Main Text

1. Introduction

The universal constants π and e are fundamental constants frequently appearing in nature and scientific theories. π typically represents stable relationships and spatial geometric properties, whereas e represents dynamic properties, natural exponential growth, and decay. These constants are not artificially defined; they inherently exist in the universe. This paper thus proposes that various combinations of π and e may imply complex structural relationships and intrinsic laws of matter at different scales.

2. Diverse Combinations of π and e

The core concept introduced by this paper lies in the various potential combinations between π and e, which could reflect intricate structural relationships and inherent properties of matter:

- π × e, π/e, e/π
- π^e, e^π
- π^(1/e), e^(1/π)
- log_e(π), log_π(e)
- √π, √e
- More complex arbitrary combinations, such as (π^e) × (e^π), (π/e)^e, etc.

The combinations listed here are not exhaustive but merely illustrate the limitless potential and flexibility of π and e combinations. Even intricate combinations such as (π^e)/(e^π) could be considered. This infinite flexibility in combinations could be the essential reason behind the remarkable diversity of matter within the universe.

3. Hypothesis on Combinational Patterns and Structural Relations

It is crucial to clarify that the exponent "n" in the combinations does not represent hierarchical scales (quantum, atomic, molecular). Instead, it indicates the complexity of structural relationships and spatial or energetic interactions of a single unit of matter with other units or itself. Specifically:

- $\pi^1 \times e^1$ represents the simplest interaction between one unit of matter and another.
- $\pi^2 \times e^2$ describes the relationship or spatial arrangement of one matter unit interacting with two others.
- $\pi^n \times e^n$ (where n is any positive integer or variable) indicates increasingly complex relationships and energy transfers between one unit and multiple units of matter.

Here, the exponent "n" does not correspond to hierarchical scales (quantum, atomic, molecular) but signifies the complexity of potential interactions, structural networks, or dimensional expansions. These combinations could be employed to investigate various structural aspects of matter, such as:

- Bonding patterns and energy transfer rules at the atomic level.

- Complex interactions between molecules.
- Fundamental mechanisms of interactions among particles at quantum scales.

4. Philosophical and Mathematical Significance for the Structure of the Universe

On a higher philosophical level, π and e could symbolize two fundamental philosophical properties of the universe:

- π can represent "memory" or "structure," reflecting stable, definite geometric relationships in space.
- e can represent "change" or "disappearance," reflecting the essential nature of dynamic expansion, convergence, and decay.

Therefore, combinations of these two universal constants represent not only mathematical innovation but potentially an entry point to understanding deeper philosophical aspects of existence and disappearance, stability and variability in the universe.

5. Potential for Future Research

This paper does not propose a specific formula or model directly; rather, it suggests a conceptual framework for future explorations, hoping future research can:

- Utilize artificial intelligence and large-scale computation to explore more potential π and e combinations, and analyze their physical implications.
- Reveal and explain previously unrecognized physical phenomena and structural relationships in matter through detailed analysis of these combinations.
- Stimulate the development of new mathematical tools and theoretical frameworks to analyze complex interactive relationships in the universe.

6. Conclusion

The diverse combination theory of universal constants π and e offers a fresh perspective to understand structural relationships within the universe and matter from a deeper philosophical and mathematical standpoint. The ideas presented here aim to inspire the scientific community to reassess these natural constants from a novel perspective, unlocking new possibilities for exploring profound principles of the universe and matter.