

# Our Cosmos = Holographic 4D-Spherical Standing Wave

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The breakthrough perspective afforded by this simple paradigm -- of viewing the cosmos as a 4D Onion, implemented as a hyperspherical standing wave -- suddenly our universe becomes demystified! Starting from a higher-dimensional perspective of viewing the grand-scale of the Cosmic Onion as being the context in which our universe experiences Space~Time expansion. It goes on to describe the most fundamental details of the invisible sub-microscopic quantum world. It does so by labeling these tiny geometric wave-constructs with the fundamental physical constants that make up the CODATA database and whose values and experimental backing are exhaustively documented at the National Institute of Standards and Technology website NIST.gov.

Amazingly, once we have described this foundational model, we will ask the model questions, that have perplexed mainstream science for centuries, and the model, ITSELF, will answer those questions. But, unlike scientific tradition, it will not stop at describing the behavior of physical phenomena, but will explain, fundamental aspects about how the universe works. We will ask the model to resolve the confusion concerning mystical concepts like: "particle-wave duality", "action at a distance", "Dark Matter" and "Dark Energy" and even resolve "relativity paradoxes." We'll ask it to explain photons, matter, Gravity, Electromagnetism as well as the Strong & Weak interactions ALL as being manifestations of these "truly fundamental" quantum-wave constructs.

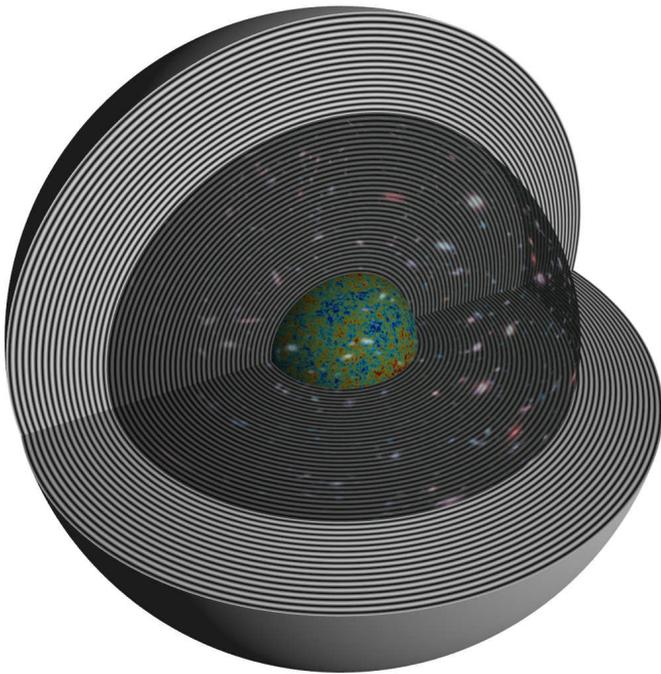
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## 1. Introduction

As Earthlings we see only surface manifestations of the universe in and around us. Our minds become aware of time by correlating past memories with present moment observations

### 1.1 Higher Perspective is the Key to Understanding

In order to grasp the Universe, our mind's eye must transcend the dimensionality of Space~Time. In addition to 3D space our model needs TIME as one of its geometric dimensions.



*Cosmic Onion: not to scale, the layers are really super-fine*

The Cosmic Onion paradigm enables us to envision our ever-expanding Universe "as an outside observer", as we can see in Figure 1. It employs a shape of a 4D hypersphere with layers to represent the whole Cosmos: past, present and future.

Cosmic~Time is the radial direction in spherical geometry. Starting from the center, it is an integer count of layers outward. The spherical layers (3D slices through the 4D Hypersphere) are the spatial dimensions, each representing a particular moment in time. They are separated one Planck-time from each other. At the core, is the Cosmic Microwave Background (which is how our Universe looked just as it became transparent); the outer darkness is waiting for "Now" to arrive.

Think of each Onion-layer as being thin holographic film - as the Universe expands, each layer could image the Universe, retaining a trace of every individual particle.

### 1.2 Aether or not?

If a cubic meter of the "Vacuum" were truly empty it would have one-and-only-one property: a "cubic-meter of nothingness" - incapable of carrying light waves. However, the Space~Time Medium has at least 4 properties even BEFORE we count the 5 Planck units.

Consider a stretched 2D drum membrane or 3D flask of water being suction pumped - an elastic fluid, under negative pressure (enabling transverse waves). This is the state of the Space~Time Medium; the context in which all quantum wave phenomena exist, including the wave constructs that create and persist "particles" of matter.

The Cosmic Onion hypersphere is a wave medium. It is a standing wave constructed by concentric inward + outward waves - passing through each other - cancelling out "apparent" motion - each layer 180-degrees out-of-phase of the next.

**1.3 Space~Time with a Twist**

Once I noticed the **RATIO** between the Magnetic Force constant,  $K_m$  ( $1 \times 10^{-7} \text{ N(s/C)}^2$ ) and  $\mu_0$  was  $4\pi$  -- the rest of the Cosmic Puzzle pieces fell in place.

The period of each oscillation = Planck-time, about  $5.38 \times 10^{-44}$  of a second; this defines the "thinness" of each layer.

Given this geometry we can already ask our first question:

**Q:** What is the differential of these standing-wave wavelets as they pass through each other?

**A:** They are transverse waves circularly oscillating, so:

$$2\pi K_m - (-2\pi K_m) = 4\pi K_m = \mu_0 \tag{1}$$

The model's geometry explains that Magnetic Permeability of Space ( $\mu_0$ ) is caused by these inward versus outward concentric, rotationally oscillating, standing waves. The Magnetic Force constant is the 1<sup>st</sup> and most fundamental and the geometries, herein, put a **constraint** upon these other values:

(Let  $\rightarrow$  mean "yields" and also defines a cause-to-effect relationship.)

$$K_m \times 4\pi \rightarrow \mu_0 \times c \rightarrow Z_0 \times c \rightarrow 1/\epsilon_0 \tag{2}$$

$$\mu_0 \times c^2 = \frac{1}{\epsilon_0} = 4\pi \times K_e \tag{3}$$

The light that we can see is electromagnetic waves propagating on the surface to the Now-Manifold. Its speed is expressed as linear-distance/unit of time, i.e. *299,792,458 meters/second*.

