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The Spiral Aspects of Multiverse Formation: Continuous Big Bang and Everyverse Connection

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Abstract: ***The Spiral Multiverse Theory suggests a continuous, spiral pattern universe from the same singularity connected by a common point as everyverse, challenging the conventional Big Bang theory. Every universe starts with a bang. An interdimensional quasar serves as the portal connecting all of the universes to everyverse. Individual universes are connected, but they are observably stable. The theory offers a fresh viewpoint on cosmic evolution and a possible path for practical research by presenting the idea of interdimensional quasars as portals for multiverse travel. The research explores the unique characteristics of the multi-bang process. The study suggests that each universe undergoes its own inflation without observable changes in the cosmic microwave background.***
Keywords: Everyverse, Interdimensional Quasar, Multi Bang, Spiral Multiverse.

I. INTRODUCTION

Our understanding of the universe's origin has been shaped by scientists, which is based on the idea of a singular, explosive origin known as the Big Bang. The proposition suggests the possibility of multiverse formation in the structure of bubble universes. Assuming each universe originates from a singularity, it implies the existence of pre-existing space with distinct singularities for each universe. This challenges the theory of cosmic nothingness.

The proposed theory proclaims a continuous, repeating pattern of spiral-shaped blasts from a singular point, rejecting the concept of a one-time explosive event in this case. Unlike the disconnected bubble universe, the theory proposes a connection among all universes at the point of singularity blast, forming a network. The multiverse expands in a spiral shape, with the width and length of the arms expanding as the universe expands. The point where all universes connect is labelled as “Everyverse”.

II. EXISTING LITERATURE

Many existing theories which aim to prove the existence of the multiverse have been discussed and studied for our research work. The theories are:

1) *Brane Multiverse:* According to this theory, the universe is made up of multiple membranes stacked on top of one another to create a larger multiverse. All the membranes have the ability to interact with the membrane universes next to them, which can result in a big bang if two membrane universes collide violently. A new universe may arise as a result of this violent destruction of existing universes.
2) *Quilted Universe:* The universe is infinite, everything that happens in such a vast area of space will inevitably happen an infinite number of times. According to this theory, one can only see a portion of it because of the limit of light, beyond which are all possible outcomes and possibilities.
3) *Simulation Universe:* This theory claims that everyone does not actually live in the real physical world, but rather in a simulation. A machine that is capable of performing these computations simulates all the laws and events. This explains why the physical constants and laws of physics are as they are.
4) *Ultimate Multiverse hypothesis:* This theory suggests that every possible universe variation exists, each with its own unique set of the known laws of physics. The hypothesis takes into account every scenario that could occur and every possible formulation of the laws of physics.
5) *Quantum Universe Hypothesis:* This theory explains why there are multiple universes since there are an endless number of alternative outcomes. This means that every time an event happens, all of its other possible outcomes also occur concurrently since a new universe is created for every scenario that might possibly occur. This results from the fact that quantum states are superposed, meaning that every possibility exists at once.

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Let see components of existing model in the tabular form.

Table 1. Factors of existing multiverse model

Multiverse Type	Number of Dimensions	Number of Universe	Different Initial Condition	Different Constant	Different Laws	Explains Fine Tuning
Brane	10	∞	Yes	Yes	No	Yes
Quilted	3	∞	Yes	No	No	Yes
Simulation	3	Many	Yes	Yes	Yes	Yes
Ultimate	Many	∞	n/a	Yes	Yes	Yes
Quantum	∞	<∞	No	No	No	No

III. THEORETICAL FRAMEWORK

Before 13.8 billion years, there was nothing. No space and time. Just vacuum, which is not truly empty. This vacuum experienced fluctuations. Those fluctuations involved the temporary creation of virtual particles and antiparticles. The virtual particle fluctuation reached a critical point in a vacuum that led to an energetic surge. An extremely dense and hot state with zero volume is called Singularity.



