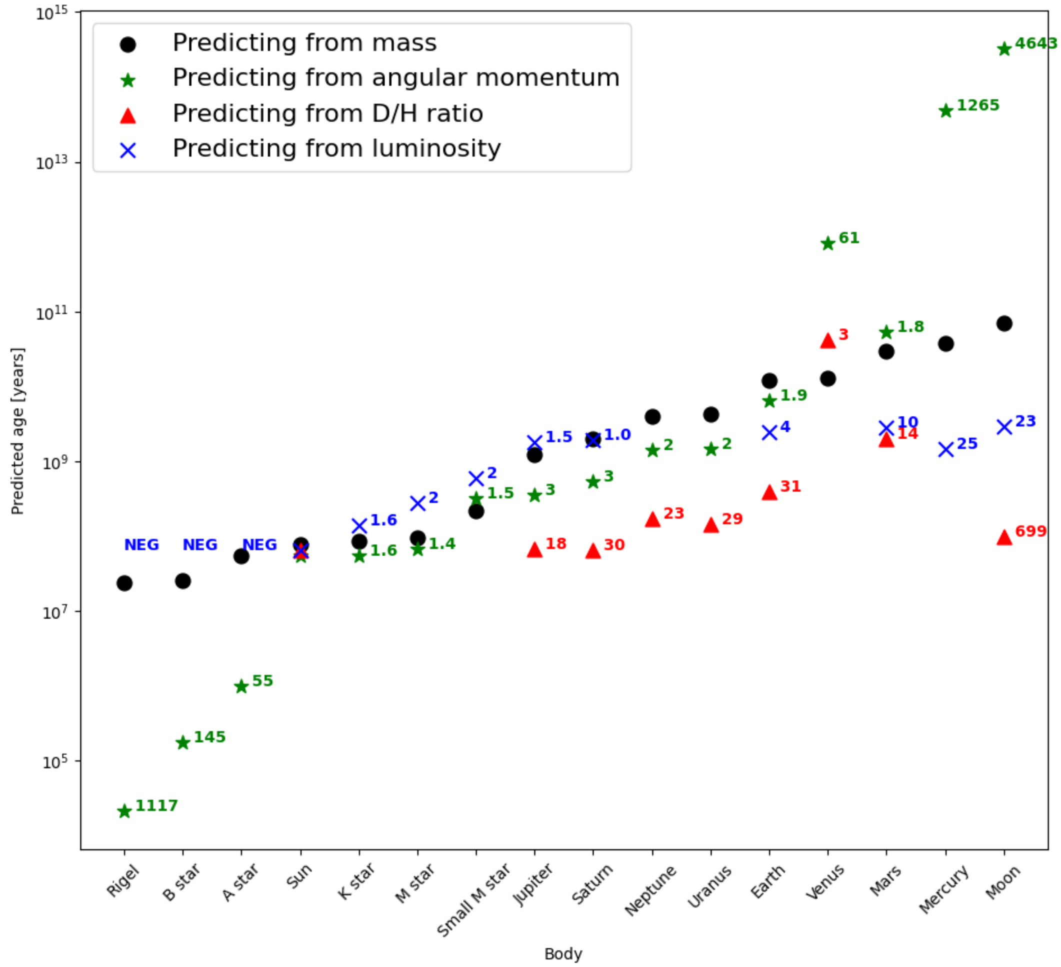

Figure 4: Diagram showing ages given by Stellar Metamorphosis for Solar System and other bodies. For each method, the difference between the mass prediction and each of the other prediction methods is given as a factor difference, which is defined as the ratio of the age prediction for the method in question by the WT diagram predictions. (If the ratio is < 1, then the reciprocal is quoted.) Note that several of the ages predicted using the body's bolometric luminosity result in negative ages; these instances are marked as "NEG" in the plot. There is a large discrepancy in the ages of almost all of the objects. No two age predicting methods agree to any reasonable degree in nearly any case, and the methods disagree by a factor of ~ 260, on average, across all of the methods.