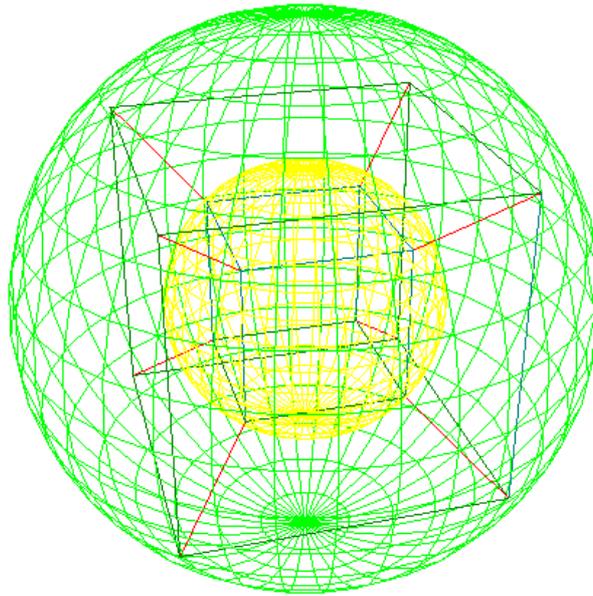
Quantum physics talks about higher-dimensions being curled-up<sup>[1]</sup> smaller than the Planck-length<sup>[2]</sup> - and, there is a debate within the physics community whether or not "time" is a "dimension."<sup>[3]</sup> The Cosmic Onion Model resolves BOTH these questions.

- 1) It models forward-time as being all the normal-vectors (a right-angle line to these Onion-Layers pointing upward.)
- 2) Because these layers are rotationally oscillating, think of each normal-vector as being caught-up in these oscillations, like tiny twisted springs.

**1.4 Big Flash... Rather than a Big Bang**

Cosmos means Order; the geometry of the whole 4D Onion. Whereas, Universe is all of Space as it exists in a single moment, the single 3D wavefront expanding within this 4D spherical Space~Time context.

To help envision a sphere expanding inside a hypercube, consider the **yellow** inner sphere, being the universe at half its current size; expanding to the outer **green** sphere, representing the universe at its current size / age. Like a pebble in a pond, the "Big Flash", beginning from the center of our Cosmic Onion,



initially this abrupt (one Planck-time thin) ever-expanding 3D wavefront; defining the moment called "Now", and established the direction that time flows.

**The expansion of  
the Universe  
IS  
one-and-the-same  
AS  
the forward flow of  
time itself!**

Analogous to the 2D surface tension of the abrupt density difference between air and water, while expanding, it encounters resistance, as it penetrates the Cosmic Onion-layers. Science calls this resistance

the Impedance of Free Space,  $Z_0$ . This resistance is what regulates expansion; literally regulating the rate time proceeds forward. Slice a plane through the center and discover the Great Circle circumference of this expanding sphere grows at  $2 \times$  speed-of-light.

Analogous to the 2D surface tension of the abrupt density difference between air and water, this "Now" wavefront, as we introduce matter, morphs its 3D-surface, develops dents, becoming a 4D Manifold = all of space as it exists right now. Therefore, from now on, we will call it the "Now-Manifold".

**Now-Manifold = The Unified Field  
≈ Einstein's Spacetime manifold.**

The table below summarizes the inward+outward standing waves; showing the "affinity" the Now-Manifold has for the outward righthand twisting of the forward time direction. This goes along with the right-hand rule for current vs. B-field.

<b>Cosmic Onion</b>	Clocks	Time	Handedness & Direction	Angle
	Forward	will be Future	Right - ↑	positive°
	<b>Now-Manifold</b>	Is Now	Right - ↑	positive°
	Backward	was the Past	Right - ↓	negative°

**1.5 Invisible Symmetry Revealed**

For gravity, electric and magnetic forces the 3 familiar Newton force equations are the same form, yet have different constants of proportionality:  $G$ ,  $K_e$  and  $K_m$ . In the equation table below notice the dimensional units; factoring out Newtons reveals symmetry and the need for the missing  $K_\phi$ . Notice how  $(\text{m/kg})^2 = (\text{s/kg})^2 \times c^2$ , where  $c^2$  is the conversion factor for mass-to-energy and  $(\text{m/C})^2 = (\text{s/C})^2 \times c^2$ , where  $c^2$  also converts temporal displacement of magnetic polarity  $(\text{s/C})^2$  to its spatial electric charge potential  $(\text{m/C})^2$ .



### 3 An Absolute Context for Relativity

#### 3.1 Mach's Principle meets the Cosmic Onion

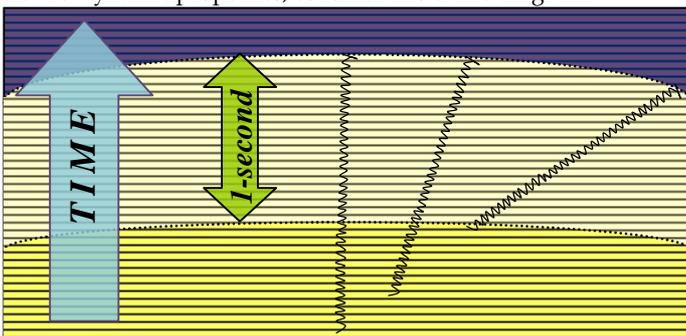
When the centerline of a spring-shaped particle wave is perpendicular to the Onion-Layers - the "particle" is at rest! Conceptually, the Cosmic Onion Model has the unique ability to have an **absolute** reference frame - the Onion-Layers themselves provide an absolute coordinate in time. By virtue of the normal vectors to the Onion-layer, conceptually this gives us a reference for absolute rest. Rather than the distant "stars" being a "frame of reference" each Cosmic Onion-layer is the "preferred local reference-frame" - the basis for gauging physical properties and laws. THIS is Mach's Principle taken to perfection.

**Table 2: Three different red/blue shifts for three relativities.**

Relativity	Type of Red/Blue Shift Phenomena
<b>Special</b>	Doppler Shift: caused by an objects motion through SPACE. This happens instantaneously: blue-shifting in front and red-shifting behind. This affects both emitted & receiving waves.
<b>General</b>	Redshift happens while light emerges from a massive object. Blueshift happens while light enters into a gravity wall. Bending occurs as it passes thru space curved by a massive object.
<b>Cosmological</b>	This cause of Redshift NOT motion objects through space, but is of SPACE itself expanding through TIME. This happens slowly over the entire duration of the lights journey. The net effect is a measure of the percentage the universe has grown since time light was emitted from its source to the time it is received at a destination.

#### 3.2 Special Relativity and Doppler Effect

Einstein introduced Special Relativity in his 1905 paper "On the Electro Dynamics of Moving Bodies". Given this idea that every electron, proton & neutron that makes up an object has electro-dynamic properties, consider this crude diagram.



