Stellar Metamorphosis: Using D/H Ratios of Saturn and Jupiter to Determine their Ages

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Abstract: In the general theory stars evolve into what are called "planets/exoplanets". We can figure out how old they are by measuring their atmospheric deuterium/hydrogen ratios against the Earth. I have made this paper as simple as possible by starting with the Earth as 4.5 billion years old, and with a D/H ratio of 1/6250. From that we can determine how old Saturn and Jupiter are.

"We present new measurements of the deuterium abundance on Jupiter and Saturn, showing evidence that Saturn's atmosphere contains less deuterium than Jupiter's. We analyzed far-infrared spectra from the Cassini Composite Infrared Spectrometer to measure the abundance of HD on both giant planets. Our estimate of the Jovian D/H = (2.95 ± 0.55) × 10−5 is in agreement with previous measurements by ISO/SWS: (2.25 ± 0.35) × 10−5, and the Galileo probe: (2.6 ± 0.7) × 10−5. In contrast, our estimate of the Saturn value of (2.10 ± 0.13) × 10−5 is somewhat lower than on Jupiter (by a factor of ${0.71}_{-0.15}^{+0.22}$), contrary to model predictions of a higher ratio: Saturn/Jupiter = 1.05–1.20. The Saturn D/H value is consistent with estimates for hydrogen in the protosolar nebula (2.1 ± 0.5) × 10−5, but its apparent divergence from the Jovian value suggests that our understanding of planetary formation and evolution is incomplete, which is in agreement with previous work."

Source: https://iopscience.iop.org/article/10.3847/1538-3881/aa899d/meta

To make the work complete all they need to do is use their D/H ratios to determine how evolved (old) they are. Using the General Theory, the ISO/SWS measurements set the age of Jupiter as:

632.8 ± 98 million years old

Using the Galileo probe's measurement, Jupiter's age is:

731.3 ± 197 million years old

Saturn's age is different though. With its D/H ratio it is determined to be:

590.6 ± 141 million years old

What these D/H ratios show us is that Saturn is younger than Jupiter by 40-140 million years. This could be an explanation as to why it is less dense, it had its atmosphere ripped apart before it could experience more mass dependent fractionation. This meaning it is travelling down a lower transformation curve (faster). Saturn's ending Earth type stage will be smaller than Jupiter's, as they reside on close phase curves, but different transformation curves.

As a side note the objects that are adopted will experience a faster rate of mass dependent fractionation, meaning there can be gas giants that are older, but more massive than younger ones. This can appear to be backwards in the general theory but it is okay. Stars can lose their mass relatively quicker (evolve faster) if they orbit a hotter host much more closely. That is probably what happened to Saturn, it was orbiting a much hotter star which caused it to puff out significantly and lose mass more rapidly than Jupiter.

