Time and Space Overlapped

As the first step in cutting through the jungle to details, we will investigate the mystical phenomenon of time dilation as a high level overview entry point into the impenetrable labyrinth of the fabric of spacetime, to gain some semblance visceral, intuitive purchase. Once again we will start with simplistic intuitions, that may (definitely) initially appear wrong from classical interpretation, but that will lead to new avenues of perspective.

Why does the passage of time for a particle slow down around strong gravity and also slow down when the particle is moving at high velocity? What general gut instinct commonalities can we come up with by assuming a perspective of naivety and doing some brainstorming?

Einsteins field equations have been paraphrased by John Archibald Wheeler as "Spacetime tells matter how to move and matter tells spacetime how to curve" but if we assume for a second that mass is made of spacetime and vice versa, (via mass/energy equivalence) and instead say: "mass tells spacetime how to curve and curvature tells mass how to move" it might point us in a direction.

Loosely speaking, gravity makes things move and of course velocity is itself the phenomenon of motion. A common theme in dilation could be said to be a kind of fluid dynamics property that roughly describes both of these time dilation circumstances, high gravity and high velocity based on the lose idea of motion. The increase of "flow" associated with the force and the increase of "flow" associated with a traveling particle, both cause time to slow down. The difference between the two seems to be that a particle somehow "retains" the fluid behavior from the force of gravity and in doing so accelerates to a higher velocity, gains energy and becomes more time dilated.

The first group of glaring red flags as we have gone abstract and off-trail here would seem to be that, although the force of gravity could very loosely be described as "flowing" past a particle, a moving particle in a vacuum does not flow through anything, according to the standard model. But again, loosely speaking, force does flow in some kind of ascetic way. To get more specific, time dilation, as an event associated with increased flow, would require a "something" that was flowing in the presence of a strong force and a same something that a particle moves-through as it travels, approaching the speed of light.

At this point we have the choice to either discard our instinctive description of

flow as a potential correlation or discard the traditional idea of the vacuum being empty of anything a particle might flow-through or that might itself flow, as in the action of a force. The general understanding of the standard model does acknowledge that spacetime is full of lots of unpredictable "energetic something", and this idea of flow might have some yet-indescribable nuance that can shed light on quantum behavior, so we will proceed by adding a not sure emoji and 4 question marks next to this point. If we push forward we must precariously work with the idea that particle motion and force propagation are the same thing, in some unclear way. Maybe wave behavior will help with that connection.

Before we leap forward, we should ask if any other unexplained behaviors can be attributed in any way to something describable as "flow" within spacetime? Magnetic flux, gravitating bodies, along with the motion-related relativistic factors in electromagnetics would seem to initially bolster the assumption and support the fact that we should not discard the flow hunch yet. We also can't avoid the uncomfortable c^2 that is featured so obtrusively in the intrinsic description of a rest-mass. What flows but does not flow, what spins but does not spin and could the definitions of spin and flow be made of more complex versions within?

Since exploring the intuitions that come from correlations is our objective, we will continue forward, maintaining our safety line by making notations of the assumptions to be revisited and revised or discarded. By this method we can later address the validity of either our assumption or the conventional assumption, or if nothing else, see if any bonus insights can be drawn from the flaws in our new (possibly flawed) map.

From now on, (to streamline the explanation), we won't blatantly describe the meta process of iterative analysis and degree of stray from the classical description as we go, but it should be known that for each branch in the assumption, the flaws are documented and ranked according to how frequently they appear in different forms and whether they converge around the empirical data or diverge from the data. The list of paradoxes and mathematical incongruities which appear, themselves prove to be very useful "off trail".

The word "time" is marked seemingly everywhere on the map given to us by the standard model. We must clench our teeth and use the hatchet to break open the box labeled "time" and see what is inside it. The gut instinct is that time is a thing that is present everywhere and in everything, like a magic spell that governs how things happen. Relativity treats the concept of time as being

somehow interwoven with the concept “space”. The math validates this woven relationship. But for right now, our goal isn’t to dig under the concept of time but just to see how it touches space, and more importantly, how it touches space in the moving parts called matter and might even affect the rate that those parts do their thing.

Since for our purposes, non-relativistic time can be considered to be intertwined with a kind of inner, intrinsic motion of matter, the first abstract mechanical possibility where we might take a stab at involving the fluid-motion intuition might be that a high rate of flow of motion that is exterior-to or more generally that is simply “not-mass” somehow results in a slower rate of the inner-progress of the action of mass in a kind of balance of inner and outer “fluid pressure”. This vaguely parallels concepts in fluid dynamics such as the Venturi effect or the way atmospheric pressure affects boiling point or even heat conduction between mediums of different properties. The general concept being that the energy action within the stuff flowing by, might have some equilibrium relationship with energy action of the particle, such that the rate of flow of the something increases or decreases the rate of energy action in the particle.

The concepts of atmospheric pressure on boiling point and the interaction with air molecules in supersonic airplane travel seem to form a parallel to our particle interacting with something unseen. Let’s assume for a moment that the something the particle is traveling through, or perhaps that is traveling through the particle would also be “particle-ish”, (with boundaries and with some intrinsic momentum or oscillation), with a corresponding energy.