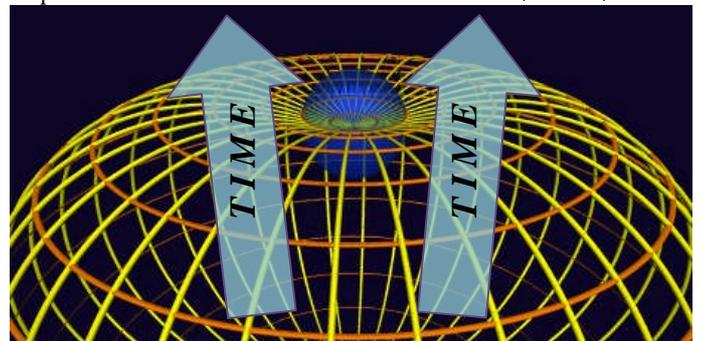
This simplified illustration is a tiny cross-section of Space~Time. The near future is the top purple section of the diagram while the bottom represents the past. The center section represents the amount the universe expands in 1 second. The horizontal lines represent the quantum thin Cosmic Onion-layers though the lines and gaps are not drawn to scale. In reality they are so fine that they sub-divide an individual proton by 19 orders of magnitude. The "springs" are the oscillating wave-functions that represent particles of matter. Remember, the "size" of a particle is the amplitude of the wave oscillations (charge radius) and

the "mass" of a particle is proportionate to the number of wave-oscillations per second. The spring on the left is a particle at rest determined by the centerline of the spring intersecting the Onion-layers at a right angle, thus having the minimal number of oscillations per second. This is what physicists call "the rest mass of a particle." The middle spring-wave shows more oscillations fitting into the same 1 second time gap and represents a particle moving at about 20% of the speed of light. The right most spring represents a particle moving at about half the speed of light. From the viewpoint of an observer at rest, the additional oscillations per second means the particles appears to the stationary observer to manifest more mass. But, from the particle's viewpoint (or co-moving observer) the duration of a second is less, so the particle always sees itself as manifesting its rest mass.

Doppler Shift happens the instant that light is received and being emitted; compressing wavelengths in front and stretching wavelengths behind. This is an entirely separate phenomenon from Cosmological redshift, which happens slowly the entire duration of the light's journey. This important distinction is missing from most scientific literature. Most writings mentioning Doppler shift in a cosmological context mistakenly attribute this to relative velocities and leaving the reader oblivious that Doppler is always two separate instantaneous occurrences.

#### 3.3 General Relativity and Gravitational Red/Blue Shift

In and near large collections of matter, like planets or stars, the interaction of the spring-shaped waves that persist particles of matter cause quantum-scale jitter motion. This is a kind of quantum-scale thermodynamics that "fractalizes" the Now-manifold. This fractalization's lower limits are the Planck-units. Thus the COM accommodates QM's renormalization - where the Planck unit cutoff keeps calculations from yielding infinite quantities.<sup>[4]</sup> The fractalized path along the time-dimension slows the Now-Manifolds expansion -- with diminishing effect as the inverse-square of the distance from the object. This creates a temporal dent in the Now-Manifold in and around the object. The temporal slope of this dent, as it penetrates the Impedance of the Onion-Layers, manifests as the gravitational field. The temporal slope near Earth's surface is about 9.80665 meters/second/second.



The more massive an object is; the deeper the Now-Manifold dent. The denser the object is; the steeper the temporal slope. The steeper the slope the greater the effect of the Onion layers' Impedance has on manifesting gravitational field strength.

Light traversing a "gravity well" gets bent spatially. Wave-length compresses while entering and stretched while exiting.

This “gravitational” space-curvature is relative to the Onion-layers “cosmological” curvature.

**Q:** What is the Pioneer 10 & 11 “anomaly” & what causes it?

**A:** These spacecraft were tracked for about 30 years, carefully monitoring their positions, primarily by Doppler Shift and timing their radio signals. Measurements showed they seemed to have a slight acceleration component  $(8.74 \pm 1.33) \times 10^{-8} \text{ cm/s}^2$  that put them off position by 3,000 miles per year closer to the Sun than calculations. [5] The explanation is this: they are not tied to Earth-Sun Space~Time reference-frame, **and** are moving faster than escape velocity leaving our solar system’s gravity well. They are really at the position that scientist think they are, but in a reference frame “drifting” 16.1 seconds per year relative to our Earth-based reference frame.

**Q:** Can this model explain why gyroscopes lose weight?

**A:** Four steps: First, stop thinking about gravity as if it is a fundamental cause; it is an observable effect of temporal distortion. Second, inertia “persists” the spinning gyro; keeping the atoms in a state of constant acceleration towards the center. Third, the velocity of this rotation creates Doppler Shift effect which tilts the Now-Manifold in a cone shape. Forth, this changes the net temporal slope of the Now-Manifold so that its slope is lessened, thus it is affected less while penetrating the resistance of the Cosmic Onion-layers. Thus, the *EFFECT* that we call gravity is decreased.

## 4. The Dark Side of the Cosmos

### 4.1 Dark Matter

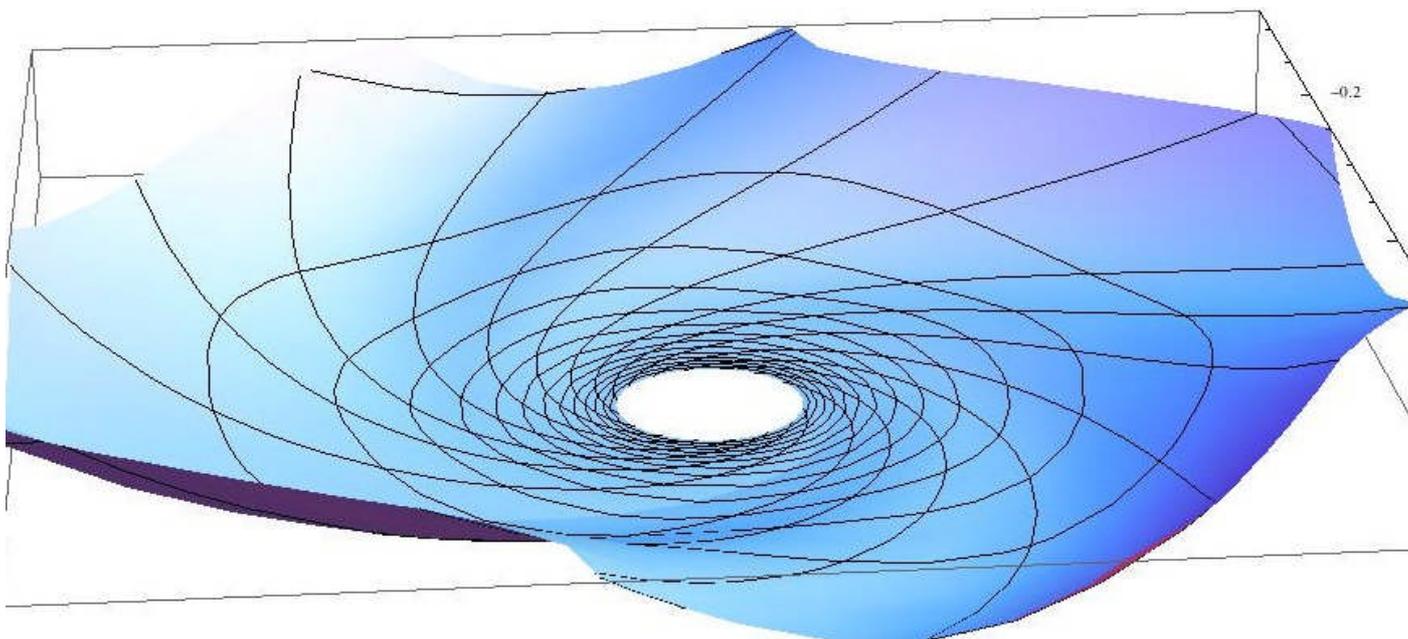
Dark Matter [6] was an idea put forth by Fritz Zwicky in 1933 to try to explain why spiral galaxies had higher rotational velocities than their mathematical models predicted. The idea caught on and has been extended to **try to** explain star formation from clouds of hydrogen gas. His idea was to distribute the Dark Matter in and around the haloes of galaxies to keep their mathematical models of gravity from breaking.

