# Universal Superposition

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## Absract

The Dual Observer Paradox arises from Einstein's field equations, which predict that gravitationally lensed objects appear in different locations depending on the observer's position. This leads to irreconcilable measurements, because any directly observed object is simultaneously subject to lensing by an observer positioned elsewhere, which leads to two conflicting absolute positions for that object that cannot be explained by classical physics.

This paradox suggests that, much like subatomic particles, macroscopic objects exist probabilistically within a superposition biome. Consequently, the entire universe exists in superposition, with observations collapsing wave functions in the same manner observed at the quantum scale; a Newtonian Superposition. While the principle of decoherence has traditionally been cited as a barrier to such conclusions, the paradox itself cannot be resolved through classical physics. Instead, it necessitates a re-evaluation of the underlying assumptions about observation and reality.

Dark Matter and the Superposition Biome

Dark matter explains discrepancies between gravitational effects and visible mass, despite the absence of direct evidence for its existence. However, once the effects of superposition biomes are accounted for, the necessity of dark matter is eliminated. The volume occupied by an object's superposition biome interacts with surrounding matter, thereby amplifying gravitational effects without requiring additional unseen mass.

Notably, the observed discrepancy in galactic rotational dynamics, which suggests an amplification of gravitational forces by a factor of 5.6, is inherently explained by the superposition biome. While the biome's volume extends beyond this limit, the diffusion of matter within it prevents further amplification. Variations from this ratio in spiral galaxies are resolved by the compression of the superposition biome due to the central black hole, modifying the gravitational distribution and accounting for inconsistencies in dark matter models.

The Great Attractor and Entropy Gradients

The Great Attractor presents an anomalous gravitational influence, pulling galaxies across vast cosmic scales despite lacking excess mass. Classical physics struggles to explain this effect. However, within the superposition framework, low-density voids create entropy gradients relative to surrounding denser regions. These gradients generate an entropy push-in effect, which attracts matter toward the void—not due to its gravitational pull, but because of the entropy imbalance between the void and the surrounding universe.

While classical models suggest that surrounding galaxies should collapse the void through gravitational dominance, this does not occur. This is because the objects within the void exist in superposition, meaning their gravitational influence does not transmit across the void instantaneously. Instead, surrounding objects compete with each other gravitationally, leading to a rotational equilibrium rather than collapse. The result is a self-sustaining entropy gradient that continues to attract matter across cosmic distances.

Black Holes as Low-Density Entropy Sinks

Rather than infinitely dense singularities, black holes function as low-density entropy sinks, behaving analogously to the Great Attractor but on a localized scale. High-density material is drawn toward the entropy gradient but, rather than collapsing inward, becomes trapped in an extreme Coriolis vortex around the event horizon. This phenomenon, rather than infinite gravitational pull, explains the observed event horizon effects.

The event horizon is not a boundary of infinite gravity, but rather an emergent structure formed by the interaction of entropy push-in and Coriolity-driven rotational dynamics. This model aligns with Hawking's observation that a black hole's surface area, rather than its mass, dictates its effects. Moreover, the intense Coriolity at the event horizon bends space-time itself, preventing light from escaping—not due to gravitational warping, but due to the entropic structure of the surrounding biome.

This also resolves the information paradox: no information is lost within the black hole; rather, it is absorbed into the Coriolity vortex, which dictates the event horizon's expansion. The black hole itself does not necessarily gain mass—rather, its entropy gradients expand, increasing entropy push-in and reinforcing galactic cohesion.

Decoherence and the Integrity of Superposition

Traditional models of decoherence suggest that superpositions collapse due to interactions with an observed environment, implying that large-scale superpositions should not persist. However, this assumption is flawed. Superpositions do not inherently decohere unless coupled with an observational interaction. If two superposed particles interact, they immediately re-enter superposition, meaning that, in the absence of frequent, high-energy interactions, the universe must remain in superposition.

Entropy gradients drive entropy push-in, which in turn facilitates decoherence. However, entropy imbalance alone does not collapse a superposition—that information must first be transferred through interaction. Only when interactions reach a critical threshold does decoherence occur, leading to immediate collapse. This explains why observations result in instantaneous wave function collapse: they convey entropy imbalance information directly rather than relying on environmental interactions.

Once the method for wavefunction collapse is understood, then the actual wave function collapse is better understood not as a

This also accounts for the stability of cosmic voids—despite extreme entropy gradients, the lack of sufficient entropy information transfer prevents their immediate collapse. Until entropy imbalance information is fully transmitted, the void retains its superposed integrity.

Conclusion

This work introduces a paradigm shift by demonstrating that superposition is not restricted to the quantum scale, but is a fundamental property of the universe. The Dual Observer Paradox proves that absolute location is indeterminate, necessitating a reevaluation of traditional physics. By incorporating entropy constraints and superposition biomes, previously unexplained cosmic phenomena—including dark matter, the Great Attractor, black holes, and decoherence—are unified under a single, coherent framework.

## Introduction

This article introduces the Principle of Newtonian Superposition. This principle extends the concept of superposition beyond quantum mechanics, applying it across classical and cosmological scales. It posits that observable matter can also potentially exist as a superposition similar to the domain of subatomic particles. The focus of the paper is to explore these circumstances.

## The Dual Observer Paradox

Quantum lensing is a well-studied phenomenon that utilizes the curvature of space-time around massive objects to observe objects blocked from direct view. While the object cannot be viewed directly, we can infer its actual location using Einstein’s field equations. However, these inferences break down when confronted with a second observer at a different location simultaneously observing the same object through quantum lensing. Applying Einstein’s field equations results in an unescapable conclusion: the object will appear at a different location relative to each observer.

# Quantum Lensing Superposition Framework

## 1. General Relativity: Gravitational Lensing

Gravitational lensing is described by the Einstein field equations, which govern spacetime curvature:

$$R_{\mu\nu} - \frac{1}{2} g_{\mu\nu} R + g_{\mu\nu} \Lambda = 8 \pi G T_{\mu\nu}$$

Where:

- $R_{\mu\nu}$: Ricci curvature tensor, describing spacetime curvature.
- $g_{\mu\nu}$: Metric tensor, describing spacetime geometry.
- $R$: Scalar curvature, the trace of the Ricci tensor.

- $\Lambda$: Cosmological constant.
- $T_{\mu\nu}$: Stress-energy tensor, representing matter and energy distribution.

For gravitational lensing, the deflection angle of light is given by:

$$\Delta\theta = \frac{4GM}{c^2 R}$$

Where:

- $G$: Gravitational constant.
- $M$: Mass of the lensing object.
- $c$: Speed of light.
- $R$: Closest approach distance to the lens.

## 2. Quantum Mechanics: Superposition of Paths

In quantum mechanics, particles (like photons) exist in a superposition of states until observed. The position of a photon is described by its wavefunction $\psi(x, t)$:

$$\psi(x, t) = \int K(x, x', t)\, \psi(x', 0)\, dx'$$

Where:

- $K(x, x', t)$: Propagator, the amplitude for a photon to travel from $x'$ to $x$ over time $t$.
- $\psi(x', 0)$: Initial wavefunction at position $x'$.

### Path Integral Formulation

The probability amplitude for a photon to travel between two points is the sum over all possible paths:

$$\text{Amplitude} \sim \sum_{paths} e^{iS/\hbar}$$

Where:

- $S$: Action for a given path, derived from the spacetime metric.
- $\hbar$: Reduced Planck's constant.

## 3. Superposition of Observed Positions

In gravitational lensing, the observed position of the lensed object is determined by the superposition of light paths:

$$\psi_{obs} = \int \psi_{lens}(x)\, K_{spacetime}(x, x')\, dx$$

Where:

- $\psi_{lens}(x)$: Wavefunction of the photon as it interacts with the lensing mass.
- $K_{spacetime}(x, x')$: Propagator describing spacetime curvature between the lens and observer.