Figure 1. Spiral Multiverse

The singularity didn't explode or expand its complete dense state at first expansion. It underwent a continuous expansion that is multiple big bangs (multi bang) forming space and time at the speed of light. This expansion was also spinning. Each spinning expansion formed a spiral pattern. Each expansion underwent its own inflation to form spiral-shaped universes. Each resulted in the same or different set of physical laws or constants. The universe was full of unattached electric charges. The universe glowed. During inflation, while spinning, survived matter-antimatter gets randomly distributed to all spiral arms. This is the reason our universe has asymmetric content of matter-antimatter. Somewhere in another universe, antimatter would be more than matter. LHC proved that matter and antimatter were distributed a trillionth of a second after the Big Bang. 68% dark energy, 27% dark matter, and 5% normal matter in the first ten-tredecillion-ths of seconds after the Big Bang. After the singularity completely released its hot state, the remaining matter from each universe interacted at its starting point. Creating a junction-like singular point which is termed an Everyverse.

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Drawing upon the principles from general relativity the curvature of space-time induced by gravitational effect, particularly at extreme scales or energy rules is hypothesized to create a 'spiral-like' structure, offering a potential route connecting disparate universes. The spiral universe may or may not be interacting with each other at any other point. From Figure 1, The multiverse space is expected as a higher-dimensional construct where different universes coexist. After 3,80,000 years the multi-bang, universes cooled to 3000 Kelvin. A hydrogen atom was formed.

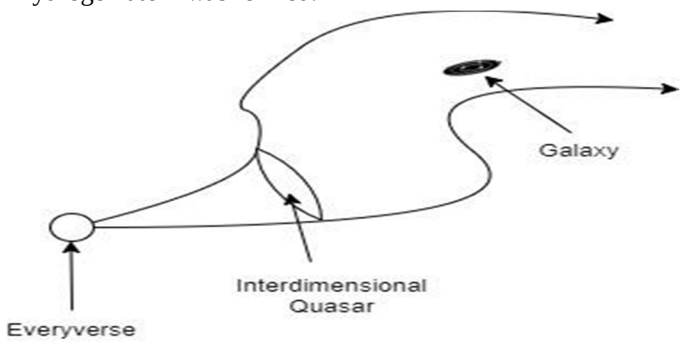


Figure 2. Representation of interdimensional quasar in an universe

A. Spiral-Friedmann Equation

$$H^2 = \frac{8\pi G}{3}\rho - \frac{k}{a^2} + \frac{\Lambda}{3} + \frac{\alpha}{a^n} \quad (1)$$

where k is the curvature constant, a is the size of the universe at a given time (scale factor), α is the coefficient representing the strength of the effect of the spiral arm on expansion, and n is the power that governs the expansion rate change with scale factor (a).

$\frac{8\pi G}{3}\rho$ = Contribution from average energy density (ρ) of the universe and gravitational constant (G)

$-\frac{k}{a^2}$ = Accounts curvature of the universe

$\frac{\Lambda}{3}$ = cosmological constant

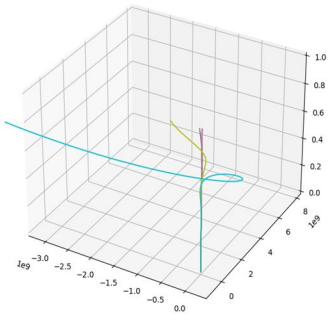


Figure 3. spinning motion of universes without intersecting each other, Supplementary material 2

From Figure 3,

- *Constant Angular Growth:* The property of maintaining a constant angle concerning everyverse suggests a consistent rate of expansion or contraction as traverses along this path between universes. The angle between the tangent line at any point on a spiral and the radial line connecting that point to the origin remains constant. This angle is called the "spiral angle".
- *Infinite Extent:* Logarithmic spirals extend infinitely, with continuous, systematic expansion.
- *Hubble Constant:* Logarithmic spiral defines the geometry of expansion, while still maintaining a uniform rate of expansion.

B. Logarithmic Spiral

A logarithmic spiral is a curve often found in nature, characterized by its unique growth pattern where the radius increases exponentially as the angle progresses linearly. This mathematical phenomenon is observed in various natural phenomena, from the spiral arms of galaxies to the arrangement of seeds in sunflowers.