The Cosmic Onion Model says: Matter **MUST STRONGLY** interact with the Now-Manifold in order to fractalize (jitter motion) its 3D surface. This should lay to rest any notion of Weakly Interacting Matter Particles. Do not confuse Dark Matter with the density of the Space~Time Medium for each is defined and distributed differently. Cosmic Onion mass is throughout Space~Time -- lower density in the past and in gravity wells; higher “relative” density in the future.”

Our solar system, concentrates 99%+ of its mass in the Sun. So the temporal slope is totally dominated by the Sun and talls towards the sun. Galaxies, on the other hand, **SPREAD OUT** their mass *unevenly*. Higher density in the center halo area, less along the spiral arms, and lesser still in the gaps between the arms. This causes the Now-Manifold, itself, to become a spiral shaped vortex. The net effect is, stars do **not** “fall” towards the center of the galaxy; but, the local slope in the Now-Manifold says they are falling, primarily, towards the inner contours of the Now-Manifold vortex. This rotating twist in Space~Time explains spiral arm stability.

### *Cosmological Relativity is the Predominate Cause of Redshift of Light from Distant Galaxies.*

Both space and clock-rates expand as time proceeds forward. ALL natural processes are slowing proportional to the reciprocal of the age of “the volume of space” the object occupies. Even the atoms within an object expand as space itself expands, albeit slower than the surrounding space. Cosmological redshift happens slowly while light is in-transit. Unlike Doppler, which can indicate relative velocity, Cosmological redshift is an indication of how much the universe grew from the time light left its source to when it arrives at a destination. Since clock-rates continually grow this dramatically effects our perceptions of time and of the age of the universe. **Each time the universe doubles in size its perceived age increases by 144.69% =  $1/\ln(2)$ . Each doubling takes  $2 * 1.4469$  in perceived age of the universe.**



## 4.2 Dark Energy

The Cosmos is NOT Euclidean Geometry. When we look out into the universe we are NOT seeing outer space – we are seeing into the depths of times past when the universe was smaller. Slicing a plane through the Cosmic Onion, we get the diagram shown below. Notice that all the light we see from distant galaxies comes from the past when the universe was smaller. But this means that *everything* in the universe is expanding!

### Covariant Space~Time Metric

- (1) The speed of light is determined by the properties of the Space~Time Medium = 299,792,458 meters/second within each reference frame. Note that speed is a RATIO: distance per unit-of-time. This does not mean distance is fixed nor does it mean clock rates are fixed.
- (2) What this DOES mean is that with the forward flow of time, a meter expands by some amount while the duration of one second changes by the same ratio.

What does it mean to scale time? (#1) Are we scaling our perception of the passage of time? Or, (#2) are we scaling the metrics by which Space & Time are measured? Answer: First, by scaling the space & time metrics this causes our perceptions of both to be warped. Dark Energy and accelerated expansion is an illusion caused by a wrong understanding of Cosmic Geometry. The truth is: as we expand the Earth slows along with all clocks and processes, thus as we compare our local Space~Time with the distant past it only SEEMS as if the universe is accelerating.