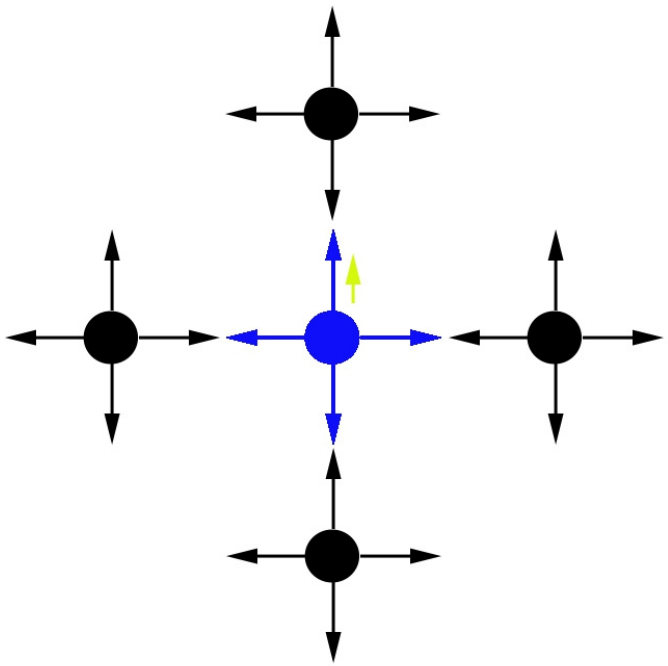
The greater rate of flow taking place past, (or through) the particle when the particle is at higher velocity or when strong gravity causes a higher flow would potentially change the influence of the wave-like interaction a particle has with this immeasurable something. It could be considered loosely analogous to a pot of water that ends up having a faster molecular kinetic energy in a higher atmospheric pressure, and lower kinetic energy in a lower pressure. Or even more simply it could be compared to trying to cross a busy road when walking slowly, vs running quickly. Moving fast across the street would reduce the amount of “interaction” with oncoming cars.

Whatever the specific dynamic, the notion of equilibrium and a rate of flow as a variable seems present. The relative wave-ness of this “something”, and how it would possibly “flow” without classical observable interaction has been of great importance when similar questions have been asked historically, and as we will see, this question of the definition of interaction might be the key to solving the

mystery.

It could be that the non-existent dark-something and the particle might interact in some way but not in a classical collision situation. The question becomes, if direct observable momentum-exchanging collision isn't occurring, what could we mean by interaction between the two different particle velocities, one observable and the other non-observable? How could there be energy interaction but not appear to be any loss or gain of momentum? As a clue, we will stop to remember the unusual fact that photons only ever travel at the speed of light and if photons, as particles also interact with this dark something, their momentum is lost only by alteration of its internal, intrinsic motion, not by change of speed. We will also note that matter particles with lower than c velocities have very different wavefunction structures.

A quick recap of the rough sketch at this point shows forces being a flow of something that alters the intrinsic motion-structure of mass, causing its motion to become more like the speed of light, and the faster the mass gets toward that max speed, the longer it takes for its internal clock to complete a circuit, (whatever that might look like). So now, if a mass particle was moving close to the speed of light, through this dark medium, the vibrating mass interacting with the medium would look something like this simplified diagram as it moved past the invisible, also-vibrating particles.



We will assume the dark stuff has some frequency of vibration that is randomized, since absolutely everything else in the universe is. We will use a very small particle traveling at close to the speed of light, represented by the blue circle. If we look at the vibration speed (kinetic energy) of the medium we could noticed how the medium's vibration would reduce the speed of the particle, (when it is vibrating against the direction of motion of the particle) and increase the particle speed when it vibrates in the same direction as the moving particle. These actions tend to cancel out, but something else very interesting can be noticed here.

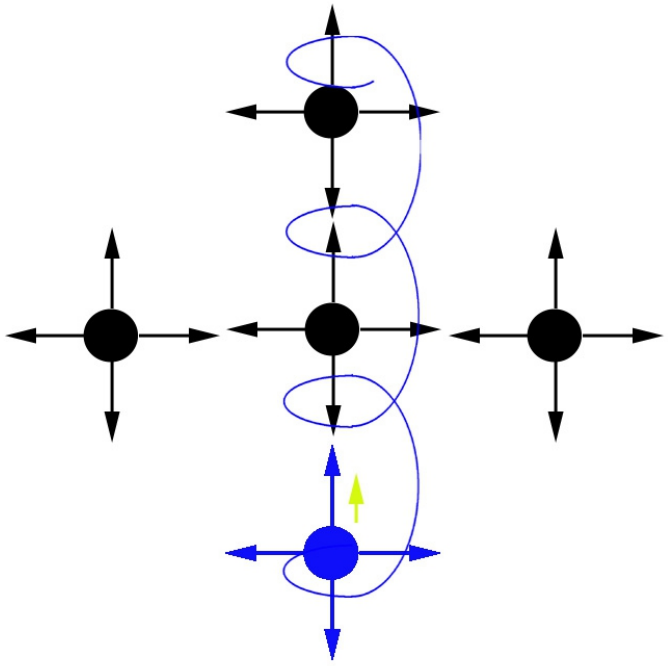
If we jump back to the knowledge that the speed of light is fixed and consider, what would happen when our immeasurable particle medium interacts with a photon, which is already moving at the speed of light? Well, lots of questions pop up, but an important one is: what happens when the medium-vibrating-action tries to push the photon faster than the speed of light?

