A New Quantum Theory of Everything: Reshaping Space-Time, Gravity, and Fundamental Interactions

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Abstract

This paper presents a novel theory in quantum physics that explains the creation of space and time at **sub-quantum** scales(In this theory, the term **sub-quantum** refers to scales significantly smaller than the Planck length, where the fundamental oscillations of the Zurvan particle occur, and where the conventional rules of quantum mechanics may no longer apply). The theory addresses fundamental mysteries in quantum mechanics, providing a comprehensive explanation of the origin and mechanism of the Big Bang, and revealing the internal structure of black hole singularities. Additionally, it rejects the existence of dark matter and dark energy, while explaining the nature and mechanism of gravitational force and proving the unification of fundamental forces. The theory also defines the structure of light and electromagnetic waves, and challenges the Heisenberg Uncertainty Principle by offering a detailed explanation at scales far below the quantum level, ultimately refuting it. Furthermore, it rejects the existence of several accepted fundamental particles, including the Higgs boson, photons, and gluons. This theory proposes a unified framework that revisits foundational concepts of modern physics, offering new insights into the structure of the .universe

Introduction

Since its inception, quantum physics has been instrumental in explaining a wide range of natural phenomena and answering fundamental questions about the structure of matter and the forces that govern it. However, several unresolved problems remain beyond the reach of current theories. Notable among these are the origin of the Big Bang, the internal structure of black hole singularities, and the existence of dark matter and dark energy—phenomena that modern physics has yet to fully explain. Furthermore, despite extensive efforts to unify the .four fundamental forces, a fully consistent theory of quantum gravity remains elusive

A key challenge within quantum mechanics is the **Heisenberg Uncertainty Principle**, which asserts that certain pairs of physical properties—such as position and momentum—cannot be simultaneously measured with arbitrary precision. While this principle has been foundational to our understanding of the quantum realm, its limitations at **sub-quantum scales** raise critical questions about the true nature of particles and spacetime at these .scales

This paper proposes a novel theory that extends beyond the quantum framework to examine the fabric of spacetime at sub-quantum levels. The theory provides new insights into the mechanisms behind the Big Bang and black hole singularities, while also challenging the need for dark matter and dark energy by offering alternative explanations for gravitational phenomena. Furthermore, the theory addresses the limitations of the Uncertainty Principle at extremely small scales and offers a new interpretation that refutes its validity in these .regimes

In addition, the theory redefines the structure of light and electromagnetic waves and questions the existence of several accepted fundamental particles, including the **Higgs boson**, **photons**, and **gluons**. By presenting a unified framework, this paper aims to reevaluate key assumptions of modern physics and offer testable predictions for future .research

Background and Review of Current Theories

Quantum physics and general relativity are the two foundational pillars of modern physics, each explaining different aspects of the universe at different scales. **General relativity**, introduced by Einstein, successfully describes gravitational phenomena on large scales, such as black holes and galaxies, through the curvature of spacetime. This theory shows that mass and energy warp spacetime, and this curvature is experienced as gravitational force. However, general relativity fails to describe the behavior of matter and energy at .quantum scales, where gravity becomes relevant at extremely small distances

On the other hand, **quantum mechanics** is used to describe the behavior of particles at small scales, such as electrons and photons. This framework relies on principles such as the **Heisenberg Uncertainty Principle** and **Schrödinger's wave mechanics**, which emphasize the probabilistic nature of physical properties. One of the major challenges of quantum mechanics is its inability to incorporate gravitational interactions at scales smaller than the Planck length. The search for a unified theory that combines quantum mechanics with .general relativity into a single framework, known as **quantum gravity**, remains incomplete

One prominent attempt to achieve such unification is **string theory**, which posits that the fundamental constituents of the universe are not point particles but vibrating strings. String theory aims to unify all the fundamental forces of nature, including gravity, within a single theoretical framework. However, despite its mathematical elegance, string theory has yet to .produce conclusive experimental evidence and remains unverified in many respects

Meanwhile, the **Standard Model of particle physics** has successfully described three of the fundamental forces—electromagnetic, strong nuclear, and weak nuclear—alongside the discovery of various elementary particles such as the **Higgs boson**, **photons**, and **gluons**. Nonetheless, one of the critical limitations of the Standard Model is its inability to fully explain .gravity and the nature of dark matter and dark energy

Dark matter and **dark energy**, which constitute the majority of the universe's mass-energy content, remain among the biggest mysteries in physics. The gravitational effects attributed to these entities do not correspond to any known particles in the Standard Model.