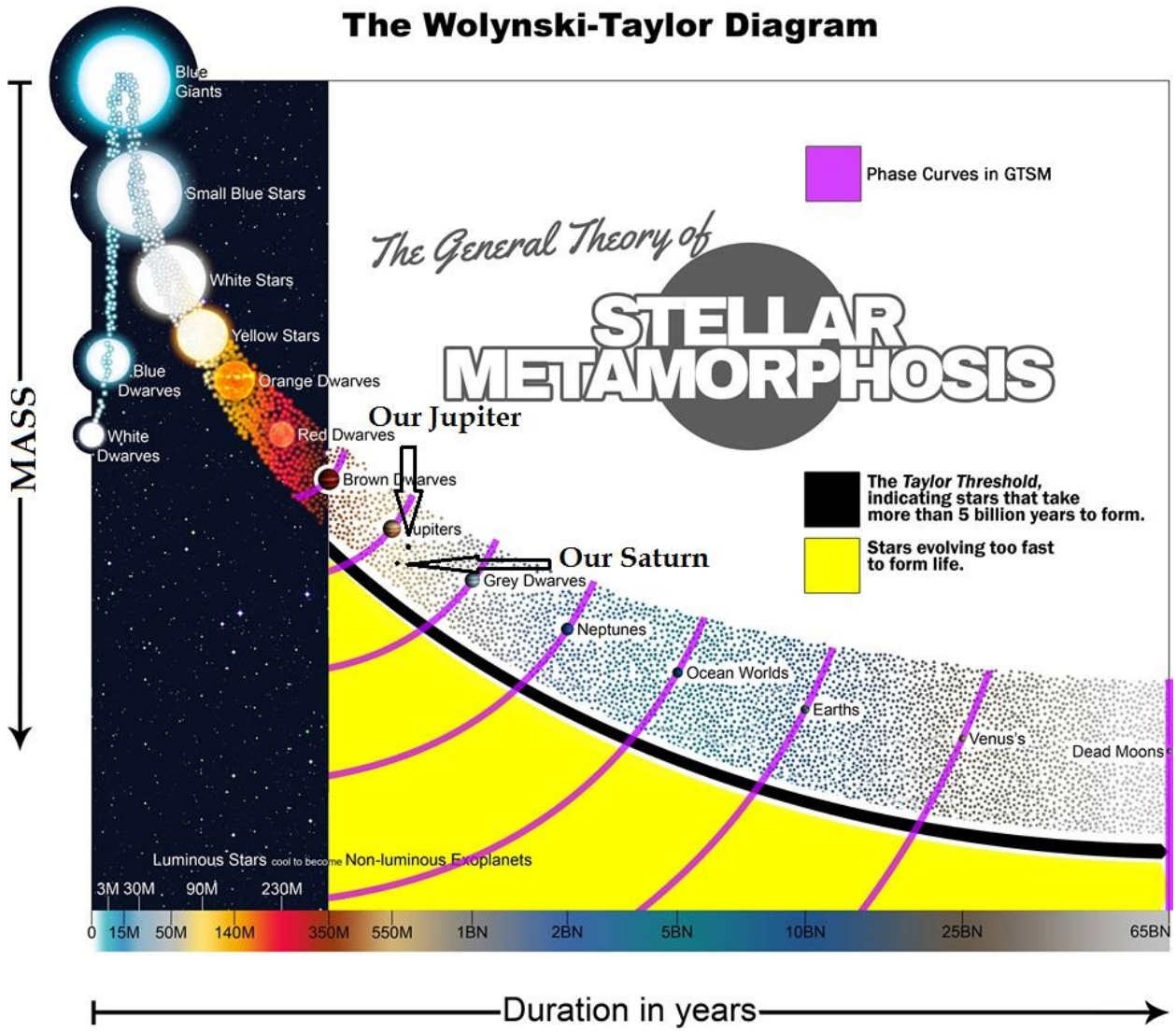
The quoted article abstract where they say their understanding of planetary formation and evolution is incomplete can be solved by realizing planet formation is its evolution. A planet evolves and forms simultaneously, not at separate times. This is outlined by the principle of planet evolution:

"A planet forms as it evolves."

Source: http://vixra.org/pdf/1607.0079v1.pdf

This law states quite clearly that a planet does not “form” and then evolve. The process of planet formation is its process of evolution. This releases the assumption of Earth forming “as is” and then remaining relatively unchanged, when in fact the opposite is true. As the Earth was evolving from a much hotter, bigger, more energetic state, it was forming. This is also true for Saturn and Jupiter, they are forming as they evolve. What you see now in telescopes when you see Jupiter and Saturn are not the final products, they are intermediate products as evidenced by their D/H ratios which are used to determine their ages. They are two independent snap shots of a much larger more time consuming process, which will result in Earth-like structures many more hundreds of millions of years into their futures.

Furthermore, it was suggested to the author of this paper to place the objects as being EA, or Earth Age, instead of billions. I suppose both can be mentioned. Saturn, without the plus/minus signs is .13 EA (Earth age), and Jupiter is .14-.16 EA. They both have a long way to go before they host life like Earth. They are not ready yet, they are way too young. As well, it is clear now. Saturn's D/H ratio diverges from the Jovian D/H ratio because it is younger, and has a different orbital past.


The Wolynski-Taylor Diagram
Blue Giants
Small Blue Stars
White Stars
Yellow Stars
Blue Dwarves
Orange Dwarves
White Dwarves
Red Dwarves
Brown Dwarves
Jupiters
Grey Dwarves
Neptunes
Ocean Worlds
Earths
Venus's
Dead Moons
Luminous Stars cool to become Non-luminous Exoplanets
3M 30M 90M 230M
0 15M 50M 140M 350M 550M 1BN 2BN 5BN 10BN 25BN 65BN
MASS
Duration in years
Phase Curves in GTSM
The General Theory of
STELLAR METAMORPHOSIS
Our Jupiter
Our Saturn
The Taylor Threshold, indicating stars that take more than 5 billion years to form.
Stars evolving too fast to form life.