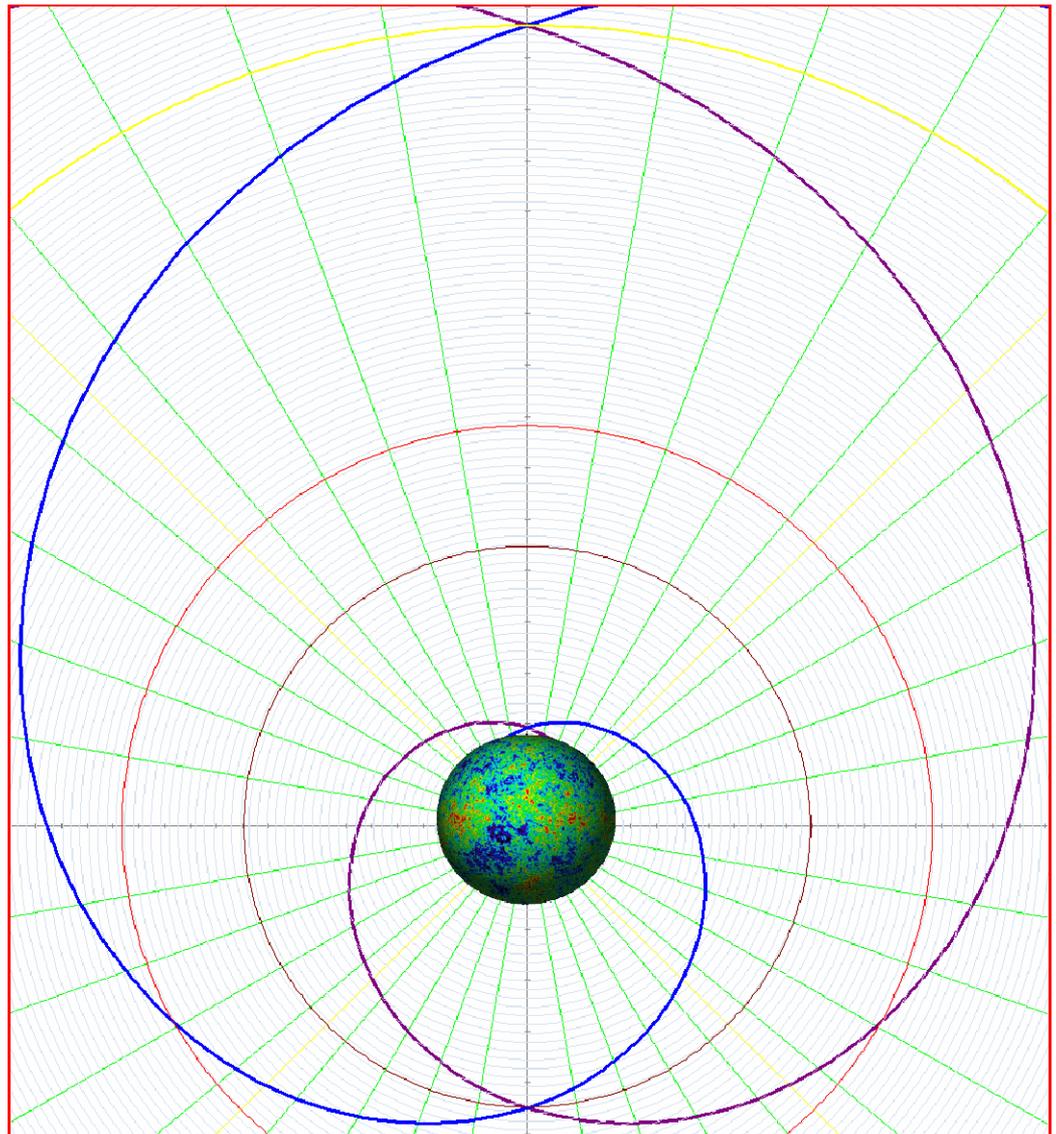
## 4.3 Dark Flow

Deep space observations between the constellations of Centaurs and Vela show that galaxies in that region of space appear to be merging towards point. How does the Cosmic Onion Model explain this weird phenomenon? That particular direction represents the opposite side of the Cosmic Hypersphere. As the universe expands that is the point from which we are expanding away from the fastest. (Those galaxies are in the distant past, were smaller than a Euclidian perspective would think.)

Imagine, at the bottom-center of this Space~Time diagram, a very distant galaxy when the universe was half its current size but  $\ln 2$  or ~69.3% of its current

age. The orange circle represents the Now-manifold when light left that galaxy. The stair-stepped blue and purple curves represent light leaving the galaxy in opposite directions. The entire duration of the journey stretches the light, while clock-rates continually slow, thus always keeping  $c$  constant. Our Milky Way galaxy is at the top at the intersection of the yellow “Now-manifold” and can observe light from the very distant galaxy by photographing it from in-front or from behind just by turning our telescope about 180-degrees around. The intersection and the bottom of the diagram is the point of Dark Flow between the constellations of Centaurs and Vela. Note this model does not need to add something new to predict “Dark Flow”. Unlike some current speculations, it is not because something is sucking those galaxies into the distant void, rather it is we ourselves moving away from the opposite side of the 4D spherical universe.

One prediction of this model is that this same convergence or emergence that we call Dark Flow should be observable in same direction as Centaurs & Vela –OR– in the opposite direction but look for this phenomenon to “appear” in the WMAP image.



### 5. Particle-Wave Duality?

**Table 3: Brief Overview Photons, Matter, Neutrinos**

<b>Photons</b>	<p>☞ Spirally polarized quantized wave-snippets, spreading forth on the surface of the Now-Manifold propagating along its circumference, between Onion-layers. Photons stair-step like Planck-length inchworms “Plancking” their way along a spiral staircase pathway from the depths of the past towards the future. Per inverse square-law, photons can interact with matter waves via electromagnetic induction.</p>
<b>Matter Waves</b>	<p>☞ Tightly coiled spring-shaped waves that propagate, primarily, along the time dimension. They manifest mass as they penetrate the Onion-layers. They manifest charge as dispersion of angular momentum.</p>
<b>Neutrinos</b>	<p>• Highly energetic waves that travel just behind (inside) the Now-Manifold. So they DO NOT interact Electromagnetically. In order for them to influence other matter waves requires a direct hit.</p>

#### 5.1 What is a photon, really?

Photon= $hc$ . Photons have a definite macro-scale geometry and an interesting, *incremental*, quantum behavior. The equation below explains what a photon is and how it *behaves*. **Note the curvy equal sign with forward and reverse arrows -- denotes an oscillating system.** The mixing of Planck and SI units, on either side of the oscillating equal sign, is to emphasize how this sub-microscopic **cause** produces the net macroscopic **effect**.

$$Photon = h \left[ \frac{\ell_{xy}^2 m_\ell}{t_\ell} \right] c \left[ \frac{\ell_z}{t_\ell} \right] \overset{\rightarrow}{\underset{\leftarrow}{\approx}} h \left[ \frac{m_{xy}^2 kg}{s} \right] c \left[ \frac{m_z}{s} \right] \quad (8)$$

In this example  $z$  is the direction of wave-propagation;  $xy$  is the oscillation-axis of this transverse oscillating wavefront;  $h$ , is its *incremental* angular momentum;  $\ell_{xy}^2$  is the incremental surface area growth while it propagates distance  $\ell_z$  for each time increment,  $t_\ell$ ; resulting in ( $meters_{xy}^2$ ) surface propagating at *light-speed*.

A mix of alternating left-☞-right photons suggests that the Onion-layers may, in fact, be odd and even, alternately carrying inter-☞-woven, spiral polarized photons.

$$Light = \int_0^{t_d} h \left[ \frac{\ell_{xy}^2 m_\ell}{t_\ell} \right] c \left[ \frac{\ell_z}{t_\ell} \right] dt_\ell \overset{\rightarrow}{\underset{\leftarrow}{\approx}} (hct_d) \left[ \frac{m^3 kg}{s^3} \right] \quad (9)$$

where  $t_d$  is the time-duration, *Light* is the sum total effect of the photon energy radiating outward along the surface of the Now-manifold, for a total distance of  $c \cdot t_d$ .

#### 5.2 Cosmic Context for Space~Time and Energy~Matter.

The Cosmic Onion sub-divides the 4D volume into time quanta (durations of 1 Planck-time). All EM-waves ride the surface of the Now-Manifold. At a quantum-scale, even “non-polarized light” is a mix of left-☞-right handed spirally polarized photons.

a) The Cosmic Onion-layers act as a conduit for the Now-Manifold as it carries photons of light, radio waves and, indeed, the entire Electromagnetic spectrum. The natural pro-

gression of photon-snippets travel between adjacent layers -- for half-an-instant -- these layers alternate; allowing left-hand spirally polarized photons to “ride” the surface of the Planck-spheres to the next pair of adjacent Onion-layers. Then next half-time quantum the right-hand spirally polarized photons do the same. And the process repeats. **Photon-waves ride along the surface of the Planck-spheres and don’t actually have to penetrate them so they DO NOT manifest mass.** (Contrast this with matter-waves which DO have to penetrate the Planck-spheres.)

