

Section 1. Introduction

The idea that the universe may undergo cyclic behavior has appeared repeatedly in cosmology, most often in the form of oscillatory models in which spacetime itself expands and contracts in recurring phases. Such models remain conceptually attractive because they offer an alternative to one-directional cosmological narratives and appear to provide a natural framework for large-scale recurrence. Yet they also face persistent theoretical and observational difficulties, including the absence of compelling evidence for global contraction and the problem of reconciling strict cyclic repetition with the cumulative growth of entropy and historical asymmetry.

The Cosmic Breathing framework developed in this paper adopts a different starting point. Rather than treating cyclicity as a metric oscillation of spacetime, it reconstructs cosmic recurrence as a relational and state-based process governed by accessibility, coherence, and collapse dynamics within the Chayut Universe Wave Function (CUWF) framework. The question is therefore shifted from whether the universe literally contracts and re-expands to how large-scale cosmic structure may pass through phases of coherence growth, saturation, boundary approach, and re-excitation without requiring a reversal of spatial expansion in the conventional sense.

Within this framework, Cosmic Breathing does not assert that the universe behaves like a harmonic oscillator. It does not describe a periodic mechanical rhythm imposed from outside, nor does it require a universal reset mechanism or a singular origin event that must be repeated in every cycle. Instead, it describes a structural sequence in which coherence builds, saturates, loses accessibility, approaches a near-stillness boundary, and is inevitably re-excited because latent field accessibility cannot remain macroscopically suppressed indefinitely.

This shift is conceptually important. It allows cosmological cyclicity to be formulated without committing to strict metric contraction, without treating entropy growth as fatal to recurrence, and without assuming that every return must be a repetition of the same universe in identity. Cosmic

Breathing, in the CUWF sense, is therefore not periodicity of content but recurrence of structural mode. What returns is not the same realized universe, but the same general breathing architecture of coherence emergence, saturation, collapse, and reorganization.

The purpose of this paper is to formulate that architecture in a way that is structurally explicit, mathematically docked to the CUWF framework, and observationally cautious. To do so, the paper distinguishes collapse from contraction, stillness from absence, and re-excitation from external restart. It further argues that the breathing cycle follows from the internal logic of accessibility and coherence under boundary conditions rather than from ad hoc cyclic postulates.

The sections that follow develop the conceptual and structural basis of Cosmic Breathing step by step. They begin with the foundational logic of coherence growth and saturation, move through the boundary behavior associated with near-stillness and loss of recordability, and culminate in the re-excitation phase through which the cycle continues without requiring singular reset or strict repetition. The overall claim is that cosmic cyclicity can be understood as a global solution mode of the CUWF framework—irreversible in identity, non-periodic in exact content, yet recurrent in structural form.