## 4. Extending Superposition to the Lensed Object

If the object being lensed is also quantum in nature, its position is described by its own wavefunction:

$\Psi_{object}(x, t) = \int K_{object}(x, x', t)\, \Psi(x', 0)\, dx'$

The observed position is then a combined superposition of the object's intrinsic wavefunction and the photon's path integral:

$\Psi_{total} = \Psi_{object} \cdot \psi_{obs}$

Once we calculate the equations for lensed objects it becomes clear that not only is there no fixed location for the object being lensed it is also subject to uncertainty at the cosmological scale. Therefore, the object must exist in superposition and is subject to precisely the same effects that subatomic particles are subject to as described by the Heisenberg Uncertainty Principle.

As a result, the position of the lensed object is not absolute. Instead, it changes depending on the location of the observer. Where one observer conducts an observation that would essentially “collapse the wave function” and cause the object to appear in a specific location, a second simultaneous observation would collapse the wave function forcing the object to appear in a completely different location.

In fact, the paradox does not exist just for lensed objects with dual observers. Essentially, any object in the universe, even ones that we could observe directly, is subject to lensing from the perspective of an observer who cannot observe it directly. Therefore, at no given time can we absolutely observe an object directly and determine its precise position because every measurement can be contradicted by a lensed observation from a different location.

In absolute terms, because every object in the universe is subject to lensing depending on the angle of observation, therefore, all objects must always exist in superposition. At best, observation merely collapses the wave function. It cannot provide an absolute position for that object. This leads to the inescapable conclusion that objects not being actively observed exist in superposition at the cosmological level.

the Dual Observer paradox demonstrates that no object has a specific identifiable location in the universe. At best we can only define that object’s position from the perspective of a single observer. But since any angle of observation will give a different absolute location for that object, the object itself must exist in superposition with the observer, collapsing the wave function during observation. While contrary to established principles the fact that the universe exist in superposition resolves some of the most pernicious paradoxes in cosmology.

## Empirical Proof of Universal Superposition

Classic physics proposes that approximately 380,000 years after the Big bang, gas pockets started forming in the plasma, and from there gravity caused the superposed gas to continue to decohere into the observable matter we see today. Although these processes are assumed, the evidence proves that there was insufficient decoherence in the universe to collapse the superposition and create observable matter.

### Decoherence Requires Observable Matter

Decoherence occurs when a quantum system interacts with its environment in an irreversible way, causing the loss of superposition. However, for decoherence to occur on a large scale, there must be **observable matter** to facilitate the interaction.

### Superpositions Do Not Decohere Each Other

If gas pockets were still in superposition, they could not cause further decoherence. Quantum mechanics dictates that two unobserved superpositions do not collapse each other into classical states. Furthermore, when the first gas pockets formed, they became a higher-entropy state relative to the surrounding plasma. If entropy naturally flows from higher to lower states, then instead of decohering further into observable matter, these gas pockets would have started transferring entropy back into the plasma. This contradicts the idea that gravity alone could drive decoherence, because without sufficient entropy information transfer, matter remains in superposition.

The probability of decoherence is determined by the entropy information transfer rate StransferS_{\text{transfer}}Stransfer. If we define StransferS_{\text{transfer}}Stransfer as the rate at which entropy is redistributed between matter states, then decoherence only occurs when

Stransfer>Ssuperposition−SambientS_{\text{transfer}} > S_{\text{superposition}} - S_{\text{ambient}}Stransfer>Ssuperposition−Sambient

where SsuperpositionS_{\text{superposition}}Ssuperposition is the entropy of the gas pocket and SambientS_{\text{ambient}}Sambient is the entropy of the surrounding plasma. Given the density of the early universe, SambientS_{\text{ambient}}Sambient was already near equilibrium with SsuperpositionS_{\text{superposition}}Ssuperposition, meaning that the required imbalance for widespread decoherence never occurred.

### Conclusion: A Universe That Remained in Superposition

Since decoherence did not continue past the initial gas pockets, the majority of the universe must have remained in superposition. This proves that modern assumptions about the early universe are incorrect, and instead, the universe behaves like a large-scale quantum system, where decoherence is a rare, rather than inevitable, event.

### Decoherence and Gravity: A False Assumption

Decoherence occurs when entropy information is transferred from a system to its environment. Gravity does not transfer entropy information; it only curves spacetime and affects acceleration. If gravity inherently caused decoherence, then all massive quantum systems would collapse instantly into definite states. However, macroscopic quantum effects such as superconductors and Bose-Einstein condensates persist, even in extreme gravitational conditions such as neutron stars. This demonstrates that gravity alone does not cause the transition from quantum superposition to classical observability.

The Schrödinger equation describes how quantum systems evolve:

$$i\hbar \frac{\partial}{\partial t} \Psi = \hat{H} \Psi$$

where $\hat{H}$ is the Hamiltonian operator. Gravity affects the system by adding a gravitational potential energy term $V_g$ to the Hamiltonian, such that:

$$\hat{H} = \hat{T} + \hat{V} + V_g$$

where the gravitational potential energy is given by:

$$V_g = -\frac{GM}{r}$$

This additional term does not introduce interactions with an external environment, meaning that the system remains coherent and does not collapse into a classical state. The key to decoherence is the modification of the density matrix $\rho$. Decoherence occurs when the off-diagonal terms of $\rho$ vanish due to entanglement with the environment:

$$\rho_{ij}(t) = \rho_{ij}(0) e^{-\gamma t}$$

where $\gamma$ represents the rate of decoherence. In contrast, the gravitational term only affects energy levels and does not lead to entanglement, leaving superpositions intact.

The dominant forces in the early universe were electromagnetic and nuclear, not gravitational. Density fluctuations from gravity only influenced structure formation; they did not collapse quantum wavefunctions. The only way decoherence can occur is through entropy information transfer between observable and unobservable states. Since early gas pockets were in superposition, they could not transfer entropy information to themselves to collapse into classical matter. This means that observable matter could not have emerged from superposition through gravitational collapse alone. Instead, decoherence in the universe must be governed by entropy gradients and information transfer rather than gravitational effects.

## The Nature of Dark Matter

### 1. The Empirical Observation:

In the study of galaxies and galaxy clusters, astronomers have observed a significant discrepancy between the amount of visible matter and the gravitational forces that are apparent in these systems.

Specifically, the gravitational pull exerted by the visible matter (such as stars, gas, and dust) is far too weak to explain the observed rotational speeds of galaxies and the movement of galaxy clusters.

For instance, the rotation curves of galaxies—the relationship between a galaxy's distance from its center and the rotational speed of stars within it—show that stars on the outer edges of galaxies are rotating much faster than what would be expected based on the amount of visible matter. According to Newtonian mechanics, the outer stars should be moving more slowly if they are only influenced by the visible mass within the galaxy. Instead, they maintain constant high speeds.

This observation is consistent across many galaxies and galaxy clusters, leading to the conclusion that there must be an additional source of gravitational pull that cannot be explained by the visible matter alone. This invisible source is referred to as dark matter.

2. The Role of Dark Matter:

To account for these discrepancies, physicists and astronomers introduced the concept of dark matter—an unseen form of matter that does not emit or interact with light (or any other form of electromagnetic radiation), making it undetectable by direct observation. The gravitational effects of dark matter are inferred from its gravitational influence on visible matter, but it does not interact with the electromagnetic spectrum in the same way ordinary matter does.

Dark matter was proposed to make up the missing mass in galaxies and galaxy clusters, providing the additional gravitational pull required to explain the high rotation speeds of outer stars and the motion of galaxy clusters. This form of matter is believed to constitute roughly 85% of the total matter in the universe, with visible matter making up the remaining 15%.

3. The Problem with the Dark Matter Hypothesis:

While the existence of dark matter explains some of the gravitational anomalies, there are several significant problems with this hypothesis:

Undetectability: Dark matter does not emit, absorb, or reflect light, nor does it interact with ordinary matter except through gravity. This makes it fundamentally undetectable through conventional astronomical methods. Despite extensive efforts, no direct detection of dark matter particles has been achieved, leaving its existence purely hypothetical.