Additionally, **black hole singularities**, which are regions of spacetime with infinite density, .continue to present significant challenges to both general relativity and quantum mechanics

Furthermore, the **Heisenberg Uncertainty Principle**, a cornerstone of quantum mechanics, asserts that certain pairs of physical properties—such as position and momentum—cannot be simultaneously measured with arbitrary precision. This principle has been one of the key reasons for the limitations of current theories in explaining the structure of spacetime at sub-quantum scales. Attempts to question or revise this principle have not been fully .successful due to the difficulty of accessing such extremely small scales

Despite the impressive advances made by modern physics, significant gaps remain in our understanding of the universe. Current theories continue to struggle with providing a unified explanation for gravity at quantum scales, the precise structure of spacetime, and the nature of particles and forces at sub-quantum levels. This paper aims to address these gaps by presenting a novel theory that offers a unified framework for the fundamental forces and .explains the underlying structure of space and time

Theoretical Framework

This paper introduces a novel theory, proposing that the entire universe is shaped by the oscillations of a single particle, called **Zurvan**. Unlike conventional theories, which posit that the universe is composed of numerous particles or strings, this theory suggests that there is only one **Zurvan particle**, which continuously oscillates, creating **space**, **time**, and the .fundamental structures of the physical world in each moment

The name **Zurvan** is derived from **Iranian mythology**, where Zurvan is known as the deity who is the creator of both time and space. This naming reflects the role of this particle in the creation of space, time, and the fundamental structures of the universe (Source: "Zurvan .(زروان_(ایزد)/(Deity)." Wikipedia. https://fa.wikipedia.org/wiki

1. Concept of Zurvan Time and the Creation of Space-Time

In this theory, **Zurvan Time (ZT)** is defined as a time unit much smaller than **Planck Time**. This time is derived from dividing Planck Time by the total number of strings in the universe within a single Planck Time. Therefore, Zurvan Time is significantly smaller than Planck Time .and serves as the fundamental unit for the oscillations of the **Zurvan particle**

Each oscillation of Zurvan in **Zurvan Time (ZT)** generates the **space** and **time** of a specific point in the universe. Zurvan moves from point to point with each oscillation, creating new space and time at each location. Over the course of a **single Planck Time**, the Zurvan particle oscillates across the entire universe, establishing the space and time of every point within that time frame. These oscillations occur on an extremely small timescale and at an .extremely high frequency, continuously constructing the universe

2. The Single Zurvan Particle and the Process of Creating the Universe

According to this theory, only **one Zurvan particle** exists in the entire universe, responsible for creating **space, time, and mass** throughout the cosmos. Unlike theories that propose the existence of numerous particles or strings, this theory emphasizes that Zurvan is in constant oscillation, and with each oscillation, it produces space, time, and mass across all points in .the universe at every moment

During a single **Planck Time**, Zurvan oscillates throughout the universe, establishing the space, time, and mass for the entire cosmos during that specific period. However, the number of Zurvan's oscillations in a very short interval, **Zurvan Time (ZT)**, is so immense that it is beyond our ability to perceive them directly. **Measurement tools** are incapable of detecting these extremely fast oscillations at such small scales and can only observe the .cumulative result of these continuous oscillations over larger time intervals

In other words, the physical phenomena we observe in the universe are the result of countless rapid oscillations of Zurvan. These oscillations occur at such high speed and frequency that we can only perceive their combined effects in larger timescales, as individual .oscillations are beyond our sensory and technological limits