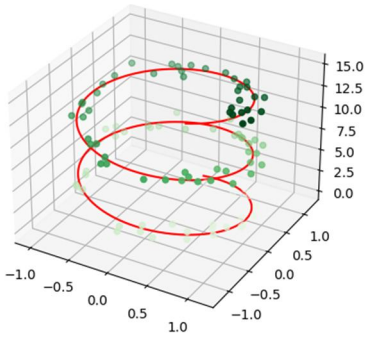


Figure 4. Galaxies, stars, and other celestial bodies reside in spiraling universe

$$r = a.e^{b\theta} \quad (2)$$

where r is the distance from the origin, θ is the angle. a = scale factor that determines how tightly the spiral is wound. b = the tightness of the spiral or rate of growth of the spiral. After can extend this equation into three dimensions by adding a third component along the z-axis.

x = r cos(θ)

y = r sin(θ)

z = c θ, where a, b, and c can adjust to control the size, shape, and spacing of the logarithmic spiral in three dimensions. This appears to be a conical helix structure. A conical helix is formed by a helix wrapping around the surface of a cone.

x = t cos(k x t)

y = t sin(k x t)

z = t f(t), where t represents time, k controls the tightness of winding, and f(t) defines the specific shape of a cone. But the universe couldn't be only a conical helix. It might possess different spiral shapes. As I said, it didn't exist only in three dimensions. Everyverse and spiral arms are in higher dimensions. So for that purpose, It is labelled the multiverse structure as a logarithmic spiral.

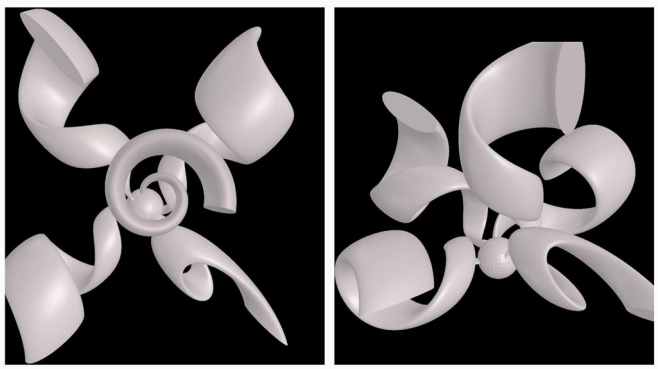


Figure 5.1, 5.2. Top view and front view of 3D multiverse model

In a series of interconnected spiral arms by Figure 5.1, 5.2, Each arm represents a distinct universe. Origin (circular dot) as everyverse. Multiverse follows this pattern, it suggests that the logarithmic spiral is a fundamental aspect of its structure. This could explain why everyone sees it in various natural phenomena, from galaxies to seashells.

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C. Multi Inflation

Each bang could have undergone its own inflationary phase, causing rapid expansion. It is an ongoing process from one point resulting in a spiral multiverse occuring on higher dimensional space.

$$V(\phi) = Vo.e^{-b\phi}.e^{i\theta} \quad (3)$$

where V(Φ) is Inflationary potential as a function of scalar field (Φ)
Vo = Constant related to the energy scale of inflation
b = Tightness of inflationary potential
$e^{-b\phi}$ = Exponential decay associated with a scalar field
$e^{i\theta}$ = Phase factor in the form of complex exponent related to angle (θ) in a logarithmic spiral



Figure 6. Multi Inflation, multiverse inflating in spiral

From Figure 6,

- *Inflation Field Characteristics (Φ):* A fundamental scalar field representing the energy density driving inflation across all models.
- *Energy Scale (Vo):* It defines the magnitude of inflationary energy density.
- *Slow Roll Parameter (ε, η, ξ):* The dynamics of the inflation field's evolution in different inflationary laws.

Earth continuously spins at about a thousand miles per hour. The Milky Way galaxy rotates at a rate of half a million miles per hour. Cosmic filament spins at a rate of 223,000 mph. They are bigger than galaxies. The galaxies are rotating around the central axis of each filament. What is causing these cosmic filaments to spin? Pulled gas, dust, and other material within the structures started collapsing which resulted in forcing these structures to spin. Similar situations could force the multiverse to spin.