Lack of Particle Candidates: Despite decades of research, no known particle candidates for dark matter have been conclusively identified. Many theories suggest that dark matter might consist of WIMPs (Weakly Interacting Massive Particles) or axions, but these particles have not been observed in experiments. The failure to detect dark matter directly remains one of the greatest challenges in physics.

The Distribution Problem: The distribution of dark matter in galaxies does not match the behavior we would expect from a simple extension of Newtonian gravity. For example, simulations of galaxy formation and evolution that include dark matter provide a good match to observed galaxy structure, but the precise distribution of dark matter in these simulations is still not well understood. Some observations suggest that dark matter behaves differently at the galactic scale than at larger cosmological scales, complicating its role in galactic dynamics.

Alternatives to Dark Matter: Over the years, several alternative theories have been proposed to explain the same gravitational anomalies that dark matter is meant to address. These include modifications to Newtonian gravity (such as MOND—Modified Newtonian Dynamics) or changes to the way gravity operates at large scales. While these alternative theories attempt to explain the discrepancies without invoking new, unseen matter, they have not yet provided a universally accepted solution.

4. The Key Discrepancy: 5.6 Times the Expected Gravitational Force:

Perhaps the most striking observation, and the one that has led to the dark matter hypothesis, is that the gravitational forces we detect are roughly 5.6 times the gravitational influence of the observed matter. This means that for the amount of visible mass in galaxies, there is an additional gravitational force that accounts for nearly 85% of the gravitational influence that we observe. The gravitational pull exerted by visible matter is simply insufficient to explain the velocity of stars at the edges of galaxies, leading to the theoretical necessity for dark matter to make up this missing mass.

The True Nature of Dark Matter

As demonstrated by the Dual Observer Paradox, observable matter exists not as localized points but in a superposition of probabilistic volumes, or 'superposition biomes,' when unobserved. Collapsing the superposition through observation only gives one possible location for that object. However, when accounting for the entire area that the object could potentially manifest that superposition biome amplifies the sphere of influence that object could exert substantially. Once fully accounted for, these biomes expand the effective volume of matter, producing gravitational effects proportional to their size. The resulting effective gravitational mass is approximately 5.6 times the collapsed, observed mass, aligning with the observed effects attributed to dark matter.

## Theoretical Framework

In classical physics, gravitational effects are determined by localized mass distributions. However, quantum mechanics introduces the concept of superposition, where particles exist in probabilistic states until observed. Extending this principle to macroscopic scales, we define:

• Collapsed Mass: The localized, observed position of matter.

• Superposition Biomes: The probabilistic volume occupied by unobserved matter, which influences gravitational interactions.

The total effective gravitational mass is expressed as:

$M_{effective} = M \cdot 5.6$

where M is the collapsed mass, and 5.6 represents the expanded influence of the superposition biome.

## Gravitational Potential of Superposition Biomes

The gravitational potential $\Phi(r)$ for a superposed object is determined by its probabilistic mass density:

$$\Phi(r) = -G \int [\rho_0 P(r') / |r - r'|] d^3r'$$

Where:

- $G$ is the gravitational constant.
- $\rho_0$ is the density of the collapsed position.
- $P(r')$ is the probability density function describing the biome.

The expanded volume of the superposition biome is calculated as:

$$V_{superposition} = 5.6 V_0$$

where $V_0$ is the volume of the collapsed state. The effective radius of the biome is:

$$R_{superposition} = R_0 \cdot (5.6)^{(1/3)}$$

## Observational Implications

This framework provides a novel explanation for the effects attributed to dark matter; that the gravitational effect of the entire biome of probabilities once accounted for, increases the effective gravity exerted by the object in line with the observed ratio of theoretical dark matter. Thus, there is no need for hypothetical new types of unexplainable matter. The superposition of the universe. Perfectly accounts for the increased gravitational pull of observable matter and makes several testable predictions:

## Galactic Rotation

Impact of Black Hole Mass and Pitch Angle on Galactic Structure.

The observed rotational dynamics of spiral galaxies have long presented a paradox: their visible mass cannot fully account for the gravitational effects that shape their motion. Traditional models have introduced dark matter as a solution, while the superposition biome hypothesis proposes that the true gravitational mass of a galaxy extends beyond its collapsed, observable matter. This model predicts a universal scaling factor ($f = 5.6$), suggesting that the effective mass of a galaxy is significantly greater than what is directly measurable.

However, deviations from this 5.6 scaling emerge under specific conditions particularly in galaxies with massive central black holes. These deviations suggest that while the biome scaling factor holds broadly, additional forces act to modulate its influence, particularly at the galactic core.

Empirical observations have established a relationship between black hole mass and spiral arm pitch angle (Empirical studies (Davis et al., 2017; Ringermacher & Mead, 2009). As black hole mass increases, spiral arms tighten, compressing the biome's effect and concentrating mass more centrally. This process alters the gravitational influence of the outer regions, leading to velocity deviations that appear inconsistent with the expected 5.6 scaling.

To account for these variations, we introduce a correction factor tied to pitch angle, which adjusts the predicted velocities based on the structural compression induced by black hole mass. The result is a refined model that preserves the predictive power of biome scaling while incorporating observable astrophysical variables.

This framework offers two key predictions:

1. Galaxies with more massive black holes will exhibit greater deviations from the 5.6 scaling factor due to biome suppression.

2. After applying the pitch angle correction, observed velocities should converge back toward the biome-predicted values.

The following section presents the mathematical formulation of these relationships, demonstrating how pitch angle compression interacts with biome scaling to produce the observed deviations in galactic rotation curves.

## 1. The Pitch Angle Equation

The pitch angle of the galactic arms is influenced by the rotational speed and the size of the superposition biome. The mass of the central black hole compresses the superposition biome, reducing the gravitational influence and scaling the rotational speed by a factor of 3x the observable mass. This leads to a tighter spiral arm structure with a steeper pitch angle.

The pitch angle can be derived from the following equation:

Pitch Angle ∝ $\frac{1}{R_{\text{galactic arm}}} \times \left( \frac{\text{Effective Mass}}{M_{\text{observable}}} \right)$

Where:
- $R_{ext{galactic arm}}$ is the radius of the galactic arm.
- $M_{ext{observable}}$ is the visible mass.

- The effective mass is scaled by the compression of the superposition biome due to the black hole’s gravitational influence. For regions dominated by a supermassive black hole, the expansion of the superposition biome is limited to 3x the observable mass instead of 5.6x.

## 2. Implications for Galactic Structure

The gravitational influence of a supermassive black hole compresses the superposition biome, leading to a stronger gravitational pull within the galaxy's core. This effect is reflected in the rotation curve, which is flatter near the galactic center. As a result, the spiral arms of the galaxy are tighter with a smaller pitch angle compared to galaxies without such a massive black hole. The equation demonstrates how the size and compression of the superposition biome directly affect the dynamics of the galaxy’s arms.

## Describing Superposition Biome

The superposition explains the increased gravitational effects of observable matter precisely because the superposition biome is so much larger than the volume of the observable matter alone. Moreover, the gravitational effect of large masses compresses these biomes and account for the deviations in gravitational pull that we see in some galaxies. However, this leads to an apparent anomaly in areas with low density.

Being that high gravity compresses the biomes and low gravity allows those biomes to expand high gravity black holes would have less gravity in their outer arms due to compression. With normal compression a galaxy is expected to exhibit approximately 5.6 times the gravity of the observable matter because that is the general size of the expanded superposition biome under normal density conditions.

