

# The Probabilistic Event Horizon: The New Paradigm

The Probabilistic Event Horizon, a new concept, which this paper will describe, derives from the continuing tension between infinite and finite processes. Such *ubiquitous* event horizons are the source of all physical systems, and their most fundamental characteristics.

If limited by *randomness*...which prohibits precise characterizations, the observable laws of quantum matter and energy, (before some great equilibrium event), might at best yield only a Planckian Chaos – by this, **I do not mean** the derivative quantum vacuum fluctuations of Quantum Chromodynamics (QCD) – but yes **the much more profound and universal close quantum regime found at the Planck and Stoney clustered scales.**

*If we were to consider the Universe as Infinite or boundless, (having only immutable eternal natural laws), **nothing should change**, i.e. we should only encounter a great plain of existence from which either bounded or infinite models **might** have been sustained.*

Whether photons or particles, planets or stars, or even Black Holes or the Universal Event Horizon itself, all expressions present high-curvature boundaries, where relativistic values *are strictly Planckian in origin*<sup>1</sup>, (see diagram) and thus defy overly strict applications using the various space-time geometries.

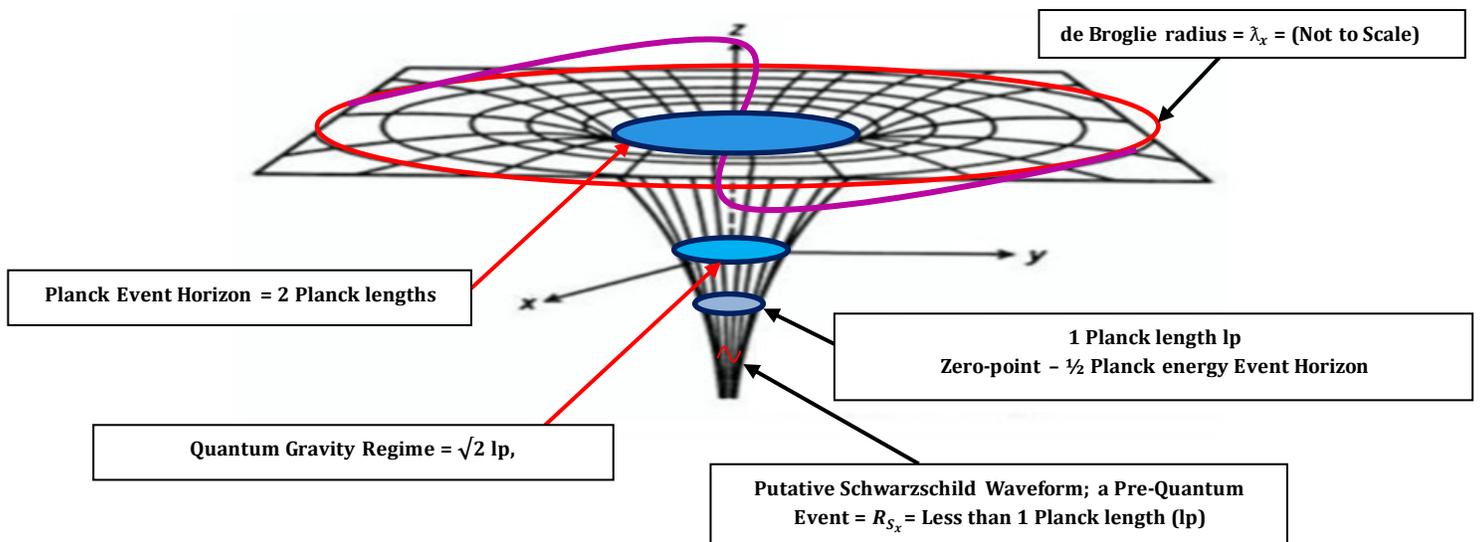


Figure (1), Concerning Pre-Quantum Events, the Quantum Well and Planckian space.

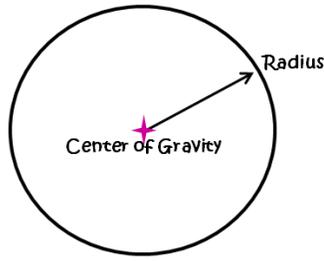


Figure (2), Strict applications of standardized geometries are *excluded*:

Infinity, as we already know through number theory, contains at least three distinct biases or attractions, (1) one towards greater macro-infinities, another (2) towards ever smaller micro-infinities, and a third bias (3) where these first types of two attractors meet, (*through equality of exchange*) towards repetition in a specific local. In such locales, chaotic synchronization<sup>2</sup> occurs through Buffon  $\pi$ <sup>3</sup> and Feynman ratchet effects<sup>3</sup> - and the Planck Interaction is born, as an Infinite-finite interaction.