3. Formation of Physical Structures

Each oscillation of Zurvan in **Zurvan Time (ZT)** creates space, time, and mass for a specific point in the universe. With the repetition of these oscillations during a **Planck Time**, all strings and fundamental particles are formed within that time frame. This process occurs continuously with an immense number of oscillations, which we are unable to detect directly .due to limitations in both understanding and measurement technology

Explanation of the Big Bang in the Zurvan Oscillation Framework:

1. Conventional Explanation of the Big Bang:

In conventional theories, the **Big Bang** is defined as the moment of the universe's beginning, in which the universe started to expand from a highly dense and extremely hot singularity. According to this model, all the energy and matter in the universe were concentrated in a point of infinite density. Then, through the Big Bang event, this energy and matter rapidly spread into space, initiating the expansion of the universe. However, questions remain regarding how this singularity formed and what triggered the expansion.

2. The Zurvan Theory's Perspective on the Big Bang:

In the framework of Zurvan theory, the **Big Bang** is not interpreted as a massive explosion but rather as the result of **Zurvan’s oscillations** at the universe’s initial moment. According to this theory, the universe was shaped by these oscillations from the beginning, continuously creating space, time, and matter at every instant. Therefore, in the Zurvan model, the traditional singularity does not exist. What we observe as the "Big Bang" is actually the result of the first oscillations of Zurvan, which shaped space, time, and the universe's earliest fundamental components at extremely small scales, from where expansion commenced.

3. Replacing the Singularity with Zurvan Oscillations:

Zurvan theory posits that instead of an infinitely dense point, the universe began from an initial oscillation. In this scenario, the first oscillation of Zurvan in the early **Planck time** generated the first units of space and time. This process continues gradually, with Zurvan's oscillations steadily expanding space and time across the entire universe.

Thus, the Big Bang in this model represents the initiation of **Zurvan's oscillations** on a universal scale, where each oscillation forms a portion of space and time, driving the continuous expansion of the universe through subsequent Planck times.

4. Connection to the Universe's Expansion:

The expansion of the universe is also explained in this theory as a consequence of Zurvan's continuous oscillations over time. With each oscillation, Zurvan generates new space and time, which in turn causes the universe to expand over time. In this model, the universe's expansion is the ongoing process of **Zurvan's oscillation**, where new portions of space and time are created in each instant on a cosmic scale.

5. Post-Big Bang Process Explanation:

After the initial oscillations of Zurvan, which led to the formation of the first components of the universe, the oscillatory process continues. With each oscillation, the universe expands further, and more particles are formed. Therefore, in the Zurvan theory, the Big Bang is not seen as a single, unique moment but rather as a continuous process of oscillations that gradually expands the universe and forms physical structures over time.

6. Implications of This Theory for the Big Bang Interpretation:

- This theory replaces the concept of an infinitely dense singularity found in conventional models with a continuous oscillatory process that gradually creates space, time, and matter.
- In this theory, the Big Bang represents the **beginning of Zurvan's oscillations**, and the universe's expansion results from these continuous oscillations.
- This model addresses problems such as the "singularity problem" and questions related to the **initial conditions of the Big Bang**, offering an alternative interpretation.

Singularity of Black Holes in the Zurvan Theory Framework

1. Classical Definition of Black Hole Singularity:

In conventional theories, such as **General Relativity**, a singularity is defined as a point at the center of a black hole where the **mass density** and **curvature of space-time** reach infinity, while the volume approaches zero. At this point, the laws of physics, including the equations of General Relativity, no longer hold, and a new theory is required to accurately describe the behavior of space-time under such extreme conditions.

Near the **event horizon** of a black hole, time for an external observer appears to slow down progressively, eventually stopping completely at the **singularity**. Additionally, the density of matter approaches infinity, as the mass is compressed into an extremely small volume.