- b) This is the root cause of why a “particle” needs to be rotated 720-degrees before it returns to its initial “spin state”. 360-degrees only leaves it in a “sign reversed” spin state. [7]
- c) All Electromagnetic propagation occurs on the surface of the Now-Manifold. All EM force interactions are the result of the shape of the Now-Manifold and its slope as it penetrates the Cosmic Onion Layers. Electric potential manifests when there is a charge differential from one location of space to another – like the separation of plates in a capacitor. Magnetic potential is when there is a charge differential in time from one place to another. Yes, this means that a magnet’s existence is spread across time, maybe only picoseconds, but one end is slightly into the future and the other slightly into the past. A permanent magnet is a kind of Superconductor, but not in the sense of electrons flowing in a wire, rather as the Superstring-photons flowing in the magnetic loop and through the magnet. *(This last statement is a bit speculative and represents the frontiers of my current thought process.)*

#### 5.3 What is Matter?

The term “matter” generally refers to a collection of “particles”, which are NOT billiard balls, but rather they are 3<sup>rd</sup> stage manifestations of these quantum-scale wave interactions:

- a) Each “particle” is created by the instantaneous intersection of the Now-Manifold as it “slides past” the wavefunction that defines the particle. The wave-function is a hollow double-axis vortexes that manifest as “Superstrings” – the shimmering outline of these tiny torus shaped manifestations. The resistance the particle-wave encounters while encountering the Onion-layers’ angular momentum manifests as the particle’s mass.

$$Mass = \frac{h \left[ \frac{\ell_{t,a}^2 m_{t,a}}{t_{t,a}} \right] f \left[ \frac{1}{t_{t,a}} \right]}{c^2 \left[ \frac{\ell_r^2}{t_{t,r}^2} \right]} \overset{\rightarrow}{\underset{\leftarrow}{\approx}} -K_\Theta \left[ N \frac{s^2}{kg^2} \right] \times c^2 = Gravity \quad (10)$$

- b) The reaction to this radiates on the Now-Manifold manifesting as fractalized ripples resulting in a dent in the Now-Manifold proportional to the particle’s mass – this is quantum gravity. In this two-way exchange of frequencies, the particle “feels” the influence of waves arriving and the particle’s own resonance radiates frequencies carried on the Now-Manifold as wavelength =  $c/f$ . Each Onion-Layer, being like holographic film, captures a trace of the particles path. Section 5.5 where radioactive decay is evidence of this.

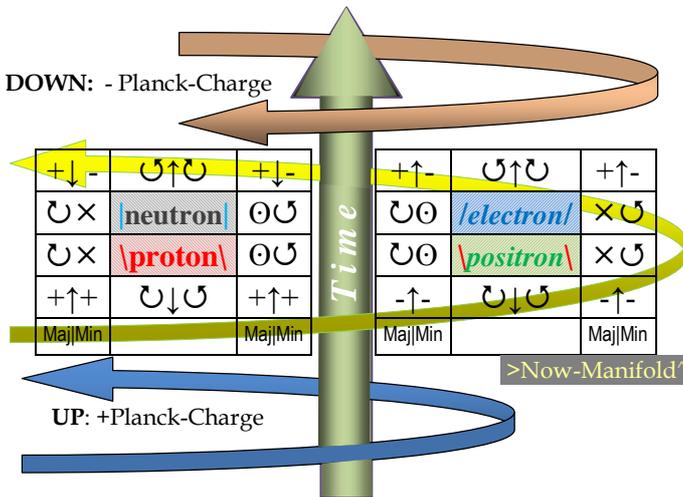
Planck-charge is about 11.7 times stronger than proton's positive or electrons negative charge. This results in about 11.7<sup>2</sup> or 137 times more surface area on the toroid that gets generated.

$$q_\ell = \sqrt{\frac{\ell m_\ell}{K_m}} = \frac{e}{\sqrt{\alpha}} \approx 1.8755 \times 10^{-18} \text{ Coulombs} \quad (12)$$

Each particle has a major and minor axis to its torus shape. The major axis is associated with the strong Planck charge, the minor axis is associated with weaker fundamental charge, *e*.

**5.4 Unraveling the Curled Dimensions [8]**

This diagram is ONLY a best GUESS (meaning this is not finalized) There are only 4 symmetric combinations of major/minor axis with left/right-handed angular momentum of the charge aspect of these "particles". (More explanation in the presentation)



Net charge of the particle is a function of BOTH major and minor torus-axis spin components. Think of the one axis as being "charge spin" and the other axis as "mass spin".

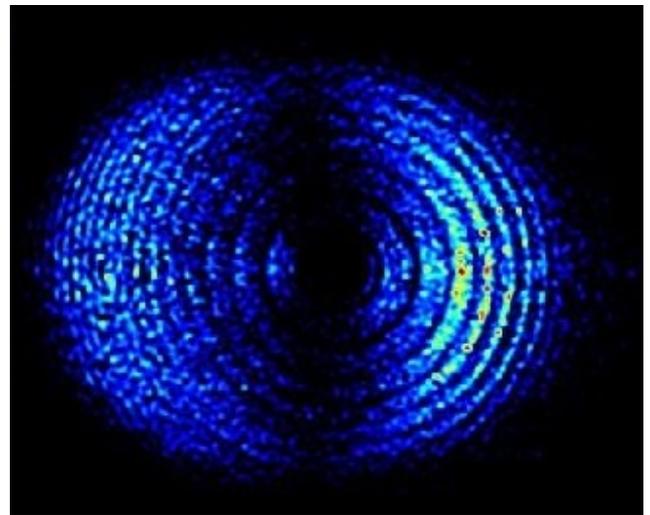
- a) An electron's wavefunction (one Bohr radius hoop pictured below) [9] While penetrating the Onion-layers each of the 137 little loops get whipped around the major axis of the big hoop at the Planck-time rate, spreading each loop across the entire surface. Stack 137 of the big hoops while rotating each hoop 1/137<sup>th</sup> more than the previous; and you are close to imagining a real electron's holographic wavefunction.
- b) An electron resonates as X-rays, -AND- its orbital frequency, acting like a mini-antenna, receives and transmits at orbital frequency (usually within an octave or so of visible light).

- c) The electron charge radius is the ratio of the Planck-mass to electron mass times the product of Product of the Fine-structure constant and Planck-length.

$$r_e = \alpha \frac{m_\ell}{m_e} \ell = 2.8179403267(27) \times 10^{-13} \quad (13)$$

- d) Note how the Fine-structure constant, *a*, is central to relating charge dimension, on the left, with mass in the middle and spatial dimensions on the right. Electron's toroid Major-axis = Bohr radius, *a*<sub>0</sub>; minor-axis = electron's charge radius, *r<sub>e</sub>*.

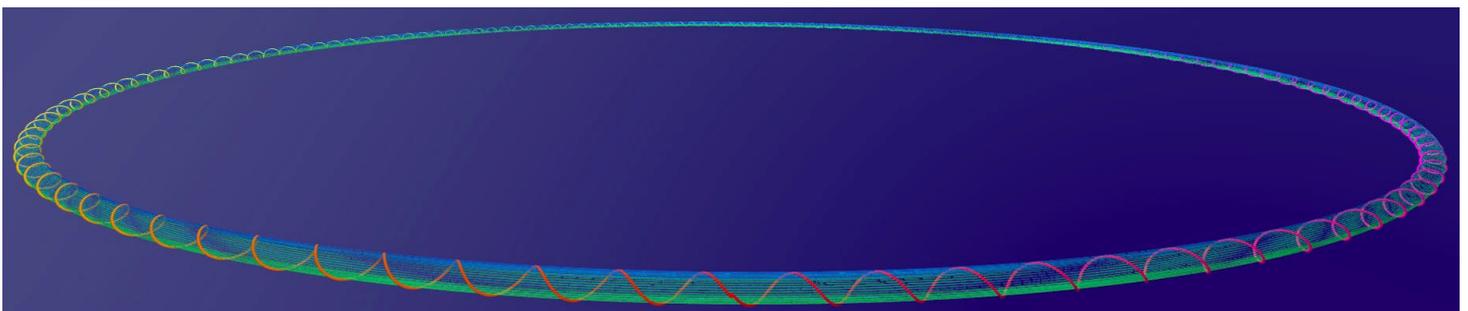
$$\left(\frac{e}{q_\ell}\right)^2 = \alpha = \frac{\hbar}{a_o c m_e} = \frac{h / c m_e}{2\pi a_o} = \frac{\lambda_c}{2\pi a_o} = \sqrt{\frac{r_e}{a_o}} \quad (14)$$