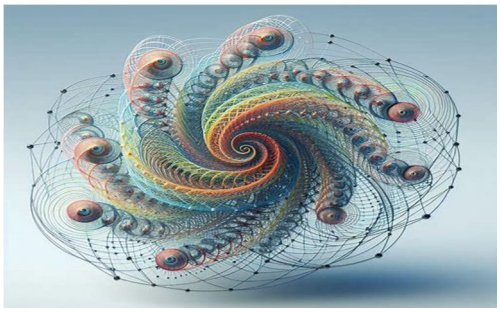


Figure 7. Spiral pattern of multiverse

C.1. Void

There are giant holes in the universe known as Bootes Void which is also called great nothing. They are the result of galaxies drawing closer to one another due to gravitational attraction which causes neighboring regions to weaken and become empty. Likewise the Bootes void, a region with lower density in the universe can be analogized to certain aspects of the multiverse. Just as cosmic voids represent areas with fewer galaxies, there may be regions where the density of the universe is lower. The space between universes is simply empty. In Figure 5.1, 5.2, black background represents empty space. This emptiness is different from what everyone's familiar with in our universe because it's devoid of any matter or energy.

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D. Multi Bang

$$R(t) = \int_0^t f(t)\,dt \quad (4)$$

At (4), integrating f(t) from initial singularity (t = 0) to a specific time in multiverse existence (t) would give the cumulative energy output from multi-bang up to that point.

$$f(t) = A.e^{-\alpha t^2}.sin^2(\beta t) \quad (5)$$

$e^{-\alpha t^2}$ = Decaying Oscillation.
As t increases, the term approaches zero, the possibility of signifying the fading energy between multi-bang. The parameter α controls the rate of decay.
$sin^2(\beta t)$ = Periodic Oscillation.
It represents the bursts of energy during multi-bang. The parameter β determines the frequency of these explosions.
A = overall amplitude of function scaling intensity of multi-bang.

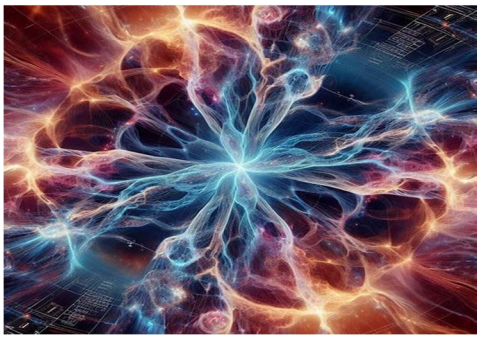


Figure 8. Multi-Bang

Dividing by the total number of bangs within the R(t) period would provide an "average bang intensity". This could be compared to individual bang intensity derived from integrating over a single bang interval, revealing any potential trends or variation in energy release of multi-bang.

E. Interdimensional Quasar (IQ)



Figure 9. Interdimensional Quasar

Luminous celestial body as cosmic portal interconnection enabling access to the parallel universe. Singularity reaches its cyclical bursts, there is a significant release of energy. During this release, conditions within the singularity become highly energetic and dynamic.

Φ (changing energy state). The dynamic changes in the scalar field contribute to the accumulation of energy at specific focal points within each inflating arm. This focal point becomes an embryonic stage of IQ. The localized concentration of energy at the focal point creates conditions where energy density surpasses a certain threshold. This localized high-energy density region is put forward to initiate the formation of IQ.

As energy continues to accumulate and concentrate, a quasar-like structure begins to take shape within the universe. The energetic condition could involve intense radiation and gravitational interaction. IQ could be 3,00,000 times heavier than our sun.

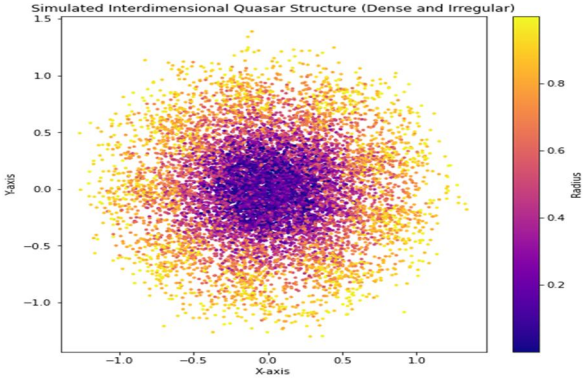


Figure 10. Predicted CMB of IQ

Principles of IQ

- They are markers
- They emit powerful bursts of quantum energy that carry information.
- Emissions fluctuate over time, creating a portal for interaction between universes.

F. Everyverse

Note: Here Everyverse is represented as spherical for simple visualization. Everyverse is not spherical but a point.