2. Interpretation of Black Hole Singularity Based on Zurvan Theory:

According to the Zurvan Theory, the **oscillations of the Zurvan particle** are the primary source of the creation of time, space, and matter. Each oscillation of Zurvan creates an extremely small unit of time (ZT) and space at every point in the fabric of space-time. If the oscillations of Zurvan stop, the result is the absence of time, space, and matter. Therefore, in the framework of this theory, a **black hole singularity** represents a point where the oscillations of Zurvan have either stopped or slowed down so much that space, time, and matter no longer exist.

a. Time and the Cessation of Oscillations:

In the Zurvan Theory, **time** is defined as the direct result of the oscillations of the Zurvan particle. Each oscillation of Zurvan generates a small unit of time within the fabric of space-time. Near the black hole singularity, as predicted by General Relativity, time for an external observer slows down progressively and finally **stops** at the singularity.

According to Zurvan Theory, this **stopping of time** implies that the **oscillations of the Zurvan particle also cease** at the singularity. Without Zurvan's oscillations, not only does time collapse to zero, but space and location also cannot exist. As a result, no processes occur at the singularity because **time and space reduce to zero due to the absence of Zurvan's oscillations**.

b. Space and Matter in the Singularity:

In Zurvan Theory, space is also a result of the oscillations of the Zurvan particle. Therefore, when time stops due to the cessation of oscillations, space also ceases to exist, and at the singularity, there is **no space for matter or forces to exist**. This explains why classical physics breaks down near the singularity: **there is no space for any physical processes to take place**.

Additionally, since matter itself is directly dependent on Zurvan's oscillations, in a region where these oscillations stop, **matter ceases to exist** as well. Hence, the singularity is described as a point where **time, space, and matter all collapse**.

c. Compression of Oscillations and Extreme Density:

Unlike the classical interpretation, where mass density and space-time curvature approach infinity, the Zurvan Theory explains the singularity as a point where **Zurvan's oscillations become highly compressed or come to a halt**. As the singularity is approached, the oscillations become so tightly compressed that **the intensity of these oscillations increases to a point where conventional physical laws no longer apply**.

In other words, rather than the mass density approaching infinity, we can state that the **compression of Zurvan's oscillations reaches a critical maximum**, after which the oscillations either temporarily or permanently cease.

3. Conclusion and Role of the Singularity in Zurvan Theory:

According to Zurvan Theory:

- **Black hole singularities are points where Zurvan's oscillations stop.** As a result, time, space, and matter collapse to zero, leaving a completely empty state devoid of any physical characteristics.
- In this state, the **laws of classical physics** cease to function, as there are no processes left to be described by these laws.
- **Space-time curvature** is explained as the result of the extreme compression of Zurvan's oscillations, which approach a point of complete cessation rather than approaching infinity.

This interpretation allows us to describe **black hole singularities** as natural phenomena without the need for infinite quantities (such as infinite density or curvature). This model may also help us better understand the physical processes at critical regions such as black holes.

Conclusion:

The **Zurvan Theory** offers a novel interpretation of black hole singularities, in which the oscillations of the Zurvan particle play a central role in the creation of **space, time, and matter**. At the point of singularity, the cessation of Zurvan's oscillations leads to the **collapse of space, time, and matter**, which explains why classical physical laws break down at such points. This model can serve as an alternative to conventional interpretations that rely on **infinite values**, providing a more comprehensive and finite explanation for singularities.

Unification of Forces

Objective:

To explain the unification of **gravitational**, **electromagnetic**, **strong nuclear**, and **weak nuclear** forces through the oscillations of **Zurvan**.

1. Fundamental Forces in Modern Physics:

In modern physics, there are four fundamental forces: **gravity, electromagnetism, strong nuclear force**, and **weak nuclear force**. These forces act separately, but attempts to **unify these forces** have faced significant challenges. Current theories are unable to explain and connect these forces at different scales, which remains one of the key unresolved problems in **theoretical physics**.

2. The Role of Zurvan Oscillations in Generating Forces

To explain the **unification of forces** within the **Zurvan theory** framework and to examine the role of the **Zurvan particle** in generating and linking the fundamental forces of physics, we must first take a closer look at the **origin of Zurvan's oscillations** and how these oscillations influence the production of various forces.

