

## ハビタブルトリニティ概念のエウロパへの適用 Application of Habitable Trinity concept to Europa

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Habitable Trinity is one of the most significant condition to bear life. Habitable Trinity is the environment where atmosphere, ocean, and landmass coexist under the driving force for material circulation between trinity components. Habitable Trinity condition is the minimum requirements to emerge life. Because life body is not made from only water component. Life needs constant supply of C, H, O, N and minor elements derived from landmass such as P, K, Fe etc to maintain the body. Therefore Habitable Trinity environment is the key for life.

This requirement can be applied to other planetary bodies in the Universe. Let's think about the case of Europa, the moon of planet Jupiter. Europa has a water-ice crust on its surface and thought to have water ocean beneath it. People who think the existence of liquid water enable life be emerged insist that there is life in Europa due to the existence of water ocean under the icy crust. Once we consider the conditions of Europa based on Habitable Trinity concept, the answer is given easily, which means there is no chance to bear life on Europa. Europa does not provide the environment to maintain coexistence of atmosphere, ocean, and landmass which is constantly circulated.