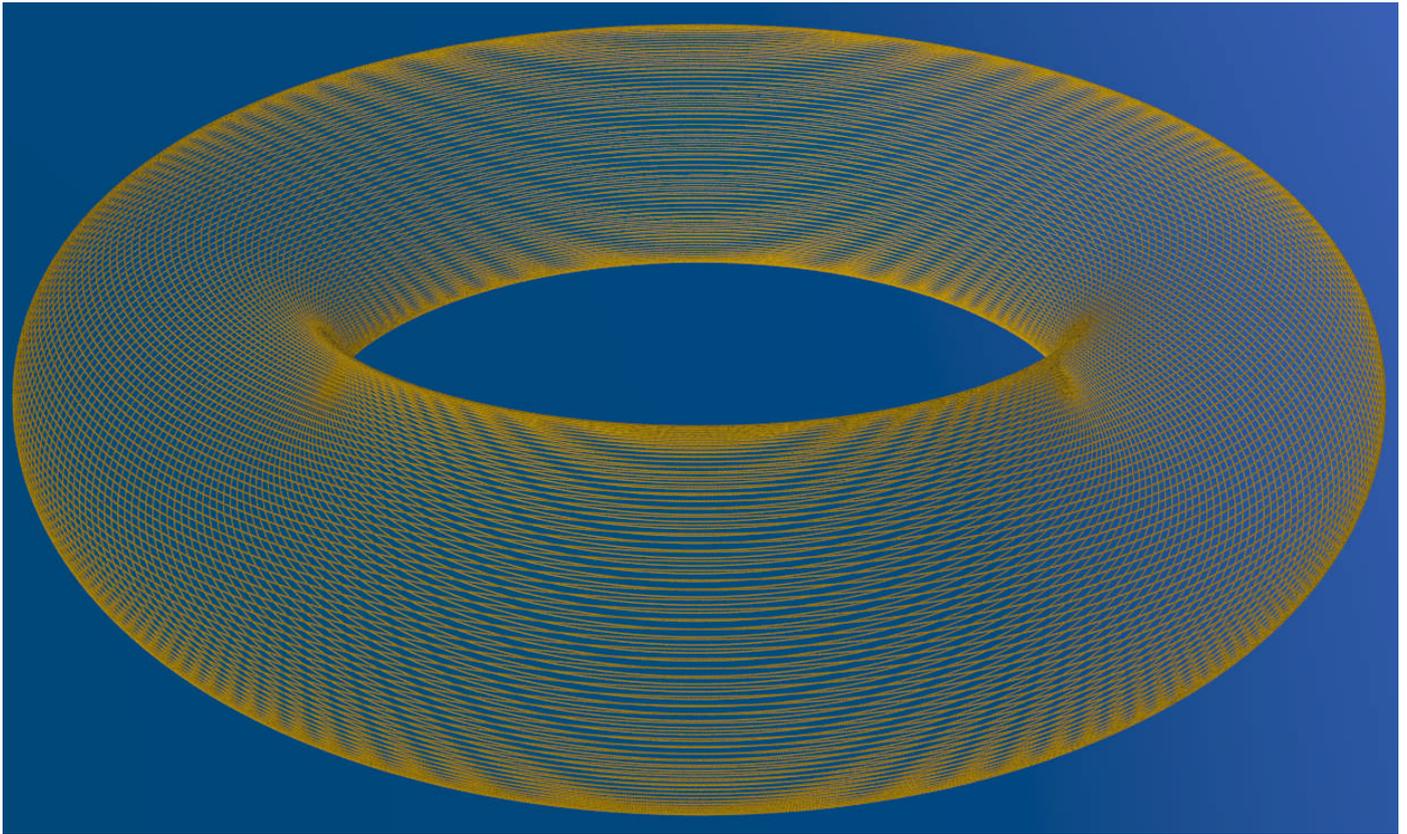


**Figure 1: Pictured above is the amazing work from Lund University, Sweden. It shows how an electron rides on a light wave just as it gets pulled away from an atom. [10]**

Q: How does this model explain the Dual-Slit Experiment?

A: Fundamentally, electrons are waves, so when an electron is shot towards two slits, as it travels it resonates (active) with the quantum-foam (reactive), this results in scalar wave resonance with the medium, so the ejected electron, through this resonance with the Space Medium, this interaction means the electron-wave interferes with itself. So this wave-front goes through BOTH slits. Another Mystery Solved!





A proton's wave-function (pictured above) is 1836.15 times more tightly wound so it manifests that much more mass (active) and slows down time (reactive) making a deeper dent in the Now-Manifold.  $a_p$  is the proton's fine-structure,  $p_o$  is the proton's torus Major-radius,

$$\left(\frac{e}{q_\ell}\right)^2 = \alpha_p = \frac{\hbar}{p_o c m_p} = \frac{h / c m_p}{2\pi p_o} = \frac{\lambda_p}{2\pi p_o} = \sqrt{\frac{r_p}{p_o}} \quad (15)$$

e) The QUantum Active-Reactive Knitting (QUARK) occurs as these wave types interact. The proton-wave interacts with the Now-Manifold and the outward Onion-waves in an Upward (forward-time) direction, and the proton wave interacts with the inward Onion-waves in their downward (reverse time) direction. Thus the proton appears to have an internal structure of 2 up-quarks and 1 down-quark.

Q: Wouldn't electrons manifest internal structure like protons?

A: Unlike a proton, which being positively charge creates a whirlpool bump on the Now-manifold spirally outward, the electron generates a vortex dent that spirals inward. So these subtle interactions are internalized.

**Electric Fields** are the temporal gradient in the Now-Manifold caused by the charge differential from one point in space to another. **Magnetic Fields** are the dissipation of angular momentum of the summation of charges manifesting as magnetic polarities.

#### 5.4 What holds the nucleus together?

**Strong Nuclear Force?** More properly called the "Strong Interaction" because it is not a force like EM or gravity - in that inverse-square law does not apply. Matter-waves are NOT point charges. Below when I say "hollow", the inside of the springs contain the Space Medium.

1. They are hollow, so we never have to divide by radius=0.
2. They are hollow, so they can be entangled with each other.