According to this theory, **all fundamental forces of nature**, including **gravity**, **weak and strong nuclear forces**, and **electromagnetism**, arise from a single fundamental process: **the oscillations of the Zurvan particle** and its **movement through space-time**. These oscillations, which continuously occur at different points across space-time, create the **fundamental units of space, time, and matter**, directly affecting the emergence and differentiation of forces.

3. Gravity as a Gravitational Force

In the framework of **Zurvan Theory**, gravity arises from the continuous **oscillations** of the **Zurvan particle** across different points in space. The Zurvan particle constantly moves between all points in **space-time**, and with its oscillations, it generates **space** and **time** at each point. As Zurvan moves between two points, this movement creates a tendency for those points to be drawn toward each other, which manifests as the **gravitational force** on larger scales.

The gravitational force depends on the **distance between two masses** and the **mass of the objects** involved. In Zurvan Theory, the oscillations of the Zurvan particle between these points, and its continuous movement through space, create an **attractive tendency** between the points. As Zurvan moves from one point to another, continuously generating space and time between two masses, this process induces a **convergence tendency** between those points, which we perceive as **gravity**.

4. The Reason for the Variation in Force Strengths:

In the framework of **Zurvan Theory**, the differences in the strength of forces (such as **weak**, **strong**, **gravitational**, and **electromagnetic** forces) are determined by the **distance between two masses or particles** and the **Zurvan oscillations occurring between them**. Since Zurvan oscillations between particles at different distances occur with varying intensities, the strength of the forces also changes significantly.

- **Strong Nuclear Force**: At **extremely small distances**, such as within the nucleus of an atom, Zurvan oscillations between **quarks** (the components of protons and neutrons) occur. These oscillations are extremely intense and continuous at very small distances. As a result, the **strong nuclear force** is very powerful on subatomic scales. These rapid and highly concentrated Zurvan oscillations result in a **very strong force** between quarks.
- **Weak Nuclear Force**: The **weak nuclear force**, which occurs during **nuclear decay**, also results from **Zurvan oscillations**, but these oscillations happen at **lower energy levels** and **greater distances** compared to the strong nuclear force. Therefore, this force is weaker than the strong nuclear force, though it is still driven by Zurvan oscillations between subatomic particles.

- **Electromagnetic Force**: This force, which acts between **charged particles**, is also the result of **Zurvan oscillations** between **charged particles**. The strength of this force depends on the **distance between the two charged particles**. At intermediate distances (such as between atoms), Zurvan oscillations generate the **electromagnetic force**, which is stronger than gravity but weaker than the strong nuclear force, depending on the **electric charge** of the particles.
- **Gravitational Force**: At **very large distances**, such as between celestial bodies (for example, between planets), Zurvan oscillations occur more **slowly** and **with less intensity** due to the great distance. This causes the **gravitational force** to appear much **weaker** compared to other forces. Nevertheless, it is still the result of the same process of Zurvan's oscillations.

5. The Variation in Forces:

The differences between the fundamental forces are solely dependent on the **intensity of Zurvan's oscillations** and the **distance between two points**. At **smaller scales** (for example, between quarks), the number of Zurvan oscillations is high, and these oscillations result in **stronger forces** such as the **strong nuclear force**. At **larger scales** (for example, between planets), the number of oscillations is fewer and more dispersed, and the **gravitational force** appears as the **weakest** force.

6. Unification of Forces in Zurvan Theory:

In **Zurvan Theory**, the unification of forces means that:

- All fundamental forces (**gravity**, **strong nuclear**, **weak nuclear**, and **electromagnetic forces**) originate from a single **fundamental process**: the **oscillations of Zurvan** between points in **space-time**.
- The differences in the **strength** and **type** of these forces depend on the **intensity** and **frequency** of Zurvan's oscillations, as well as the **distance between particles or objects**.

Thus, all the forces present in nature can be reduced to a **unified theory**, which is the **oscillations of Zurvan**.

Heisenberg's Uncertainty Principle

Objective:

To challenge **Heisenberg's Uncertainty Principle** in the framework of **Zurvan Theory** and explain how the determination of particle position and time becomes more precise in this theory.

