## 3. DEVELOPMENT OF A 7-DIMENSIONAL HYPOTHESIS

Here we formally present our 7-dimensional universe hypothesis as a modification of Einstein's General Relativity. We begin by outlining the conceptual basis for incorporating three additional dimensions: zero, infinity, and chance. Subsequently, we provide a rigorous mathematical derivation of the modified field equations that govern this higher-dimensional spacetime. To begin with we submit a definition.[1]

A dimension in this paper represents a foundational and fundamental element of the universe required for the evolution of the universe that frames our existence. Here we apply three tests. A true dimension arises only when absence becomes unstable, when the void demands form. (See Appendix 1, 2)

To qualify as a dimension under this framework, it must satisfy three emergence tests:

1. Necessity: Without it, the universe as we know it could not coherently exist.

2. Relational Emergence: A dimension must arise from an unresolved structural tension—it emerges not in isolation, but as the inevitable resolution (or recursion) of other dimensions interacting. It is not arbitrary. It is required.

3. Manifestation: It must encode itself geometrically in the fabric of mathematics and measurably in the physical world.

## 3.1 Emergence of Dimensions and the Foundations of Physical Law

The 7-dimensional universe (7dU) framework provides a causal explanation for how dimensions, physical laws, and matter emerge. Unlike traditional physics, which assumes spacetime as a fixed background, 7dU describes how the universe's dimensions, laws, and matter/energy originate, emerge, are conserved, reset and reinitiated through singularity events we currently know as the Big Bang.[1]

Because the 7dUniverse appears eternal and cyclical, we introduce 'AA' or Absolute Absence as a logical placeholder for what is beyond the limits of knowable information. (See Appendix 1) From this boundary state of true nothingness, the first dimensions emerge in a precise sequence. This generates the laws of physics, and the universe as we know it - as a probabilistically demanded consequences of nature. This being, the cosmic evolution of physics in our universe.

From the collapse of AA (Absolute Absence), zero and infinity arise. These are the first two primary dimensions. The interplay between these upper and lower limits, or boundaries, of the universe causes the first quantum fluctuations. This creates the emergent and dynamic dimension of chance, or quantum probability - This is where energy first manifests itself in a new, or proto-universe.[5], [13]

From AA, the first two dimensions emerge - giving birth to the third Primary Dimension of Chance ( $\xi$ ).

- Chance  $(\xi)$  is the first truly dynamic dimension, governing probability and creating the first energy fluctuations.
- This is where the laws of thermodynamics begin to emerge—energy becomes structured through statistical behavior. The standard model begins to emerge.
- Born from the Primary 'boundaries' dimensions of zero and infinity, chance manifest the first neutrinos, and sets up the existence of the three classical spatial dimensions. This sets in motion time, and the creation and behavior of matter itself.

This initial process defines the basis for all physical existence:

- Zero ( $\zeta$ ) prevents breakdown into singularities.
- Infinity ( $\omega$ ) ensures growth and expansion remain possible.
- Chance  $(\xi)$  provides the probabilistic nature of quantum energy and structure.

The Birth of Energy and the Spatial Dimensions

Once Chance ( $\xi$ ) introduces fluctuations, it produces the first unit of structured energy—proto-matter.

- The First Neutrino Appears  $\rightarrow$  The First Spatial Dimension Forms.
- That first neutrino emerges through the structural ratio of pi, as the first quantum point, marking the beginning of structured existence.
- This is the first measurable axis in space First spatial dimension.
- The first point arises through curvature, giving us pi, and the earliest notion of time.
- Two neutrinos form a distance, necessitating a second spatial dimension. the geometry around us begins to emerge.
- Time is not fundamental—it emerges from necessary relational interactions.
- A Third Neutrino Establishes the Third Spatial Dimension Geometry and more complex maths are born.
- This completes the 7dU framework, making complex particle interactions possible.

• Matter itself emerges as a consequence of this structured dimensional expansion.

Thus, from the emergence of Zero ( $\zeta$ ) and Infinity ( $\omega$ ), and through the probability field of Chance ( $\xi$ ), the universe acquires:

- Energy & Matter
- 3D Space & Time
- Math The fundamental laws of thermodynamics & particle interaction. The standard model, GR, and most of the widely accepted concepts in physics today.

Because these dimensions necessitate the laws of physics, the structure of the universe is not static but dynamically self-regulating. The 7dU framework predicts conservation, neutrino asymmetry, CP violation, quantum gravity, and thermodynamic evolution as direct mathematical consequences of dimensional interactions at cosmic rebirth.[5]

This leads to the next step: formalizing these consequences into explicit mathematical relationships. In the next section, we derive the necessary modifications to the Einstein field equations, conservation laws, and quantum formulations, proving that the 7dU framework is both physically consistent and testable.