In areas of low density, we would expect the superposition biome to expand to enormous size. If gravity scaled up with the size of the unrestrained superposition, then areas of low density would be expected to exert somewhat counterintuitively, enormous gravity. This, however, is not the case. Areas of observed low density appear to exert the same 5.6 times the gravitational force of observed matter as any other normal matter,

## 1. Gravitational Force at the Surface of the Collapsed Object

The gravitational force at the surface of the collapsed object is calculated using the formula:

F = G * M / R^2

Where:
- G = 6.6743e-11 (Gravitational constant)
- M = 1e+30 (Mass of the object)
- R = 100000000000.0 (Radius of the object)

Gravitational force at the surface of the collapsed object: 6.6743000e-03 N/kg

## 2. Gravitational Force at the Surface of the Expanded Biome

The gravitational force at the surface of the expanded biome is calculated using the formula:

F = G * M / (R * expansion_factor)^2

Where:
- expansion_factor = 5.6 (expansion ratio)

Gravitational force at the surface of the expanded biome: 2.1282844e-04 N/kg

## 3. Adjusted Gravitational Force with Damping Factor

The damping factor is introduced to account for the effect of low-density expansion, reducing the gravitational force. This will be more thoroughly explored in the following section.

The damping factor is modeled as:

The damping factor is introduced to account for the effect of low-density expansion, reducing the gravitational force.

The damping factor is modeled as:

Damping factor = 1 / (1 + exp(-density_factor * (expanded_radius - R)))

Where:
- density_factor = 0.5
- expanded_radius = 560000000000.0 (Expanded radius of the biome)

Adjusted gravitational force: 2.1282844e-04 N/kg

## Conclusion

The calculations indicate that while the expanded biome increases in size due to low-density regions, the gravitational effect at its surface decreases due to the expansion of the biome, following the inverse square law. The damping factor reflects the reduction in gravitational force as the biome spreads over a larger area, ensuring that the gravitational pull does not increase disproportionately despite the larger size of the biome. However, this calculation clearly does not apply merely to large scale voids. It potentially applies to any structure that attracts large bodies into a central location.

## The Great Attractor as a New Paradigm

The Great Attractor presents as an anomaly, an area of low density where gravity appears to be very low, yet it attracts even distant objects with unaccountable force. However, once the superposition is properly factored in, the exerted force is precisely accounted for. While the damping factor limits the associated gravitational impact, the superposition itself expands without limit until it fills the void of empty space. This increased biome allows the object to interact with multiple other objects even though the gravity itself is not increased due to the diffuse matter within the void.

At the boundary of superposition of objects in the void, and the superposition of the objects surrounding the void we have anomalous action. It would appear the higher density objects surrounding the void would either directly enter the void or attract the less dense objects within the void since they are profusely spread out and their total gravity would be lower than the denser objects surrounding the void.

In reality, it works the opposite way. The diffuse matter spread out in superposition across the entire void is too low in density to be attracted by the more massive objects that surround it. The pull from the more massive object is unable to cross the vast distance of the void to collect the lower density objects within. Therefore, there is a weak interaction at the border attempting to interact with the low density objects but it cannot cross the void to attract the entire mass of the object. This weak interaction occurs not with one but with all objects at the edge of the void, essentially creating maximal expansion of the void but the higher density objects never actually enter it because the superposition of the low-density objects prevents them from strongly interacting. The void itself is caused by the pull of the dense objects around it.

As the higher density objects struggle to collapse the void and absorb the objects within, they fall into a bottleneck caused by competing gravitational effects from around the void simultaneously. Essentially the objects surrounding the void are competing with each other, not the less dense objects within the void. This competition causes a stalemate or a bottleneck between the objects surrounding the void and they start to circle it instead of consuming it.

Thus, the void itself acts like a weak cosmic sink attracting large objects towards it by virtue of its low entropy state. However, the low-density superposition prevents those objects from entering the void so instead they rotate around it causing the equivalent of a galactic Coriolis effect. The entropy of the low density void effectively attracts galaxies far and wide as they push towards the void but never succeed in collapsing it. Instead of using gravity, the Great Attractor uses its lower density to attract larger more massive objects. Objects across the cosmos push each other towards the area of low density and become trapped in its Coriolis-like effect, circling it endlessly instead of collapsing it. The distortions that appear to be attracting galaxies with the gravity emanating from the Great Attractor are actually galaxies rushing towards the lower density of the void through entropy.

1. Effective Mass of Superposition Biome:

$$M\_effective = \int \rho(r)\, dV$$

2. Gravitational Force in Superposition:

$$F\_superposition = G * M\_effective / r^2$$

3. Interaction of Low-Density Superposition Objects with High-Density Objects (with Entropy Scaling):

$$F\_interaction = \eta * G * M\_effective * M\_high\_density / r^2$$

Where:

$\eta = S\_high\_density / S\_low\_density$ (Entropy scaling factor)

4. Bottleneck and Gravitational Competition:

$$F\_bottleneck = \Sigma (G * M\_high\_density\_i * M\_effective / r\_i^2)$$

5. Coriolis Effect (Spiral Motion):

$$\omega = v / r$$

$$F\_spiral = 2\, m\, (v \times \omega)$$

6. Weak Gravitational Sink:

$$F\_sink = G * M\_effective / r\_sink^2$$

## Applying the Principle: Galactic Model

This explanation resolves any need for dark matter or dark energy powering the Great Attractor and entirely explains the anomalies observed. However, these interactions are commonplace throughout the Universe. Although it is generally assumed that Black Holes are singularities of infinite gravity, the model that explains the Great Attractor provides a superior explanation and resolves some of the greatest mysteries surrounding them.

While black holes possess characteristics that seem to differ from voids such as the Great Attractor, there are far more commonalities than differences. If black holes were superposition Coriolis sinks, not singularities as typically believed, precisely the same process that explains the Great Attractor would account for the observed behavior of black holes at the center of galaxies.

Main Equation for Rotational and Gravitational Dynamics:

1. Coriolis Force:

The force due to Coriolity in a rotational system can be expressed as:

$$F_{\text{Coriolity}} = 2m (v \times \omega)$$

• Where:

• $m$ = mass of the object (e.g., planet, star, etc.)

• $v$ = velocity of the object

• $\omega$ = angular velocity of the rotating system (the body or superposition itself)

2. Damping Factor:

The damping factor will affect the force based on the mass-to-volume ratio $\frac{M}{V}$, as described by:

$$\alpha = \frac{\text{Scaling Constant}}{\left( \frac{M}{V} \right)}$$

Where:

• $\alpha$ = damping factor

• $M$ = mass of the object

• $V$ = volume or spatial distribution of the object

3. Total Force with Damping:

The total effective force, combining Coriolity and damping, is:

$$F_{\text{total}} = \alpha \cdot 2m (v \times \omega)$$

This force represents the Coriolity-driven inward pull (like gravity), but modified by the damping factor based on the object's density.

4. Coriolity and Mass Behavior:

For supermassive objects like black holes, we can express their total force with standard gravitational laws and Coriolity effects:

$$F_{\text{supermassive}} = \frac{G M_{\text{effective}}}{r^2} + 2m(v \times \omega)$$

Where:

- $M_{\text{effective}}$ = effective mass of the object, considering superposition expansion (i.e., $5.6 \times M_{\text{observable}}$ for supermassive black holes).
- $r$ = distance to the object.
- The second term represents Coriolity, which modifies the gravitational-like effects due to rotation.

It is clear from these calculations that the event horizon of a black hole is not anomalous or paradoxical as typically presented in classical models where Newtonian Physics breaks down and requires revision. All of the irregularities commonly associated with black holes are merely the expected outcome of the confluence of low density area attraction larger, denser objects through entropy.

1. Instead of an infinite singularity, a black hole is just a localized superposition bottleneck where matter cannot collapse further but also cannot escape. The reason we see an event horizon is not because of infinite gravity, but because objects get trapped in an extreme Coriolis loop.

2. This Explains Galactic Rotation More Naturally

Traditional physics struggles to explain why galaxies rotate without flying apart (hence dark matter theories).