We could guess at ideas like, maybe a photon simply maxes out the vibration ability of the medium in some way. So how could it be possible that the medium doesn't push a particle past the speed of light? What kind of plausible situation might be going on that would cause a cap on "interaction" between the blue thing and the black thing with a maximum of the speed of light? We could say there is a court order to not break the laws of physics or maybe unicorns are responsible, but it is always best to propose ideas that aren't exothermic so to speak, (i.e. don't require inventing new unexplained things that would just need more explaining than the question we are asking). Ideally the conjecture is endothermic, (it provides solutions to more unexplained phenomena than just the immediate question).

If you consider that Einstein showed us how mass and energy are essentially the same thing in different forms, this hypothetical field of immeasurable particles would likely also be energy E in some form. If you stare at this graphic long enough, you might come across the possibility that maybe the dark immeasurable particles are themselves, moving at the speed of light and a major clue might occur to you.

Remember that we have gotten to this hodge-podge metaphore by exploring the concept of flow, as it is involved in time dilation, assuming there might be some flow-based interaction that is connected to the concept of the internal intrinsic clocks of matter. The faster a mass particle flows through, or the greater the gravitational "flow" surrounding it, the slower it experiences time.

The momentum behavior of the very small, very fast moving particle in blue, becomes so similar to the medium, as it approaches the speed of light, the mass particle doesn't really need to exist independent of the medium at all. Its observability may just be some vibration-configuration difference. After all, photons lose energy by changing frequency. The fact that there is a maximum speed of light would make sense if the so-called mass particle didn't exist as anything separate from the medium, and the medium itself was comprised of particles of constant vibration speed of c, in random, unformatted directions. We might say the random, unpatterned directions of the dark stuff makes it unobservable but we could just as easily say the observable stuff is just a pattern of arrangement of the dark stuff.



In this way, the mass particle's waveform may somehow end up with a less-than-c-velocity by organized arrangements of paths of the dark stuff that goes around in a circle, and a photon would simply be a waveform with the fixed velocity of the medium somehow arranged in a straight path. The reality will prove to be somewhere in between, with both types of particles having essentially circular geometrical symmetries, but with an facet that is inverted in the photon causing its intrinsic structure to exist with one component as a linear path of the change from one dx to the next.

The medium might literally be undetectable until a periodic composition occurred within it, whereby randomized momentum was cobbled together into the shape of a particle, with a specific non-random environment of momentum. This rings a bell about dark energy and a number of other things and if true, would throw a monkey wrench in any experiment that tried to detect a medium for light that was based on the assumption that interacting with the medium would cause a gain or loss of momentum in the particle.

What if there were only one true speed in the universe and that speed were the speed of light? It is possible that arrangements of the vibration (i.e. wave-state) of these dark particles vibrating at c could somehow represent a mass particle or photon, and slower speeds were just a function of the wave action? How would periodic patterns in this medium, vibrating at c, end up with mass particles that can be observed traveling at speeds much slower than c?

If a track runner runs at 10 miles per hour, and she ran in a grass field in a big circle, could her whole circular path itself move at a much slower speed across the field, even though she continued to run at an invariant10 mph? She could do this if she started running in a path that wasn't a perfect circle, like a helical path (loop-de-loop). The faster she wanted her circle-track to progress, the greater the total circumference she would need to run, per each circuit, since she would be adding a linear direction to her circular direction.

It can be noted that the concept of a faster flow of something causing less interaction with the medium and thus time dilation was a though experiment that would prove to be wrong in our initial interpretation, but the idea of flow will take on a more complex meaning as we examine the wave dynamics in detail. Like the greater circumference of the moving track in the field, a greater "flow" associated with a particle waveform will prove to represent a greater differential footprint in spacetime that waveform requires and thus an alteration of the interaction dynamics of the particle.

If we are still dumb enough to push forward with the thought process, we can consider that somehow a particle's waveform would be altered in a way that is remotely analogous to the runner's loop-de-loop path when the flow of gravity or a linear momentum is added. How would it change the the geometry and thus the calculation of time specifically, (as it relates to any interactions)? We need to go to the known data to try mapping a particles behavior within this new context to see how it might work and find out what is under the hood.

So how can we describe what motions might be taking place inside the quantum realm of the matter particle? Two undeniable traits of spacetime are direction and motion. Another prominent observation seems to be a correlation between the velocity of a particle, its frequency and its energy. Electrons have angular momentum, so there is rotation. The nucleus derives most of its mass from quarks moving close to the speed of light. The smallest observable particles readily shed their mass and begin traveling at the speed of light, turning into photons and even photons have momentum attributed to their internal mechanics. So rotation/not-rotation is at the heart of the sub-quantum reality, in whatever form.

So, if motion, specifically periodic motion, seems to be at the base of the structure of a particle, how do we outline what those intrinsic motion properties might be? One rough observation we can make regarding the role of rotation is that matter particles, (with their "spinor" behavior) seem to probably have multiple sub-quantum axes of rotation that are compound in some way, since parts on different side of the particle, (moving in different directions) seem to interact with outside particles differently. (video references

https://subspaceinstitute.com/images/0/10639641/spinor.mp4

To get more specific about the behavior of this travel of energy and how it would exist in quantum steps or increments of energy, we go back to the science of waves traveling. The frequency of a wave is the number of repetitions of the wave divided by the length of time it takes to complete those repetitions, as in cycles per second. Stated in the geometrical metaphor, it counts the number of revolutions of a repeating action like the motion of a loudspeaker or pendulum and compares it to the number of revolutions of a clock, (or other periodic measuring device). Essentially we are simply comparing the travel of two

different looping paths of energy, the looping repetitions in the speaker, divided by the looping repetitions of whatever action of mass is used to keep time. Would it be accurate to say that time is the count of repetitions within the time keeping device? What happens when the time keeping device is mass itself? We know that loosely-speaking, mass has some version of periodic motion taking place internally.

