

## Tidal Locking in Exoplanets (Old Stars)

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Abstract: Tidal locking is when a star only shows one face to another larger (more than likely younger) star. A few ideas are shared to elaborate this in light of the General Theory of Stellar Metamorphosis.

1. Only old systems can have tidally locked objects. The Earth/Moon system is billions of years old. Jupiter and its moons are hundreds of millions of years old as a system. The Sun has no tidally locked objects, meaning the evidence of the Sun star system being very young is stronger. If the Sun were 4.5 billion years old as is claimed by the dogma, then Mercury would be tidally locked. The question arises: How many orbits should an object have with a year of ~88 days around a star the mass of the Sun before we see tidal locking? Wouldn't 4.5 billion orbits around the Sun be enough time to tidally lock ALL the claimed tiny rocky bodies around it? But I made a mistake there! Mercury's year is ~88 days! We should have taken Earth's 4.5 billion years into account. Since the Earth has a year of 365 days, then  $365/88$  is 4.15. Take that and multiply it by 4.5 billion. Mercury therefore has made according to the dogmatists ~18.67 billion orbits around the Sun! So what the dogmatists are saying is that Mercury, roughly speaking, has made ~18 billion orbits around the Sun, yet that still isn't enough to tidally lock it! There is a simpler answer. The Sun is very young, coupled with the fact that Mercury is very, very old. Two things, Mercury hasn't been in orbit around the Sun for billions of years, and the Sun isn't billions of years old. Both realizations are self-consistent.
2. Only old objects, old systems, or objects that move down a faster transformation curve can get tidally locked. Gas giants like Jupiter are never going to be tidally locked until they age considerably or get torn apart by a hotter host and morph too quickly.
3. If astronomers actually find evidence for an Earth-sized object around a host star inside the habitable zone, and their host star is still young like the Sun, then the object can not have its axial angular momentum inferred. This is because stars like the Sun are young, therefore have not had enough time to tidally lock anything, unless that object is already dead and/or extremely close in. Tidal locking can only occur because either A. the Earth sized object is extremely old and its Williams' number is below ~4 (subject to revision, this is close to Venus' William's Number), B. the object orbits too close in, removing its location from the claimed external habitable zone of the host, C. The system is really old, which removes the young Sun-like star from the picture anyways.

This paper is subject to revision and clarification. For future reference, it is proposed that life hosting stars will have a William's number between ~1,000 and ~400, which is

~300 above and below Earth's William's number of ~706. All this means is that life hosting objects, in any system, can have their life hosting capabilities inferred by their axial angular momentum as an additional variable to increase accuracy of the results.

William's number paper here: <https://www.vixra.org/pdf/1909.0155v1.pdf>

In the future it should be noted that a system of determining the axial angular momentum of near Earth sized objects needs to take priority. Earth sized objects that only show one side (very low William's number) to their host star have had their surfaces eradicated of all life. The life that could exist inside of the concept of a "terminator line" or twilight zone, due to an Earth like object being tidally locked is likely to result in too extreme of an environment for any life to exist. The reasoning stands to actually get to that point of being tidally locked, the objects spin would slow down and slowly sterilize the entire surface, until eventually no life could spring up again anywhere on the surface.