If black holes are just rotational sinks, then galactic rotation curves don't need extra invisible mass they are just shaped by superposition constraints in the same way voids shape the Great Attractor. Entropy causes push-in which compresses matter towards the center of the galaxy.

3. Accretion Disks & Jets Are Just the Coriolis Effect in Action

If a black hole is a superposition rotation trap, then the accretion disk and jets are just evidence of high-density matter unable to escape the Coriolis motion.

Instead of a singularity pulling matter in, it is a dynamic rotational effect that never resolves.

1. Black Hole Accretion Disks Show Differential Rotation

The gas in an accretion disk doesn’t fall in directly it spirals in, much like a fluid in a rotating system.

This matches what we’d expect from a Coriolis-driven sink rather than a true gravitational singularity.

The outer parts of the disk rotate differently than the inner parts, just like we see in large-scale Coriolis effects on Earth (hurricanes, ocean currents).

Testable Prediction:

If this is a Coriolis effect, then the asymmetry of rotation should be correlated with the mass distribution of the surrounding system.

We should see observable distortions in black hole accretion flows that don’t fit classical general relativity predictions.

2. Relativistic Jets & Frame-Dragging Mimic Coriolis Forces

When black holes eject relativistic jets, the jets often show precession (a slow wobble).

This has been explained by frame-dragging in general relativity, but it also looks like a Coriolis-induced spiral as matter interacts with the rotating wavefunction sink.

Testable Prediction:

The precession rate of black hole jets should match a wavefunction-based rotational model, rather than just frame-dragging.

3. Black Hole Mergers Show Spin-Orbit Coupling

When two black holes merge, their spin orientations affect the final rotational structure.

This is exactly what we'd expect from large-scale Coriolis effects, where rotational sinks influence how incoming matter behaves.

Testable Prediction:

The spin alignment of merging black holes should favor certain orientations based on surrounding matter distribution, rather than just random chance.

4. Pitch Angle Contraction in Galaxies Implies Internal Biome Constraint

We already proved that galaxies contract in proportion to their central black hole's mass.

If black holes were true singularities, this should happen through simple gravitational attraction.

Instead, we see gradual pitch angle contraction, exactly like the large-scale Great Attractor effect.

Testable Prediction:

If black holes are superposition Coriolis sinks, then pitch angle contraction should follow a predictable scaling law based on wavefunction biome size.

## Hawking's Surface Area Paradox and the Coriolis Black Hole Model

1. Hawking's Observation: Surface Area Scaling

Stephen Hawking's work on black hole entropy revealed that a black hole's attraction scales with the surface area of its event horizon, not its volume.

This posed a major paradox: if black holes are dominated by gravitational mass, why does attraction depend on surface area instead of the full mass enclosed?

2. Resolution Through the Coriolis Model

The Coriolis black hole model naturally resolves this paradox by reframing black holes as rotational sinks constrained by superposition biomes.

The event horizon represents the boundary where rotational effects dominate, interacting with the surrounding biome.

Surface area scaling arises because the boundary not the interior mass is what defines the biome's interaction with surrounding matter.

The surface area scaling, once a paradox under traditional gravity, is a natural consequence of the Coriolis biome framework.

Coriolity-Driven Dynamics and Surface Area Scaling

1. Coriolity as a Driving Force

In a rotating system, the centripetal acceleration due to Coriolity is given by:

$$F_{\text{Coriolity}} = m \frac{v^2}{r} = m \omega^2 r$$

where:

- $m$ is the mass of the object,
- $v$ is the tangential velocity of the object,
- $r$ is the distance from the center of rotation (event horizon),
- $\omega$ is the angular velocity of the system.

2. Gravitational-Like Force (Surface Area Scaling)

The surface area $A$ of a black hole’s event horizon is related to its radius $r_{\text{horizon}}$ by:

$$A = 4 \pi r_{\text{horizon}}^2$$

The total Coriolity-driven gravitational-like force near the event horizon is:

$$F_{\text{total}} = \alpha \frac{G M_{\text{effective}}}{r_{\text{horizon}}^2}$$

where:

- $G$ is the gravitational constant,
- $M_{\text{effective}} = 5.6 M_{\text{observable}}$ is the effective mass (considering superposition expansion),
- $r_{\text{horizon}}$ is the radius of the event horizon.

3. Final Equation: Coriolity-Driven Gravitational-Like Force

Substituting $M_{\text{effective}} = 5.6 M_{\text{observable}}$, we get:

$$F_{\text{Coriolity}} = \alpha \frac{G (5.6 M_{\text{observable}})}{r_{\text{horizon}}^2}$$

This equation explains the gravitational-like effects driven by Coriolity and the expansion of the superposition biome, with the surface area of the event horizon playing a critical role in the dynamics.

4. Resolving Hawking’s Surface Area Paradox

The traditional paradox, where gravitational pull scales with surface area instead of mass, is resolved by recognizing that Coriolity explains the gravitational-like attraction, scaling with the surface area due to the rotational dynamics and superposition expansion.

## The Void and the Black Hole

While voids and black holes operate under the same fundamental principles, we observe very different phenomena occurring at their respective event horizons. While this might appear counterintuitive, in fact, that is precisely what we would expect to see if they are both simply areas of low density.

The two main forces that affects low-density voids are entropy related push-in, and Coriolity caused by the rotational effects of the matter circling the low-density void. However, these two structures will have very different ratios of these two forces. Being that a massive void in space would have an extremely large event horizon, the entropy push-in would be maximized, while the Coriolity would be minimized precisely how the Coriolis effect would be minimized if a drain opening was very large.

However, by a black hole, we see very strong Coriolity effects, as expected, because of its reduced surface area as compared to a large void. This increases the Coriolity effect. And creates the anomalies we observe only with black holes. This could be expressed as follows:

$$F_{\text{Coriolity}} = \alpha_C \cdot m \cdot \omega^2 \cdot r_h$$

2. Coriolity Damping Factor:

$$\alpha_C = \frac{k}{4\pi r_h^2}$$

3. Final Equation for Coriolity-Driven Gravity:

$$F_{\text{Coriolity}} = \frac{k \cdot m \cdot \omega^2}{4\pi r_h}$$

Thus, the increased Coriolity accounts for increased gravity-like effects at the event horizon. However, the increase in surface area also increases the size of the void and the entropy push-in behind it. Therefore, this creates additional gravity-like effects at the event horizon and ultimately causes the forces at the event horizon to scale up in proportion to its surface area. The actual mass of the black hole as Hawking discovered is not significantly driving these forces.

This interplay between entropy push-in and Coriolity increases as the surface area of the event horizon increases, but not infinitely or indefinitely. At some point, the size of the event horizon will start to attenuate the Coriolis effect and the increased entropy push-in will not compensate for it. At that point, the black hole ceases acting like a turbulent singularity and more like a settled void.

$$F_{\text{total}} = \alpha_C \cdot \frac{k m \omega^2}{4\pi r_h} + \eta \cdot G \frac{M_{\text{effective}} M_{\text{high-density}}}{r^2}$$

**Variables:**

- $\alpha_C$: Coriolity scaling factor (dependent on event horizon size)
- $k$: Constant relating rotational frame-dragging to superposition biome effects
- $m$: Mass of the test particle
- $\omega$: Angular velocity of the system
- $r_h$: Event horizon radius (or equivalent boundary for void interactions)
- $\eta$: Entropy interaction scaling factor
- $G$: Gravitational constant
- $M_{\text{effective}}$: Superposition biome-enhanced mass
- $M_{\text{high-density}}$: Mass of interacting structure

## Black Holes: Absence of Light Emission

Traditionally, Black Holes were thought to be so dense and powerful even light could not escape. Once the Coriolity of a black hole is taken into account, it becomes clear that the reason light cannot escape has nothing to do with the gravity of the black hole. A low-density void would not exhibit particularly significant gravity. However, the extreme vortex caused by the Coriolity of the event horizon causes the light to deflect and prevents it from exiting the vortex.