[6] Jeffrey Wolinsky. "Stellar Metamorphosis: Venus's Age with D/H Ratios Factored as Opposed to Earth and Other Bodies". In: *Vixra* (2019). URL: `https://vixra.org/pdf/1905.0251v1.pdf`.

[7] Jeffrey Wolinsky. *The General Theory of Stellar Metamorphosis*. Vixra, 2018. URL: `https://www.vixra.org/pdf/1711.0206v5.pdf`.

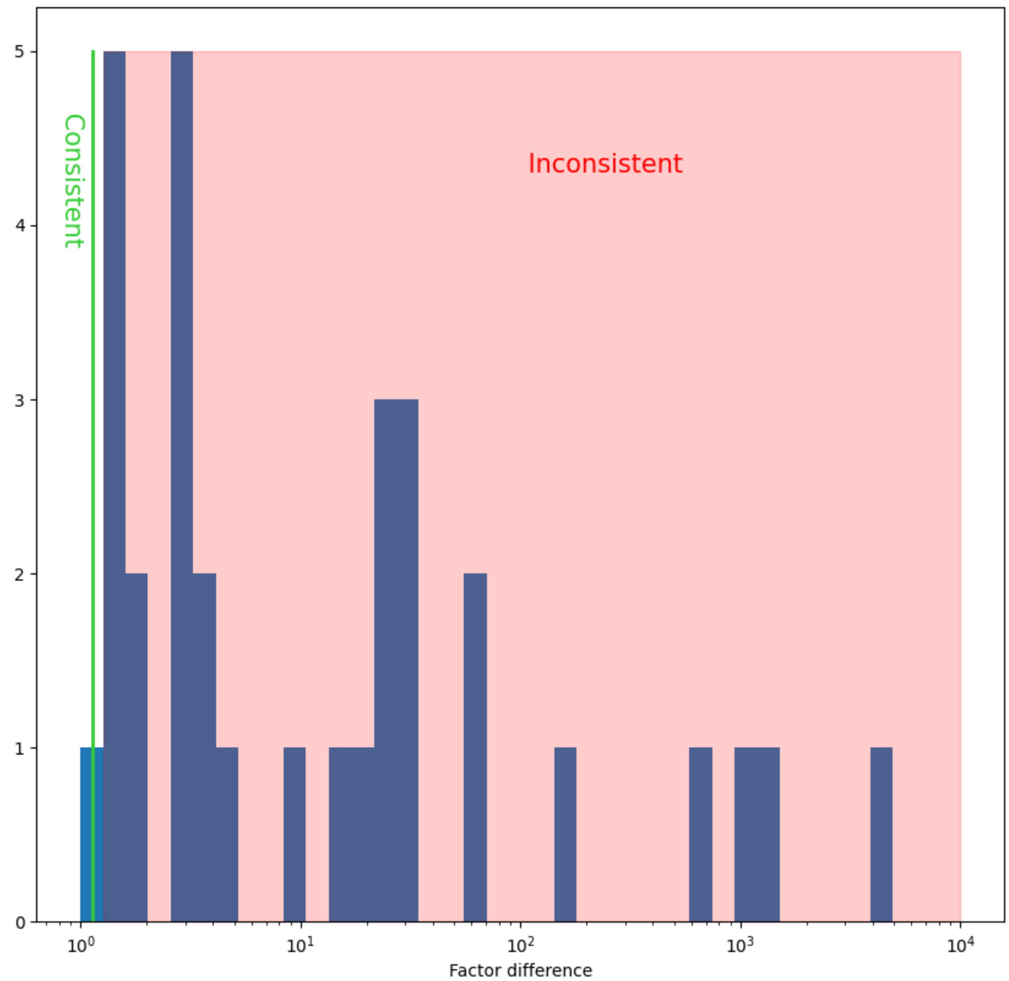

Figure 5: Histogram of all analyzed factor differences. Factor differences are equal to 1 when two methods of age estimation are consistent with one another (as a factor of 1.1 characterizes two measurements that are within 10% of each other). The large majority of analyzed methods from Stellar Metamorphosis are *severely* inconsistent, with factors of > 1,000, indicating age discrepancies of > 100,000%.