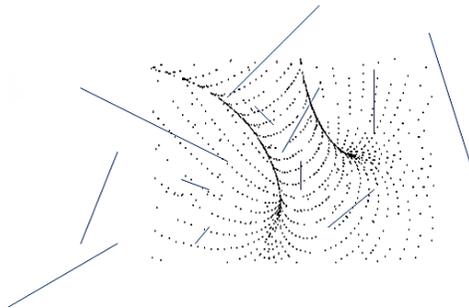


Figure (3) the (*Infinite-finite*) Interaction: *the Planck particle meets Infinity, its maker.*

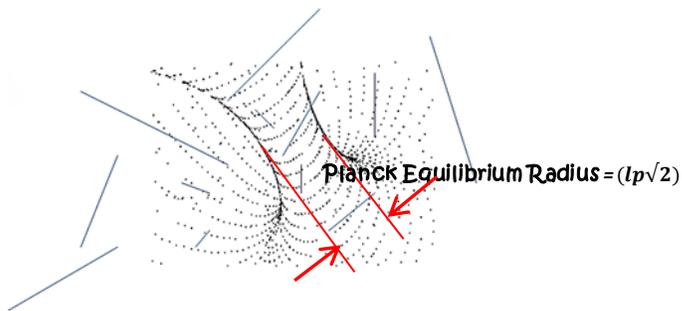


Figure (3), *Incoming* Pre- and Post- quantum gravitational and electromagnetic signals encounter at and inform the *Planck Equilibrium Radius = (lp√2)* .

We have defined that Pure Space has no characteristics whatsoever... yet, that *non-null* Pure Space<sup>4</sup> has definite and real properties which are both quantized in their interactions and

completely synchronized at the Planck Interaction scale. This Planck Interaction, for being thus universal, transcendent<sup>1</sup>, and ubiquitous takes on the character of non-locality. At quantum scales, (before large-scale system interactions are considered), the concept of *locality must also be abandoned*, and events must involve using likelihood/probability distribution calculations. These probabilities become the effective influence at any given point, however they do not, nor should they represent... *geometric certainty in any sense*.

Yet, this continuing ***Infinite to finite interaction*** propels a series of interactions, all of which have their beginnings as a localized bias in space towards Gravitational and Electromagnetic Force equilibrium. It is precisely this probabilistic bias towards equal exchanges of forces which permeates infinity, (being necessary). In our local Universe, such interactions occur primarily at Planck scale (Planck Interaction) (times and thus distances) in a mathematical regime of bijection, which permits contextual interactions at differing scales. Locally this bias is known by another name, the Planck Charge, and as the Planck Interaction. In the greater context of non-null infinite pure space, it is here that time is equalized throughout infinity.

### Planck Monopole Charge

In basic geometry we have that the square root of two ( $\sqrt{2}$ ) is involved in both the hypotenuse and area of orthogonal vectors; (the Planck length ( $l_p$ ) is unity i.e. =1).

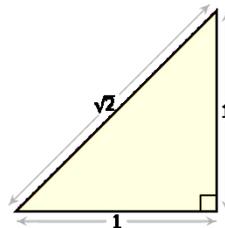


Figure (5), The *Planck Equilibrium Radius* = ( $l_p\sqrt{2}$ ).

The Planck Monopole Charge can be divided into two separate but balanced regimes (*radius and counter-radius*), being that complimentary Gravitational and Electromagnetic radius lengths always yield a product (*area axis*) associated precisely to  $(l_p\sqrt{2})^2$ , both a perfect square, and well inside the Planckian Black hole event horizon.