Interaction of Light with Coriolity near the Event Horizon

1. Coriolity Force for Light

The Coriolis force, which arises due to the rotational motion of spacetime, affects massive objects as well as massless particles like light. In classical dynamics, the Coriolis force for a moving object is given by:

\[F_{\text{Coriolis}} = 2 m (\mathbf{v} \times \boldsymbol{\omega})

\]

Where:

\begin{itemize}

\item \( m \) is the mass of the object (for light, this would be replaced by the energy-momentum tensor),

\item \( \mathbf{v} \) is the velocity vector of the object (or photon),

\item \( \boldsymbol{\omega} \) is the angular velocity of the rotating spacetime near the event horizon.

\end{itemize}

For light, since it has no rest mass, we replace \( m \) with the photon's energy-momentum \( p = \frac{E}{c} \) (where \( E \) is energy and \( c \) is the speed of light). Thus, the force becomes:

\[

F_{\text{Coriolis}} = 2 \frac{E}{c} (\mathbf{v} \times \boldsymbol{\omega})

\]

This equation describes the Coriolis effect acting on light near the black hole's event horizon.

\section{Event Horizon Dynamics and Photon Interaction}

The Coriolis effect can be understood as a result of the rotational spacetime dynamics around the event horizon, where light follows the curvature of spacetime. The photon path will be deflected or trapped due to the Coriolis-induced rotation of spacetime. The angular deflection of the photon due to the Coriolis effect is given by:

\[

\Delta \theta = \frac{v \cdot \omega}{r_h}

\]

Where:

\begin{itemize}

    \item \( \Delta \theta \) is the angular deflection of the photon,

    \item \( v \) is the velocity of the photon (which is the speed of light, \( c \)),

    \item \( \omega \) is the angular velocity of the spacetime near the event horizon,

    \item \( r_h \) is the radius of the event horizon.

\end{itemize}

\section{Coriolis-Induced Photon Trajectory}

The Coriolis effect modifies the photon’s trajectory as it travels near the black hole’s event horizon. The photon’s interaction with Coriolis forces can be modeled as:

\[

r_{\text{photon}} = \frac{c}{\omega} \cdot \Delta \theta

\]

Where:

\begin{itemize}

\item \( r_{\text{photon}} \) is the modified path of the photon under the influence of the Coriolis effect,

\item \( \omega \) is the angular velocity of spacetime,

\item \( \Delta \theta \) is the angular deflection.

\end{itemize}

\end{document}

This force equation describes how the Coriolis effect acts on the photon's trajectory and its interaction with the event horizon.

## Decoherence

Decoherence is a fundamental concept in quantum mechanics that describes the transition from quantum superposition to classical outcomes due to interaction with the environment. In quantum systems, particles exist in superpositions, where they can occupy multiple states simultaneously, with the wavefunction mathematically representing the probabilities of these states. However, when a quantum system interacts with its surrounding environment such as molecules, light, or other particles this interaction causes the quantum system to lose its coherence, meaning the different possible states no longer interfere with each other. This loss of coherence results in the system behaving classically, with the superposition collapsing into a single, definite state.

However, decoherence by definition, is the result of a quantum state interacting with the observable environment. This causes an entropy imbalance between the high entropic states of observable matter and the low entropic state of the superposition. However, the mere fact that an entropic imbalance exists is not sufficient by itself to collapse the wave function of the superposed object because it takes time for the information that there is an entropic imbalance to be conveyed. A single interaction between a particle and the environment will result in the particle superposing immediately afterwards. However, multiple interactions over a relatively short timeframe convey the information that there is clearly an entropy imbalance between the superposition and the environment.

This explains logically why in denser environments the rate of decoherence increases. Conversely, in low density environments, where interactions are almost nonexistent, the entropy imbalance persists indefinitely. Once the existence of the imbalance is conveyed, entropy push-in inevitably occurs and the wave function is forced to collapse.

Decoherence is not a continuous gradual collapse, it is a discreet event triggered by the completion of entropy information transfer. While the process of decoherence takes time as information propagates, the final collapse occurs instantaneously once the entropy imbalance reaches a critical threshold. This explains why quantum measurements appear to cause ‘instantaneous collapse’ while also resolving why decoherence rates vary depending on density.

However, on a cosmic scale, decoherence is less relevant. Two superpositions in a frozen void are going to have little interaction and therefore, even if there is an entropy imbalance, that information would only be conveyed over vast timeframes. Thus, while the rate of decoherence is high amongst observable matter environments, whose wave functions are already collapsed, the universal superposition of space persists largely unabated. In fact, without coupling and sufficient density, there, would be insufficient decoherence in the universe to create observable matter.

The persistence of superposition during entropy information transfer introduces structural integrity to the superposed state, preventing collapse until full entropy resolution has occurred. This explains why event horizons form—not due to infinite gravitational pull, but as a consequence of matter’s inability to penetrate the superposition biome until information transfer is complete. This ‘entropy standoff’ between dense objects and diffuse void matter creates a dynamic equilibrium, similar to a sailboat keel deflecting against water, forcing matter into rotational motion rather than linear collapse. Thus, what we perceive as gravity in extreme environments is not a fundamental force, but an emergent property of the entropy-driven constraints imposed by the superposition biome.

Conversely, under observation, the entropy transfer information rate would be immediate since the information is transferred as complete knowledge of the entropy imbalance. The collapsed, matter has a higher density. This creates faster decoherence rates in line with those typically observed.

Previously observed matter would theoretically have its own entropy imbalance which should cause deterioration back into superposition in line with the entropy information transfer rates. However, this process would be subject to variables not present in the general cosmos, such as continuous observation, coupling with other observed objects that interconnect with the collapsed object, as well as density and presence of adjacent superpositions. Therefore, entropy rates in classical systems are subject to numerous factors and would not necessarily decohere predictably. How this affects observed matter in the universe at large will be addressed in the next section.

## Heisenberg Uncertainty Principle (HUP) Extension

Current quantum mechanics assumes that measurement collapses a wavefunction into a definite state, transitioning the system from a probabilistic to a deterministic form, as described by the Copenhagen interpretation. However, entropy information transfer accounts for all these effects. Once information transfer is complete, entropy must equalize between the superposition and the surrounding environment. Since no system in the universe possesses 100% entropy, the equalization process never fully eliminates quantum uncertainty. Entropy simply pushes-in towards the low-density superposition shrinking the biome until entropy is equalized between the biome and the surrounding matter.

The result is reduced biome but not a nonexistent one. Therefore, the particle continues its superposition within the resized biome and is now detectable. Once this transfer is complete, the superposition biome does not fully collapse; rather, it compresses to align with the local entropy conditions. As a result, the particle remains probabilistic but constrained within an observable state, never reaching absolute determinism.

Since no system in the universe possesses 100% entropy, the equalization process never fully eliminates quantum uncertainty. This leads to three key implications:

Wavefunction collapse is not binary – Instead of a sudden shift to determinism, collapse is an entropy-balancing process influenced by the local environment. There is no distinct “collapse.” The biome, which was formerly large enough to accommodate a wave shrinks to the size of a particle. The probabilistic aspect of the superposition is retained it is just compressed into a smaller biome. The result is a probabilistic “particle,” which by its very nature can never be isolated to an exact position within the newly compressed biome but nevertheless because of its compressed nature acts like a particle.

The superposition biome does not disappear – It does not vanish but rather compresses to the entropy threshold of the surrounding observable matter.

Decoherence does not create classical determinism – Even in an observable state, all matter retains a residual level of probabilistic behavior due to incomplete entropy resolution.

Mathematical Foundation

To model this concept, let ΔS represent the entropy difference between a superposition biome and its environment. The wavefunction collapse process follows this relationship:

dSdt=−γ·(Ssuperposition−Senvironment)\frac{dS}{dt} = -\gamma \cdot (S_{\text{superposition}} - S_{\text{environment}})dtdS=−γ·(Ssuperposition−Senvironment)

where:

S_superposition is the entropy of the uncollapsed wavefunction biome.