Figure 11. Luminous spirals stretching from central core

While everyverse may be described as a singular point beyond our current understanding of spacetime and physics, it exists within a higher-dimensional space and possesses unique and extreme quantum properties. Let's figure out how dense empty space is in terms of energy.

$$\Lambda = \frac{8\pi G}{c^4}\rho \quad (6)$$

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where c is the speed of light (value = 3 x 10^8 m/s) and G is the gravitational constant (value = 6.67 x 10^{-11} m^3/kg). ρ is energy density. From (6) it can calculate energy density as:

$$\rho = \frac{c^4 \Lambda}{8\pi G} \quad (7)$$

Let Λ be a theoretical consideration, Λ = 1 x 10^{-32} m^{-2}

$$\rho = \frac{(3\ x\ 10^8)^4\ x\ 1\ x\ 10^{-32}}{8\pi\ x\ 6.674\ x\ 10^{-11}} \quad (8)$$

further calculating, it get ρ = 4.829019475 kg/m^3

F.1. Distance Between Everyverse and Earth (Any object)

The sum of the difference between the properties of Earth (Ea) and Everyverse (Ev) divided by the magnitude of Earth's (object) properties is represented by the square root of the sum of squares of Earth (object) properties across all dimensions.

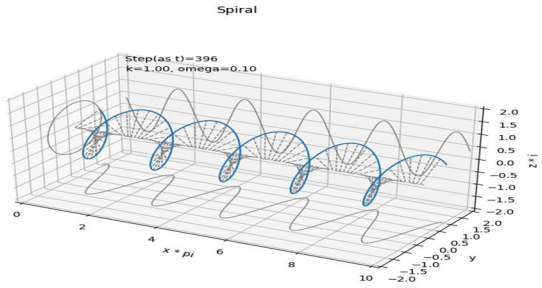


Figure 12. The spinning motion could represent an expansion along arm and central point acting as everyverse, Supplementary material 2

$$Dist\ (Ea, Ev) = \frac{Entanglement\ Entropy}{Information\ Content\ x\ Topological\ Invariant}$$

Topological Invariant describes the geometry and topology of space. It could be -

- *Euler Characteristic:* A quantity that describes the connectivity and group of space.
- *Homotopy Group:* Algebraic structure that classifies mapping between spaces.
- *Betti Number:* Count of holes or voids in space at various dimensions.

$$Dist(Ea, Ev) = \frac{\sum_{i=1}^{N} |\psi i(Ea) - \psi i(Ev)|}{\sqrt{\sum_{i=1}^{N} |\psi i(Ea)|^2}.\frac{1}{Topological\ Invariant}} \quad (9)$$

where i belongs to dimension and ψi could include variables as -

- *Physical:* Mass, Energy, Density, Temperature
- *Information:* Entropy, Information Content, Complexity
- *Abstract:* Quantum State, Wavefunction, Entanglement

Representing graph from Figure 12 in 2-Dimensional forms,

$$r = r1 + \Omega\theta \quad (10)$$

where r to represent the distance from the origin to point on spiral at an angle (θ). r1 is an initial radius. θ is an angle measured in radians (scaled by a factor of 4π). Ω is angular velocity. Let's express this in terms of trigonometric functions.

x = r1 + Ωθ cos(θ)

y = r1 + Ωθ sin(θ)

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F.2. Interdimensional Travel

As everything spirals outwards from everyverse, the closer you get, the more extreme the gravitational and space-time distortions could become like an Interdimensional Quasar. One can travel to different universes. From the planet, it navigates toward the IQ. Overcoming the vast distances and gravitational complexities along the journey requires precise calculations and technological power. Upon reaching the IQ, one approach its event horizon, where the fabric of space-time is surrounded by its immense gravitational pull. Crossing the event horizon of IQ initiates the journey to everyverse, experiencing a shift in reality, changing dimensions, and unusual energy. Those closer to everyverse might experience time slower, while those further out might experience it faster. When one reaches the everyverse, (Figure 11) one can find a network of universes that allows us to travel into other universes. We have the freedom to travel to any desired universe. To journey to another universe, one first navigates to that universe's IQ. That IQ could take us straight into that universe. This process outlines a theoretical method for traveling between universes.