Although time is an ever-present and mysterious driving factor in spacetime, the basic measurement of it, and the use of it in calculations, is exclusively tied to the ticking steps of quantum mechanical movements which take place in mass and energy objects. If we can mathematically express everything in Lorentz invariant terms, and that mathematics is a complex form of geometry, maybe we can look literally at that geometry. Since, at the moment, we are being over-simplistic for perspective, we will splice together the relativistic and quantum ways of looking at the universe and sort out the implications afterwords, (by brainstorming method). We will therefore take Einstein's mathematical treatment of time being a vector in spacetime literally for a moment and extrapolate that idea and consider measurable time to be the physical travel of energy going in a simplified circle with some associated momentum.

Before we go any further, this notion of a predominance of vibration-direction as a flow of something on a medium, that affects clocks has now crossed the line into the dangerous realm of theorizing about directly disproven suppositions of not only quantum determinism, but a physical explanation for the quantum wavefunction, time dilation and perhaps worst of all, an immeasurable "medium" for photons to travel on. You would be justified in saying that this branch of logic has been completely ruled out and the subject is closed permanently. But there may be more to it yet.

Recently it has been made seemingly official that, as found by use of Bell's inequalities in quantum entangled particles, the universe does not follow causal realism and/or is also non-deterministic. This discussion, centered around entangled particles goes back to a contention Einstein had with quantum mechanical theories at the time. He did not believe the purely probabilistic description of quantum particles and asserted that there must be a hidden variable that makes the photon behave the way it does when entangled.

John Bell formulated a test to prove whether or not the photon and other quantum particles were logically able to have a hidden variable, and it has since been conducted to a high level of accuracy. It has been found that Einstein was wrong. But as we have noted, logic can't know the properties of what is hidden,

logic can only compare what is already known.

Maybe we can prove that Einstein and Bell could have been both right and both wrong at the same time. This is not because local realism doesn't exist or because the universe is non-deterministic, but because the human mind can only create models based on currently known facts. For many reasons, we must construct rigid boundaries between the world of what exists and what does not exist, but sometimes we must tear down some walls for a remodel. It is the plight and intrigue of all scientists. Rational analysis is a powerful tool that is eternally betrayed by what is yet unknown.

If there is an irony to highlight, it is the inherent contradiction that exists in making the determination that the universe is non-deterministic. This paradoxical statement is a way of saying that perhaps the human mind features realism but the universe does not. This is maybe something like saying the bucket is wet but the water in it dry, (anything becomes perfectly acceptable if the universe is officially not-rational). The struggle to make sense of the incomprehensible by using ascetically-reassuring if dubious rationale is an age old tradition. In a pinch, reality sometimes needs gift wrapping with statements like "it's turtles, all the way down" or "we have determined that reality is non-deterministic".

Assuming what an unknown might be, (in order to disprove it) has a long track record of being unreliable. Not only has the universe never demonstrated this concept of direct linear extrapolation (re-combinations of existing formats) wherein one can use logic to predict the future. It can be shown that, in fact the second law of thermodynamics is implicated in the fact that the opposite is true and it is the most fundamental dynamic of the universe to scale itself just barely incongruent with previous orders of magnitude.

If there is action taking place somewhere in the universe with an unknown explanation, it is far more advantageous to make bold assertions that there are yet-unverified things that exist to explain the unexplained, than to conclude that explanation is not possible. It is much better to forge ahead with the first assertion and then make corrections to any initial assumptions. All science, after all, began with assumptions that were later proved to be largely false, but were nonetheless an absolutely essential step in order to gain the knowledge of what was true.

So as we will see, Bell and Michelson and Morley have something in common. They formulated highly intelligent tests to disprove the existence of something

based on a very strict definition of what that something would be. We are faced with a choice, do we believe the most astronomically unfathomably ironic scientific assumption in history? Do we settle for the determination that the universe is non-deterministic and that realism is not real?

What if we could simply believe that one single experimental assumption was wrong, even if that assumption supports all of our modern paradigms by a thread? Occam's razor is useful for this kind of standoff between logical conviction and existential conviction. It is the classical battle between things feeling safe and familiar or things progressing.

Einstein did not believe the universe was inherently unknowable and irrational, he believed in determinism, no matter the difficult complexity. Einstein's general and special relativity equations came to prop up the rapidly developing foundations of quantum mechanics, after Michelson and Morley concluded that light did not travel on a medium.

Einstein himself penned the mathematics that proved a medium did not need to exist, but as we will see, a medium is exactly what will rectify realism, and his mathematics describes the foreground of that medium in great precision. All that is needed is to describe the background of that math to match Einstein's foreground.

So what if we have a medium that somehow evaded the Michelson and Morley definition of existence but nonetheless conforms to Einsteins field equations, general and special relativity and describes quantum behavior, forces and particle systems? What if it the concept of "locality" was just a touch more complex than Bell's test could account for? What would that medium-particle interaction look like? In order to address this, we will first go back to the start of this very old debate. We will briefly revisit the premise of the Michelson-Morley experiment.