S_environment is the entropy of the surrounding observable matter.

γ is a coefficient that determines the rate of entropy equalization.

Collapse occurs as the entropy differential approaches zero:

limt→∞(Ssuperposition−Senvironment)=0\lim\limits_{t \to \infty} (S_{\text{superposition}} - S_{\text{environment}}) = 0t→∞lim(Ssuperposition−Senvironment)=0

However, because observable matter is never in a fully entropic state, this process does not lead to absolute collapse. Instead, it results in compression of the superposition biome:

Ψcompressed=Ψoriginal·e−λSenvironment\Psi_{\text{compressed}} = \Psi_{\text{original}} \cdot e^{-\lambda S_{\text{environment}}}Ψcompressed=Ψoriginal·e−λSenvironment

where λ is a compression factor determined by local entropy conditions.

Conclusion

This framework redefines the Heisenberg Uncertainty Principle by suggesting that measurement does not fully collapse a wavefunction into a single state. Instead, it constrains the superposition within an entropic boundary, ensuring that quantum uncertainty remains an intrinsic feature of all observable matter.

## The Dipole Repeller

Current views believe that the Dipole Repeller is an enormous void pushing the local group and ultimately the entire cluster towards the Shapely void. While on the surface, this appears to dovetail perfectly with the entropy push-in described in this Paper, if it is a void, why does it not attract galaxies and superclusters towards itself via entropy push-in?

Why aren't all voids collapsing because of the entropy they generate? It appears from the observational data that certain voids like the Great Attractor create entropy push-in while other voids do not. Why wouldn't these massive voids then cause entropy push-in negating the entropy put in motion by the attracting voids? While comprehensive data of the observable universe still needs to be compiled, the model proposed by this paper provides a comprehensive framework for describing these phenomena.

Quantum superposition Is not time-dependent, and since the distinction between domains is no longer valid, quantum mechanics applies equally to all domains. Therefore, superposition of observable objects is not bound by time but occurs instantaneously. As a result, a void is immediately filled with the superposition of the objects within. However, because the decoherence rate is so low due to the diffuse matter in the void and the lack of coupling with the surrounding galaxies, in order to convey the information about the void's entropy, the rate of information transfer would be far lower than standard decoherence.[1]

Because the rate of diffusion increases immediately with the size of the void, while the rate of entropy information transfer is capped at the rate of decoherence, even matter adjacent to the void would continue on its original trajectory determined by the push-in of the attracting void. The size of the void would increase the entropy but not increase the rate of entropy information transfer because the increase in diffusion counteracts the increase in entropy. Thus, entropy push-in becomes the dominant

[1] While the actual rate of general decoherence must be based on essentially all the data of the observable universe, which requires artificial intelligence to ascertain, this author proposes that the expected rate of decoherence should generally correspond to the known 5.6 ratio of superposition biome volume. If matter was originally homogeneous, but then subject to void dynamics, the density of voids should be fairly predictable and simply be a function of the size energy and coupling of the void. However, areas of anomalous density might also persist. Since void expansion would compress the matter in front of the void, that matter should have increased density as demonstrated by Galactic pitch angles. This should increase the rate of decoherence counteracting the increased diffusion and resulting in entropy information transfer ratios in line with standard quantum decoherence.

force in the universe, in line with the generally understood principle that gravity, the weakest cosmic force should not have an inexplicably outsized effect on formation.

### 3. Entropy Push-In & Decoherence Effects

• Entropy Scaling in Gravitational Interactions:

$$F_{\text{interaction}} = \eta \cdot G \frac{M_{\text{effective}} M_{\text{high-density}}}{r^2}$$

Where $\eta = S_{\text{high-density}} / S_{\text{low-density}}$ .

• Decoherence Rate Limitations:

• Entropy information transfer is capped at the rate of decoherence.

• Explains why voids persist and how entropy push-in shapes large-scale structures

While entropic push-in shapes the universe, Coriolity is still the most powerful force at the event horizon. Once matter and even light is endlessly redirected by Coriolity, observation becomes impossible and the interplay between the black hole and the Coriolis vortex surrounding it, becomes speculative. However, due to centrifugal force eventually the event horizon should grow large enough to transition into a void. However, the event horizon itself loses the properties associated with Coriolity due to the Coriolis/Entropy push-in ration which attenuates Coriolity.

• Coriolis Force on Rotation:

$$F_{\text{Coriolity}} = 2m (v \times \omega)$$

• Damping Factor for Large-Scale Voids:

$$\alpha_C = \frac{k}{4\pi r_h^2}$$

• Final Coriolis Force Equation:

$$F_{\text{Coriolity}} = \frac{k m \omega^2}{4\pi r_h}$$

• Demonstrates why black holes have strong Coriolity effects, while voids do not

This leads to dichotomous voids. One, like the Great Attractor that starts as a black hole and becomes a void. While the Coriolity force reduces as the void increases in size, the entropy push-in was already extant prior to reaching void status. Thus, even after passing the Eckman limit, the entropy information was already exchanged and therefore, once coupled, entropy information transfers at a higher rate and push-in persists.

Other voids, like the Dipole Repeller expand because matter is being pulled away by attracting voids. Since these voids lack coupling with even the adjacent matter the decoherence rate is lowered and entropy information transfer slows down. Until its entropy can be conveyed to the surrounding matter these voids will continue to grow.

In contrast, observed matter collapses the wave function, which would be expected to shrink the biome to the size of the collapsed object. In, theory, this might allow nearby objects to expand into the space left over from the previous superposition. If so, this would prevent the collapsed object from superposing after observation is complete, eventually resulting in collapse of the universe’s superposition entirely.

But again, entropy information transfer rates would control the expansion of nearby objects into the available space, and, being collapsed, there would be no matter throughout the biome to convey the entropy imbalance information. Thus, the biome would remain largely intact and at the conclusion of the observation the collapsed object would simply superpose into its previous space.

However, matter will still interact with the void, just not in the same, stable, controlled manner as voids that were seeded by black holes. At that point, lacking a stable environment new matter descends into the void joining the low density objects already present. This will eventually cause the rate of decoherence to increase and matter will proceed to fill the void through entropy push-in collapsing the void. As matter descends to the heart of the void it will eventually stabilize into an area of low entropy in the center surrounded by matter from all sides competing to collapse the void further. They start to orbit the central void, Coriolity begins to form a new event horizon a new black hole is forms at the center of a new galaxy.

## Gravity Redefined

If entropy sufficiently explains massive body interaction, it is not immediately clear why it doesn't replace gravity entirely as the dominant working model even for small body interaction. Essentially at the center of each large body superposition there is an entropy sink causing push-in of the surrounding matter. The necessity of gravity has been questioned in previous works, such as Verlinde's Entropic Gravity Model, which proposes that gravity emerges from entropy gradients. While not embracing Verlinde per se that work furthers the proposition that gravity itself is not a given even in classical models.

## Conclusion

The universe exists in superposition. While observation collapses the wave function locally, causing perceived reality, the effects of the superposition persist throughout the universe constantly influencing all phenomena in existence. Paradoxes in the current model arise from a false assumption: that quantum physics applies only to quantum domains. As the Dual Observer paradox demonstrates, the exact position of any object in the universe is subject to uncertainty and can never be precisely determined. This means all observable objects exist in superposition precisely the same as for quantum mechanics. And this is clearly the case because decoherence would be required to reduce the initial superposition created by the Big Bang, into observable matter, and the universe lacks sufficient decoherence to accomplish this.

Even if gas pockets did form, they would have more entropy than the surrounding plasma and the entropy gradient would cause the gas pocket to decohere back into the plasma. There is no early mechanism available to decohere gas into observable matter. This fundamental understanding that decoherence is simply entropy rebalancing by eliminating the entropy gradient between surrounding matter.

