## The Container Principle of Life Formation

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Abstract: A forth principle is added to explain where life begins and why.

In addition to the mobility, gravity and volume principles of life formation the forth principle is the container principle. If the gravitation is not strong enough on the object to hold onto newly forming molecules, then the life which forms would still need to be held back from escaping into interstellar space. A good example of this would be subsurface oceans on an object with a very weak gravitational field. There could be lots of water underneath the rocky/icey surface that could allow for mobility of the molecules. Though it is suggested that only very simple microbial life would occur on smaller objects, as there is not enough mobility or volume for life to evolve to the point it currently exists on stars such as Earth. A good rule of thumb for this principle is to consider how large of a single container the object is, given container means physical matter trapping material, or a significant gravitational field to do the same. With that in mind, we can project the amount of evolutionary processes that would have taken place. A random thought to consider would be to realize how large a food chain is. If you have life forming and evolving in a very small environment, then there is no upward pressure to look for bigger and/or more abundant food sources, so the life would stay small and survive indefinitely, only changing and morphing into different forms, never really evolving to more complex organisms. Placing an animal such as a whale shark inside of a small lake does not make sense, because there will not be enough food. Placing a few bacteria would be ideal as the bacteria would grow and adjust to the changing conditions of the lake indefinitely. So we could have really ancient bacteria that never really changes being found in subsurface lakes on other worlds, given they are smaller worlds than the Moon for instance. It is more reasonable to therefore look at rocky Earth type objects and realize the abundance and variety of life would be much higher, versus objects that are a lot smaller and can only sustain certain species. All this being said, future astro people will find ancient, small organisms on smaller evolved stars given all the other conditions are met appropriately, and large, evolved organisms will be found on larger evolved stars. A weird thought would be to consider that maybe there is a size threshold for stars concerning its ability to host really advanced life forms like humans. For instance, maybe it is a good thing Earth is so big or else any type of creature that would try to evolve on it would have killed itself long ago. A poor example would be to look at nuclear weapons. We set of literally hundreds of them around the world back in the 20<sup>th</sup> century, yet the danger of radioactivity is low currently. If we were to do the same on a much smaller object, the radioactivity would have been much more concentrated. A better example would be farming. We can farm huge portions of land which supports the continued growth of a giant population of humans, without that land, farming would not have got as far as it did. Therefore a smaller world would have inhibited growth, and a famine would have not only devastating effects, but could completely wipe out a civilization before they evolved to our current status. Or even plagues would have spread across the entire planet, the luxury of avoiding the epidemic of Ebola which plagued western Africa back in 2014 was a good example. The author is already aware of extraterrestrials, chances are most likely they came from stars around Earth size, as per the container principle, not asteroids.