1. Heisenberg's Uncertainty Principle in Quantum Mechanics:

Heisenberg's Uncertainty Principle is one of the fundamental principles of quantum mechanics, stating that the **simultaneous precision** in measuring the **position and momentum** (or **time and energy**) of elementary particles is inherently limited. According to this principle, the more precisely one of these quantities is measured, the less precise the measurement of the other will be. The relationship is expressed as:

$$\Delta x \cdot \Delta p \geq \hbar / 2$$

where:

- Δx is the uncertainty in the particle's position,
- Δp is the uncertainty in the particle's momentum, and
- $\hbar$ is the reduced Planck constant.

This principle shows that at **quantum scales**, it is never possible to precisely measure both the position and momentum of a particle at the same time, which poses a significant limitation for classical physics.

2. Interpretation of Heisenberg's Uncertainty Principle in Zurvan Theory:

Zurvan Theory challenges this principle, arguing that such limitations only apply at quantum scales based on current quantum mechanical concepts. In this theory, **Zurvan's oscillations** operate at **sub-quantum scales**, where the Uncertainty Principle no longer holds.

In **Zurvan Theory**, the **Zurvan particle** oscillates at every moment, simultaneously creating **space and time** for different points in space-time. Since these oscillations occur at extremely small, sub-quantum scales, Zurvan Theory asserts that the **precision of determining the position and time of particles** can exceed the limits imposed by quantum mechanics.

3. More Precise Formulation of Position and Time in Zurvan Theory:

In the framework of Zurvan Theory, these oscillations occur in a regular and precise manner across different points in space-time. Each oscillation of Zurvan creates a distinct unit of time and space at that specific point, meaning that if **Zurvan's oscillations are fully understood**, the **exact position and time** of particles can be determined without the limitations set by Heisenberg's Uncertainty Principle.

In other words, in Zurvan Theory, the quantum limitations described by Heisenberg's Uncertainty Principle no longer apply at sub-quantum scales, and due to the **regular and precise nature of Zurvan's oscillations**, **infinite precision** in measuring the position and time of particles can be achieved.

4. Rejection of Uncertainty and Replacement with Zurvan's Oscillations:

Since the **Zurvan particle** determines the position and time with every oscillation, the Uncertainty Principle is rejected within this framework. Instead, Zurvan Theory suggests that if the position and phase of **Zurvan's oscillations** at each moment are known, the **position and time** of particles can be determined with **extreme precision**.

This concept extends beyond current quantum mechanical theories and introduces a new approach to **precisely determining the position and time of particles**, where the **Uncertainty Principle** no longer poses a limitation.

Conclusion and Future Directions

In this article, the **Zurvan Theory** has been presented as a novel framework to explain major phenomena in physics. This theory successfully demonstrates how the **oscillations of a single Zurvan particle** can not only explain the creation of **space, time, and mass**, but also provide insights into **fundamental forces** and phenomena such as the **Big Bang** and **black hole singularities**. Specifically, by redefining the concept of **sub-quantum oscillations**, this theory addresses many of the unresolved questions in modern physics.

Some of the key accomplishments of the Zurvan Theory include:

1. Explaining **black hole singularities** and the collapse of space and time through Zurvan oscillations.
2. Redefining the **Big Bang**, not as a massive explosion, but as the result of Zurvan's initial oscillations.
3. Unifying all **fundamental forces** through Zurvan's oscillations, where the differences in force strength depend on the **frequency and distance** of the oscillations.
4. Challenging the **Heisenberg Uncertainty Principle** and offering an approach to achieve greater accuracy in determining the **position and time** of particles.

The Zurvan Theory not only explains these significant phenomena but also holds potential for further insights. This theory could provide a comprehensive explanation for **light and electromagnetic waves**, offer new perspectives on **dark energy and dark matter**, and shed light on **electric charges and electric fields**.

In the future, I will further explore these phenomena in separate publications based on the **Zurvan Theory**. As a robust framework for addressing many of the open questions in physics, I invite **scientists and physicists** to critically examine this theory and reconsider their perspectives on physical phenomena in light of its potential.

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