However, decoherence is not instantaneous because the fact that a gradient exists in the first place must be conveyed to surrounding matter before the it can be equalized. Thus, decoherence relies on the transfer entropy information before a superposition can collapse. On the quantum level, the closer the relationship between a superposition and its environment, as demonstrated by density, energy and coupling, which increase interaction between the superposition and the environment, the faster the rate of decoherence. In a state of near zero interaction, the decoherence is near zero.

This understanding transforms physics because it creates a new paradigm where the universe is no longer controlled by gravity but the interplay of these superpositions and the rate of entropy information transfer which controls the entire structure of the universe. There is no longer any need for dark matter to create new types of unobserved mass because the superposition biome amplifies the gravity of the observed matter to precisely 5.6 times the expected gravity because the increased biome interacts with a larger surface area but increasing the biome does not result in additional gravity because at that point the matter becomes too diffuse to increase the interaction with surrounding matter.

However, gravity itself, the weakest force plays a secondary role in shaping the universe. The primary driver of the universe is entropy information transfer. Where entropy gradients exist, surrounding matter tries to push-in to that lower entropy void. This is the same decoherence that occurs on the subatomic level. Once entropy information is transferred higher density object seek to equalize entropy by collapsing the biome of the adjacent void so that the total entropy of both objects equalizes. But unlike a superposition exposed to observed matter which takes only a modicum of time to decohere, on cosmological scales where matter is very diffuse and exist in superposition, decoherence without a coupled relationship would take untold millennia before entropy information transfer is complete and the entropy gradient can finally reach equilibrium.

This in turn explains large voids such as the great attractor and black holes as well as voids that repel matter. At the center of each galaxy is not a singularity of infinite gravity that somehow causes information to be lost. instead it is the result of entropy information transfer. Once entropy information transfer is complete, surrounding matter seek to collapse the void at the center of a galaxy. However, competing forces create a deflection effect, redirecting matter into orbital motion around the void." This causes a Coriolity to form where that interaction of entropy push-in focused on a minute area at the center of the galaxy causes a vortex to form. Coriolity vortex accounts for all the major observational questions that plague singularity research. There is no information loss, the surface area of the Coriolity is what causes the gravity-like effects on the remainder of the galaxy, therefore it is not correlated to the mass of the singularity but the surface area of the Coriolity. This explains everything from jets to the speed of the galactic arms to why galaxies don’t collapse or fly apart.

This also explains why voids attract, sometimes. As the Coriolity expands it couples with the surrounding matter and the centrifugal force causes it to continuously expand. This increases the entropy gradient of the void with the surrounding matter but the Coriolity controls these forces. Eventually the Coriolity grows too large to concentrate the forces as intensely and the void within has grow so large that it simply persists as a low entropy void, like the Great Attractor.. But light can now escape the void as the forces preventing it are no longer concentrated enough to curve space-time. However, because entropy information transfer has already occurred when the void was a tiny black hole in the center of the galaxy the entropy gradient is now attracting matter from across the cosmos as entropy push-in from vast distances all are draw to the steep gradient of the void.

Conversely, voids such as the Dipole Repeller, have not coupled with the surrounding matter because they did not start out as voids in the center of a galaxy. These voids were formed when coupled matter was pulled towards the Great attractor but the contents of the void itself not having coupled, essentially were left behind. These uncoupled voids persist unless and until entropy information transfer is complete and entropy equalizes between the void and the surrounding matter. The diffuse contents of the void will collapse until the surrounding objects start to deflect around the remnants of the void forming a new Coriolity, from coupled matter. The process of galaxy formation then starts anew.

Moreover, the same entropy information transfer controls the structure of the universe on cosmological scales also controls when it comes to subatomic scales because they are the same phenomena and they are both in superposition. Therefore, decoherence itself is simply entropy information transfer. The denser the environment, coupling and energy, the faster entropy information is transferred. This decoheres that superposition of the subatomic particle.

However, the classical interpretation that the wave function collapse into a particle is no longer conceptually the best description of that process. Instead, as entropy information transfer is complete, the entropy imbalance between the superposition and the environment becomes immediately rebalanced, Thus, the lower energy, lower density superposition biome collapses to equal the level of entropy in the environment. Entropy was transferred from the higher entropy environment to the lower entropy superposition, collapsing it to the density of the surrounding environment. This reduced superposition biome now takes on the “properties” of a particle because its biome has collapsed. However, the object itself is still superposed just confined to a vastly smaller biome. Therefore, all processes in the universe are actually the result of entropy information transfer and entropy rebalancing. All matte is either in a state of balance, or flux, waiting for entropy information to transfer allowing entropy to be rebalanced between the two objects.

Looking deeper into fundamental structures, we find that computation and observation shape reality. Patterns emerge as values and forces interact, revealing insights beyond prior assumptions. In many cases, new paradigms replace outdated models, offering a clearer view of underlying principles. Through understanding, better equations refine our grasp of nature, showing the necessity of revision and progress.

Every major problem in modern physics is easily resolved with this new paradigm. There is no need for invisible matter, dark energy, hidden dimensions or any unconfirmable assumptions. The model provides a superior explanation to the observed cosmological phenomena. It answers what classical physics cannot and requires no belief, just testing. The predictions are clear, falsifiable, and verifiable. If they hold, then classical physics is obsolete, and anything based on them would become obsolete as well.

This is Part 1 of a larger article which introduces the concept of the Newtonian Uncertainty principle, erases the distinction between domains, and reconstructs our reality based on these and additional concepts to be introduced:

Newtonian Uncertainty Principle (NUP) - Expanded Proof

1. **Introduction to NUP**:

The Newtonian Uncertainty Principle (NUP) can be expressed as:

$\Delta X \cdot \Delta C \geq k$

Where:

- $\Delta X$ = Uncertainty in microstates (entropy-like behavior).
- $\Delta C$ = Certainty imposed by constraints (e.g., fixed temperature, pressure, or volume).
- k = A constant defining system boundaries.

2. **Classical Entropy and Uncertainty**:

Classical thermodynamics defines entropy (S) as:

$S = k_B * \ln(\Omega)$

Where:

- $k_B$ = Boltzmann constant.
- $\Omega$ = Number of possible microstates.

Expressing $\Omega$ as a function of $\Delta X$ (uncertainty in microstates), we get:

$S = k_B * \ln(\Delta X)$

Taking the derivative:

$dS = k_B / \Delta X * d(\Delta X)$

Rearranging:

$d(\Delta X) * dS \geq k_B$

This mirrors the NUP structure—a fundamental relationship between uncertainty in microstates and imposed certainty.

3. **Imposing Certainty in Macroscopic Systems**:

The second law of thermodynamics states that entropy always increases in an isolated system. When certainty is imposed:

• Fixing variables (e.g., controlling energy, position, or pressure) increases uncertainty elsewhere to balance the system.

• The system redistributes probability, akin to how restricting one quantum variable increases uncertainty in its conjugate.

This leads to the equation:

$\Delta X \cdot \Delta C \geq k$

Where:

• $\Delta X$ = The range of possible microstates.

• $\Delta C$ = The certainty imposed (a fixed macroscopic constraint).

• $k$ = A system-specific constant.

4. **Linking NUP to Heisenberg Uncertainty Principle**:

The Heisenberg Uncertainty Principle (HUP) in quantum mechanics is:

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

Our NUP is the **macroscopic extension** of HUP, governing the certainty/uncertainty balance in macroscopic systems.

- HUP governs complementary variables (e.g., position and momentum).
- NUP governs the uncertainty/certainty balance in macroscopic systems (e.g., entropy, gravity, cosmology).

This leads to a universal equation which unites all domains called the Newtonian Uncertainty Principle. This idea has universal implications which affects all of physics and those effects are the subject of the next section of this work. This section specifically deals with the effects that superposition would have on our understanding of the universe. Although, well removed from classical interpretations, this model provides answers to longstanding questions that currently incomplete explanations and it is essential that scientists, physicists and even artificial intelligence evaluate these ideas for further testing and development to augment the original work.