There are plenty of videos on the subject of their experiment you can watch to get the full background, but in short, they tested whether or not photons traveled on an undetectable medium, by testing if momentum was gained or lost by a photon interacting with such a medium. They did this by assuming that the rotation of the earth through a stationary medium would result in a velocity of the medium relative to earth. They shot a photon in the same direction as the earth's rotation and also in the opposite direction of the earth's rotation, and they then tested to see if there was a change in the travel-time due to an unseen stationary medium "slowing" the progress when traveling "upstream",

(i.e. if momentum was exchanged by “the something”).

We know very clearly and with great accuracy that their experiment answered their question correctly, as did countless other similar experiments after theirs, but what if Michelson and Morley weren’t asking the right question? (Btw they also eliminated the possibility of an inertial medium that might be rotating along with the earth (with matched speed) and therefore would be stationary with respect to earth).

They assumed the very clear logical premise that such an invisible medium could only be either 1. stationary with respect to the earth’s motion, with the earth moving through it or 2. move synchronized along with the earth’s motion.

There is just one problem, there is a third logical condition that wasn’t available to them at the time of their experiment, so they didn’t know it was a possible condition.

Option 3. The momentum of the particle and the earth are both already fixed-period configurations of the random-period momentum of the medium. The notion of classical linear momentum, (such as the medium moving “with earth” or “around earth”), would not apply. The “relative” momentum of the medium with respect to earth or a particle would be one of conforming to a random periodic motion (when integrated over time) or geometrically fixed period. In other words the earth and all particles are “made of” the medium’s momentum and the relationship a particle has with the medium is describable in terms of gradient of the periodic motion, (where fixed -period observability is conformed and exists as a lower gradient state of the momentum of the medium).

In the 100+ years since their experiment, we have learned that energy is not the only thing that exists as both particle and wave but matter also exists as both particle and wave. The earth and everything on it would also have been a wave on the medium they were testing for. So since Michelson and Morley’s third option is that both matter and energy could be modulations of this same hypothetical medium, the medium could be at “rest”, (according to their measurement parameters) with respect to both the earth and the photon.

It could be that the mass and energy particles are just wavelike configurations of the kinetic energy of the medium, and those configurations aren’t fundamentally based on observable exchanges of momentum with the medium, but observable exchanges of momentum occur after observable structured wavefunctions exist on the medium, (with wave properties as the momentum

exchange). The conservation of energy would necessarily need to be extended to dark energy and dark matter and the exploration of these in-observables will be aided by this method of description.

In all classical waves, the energy of the wave is just a modulation of whatever underlying kinetic energy is present in the mass of the medium, but at this fundamental level, where we are now forced to measure the existence of the tool that classically did the measuring, the modulation must be viewed in an existentially different way. In a way, this is just a slight twist on an old observability precedent.

In water, not only the macro momentum is involved, (from the direction of the moving water, like when waves are made in a moving river), but the momenta of the molecules and atoms of the water itself are at play and were unobservable to our ancestors. The macro water wave was observable to ancient man and is a "format" of the molecular motion of water molecules, (i.e. wave energy altering molecular motion in concert with the gravitational returning-force). In the same way, fundamental particles, (which are observable to modern science) derive their observable momentum from unformatted unobservable dark energy in concert to form their intrinsic wavefunctions, (then making them observable to our current methods).

To be clear about this logic, a wave on a wave-medium is always necessarily a modulation of a dynamic that itself has greater degrees of freedom, (i.e. the wave represents an alteration-to-equilibrium that manifests with at least one fewer dimension of motion than the medium). The medium itself is not detectable as a "disruption" which would be equivalent to a wave on that medium. The motionless pendulum does not "keep time", the unplucked guitar string does not make sound and the medium within which momentum is conformed into an observable wavefunction does not add or subtract momentum from that wave. The wavefunction is a simpler-order alteration-to-equilibirum of a higher order differential dynamic between time and space.

When we get to the quantum level, we are already at the level of the intrinsic momentum of the particle. The Michelson-Morley experiment was looking for a non-fundamental medium. They were testing waves on the beach to see if water existed, by seeing if they could get microscopic things to "surf". Nothing surfs on still water, but the action that waves use is still there, nonetheless.

What they needed to be looking for is a massless, momentum-less medium. Interacting with such a thing would not impart momentum. In fact, the definition of

“interaction” would prove to be purely an observable-period wave property, and the notion of momentum that is “wave shaped” we will find to be derivative from a simpler set of rules governing the format of a condensate of momentum that is dark energy.

As we will see, mass and energy particles and the forces they exhibit are geometrical formats of an unformatted constituent of what we call energy and momentum, describable only by the differential relationship that results in periodic observables, (and some geometry).

When we travel farther down this rabbit hole we find that since both mass and energy particles are modulations of the medium, many of the laws of physics are functions purely of whatever geometric dynamic is taking place in the observable configurations of that medium. The medium itself exhibits a simpler version of physics, that assumes more complexity in the macro. Like the complex branches of an oak tree, the greater simplicity of the trunk actually makes it more recognizable as an oak tree. In this way, the laws of conservation become more contiguous and more re-affirmed, even though at first glance our classical familiarity with the laws might cause us to think they are being violated.