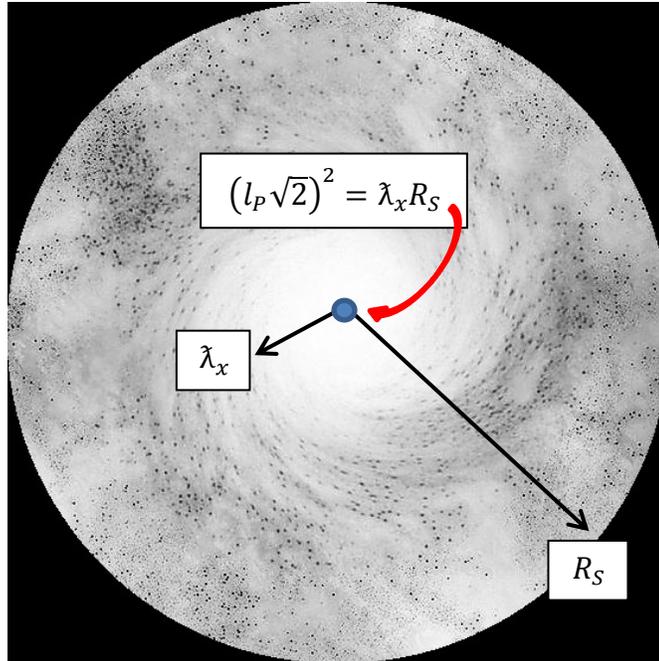


Figure (6), Macro-dimensional\* radius x counter-radius; yields the *Planck Area* =  $(l_p \sqrt{2})^2$  axis.

\*Note that the relative size of the *de Broglie* radius is unimportant; whether photon or particle, planet or star, it is always accompanied by a complimentary size in the Schwarzschild radius, and yields an exact relation (*the inverse is also true*).

$$2 \frac{G\hbar}{c^3} = 2l_p^2 = (l_p \sqrt{2})^2 = \lambda_x R_{S_x}$$

Where;

$2 \frac{G\hbar}{c^3} =$  the *Bekenstein Hawking Area Constant*.

For any event whatsoever, a general equilibrium is achieved according to the event's *de Broglie* and *Schwarzschild radii*. Whether photons or particles, planets or stars, or even Black Holes or the Universal Event Horizon itself, all expressions have boundaries, whose *centers of gravity* are strictly *Planckian*, and at the **Planck Equilibrium Radius** =  $(l_p \sqrt{2})$ .

1. Gravitational bias: is towards the internal plain, the ever smaller micro-infinities, and as such it forms (*what we would view from outside of a Planck Interaction locale*) the monopole basis, the singularity portion of the interaction.

2. Electromagnetic bias: is towards ever greater macro-infinities, (1<sup>st</sup>) is charge separation, then (2<sup>nd</sup>) creation of the baryonic world, and then finally (3<sup>rd</sup>), the cosmos... *the 3<sup>rd</sup> regime*).

We note that the square root of two is a widely used constant which occurs often in probability theory and power calculations.

$$\sqrt{\frac{1}{2}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2} = \sin 45^\circ = \cos 45^\circ = 0.70710678$$

In the case of baryonic particles (*using the proton as an example*), we have:

