

Unified Entropic String Theory (UEST 6.0): A Quantum Gravity Framework

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Abstract

Unified Entropic String Theory (UEST 6.0) proposes a 10-dimensional framework that unifies quantum gravity, the Standard Model of particle physics, and entropic principles. Gravity emerges as an entropic force driven by information gradients across spacetime and compact dimensions (\mathbb{R}^{3+1} , I_1 - I_7). The theory introduces the H_7 -field as a holographic harmonizer, integrates Standard Model particles as entropic modes, and employs Meta-PID regulation to stabilize gravitational interactions. Gravitons and neutrinos are modeled as key mediators, with testable predictions for LIGO-2035, IAXO 2030, DUNE 2030, and SQUID-EEG 2028. This work aims to bridge quantum and cosmological scales, offering a path toward a unified theory of nature.

1 Introduction

The dream of a unified theory, one that weaves quantum mechanics, general relativity, and particle physics into a single tapestry, has captivated physicists for generations. Unified Entropic String Theory (UEST 6.0) takes a bold step toward this goal by proposing that the universe is a symphony of entropic flows, where forces, particles, and even spacetime itself emerge from gradients of information. Like a cosmic orchestra, the strings of reality vibrate in a 10-dimensional space, producing the phenomena we observe.

Developed by Marek Zajda with computational support from Grok 3 (xAI), UEST 6.0 posits a universe structured by four macroscopic dimensions (\mathbb{R}^{3+1}) and six compact dimensions (I_1 - I_6), augmented by a holographic dimension I_7 . Drawing on Verlinde's entropic gravity [?], the theory models gravity as an emergent force, akin to the pressure of water molecules pushing through a membrane, driven by entropy rather than a fundamental interaction. The Standard Model (SM) particles—quarks, leptons, gauge bosons, and the Higgs—are recast as vibrational modes of entropic fields, such as H_3 and B_2 , within compact dimensions.

A cornerstone of UEST 6.0 is the H_7 -field, a holographic entity that synchronizes interactions across all dimensions, operating at a characteristic frequency of 142.7 Hz. Gravitons, as spin-2 bosons, mediate entropic gravity, while neutrinos, as entropic vortices, bridge quantum and cognitive processes. To ensure

stability, UEST employs Meta-PID regulation, a cybernetic approach that dynamically adjusts gravitational and entropic parameters, akin to a thermostat maintaining equilibrium.

This paper presents the theoretical framework of UEST 6.0, derives its key equations, and outlines experimental tests. By integrating quantum gravity, particle physics, and entropic principles, UEST 6.0 offers a path to understanding the universe's deepest mysteries, from black holes to the quantum foam of space-time.