To understand this deeper layer of the universe, instead of using momentum exchange as evidence for an underlying particle medium, we will instead, (at least initially) use all the unexplained and often paradoxical roadblocks in the current classical description of spacetime. We might see if a description of spacetime that does not contain these paradoxes and conundrums, is itself the evidence for what is currently dark, in the standard model.

The dark immeasurable effects in the universe may simply be different configurations of the actions of the medium which don’t conform to interaction with the particles we use to try to detect them. For instance, our friend the neutrino is alive and well but only drops by our observability for weddings and funerals. Dark energy and dark matter are not so polite, (they won’t even wave).

Since we test for things based on how those things interact with the configurations of normal mass and energy particles, if the medium itself is randomized, it might make sense that the medium is, as of now, still dark and unverifiable. This potentially unsettling doorway into what exists in that darkness is unlocked by way of the gradient calculus of random period vs fixed period expressions of fundamental motion, which is our destination. In fact, everything is waving, if we know how to look.

We must however brace ourselves existentially, to pursue this line of exploration, because it is logically unavoidable that in order for there to be something that constitutes a more fundamental explanation for the laws of spacetime, the laws we are finding the explanations–for must necessarily be, themselves, derived from some simpler set of laws, perhaps vastly foreign to our classical sensibilities. We must be prepared for concrete distinctions to be blurred and hold tight to what we observe directly and the story it tells us, not cling to classical truncated anthropomorphic descriptions that are more comfortable to our sensibilities. The reality may so bizarre, some may indeed choose the instinct to reject imperial rationality for the comforts of classical cut–and–dried materialism, (however paradoxical the classical view has become, in light of mounting evidence).

We will at this point begin assembling a cohesive picture of some of the correlations so far by assuming a medium that has dynamics that will bridge those irrational–seeming unknowns in physics. We will build from the bottom up, from the perspective of the previously discarded possibility of a medium, with a new lens, through which we can view some of the unsolved mysteries.

The first classically–fundamental term that will have to be used with specific qualification is the concept of "energy". A photon is an "energy" particle but a photon itself "has energy", as a quantity based on its frequency. Mass also "has energy" and can "gain" energy. Matter and antimatter both "have energy" and can annihilate each other to produce a photon which "has energy" and is an energy particle. Dark energy exists and observable energy exists. We will begin by addressing the fact that all things are ultimately reducible to energy and that all things ultimately are in motion and that motion and energy are synonymous, with only a geometrical difference, describable by the differential equations of their periodic motions.

We will therefore begin from the most simple premise, that the fabric of spacetime, is "made–of" energy and this energy is a measure of motion @c (i.e. "change") according to some geometric path with quantities accounted for by mc^2. We will show that this duality of an "action" which is also a "substance" is at the heart of the wave–particle duality of spacetime, and the distinctions between the two are not only of philosophical interest but are vital to uncovering the differential dynamics that bridge the quantum and relativistic worlds. We will show that the essential laws of physics and its laws of conservation are just arithmetic descriptions of the geometric paths of energy @c which form stable,

(and unstable) observable periodic structures out of the dark in-observable energy of spacetime.

One of the pivotal concepts we will be focusing on is relativity and relative motion,m (or relative differential change). The geometrical cause of relativity is profound and woven through the laws of physics. A seemingly stationary object would seem to be moving, from the perspective of a moving object, (road signs seem to be moving backward at the speed of the vehicle, etc). As we will see, a medium that is more fundamental than particle formation (and is stationary with respect to all particles), is more fundamental than momentum itself, (although as we will see, the fundamental medium still bears the underlying law of the conservation of momentum, in its raw form). That is to say, like all wave mediums, the medium that manifests observable momentum has an extra degree of freedom, (i.e. classical momentum=momentum+something).

For this reason we must assume a medium that is a momentum "condensate". We will see that this is the result of the foreground-backround differential interchange constantly at play, (the conservation of energy applied to dark energy and matter). A simple structural dynamic of this makes the concepts of relativity of motion, time, action, mass etc a cut and dried linear vector analysis based on a single velocity, (and some particular geometry). The "which thing is actually moving" paradox in relativity is actually straight forward.

The science at the beginning of the twentieth century proved there was no medium for light and also proved that they didn't even need a medium to model the waves of particles. But with all the dead ends that have eventually arisen from those undeniably brilliant work-arounds in quantum mechanics and relativity, maybe a medium wasn't so unnecessary after all.

With just a single, tiny alteration of the assumption, we can not only solve these conundrums but we can also point out that we have in fact already identified the dark parts of the medium. We are course very familiar with the standard model observable particle configurations of the medium. And we have already acknowledged the medium in its many field formats, in what we call fields, and what we call virtual particles.

There is just the one missing description in the paradigm that will sew these already-present fragments up together. We will find the hidden variable of the medium and mend the majority of the problems we currently face in physics. So the only thing left to do now is describe how the medium works. To begin, we will lay the foundation and reinforce the basis for assuming a dark medium in

another way: the Planck length.

The Dark Medium of Energy

As we travel across the border between the world of present non-existence and the world of measurable existence, the boundary seems to trace the outline of geometrical structure as the key to observability. We will find that existence, in and of itself is a class of shapes (i.e. a path of energy with a symmetry) and non-existence is a no-shape, a lack of symmetry, or at best, a shape that does not interact with matter in the way we detect matter and energy. Existence itself must, at its simplest level, be based on the principle of measure-ability, because in the language of science, measure-ability, (interact-ability) and existence are the same things and require the same circumstances to exist. The emergent, derivative laws of physics exhibited reside as a function of their geometry, within the random energy behavior of spacetime, in which resides the more fundamental, underlying basis of physics.