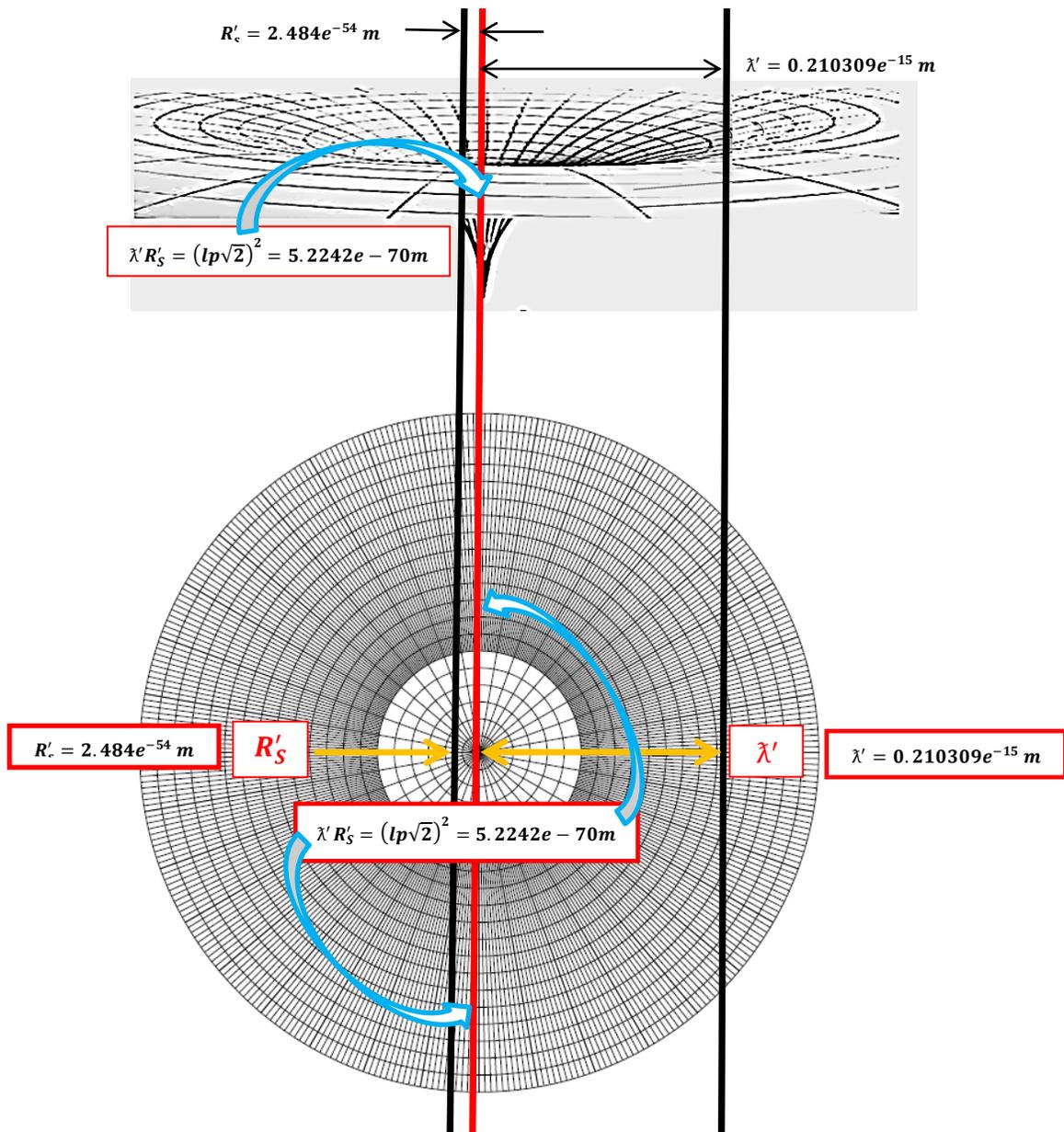


Figure (7), Radius and contra-radius yield the *Planck Area* =  $(l_p\sqrt{2})^2$  axis.

The Proton is an example of Universal Coherence:

Where;

$l_p$  = the Planck length;

$l_p\sqrt{2}$  = the Planck Equilibrium radius

$R'_{sw}$  = the Proton Schwarzschild radius;

$\lambda'$  = the Proton de Broglie radius.

### Probabilistic Event Horizons

The probabilistic “black hole” event horizon refers to the well boundaries delimited above, the Quantum - Gravity Regime then really begins at the  $l_p\sqrt{2}$  probability amplitude (the well), and *within* the Planck Energy Event Horizon of 2 Planck lengths. The square of this ubiquitous event,  $(l_p\sqrt{2})^2$  is a “probability density”, it delineates the Bekenstein Hawking Area expansion constant  $2 \frac{G\hbar}{c^3}$  <sup>ref</sup>, and is where *Graviton - Particle* interactions begin to integrate.

The energetic probability density found at  $(l_p\sqrt{2})^2$  defines a (de Broglie × Schwarzschild) radius product for all particles <sub>(x)</sub> at  $\lambda_x R_{S_x}$  ;

$$2 \frac{G\hbar}{c^3} = 2l_p^2 = (l_p\sqrt{2})^2 = \lambda_x R_{S_x}$$

This ubiquitous (well) event, a direct result of Continuing Quantum Iteration<sup>5</sup>, is possible only thru contradictory forces i.e. Gravity vs CQI<sup>5</sup> (de Broglie) expansion continues being applied at all times.

Simply, particle resonance requires a well, where gravity acts as a sink... this probabilistic black hole event horizon serves as the well boundary... in which resonance can occur.

In quantum theory, for this well's existence, the (de Broglie \* Schwarzschild) radius product ( $\lambda_x R_{S_x}$ ), (the modulus squared of two probability amplitudes)... or “probability density” (P) may be used

$$P = |\phi|^2$$

Such events, though detectable as effective probability amplitudes ( $\phi$ )... cancel around their mean waveforms, and thus, we must use their probability amplitudes squared ( $\phi$ )<sup>2</sup>, the “probability density”. We consider that our probability amplitude (below) is derived from the above mentioned Quantum Gravity Regime.

$$(\phi) = \sqrt{\lambda_x R_{S_x}} = l_p \sqrt{2}$$

The significance of this wavelength is that it is both universal, and yields the RMS value (0.707) of the Planck Energy.

For a symmetrical sinusoidal waveform, the average value is zero, however, this average value is neither correct nor does it serve any purpose. To rectify this problem, the RMS value can be defined as the effective value of a varying voltage or current. It is the equivalent of a steady DC (constant) value which would yield the same effects. Hence, it is also a real measure of energy content.