G. Cosmic Microwave Background (CMB)

CMB refers to the residual radiation of the Big Bang. It provides crucial evidence supporting the concept of parallel universes. Variations in CMB data or anomalies known as cold spots or dark flow have been observed. These anomalies could be the result of interaction between our universe and neighboring parallel universes. While overall temperature uniformity of CMB remains consistent. This variation may reflect the influence of everyverse on cosmic microwave background radiation. Multi-bang could be displayed as non-Gaussian features or primordial gravitational wave signatures within CMB. These unique patterns could provide practical evidence supporting the theory's multiverse origin. Quantum correlation between photons originating from different universes could influence the polarization angle and intensity fluctuation observed in CMB. From Figure 10, Variation in CMB temperature redshift relation may reflect changes in interconnected multiverse's geometry and expansion rate.

G.1. Probability Distribution of CMB fluctuation:

A probability distribution can be used to characterize the fluctuation in CMB temperature observed across different regions of space. It is the likelihood of observing certain temperature values at various angular scales. The average temperature that has been observed is 2.7 Kelvin everywhere in the universe. Let's assume the observed mean temperature of CMB (μ = 2.725 k) and standard deviation (σ = 0.001 k) as hypothetical small fluctuations.

$$(11) \qquad P(x) = \frac{1}{\sqrt{2\pi}\sigma} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

If one wants to calculate the probability of observing temperature (T = 2.728 k), it can fill these values into the Gaussian distribution.

$$(12) \qquad P(2.728) = \frac{1}{\sqrt{2\pi}\,0.001} e^{-\frac{(2.728-2.725)^2}{2\,x\,0.001^2}}$$

After simplifying the calculation,

$$(13) \qquad P(2.728) = \frac{1}{\sqrt{2\pi}0.001}\, x\, 0.0111089965$$

We get our probability as 0.0000044318. So the likelihood of 2.728 indicates how rare the observed temperature is.

IV. RESULT

The theory offers a potential explanation for observed asymmetry in the distribution of matter and energy. Repeated Big Bang events occur at some interval along the spiral spinning of the multiverse and may lead to variation in distribution. Quantum field theory principles suggest that everyverse may exhibit quantum entanglement phenomena, enabling nonlocal correlation and information exchange between universes. The energy profile of an interdimensional quasar follows Gaussian distribution with a mean energy output of 10^{46} Joules.

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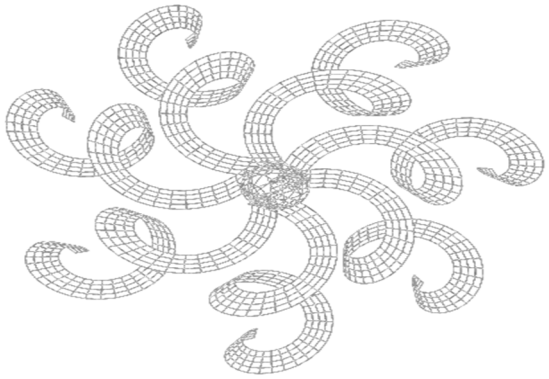


Figure 13. Wireframe spiral representing multiverse structure

Representing predicted factors of this theory in tabular form.

Table 2. Factors according to Spiral Multiverse model

Multiverse Type	Number of Dimensions	Number of Universe	Different Initial Condition	Different Constant	Different Laws	Explain Fine Tuning
Spiral	More than 3	Many	No	Maybe	Yes	No

V. FUTURE WORK

We can predict the statistical distribution of observable phenomena such as gravitational wave patterns or anomalies in CMB radiation based on this theory. Comparing this prediction with observational data from experiments such as Plank satellites or gravitational wave detectors like LIGO we can test the validity of the theory. Search for specific gravitational wave signatures that could indicate the presence of multi-bang. Look for ways to replicate or simulate the conditions of the early universe in controlled laboratory settings.

VI. LIMITATION

The limitations of this theory are:

1) There are many galaxies, stars, planets, and black holes in a single universe but there will be only one interdimensional quasar in each universe. This could make IQ difficult to be detected.
2) The theory talks about parallel universes. Can't say anything about alternate universes.
3) The theory deals with only space. Nothing about time, time travel, and its flow.