The spring-waves can and DO twist around each other - this is what holds the nucleus together - simply quantum entanglement - it is not a force at all. If anything it is the geometry of the angular momentum of the charge. When an atomic nucleus has perfectly balanced proton-neutrons, it has symmetry. The entangled proton-neutron nucleon-pairs wrap in a bundle and vibrate in a stable fashion.

#### 5.5 What causes radioactive decay?

Isotopes have additional neutrons wrapped into or around the nucleus. More often than not, this breaks symmetry. As this bundle penetrates the resistance of the Onion-layers it causes part of it to twist building up torsional tension around the time-axis which, in time, reaches a threshold; suddenly breaking away - resulting in thermonuclear decay. Releasing energy as angular momentum causing spiral tracks in cloud and bubble chambers.



**Figure 2: Bubble Chamber Tracks**<sup>[11]</sup>

I envision, that the distinguishing factor that determines alpha decay versus beta decay is that beta-decay involves a lone-neutron that twists on the surface of the “layering” of the bundles of proton-neutron pairs. (This “layering” is analogous to the electron orbital shells – and, in fact, is the core reason for those shells.) Alpha-decay involves a proton-neutron pair, twisting around a second pair. This double-pair bundle, in time, twists up to the point, that the torsional tension just can’t take it anymore, and snaps the entanglement, suddenly releasing the built-up energy and a rapidly spinning alpha particle.

## 6. Recap & Conclusion

### 6.1 Unraveling the twists reveal $\alpha$ harmonic simplicity

Q: Why does “ $\alpha$ ” show up so frequently in these equations?  
What is the significance of the fine-structure constant?

A: Currently I’m exploring the possibility that higher dimensions of reality are  $\alpha$  proportionality of cosmic resonance. The fine-structure constant may be the scaling-factor that determines the resonance of the higher dimensional fractalization -OR- each dimensional level may have its own factor. What that means is this: When you watch a video that zooms into a Mandelbrot set, (*follow link* <sup>[12]</sup>) you will see “patterns” that repeat at difference size-scales, but they twist as higher harmonics; for our universe this span between one pattern-set and the next is the meaning of the “fine-structure”. It is the resonance between one dimensional level and its neighbor.

### 6.2 Conclusion and Future Research

All fundamental properties of the “Vacuum” of Space, physical constants & Planck-units have, herein, been successfully mapped, one-to-one, to the quantum-scale geometry of this simple model. Nothing about the

“Vacuum” has been excluded and no “holes” in the Space~Time aspects of the model. The geometry of these “truly fundamental” wave constructs is sufficient to describe the mathematics that defines our cosmos.

The Now-Manifold is similar to the event horizon of a black hole – the surface is the equilibrium point between forward time and backward time. In a sense, time stands still because it is always “Now”. The fact that we experience the forward flow of time may be analogous to a black hole’s Hawking Radiation. This ties in nicely with Nassim Hamein’s assertion that the “Schwarzschild Proton”<sup>[13]</sup> is a kind of mini-black hole, its surface being the event horizon.

Within this framework there is much more work to be done to define each particle type and then to go on to model atomic nuclei and show how layering of twisted proton-neutron pairs create a layering of electron shells, and the twisting together create the s, p, d, & f orbitals.

Much more needs to be said about the implications of Space~Time expansion, but this will need much more research into radioactive decay and its use in dating rocks and stars. This will be the subject of next year’s research.

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- <sup>1</sup> M. Kavcic, J.H. Simonetti, S.E. Cutchin, S.W. Ellingson, and C.D. Patterson, "[Transient Pulses from Exploding Primordial Black Holes as a Signature of an Extra Dimension](http://stacks.iop.org/1475-7516/2008/i=11/a=017)", *J. Cosmology and Astroparticle Physics*, No. 11, 2008, 017 (10pp). <http://stacks.iop.org/1475-7516/2008/i=11/a=017>.
- <sup>2</sup> Science News, “Searching for a Tiny New Dimension, Curled up like the Universe before the Big Bang”, Mar 12, 2008
- <sup>3</sup> <http://www.physicsforums.com/showthread.php?t=265455>, “Is Time a Dimension?”
- <sup>4</sup> Hamein, Nassim: “Quantum Gravity and the Holographic Mass”, *Science Domain Int’l, Physical Review & Research Int’l*, ISSN: 2231-1815, p 270-292
- <sup>5</sup> Anderson, John D, Philip A. Laing, Eunice L. Lau, Anthony S. Lie, Michael Martin Nieto, Slava G. Turyshev, “Study of the Anomalous Acceleration of Pioneer 10 and 11”, 19-Apr-2001, revised (10-Mar-2005), <http://arxiv.org/abs/gr-qc/0104064>
- <sup>6</sup> [http://en.wikipedia.org/wiki/Fritz\\_Zwicky#Dark\\_matter](http://en.wikipedia.org/wiki/Fritz_Zwicky#Dark_matter)
- <sup>7</sup> [http://en.wikipedia.org/wiki/Spin\\_\(physics\)](http://en.wikipedia.org/wiki/Spin_(physics)) see reference 6. Tomonaga, Sin-Itiro; Oka, Takeshi (trans.) (1997). Chapter 7: “The Quantity Which is Neither Vector Nor Tensor”. *The Story of Spin*. University of Chicago Press. ISBN 0-226-80794-0.
- <sup>8</sup> Wsol, John: “Unraveling the Curled Dimensions”, [http://MysteriesOfTheUniverse.info/Unraveling\\_theCurledDimensions.htm](http://MysteriesOfTheUniverse.info/Unraveling_theCurledDimensions.htm)
- <sup>9</sup> [http://shoestringscience.com/wiki/index.php?title=File:Orthogonal\\_3-phase\\_13-8\\_torus\\_knots\\_1920x1080.png](http://shoestringscience.com/wiki/index.php?title=File:Orthogonal_3-phase_13-8_torus_knots_1920x1080.png) : Electron & Proton images are derivative works based on Don Mitchell’s POV-ray source-code.
- <sup>10</sup> <http://www.sciencedaily.com/releases/2008/02/080222095358.htm>: Electron Gets Film Debut in First-Ever Video of its Kind
- <sup>11</sup> <http://TheBubbleChamber.org/2010/10/> image credit
- <sup>12</sup> Jager, Alex: “The Infinity of Iterative Elegance – Mathematics of the Mandelbrot Set”, *excellent YouTube video* (Zoom starts at about 4:30) <http://www.youtube.com/watch?v=3Fync5HL4Lg>
- <sup>13</sup> Hamein, Nassim: “The Schwarzschild Proton”, AIP Conference Proceedings, CP 1303, ISBN 978-0-7354-0858-6, pp. 95-100. [http://hiup.org/wp-content/uploads/2013/05/AIP\\_CP\\_SProton\\_Hamein.pdf](http://hiup.org/wp-content/uploads/2013/05/AIP_CP_SProton_Hamein.pdf)