Dimensional Cycle Theory

Dimensional Cycle Theory: A Framework for Continuous Cosmogenesis via Stable Quantum Excitations

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Abstract

We propose a novel cosmological framework-Dimensional Cycle Theory-which postulates that energy continuously enters our 3D universe from a higher-dimensional field and is converted into mass via the Higgs mechanism. Departing from the classical notion of a singular Big Bang, this model suggests that cosmic expansion arises from ongoing dimensional energy inflows, producing localized bursts of structure formation-interpreted as miniature bang events.

At the heart of this theory lies the electron, interpreted as the first stable, negatively charged quantum excitation capable of anchoring dimensional energy within 3D spacetime. In contrast, other negatively charged particles (e.g., muons, taus, antiprotons) are shown to be unstable, reinforcing the notion of the electron as a unique dimensional resonance.

We introduce a differential mass-generation equation:
dM(t)/dt = E_dim(t) * phi_H(t)
where E_dim(t) denotes the time-varying energy flux from higher dimensions and phi_H(t) the Higgs field's interaction strength. This formulation is integrated into a modified Friedmann equation to model time-dependent expansion driven by both visible and dimensional energy components.

Simulations under varying conditions-energy spikes, Higgs suppression, and chaotic fluctuations-demonstrate plausible evolutionary mass curves consistent with observable star formation behavior. The theory predicts a multiverse architecture, where dimensional overflows may seed entirely new 3D universes.

Dimensional Cycle Theory provides a unified conceptual bridge between quantum stability, cosmic inflation, and multiverse logic, offering a testable alternative to LambdaCDM and dark energy models through measurable variations in expansion rates and mass emergence patterns.

Introduction

The prevailing cosmological model centers around a singular Big Bang as the origin of the universe, from which time, matter, and space emerged. While this model explains cosmic microwave background (CMB) anisotropies and redshift observations, it relies on the inclusion of a cosmological constant (Lambda) or dark energy to account for continued expansion.

In contrast, the Dimensional Cycle Theory (DCT) suggests that the universe is not a closed singular event but a dynamic system continuously pulling energy from an external, higher-dimensional source. This energy flows into our universe through mechanisms not yet fully described by Standard Model

physics, but can be conceptually anchored via the Higgs field, which enables energy-to-mass conversion.

Within this framework, mass is not a fixed initial quantity, but an emergent property resulting from stable quantum excitations. Among these, the electron stands uniquely as the only stable, negatively charged, elementary particle in nature. Its unchanging charge and mass across the cosmos imply that it is the first successful resonance of extra-dimensional energy within our 3D framework.

This paper aims to formalize this insight into a testable framework using foundational field equations, simulations, and modified cosmological models that integrate dimensional energy influx as a functional driver of matter formation and cosmic expansion.

Methods

We define the mass-generation rate as a function of two dynamic quantities:

- E_dim(t): The inflow of energy from a higher-dimensional field
- phi_H(t): The time-dependent interaction strength of the Higgs field

The resulting differential equation:

$dM(t)/dt = E_{dim}(t) * \phi_H(t)$

This describes how energy transitions into stable mass.

Cosmological Integration:

The mass-generation mechanism is incorporated into a modified Friedmann equation:

$H^2 = (8\pi G / 3) * [\rho_{visible} + E_{dim}(t)]$

where:

- H is the Hubble parameter,
- rho_visible is the energy density from standard matter and radiation,
- E_dim(t) is treated as an additional dynamic energy density component.

Numerical Simulations:

We simulated M(t) using Python's odeint under:

- Energy spikes (Gaussian bursts),
- Higgs suppression (phi_H dips),
- Chaotic fluctuations (Gaussian noise in E_dim)

Results

Simulations revealed:

- Sharp mass accumulation during energy spikes
- Temporary stagnation under Higgs suppression

- Progressive chaotic mass growth under dimensional bursts

These outcomes align with known patterns of star formation and support the idea of ongoing dimensional micro-bangs.

Discussion

The electron's exceptional stability among all negatively charged particles indicates its role as a true dimensional resonance. Other particles decay rapidly, suggesting failed excitations.

The time-varying energy-mass mechanism complements Einstein's field equations and reconceptualizes the Higgs field as a conversion interface. The multiverse potential is consistent with string landscape and inflationary bubble scenarios, but introduces a mechanism for cosmic propagation via dimensional energy spillover.

Conclusion

Dimensional Cycle Theory offers a testable, mathematically sound framework for continuous cosmogenesis. It synthesizes quantum field dynamics, mass creation, and universal expansion without reliance on dark energy. It invites re-evaluation of the Big Bang and suggests that multiverse emergence is a recursive and energetic inevitability.

References

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