



Chayut Universe Wave Function

Paper A-21 : Life and Biological Emergence under CUWF
From Entropic Geometry to BMIR Living Closure

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Abstract

Not everything biological is alive, and not every organized structure is living. A DNA molecule, a protein, a membrane fragment, a crystal, a flame, a virus outside its host, and a dead cell may each possess structure, function, information, or dynamic activity, yet none of these alone is sufficient to constitute life. This paper develops the CUWF interpretation of life as an emergent entropic-geometric state rather than a material category, a biological label, or a simple consequence of increasing entropy. Within the Chayut Universe Wave Function (CUWF) framework, life arises when Entropic Geometry becomes organized into a self-maintaining closure composed of four mutually dependent functional conditions: Boundary, Metabolic Flow, Information Memory, and Feedback Regulation, here called the BMIR framework.

The central thesis of this paper is that one life corresponds to one integrated entropic-geometric system whose BMIR functions close into a self-maintaining living stability basin. Boundary defines the self-environment separation of the living basin. Metabolic Flow maintains the basin through regulated exchange of matter, energy, entropy, and coherence with the environment. Information Memory preserves the constraint patterns required for organization, repair, reproduction, and adaptation.

Feedback Regulation detects deviation and restores the system toward a viable stability basin. These four conditions are not life individually. Rather, they are four functional expressions of a single living Entropic Geometry. Life emerges only when they become mutually coupled into a self-maintaining closure.

This framework distinguishes biological material from living systems. DNA may contain information memory without autonomous metabolism or regulation. A membrane may provide boundary without living closure. A virus may possess information and partial boundary while depending on a host for metabolic flow and feedback regulation. A dead cell may retain biological structure while losing the closure that made it alive. In contrast, a living cell, organism, or integrated multicellular body qualifies as life when its nested structures participate in a unified BMIR closure. Thus, biology alone does not define life; living closure does.

The paper further clarifies the role of entropy. Life does not arise from entropy increase alone. It arises when entropic-geometric complexity becomes organized enough to sustain BMIR closure while exporting entropy to the environment. Living growth increases organized entropic-geometric complexity, whereas death increases disorganized thermodynamic entropy after BMIR closure collapses. Death is therefore not the disappearance of matter, but the irreversible breakdown of the living entropic-geometric organization that maintained the system as one life.

By linking physics, chemistry, biological material, living systems, and conscious systems through the BMIR framework, this paper positions life as a higher-order regime of CUWF Entropic Geometry. It proposes that the transition from non-life to life occurs not at the appearance of a single molecule, reaction, or structure, but at the closure threshold where boundary, flow, memory, and regulation become one self-maintaining living stability basin. The result is a unified CUWF account of biological emergence: life begins when Entropic Geometry becomes able to maintain itself.

Keywords

CUWF; Chayut Universe Wave Function; life; biological emergence; Entropic Geometry; BMIR; Boundary; Metabolic Flow; Information Memory; Feedback Regulation; living stability basin; biological

material; entropic closure; metabolism; biological information; homeostasis; entropy-gradient engine; organized entropic-geometric complexity; death; consciousness.

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