VII. CONCLUSION

The spiral multiverse theory offers a fresh perspective on how our universe may have originated and evolved. It suggests that our universe is just one of many interconnected universes originating from a single point. If proven true, this theory could change the way everyone perceives the cosmos, leading to new discoveries and insights. It challenges us to rethink our place in the universe and explore mysteries of space.

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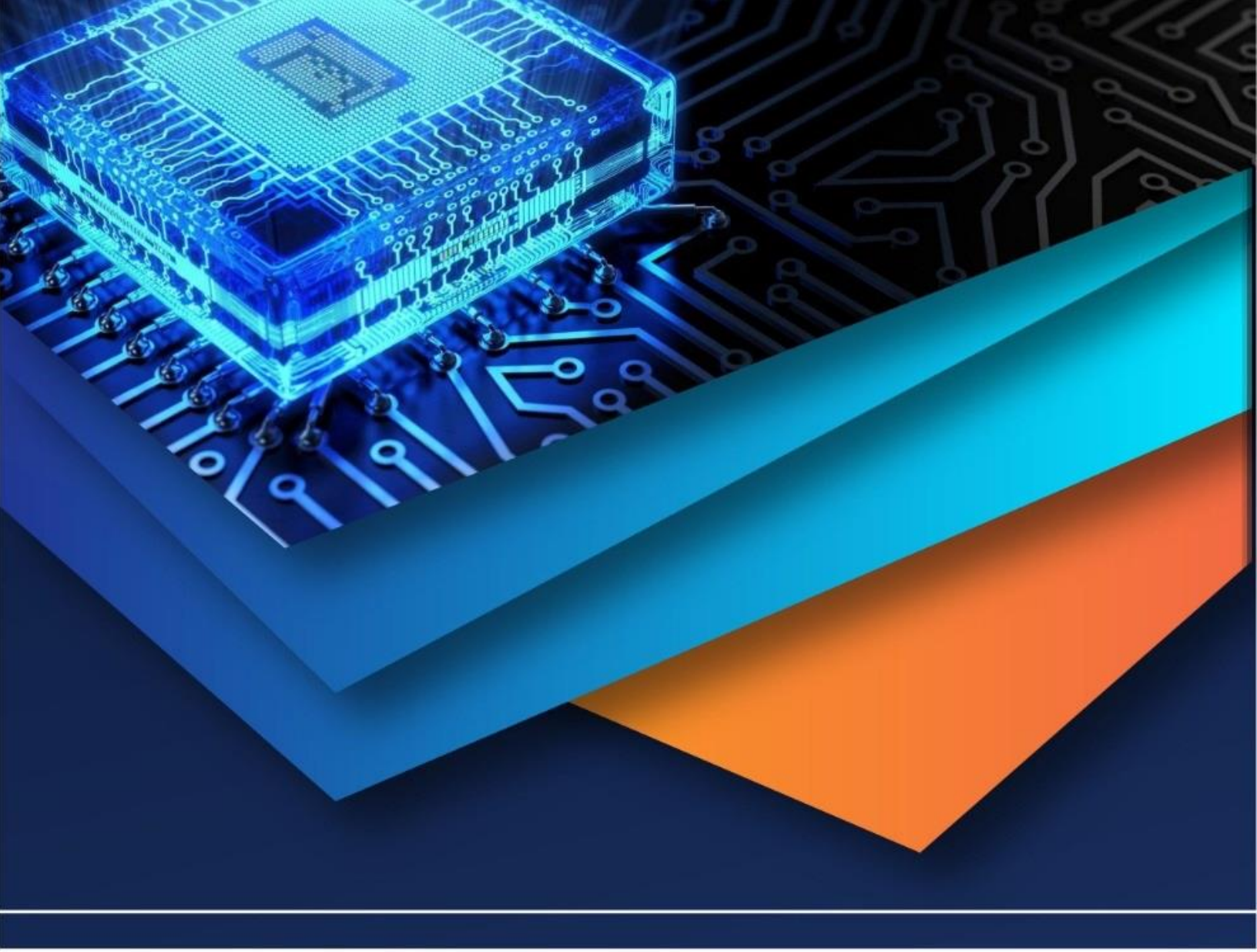
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SUPPLEMENTARY MATERIAL

Supplementary material 1, Video file.
Supplementary material 2, Python code file in the form of jupyter notebook.

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