Discovery of the Closed Point: A Formal Model of Dimensional Duality

Evert van Brummelen

May 2025

Abstract

We propose a foundational framework in which the Universe, emerging from Nothing, necessarily expresses duality at every dimensional level. Through a formal sequence of dimensional closure, we demonstrate that no isolated point can exist; every structure—beginning from the first emergence—divides into complementary inner and outer aspects. This principle resolves the origin of the dual positive/negative phenomenon, not as an arbitrary symmetry but as a necessary consequence of closure itself.

1 Introduction

Where does duality come from? Why does every structure in the Universe seem to split, mirror, or oppose itself—particle and antiparticle, charge and polarity, light and darkness?

This work began with a simple yet radical premise: *Nothing cannot exist.* That is, absolute Nothingness is not stable—it cannot remain. From this we assert:

1. Everything must exist.
2. Infinities cannot exist; therefore, Everything must be closed.

These two axioms form the backbone of a dimensional reasoning that leads to a powerful insight: that the act of *closure* at any dimension inherently generates *duality.* When a point is closed, it is no longer a singularity—it implies a boundary, and therefore an *inside* and an *outside.* We call this process the **Dimensional Closure Sequence**, and from it we derive the impossibility of a single isolated point and the inevitability of dual structure across all scales.

This paper presents that sequence, step by step, and its implication: that the dual nature of reality is not an artifact of physics, but a geometrical necessity of existence itself.

2 Foundations

2.1 Core Assumptions

We begin with three foundational premises:

- **Axiom 1 (Instability of Nothing):** Let N denote absolute Nothingness. Then,

$$\neg\text{Exist}(N) \Rightarrow \text{Emergence}(S)$$

- **Axiom 2 (Finitude and Closure):** All emergent structures are finite and closed.

$$\forall S_n, \quad \text{Closed}(S_n) \wedge \text{Finite}(S_n)$$

- **Axiom 3 (Dimensional Polarity):** The closure of a structure in dimension n implies an internal distinction in dimension $n+1$:

$$\text{Closure}(S_n) \Rightarrow S_{n+1}^{\text{inner}} + S_{n+1}^{\text{outer}}$$

2.2 Dimensional Closure Operator

Define a closure operator C such that for any structure S_n in dimension n:

$$C(S_n) = S_{n+1}^{\text{inner}} + S_{n+1}^{\text{outer}} = S_{n+1}^{\text{total}}$$

3 Dimensional Closure Sequence

3.1 Closure of Nothing $(-1D \to 0D)$

$$C(N) = P^{\text{inner}} + P^{\text{outer}} = P^{\text{total}}$$

3.2 Closure of the Point $(0D \to 1D)$

$$C(P^{\text{total}}) = L^{\text{inner}} + L^{\text{outer}} = L^{\text{total}}$$

3.3 Closure of the Line $(1D \to 2D)$

$$C(L^{\text{total}}) = A^{\text{inner}} + A^{\text{outer}} = A^{\text{total}}$$

3.4 Closure of the Area $(2D \to 3D)$

$$C(A^{\text{total}}) = V^{\text{inner}} + V^{\text{outer}} = V^{\text{total}}$$

3.5 Cycle Closure $(3D \to -1D)$

$$V^{\text{outer}} = N \quad \Rightarrow \quad C(V^{\text{total}}) = N$$

4 Illustrative Example: Circle on a Sphere

A circle on the surface of a sphere, divides that surface into two area's. Let the sphere represent a closed 2D area A^{total}, and the circle be the result of closure applied to a 0D point sequence:

$$C(P^{\text{total}}) = L^{\text{total}}$$

This line divides the surface into:

$$A^{\text{inner}} + A^{\text{outer}} = A^{\text{total}}$$

Every closed structure at dimension n partitions the next-higher structure at $n+1$ into dual regions. The circle on the sphere is a geometric echo of the universe's logic.

5 Implications

5.1 No Isolated Point Can Exist

$$C(N) = P^{\text{inner}} + P^{\text{outer}}$$

5.2 Inherent Duality in All Structure

$$C(S_n) = S_{n+1}^{\text{inner}} + S_{n+1}^{\text{outer}}$$

5.3 Polarity as a Dimensional Necessity

Dualities such as charge, spin, and Yin/Yang are geometric consequences of closure.

5.4 Finitude and Cosmological Boundaries

$$C(V^{\text{total}}) = N \quad \Rightarrow \quad \text{Universe is Finite and Returns to Source}$$

6 Conclusion

The principle of Dimensional Closure offers a first-principles explanation for the presence of duality, polarity, and finitude in the Universe. From the instability of Nothing, structure emerges—not arbitrarily, but necessarily, and with an intrinsic dual nature at every level of dimensional expression.

Each act of closure divides what was whole, generating a new level of reality that is always composed of two aspects: an inside and an outside, a self and a boundary.

At its highest closure, the system returns to its origin—completing a cycle that binds existence within limits. There is no escape to infinity, no absolute beginning, and no pure singularity. What exists is not singular—but closed, and thus always twofold.

I want to thank Hans and Vale for their infinite support. This work is entirely original and independently developed by the author.

References

1. Penrose, R. (2005). *The Road to Reality: A Complete Guide to the Laws of the Universe.* Jonathan Cape.

2. Wheeler, J. A. (1990). "Information, Physics, Quantum: The Search for Links." *Foundations of Quantum Mechanics.*

3. Kauffman, L. H. (2001). *Knots and Physics.* World Scientific.

4. Bohm, D. (1980). *Wholeness and the Implicate Order.* Routledge.