In the simplest terms the quantum wavefunction is an organized periodic structure. In order to detect these organize periodic structures, we use other organized periodic structures. In this light, the periodic shapes we use to detect things would seem to be important. We will start by going deep, from the bottom-up and try to understand how the medium we have described might be capable of forming structures in the first place. We will address the macro quantum questions in a moment but first it is important to diagram the anatomy of the basic understructure of "what existence is" according to the current definition. That is to say, what common items are found throughout all dynamic structures in physics and chemistry and what do those items look like when they are pulled out of their structural contexts? What parts are intrinsic to the understructure and what parts are left with the context?

So, for existence to take place there must be interactability. Our most fundamental quantum measuring tools such as photons or electrons or quarks are defined, in essence, by their interactability. These particles are made of this immeasurable-able homogeneous substance we are trying to model but those objects are still knowable due to some more fundamental structure of measure-ability. Spacetime itself has resulted in a fundamental physical structure that has been able to create contrast in an otherwise structureless medium. What

structure is simplistic enough to fit that stark criteria? What is on the other side of that boundary into chaos and how can immeasurable properties of chaos form the measurable properties of order?

Since we are attempting to model dynamics at a scale that is as-yet immeasurable, we should remember that it is always best to go looking for an invisible monster in the rain, so that where the rain stops and the beast begins, we can trace out a set of rough dimensions to gain an entry point. To enter into this existential darkness, we will invent a magic raindrop that we will call a Q.

The "Q" will be our hypothetically-material division in spacetime, used as a kind of mathematical ink-dye test for processing the potential dynamic geometrical relationships involved in relativistic quantum physics. Until a means of experimental measurement is developed for dynamics at this scale, it should be recognized that it is only a theoretical metric for analytical perspective. From a mathematical standpoint the Q will initially play the roll of cipher in unlocking the rationality in the seemingly irrational underpinnings of the quantum world. But indeed we will find the Q to be the Planck-length and the simplest fundamental geometry of the differential relationship of spacetime.

As a caveat, there is an interesting property that, since we are modeling a scale of particle physics that approaches the maximally fundamental scale, (detecting what the detecting tool is made of so to speak), this hypothetical division we are using and the mathematical behavior of reality converge to be functionally the same things, at the boundary of our definition of existence and nonexistence, at the boundary between noun and verb, (energy and form). Math should traditionally be considered a symbolic abstraction of reality, and practicality speaking, it is. But along the path of using mathematics to describe our reality, there is necessarily a conceivable "bottom", where the math, and the reality, (which we are describing with the math) literally must be the same thing, both simplified to indistinguishability.

Describing the describing-tool makes the description no longer a symbolic tool. At that existentially unique point, where matter and energy converge and the relativistic and quantum converge, the reduction is complete in that the math that describes reality is no longer an abstraction, and in fact we will find that the subjective classical view was the abstraction all along.

To get a perspective of the role of the Q in a context, we will first go to the analogy of how patterns of energy are propagated through gas molecules. Although different in many ways, it is a good place to begin the abstract

framework for what kind of kinetic properties might be exhibited an immeasurable dark energy medium.

Gas molecules are all vibrating and bumping into each other, causing an overall energetic pressure whenever they are in a confined space. The mechanism that causes the transfer of a sound wave, (and many other physical waves) is a physical object bumping into the air molecule, causing a non-random disturbance in the frequency of the gas molecule's natural, random paths of vibration. This change in oscillation then bumps the next molecule, changing its path slightly and so on, all the way to a molecule that bumps the ear with a distinctive periodic pattern. A pattern which, due to its periodic nature is different than the random "white noise" motion the eardrum and brain interpret as silence. We can note that in a silent room, the overall random vibration of all the gas molecules would mathematically cancel each other out, with no single period of oscillation having any specific prominence, causing the field to be undetectable as anything but an kind of ambient temperature.

But gas molecules are subject to the properties of things on a smaller scale than their vibrations. In truth, gas molecules themselves don't even actually "collide" with each other but interact via the more intrinsic periodic dynamics we seek to map. What is the most basic way of defining this action we have been describing as "collision"? Obviously something more geometrically complex would have to be going on, on the quantum scale, that would result in propagation, repulsion and things like heat and motion. As we continue, leaving the simple gas collision analogy, we will try to verify whether or not a single action, (geometrically arranged) could be the basis for the rest of the laws of physics. What would this look like?

Building Blocks

The first step in sketching out what the Q building block looks like is to recognize that we are necessarily talking about some kind of motion behavior. We will start with the big picture with the concept of energy, which stands alone in its essence, as an undeniable thing, and map the bridge between energy and the matter particles and light particles that are formed from it. We will make the wild assumption that things which are observable and mathematically describable are ultimately physical, rational and deterministic in nature, (if perhaps beyond our present ability to calculate). We will assemble our Newtonian building blocks around two of the most well known and simple relationships between energy and

mass $E=mc^2$ and $E=hf$ and discuss their differential equivalents as our measuring stick. We will ultimately arrive at a description of the quantum wavefunction as it can be described geometrically.

