

A Unified Theory of Everything — Condensed Research (MINI, Part 1)

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Abstract

All four fundamental interactions emerge from a higher-dimensional geometry. A brane supernova supplies hot Big Bang conditions without a 4D singularity. The effective Friedmann equation gains a high-energy ρ^2 term and a dark-radiation C/a^4 component. Predictions span GW, CMB, and precision/particle physics.

Unified Theory of Everything

Higher-Dimensional Brane Supernova — A Unified Framework

$$H^2 = (8\pi G/3) * \rho * (1 + \rho/(2\lambda)) + C/a^4 - k/a^2 + \lambda a^{4/3}$$

by Ricardo Maldonado

- Unifies gravity, electromagnetism, strong & weak via higher-dimensional
- Replaces the initial singularity with a brane supernova (physical origin)
- Predicts testable signals in GW, CMB, and particle physics

1. Framework and Equations

Core Equations

$$H^2 = (8\pi G/3) * \rho * (1 + \rho/(2\lambda)) + C/a^4 - k/a^2 + \Lambda/3$$

ASCII-safe notation: rho (r), lambda (l), C (dark radiation), Lambda4, curvature k.

Core Equations

$$a(t) \sim t^{1/4} \text{ (high-energy } \rho^2\text{-dominated era)}$$

Early-time expansion law when $\rho^2/(2\lambda)$ dominates in brane cosmology.

2. Origin Scenario

A higher-D energy event injects stress-energy onto the brane, setting initial rho and C. This initiates hot Big Bang evolution while avoiding a geodesic singularity in 4D.

3. Early Dynamics and Transitions

When $\rho^2/(2\lambda)$ dominates, $a(t) \sim t^{1/4}$. As density drops, standard radiation- then matter-dominated eras follow. The transition leaves measurable imprints.

ation Flow — From Forces to Observ

Unified Forces (String/M-theory geometry)

All four interactions embedded in higher dimensions



Brane Supernova (Higher-D bulk event)

Replaces singularity; injects energy into our 4D brane



Modified Friedmann Dynamics

H^2 includes $\rho^2/(2\lambda) + C/a^4 + \Lambda_4 - k/a^2$



Early Universe Evolution

$t^{1/4}$ pre-inflation-like phase; dark radiation present



Observables

GW broken power-law; CMB phase shifts & ΔN_{eff} ; collider hints