In statistics and its applications, the root mean square (RMS) is defined as: the square root of the mean squared (the arithmetic mean of the squares of a set of numbers). This RMS is also known as the quadratic mean and is a particular case of the generalized mean with an exponent of two.

This probabilistic bias (mentioned above) descends into the **Infinite-finite** interaction plain<sup>6</sup> between the incalculable infinite and the localized Quantum-Schwarzschild relativistic surface. It is the purest form of quantum energy and is the source of all other forms of energy.

### **The Planck Charge Monopole**

Charge can be used in the sense of bias. In Planck’s quantum derivations, this bias is known by another name, the Planck Charge. The Planck Charge Monopole is this universal probabilistic bias, deduced as allowable for the Planck particle, and greater than the quantum of electric charges ( $e^{-/+}$ ), which are derived from it. The Planck Monopole Charge is an ubiquitous characteristic of quantum space, and Gravity is its complimentary force.

The most essential characteristic of charge is that it has no bias other than de Broglie outward *repulsive* bias, and though the derived opposing electric charges ( $e^{-/+}$ ) continue to react; it is only with each other  $e^{-}$  to  $e^{+}$ . In the case of the derivative electric charge ( $e^{-/+}$ ), we can characterize the outward de Broglie *repulsive* bias *and* include its effects together with a complimentary attraction towards an existing opposite ( $e^{+}$  towards  $e^{-}$ ) *or* ( $e^{-}$  towards  $e^{+}$ ). This action is all derivative of the monopole base: the Planck Monopole Charge background. This will

be discussed in another paper on Charge Separation, and further, as a compliment, the author will release a study on the Nature of Event Horizons.

## Conclusion

Every quantum well must express in two ways, (through its putative outward de Broglie pressure), and through its opposing gravitational (inward pressure). An internally generated and finalized de Broglie radius (or series) is counterbalanced by a complementary Schwarzschild radius-series. Yet, particles themselves are derived from, already exist within, and are part of a greater local universal event series.

So how then is the jump made to the “rest” of the Universe? What is a correct understanding of the universal frame? These questions will be addressed in a proximate article “the Nature of Event Horizons” exploring the notion that the well-known Schwarzschild equation is also a *gravitational to quantum conversion equation*.

$$c^2 = \frac{2GM}{R_s}$$

Where symmetric equilibriums which determine the quantum space, (in which we reside), are found in a state of fugue, producing “wells” through a continuing tension sourced in an infinite process.

## References

1. [https://www.academia.edu/4228866/The\\_Planck\\_Interaction](https://www.academia.edu/4228866/The_Planck_Interaction)
2. [https://www.academia.edu/37930511/Coherence\\_from\\_an\\_Infinite-finite\\_series\\_Einstein\\_s\\_Dice\\_and\\_Feynman\\_s\\_Solution](https://www.academia.edu/37930511/Coherence_from_an_Infinite-finite_series_Einstein_s_Dice_and_Feynman_s_Solution)
3. [https://www.academia.edu/37553069/Feynman\\_Mechanism\\_as\\_a\\_Low-Entropy\\_Beginning\\_for\\_a\\_Universe\\_in\\_Equilibrium](https://www.academia.edu/37553069/Feynman_Mechanism_as_a_Low-Entropy_Beginning_for_a_Universe_in_Equilibrium)
4. [https://www.academia.edu/37487395/On\\_Infinite\\_Curvature\\_and\\_the\\_Development\\_of\\_Pure\\_and\\_Quantum\\_Space](https://www.academia.edu/37487395/On_Infinite_Curvature_and_the_Development_of_Pure_and_Quantum_Space)
5. [https://www.academia.edu/36456794/The\\_Cosmic\\_Microwave\\_CMB\\_and\\_Infra\\_Red\\_Background\\_CIRB\\_are\\_Simple\\_Effects\\_of\\_Continual\\_Quantum\\_Vacuum\\_Iteration](https://www.academia.edu/36456794/The_Cosmic_Microwave_CMB_and_Infra_Red_Background_CIRB_are_Simple_Effects_of_Continual_Quantum_Vacuum_Iteration)
6. [https://www.academia.edu/37930511/Coherence\\_from\\_an\\_Infinite-finite\\_series\\_Einstein\\_s\\_Dice\\_and\\_Feynman\\_s\\_Solution](https://www.academia.edu/37930511/Coherence_from_an_Infinite-finite_series_Einstein_s_Dice_and_Feynman_s_Solution)