The observed quantity called velocity was a transparently intuitive concept to early science, since macro objects exhibit motion in straight lines everywhere in nature. Energy was also intuitive and obvious since large amounts of energy makes large physical changes. The fact that velocity was included as a scalar in the calculation for momentum and energy was just as simple and intuitive. A fast moving something makes more energetic changes to things when it collides. So we get the straightforward description of momentum as mv.

The fact that the velocity factor needed to be squared in order to represent the energy contained in a moving body is not quite as straight-forward. Ironically, it was also quite intuitive for early physicists to accede to the fact that nature (and certainly mathematics) did not need to make intuitive sense, previous history had continually attested to that fact across the board. The picture of a partially solved jigsaw puzzle makes is an intensely irrational thing to look at but we excuse this under the knowledge that it is ultimately solvable. We continue filling in the empty spaces with the unknowns and loose-ends tied up in pretty bows based on assumption and just avoid looking at those paradoxical bows directly in the eyes, so to speak.

To proceed to unravel those knots, we will start with $\frac{1}{2}mV^2$. The seemingly naive knee-jerk mathematical instinct would be that if motion equates to energy in some way, then the presence of a velocity -squared- must indicate that the simple motion of a body moving in a straight line must somehow actually include two dimensions of velocity in order to produce the energy we equate to one dimension of observable energy. The mathematician would argue that there are math-based intuitions that provide an explanation for the V^2 present, and although somewhat fulfilling in their structures, we are nonetheless forced to play a shell game to pretend that it truly satisfies our intuition.

The concept of acceleration being “distance per time”, divided by time, (i.e. a change in velocity per unit of time), makes intuitive sense. Velocity obviously has something to do with energy and an increasing velocity should be associated with an increasing energy. So then we get “acceleration times distance” deftly swapped-in, to replace velocity squared and we are to be satisfied that one abstracted math truth should explain the basis for another abstraction. The rationale being that we know that acceleration of a mass for a certain distance just simply equals its energy, or “work done”. We can even go one step further

and say that an acceleration times a mass is the idea of a force and be intuitively satisfied that an increasing speed associated with a mass involves an increase of energy to the mass and that kind of makes sense as a force, but still we wonder, why velocity squared?

We could conclude that acceleration is evidently the main culprit behind energy phenomena in the universe but we still arrive back at that same crossroad, where tangible intuition is beyond our grasp. It may be enough to stop here because accelerating certainly feels like an energy-adding kind of thing from an everyday perspective, but when we look closer, the concept of acceleration by itself is a false friend.

In reality, acceleration can't stand alone, but requires a distance traveled to even exist. Can something be accelerating but not moving? It's possible to get sneaky and say that an acceleration can cause heat without moving etc, but in the end something is always moving, even if just in the form of particle vibration.

So we will be belligerent and ask again...what is taking place when something is accelerated for a distance and why would it seem to be equivalent to a velocity squared. Furthermore, why does an "amount" of this action, in the form of the simple scalar "mass", describe a very visceral, tangible thing called force?

If we stop for a moment here we can find a clue. Even though all this speeding up business happened with the particle, the underlying mathematical action is simply a fixed thing called acceleration happening for a fixed distance. If we note that the application of acceleration can sometimes cause only heat in the form of vibration, which is a less intuitive way to accomplish the distance-traveled part, we can get closer to the geometry of how acceleration causes the appearance of "energy". Believe it or not, we are getting get within arms reach of a tangible understanding of the action of spacetime.

Zooming in on the action of a force that results in heat, (as a vibration of the forces holding molecules together in a mass for instance), and then zoom further to the vibration of atoms and then electrons with their nuclei and then vibrating quarks, we get to the level where the kinetic energy of the quantum world and rest energy of a mass are indistinguishably blurred into one thing. A thing that's main actor is c times itself, (once again, a square of motion).

The kinetic energy of the quarks in the nucleons give mass to the nucleons. But we notice that the concept of acceleration, (or the increase in velocity) times a

distance, still holds for calculating energy, even at that level. Quarks have a rest mass, even though the mass of atoms comes from the kinetic energy of quarks moving. So if an atom's rest mass is caused by the motion of quarks, what causes the rest mass of quarks? So this is currently an unanswered question by the standard model, but for our purposes it can serve as a clue.

We have arrived at a level of zoom that has turned both solid objects and forces into simply motion, with one mystery, (that motion is multiplied times itself). If we get back to this idea of energy and the fact that motion is involved in the expression of energy, we are starting to get somewhere. We know that $E=mc^2$ and so we already know that in some sense mass is energy. We also know that there is an unanswered question of what is going on with acceleration's involvement in that energy equation and we can ask "why does increasing velocity of a particle structure for a distance (ax) in straight line involve velocity multiplied by velocity (V^2)? For that matter, why is the velocity that is squared specifically the velocity of light, when it comes to mc^2?

If we observe that mass seems to be emergent from motion, we must necessarily be left with only motion as the fundamental substance that constitutes energy. The mass would seem to be a structure constant. Then if $E=c^2$, (with a scalar), what is moving? Might we go so far as to say that we know energy exists and we know motion exists, but all other things seem to be arrangements of the two descriptions of the same thing? How can this ax or V^2 business give us an indication of how energy in its simplest form exists and how geometries lead to structured existence like mass?

Since we are shooting for an extreme-basic equivalence that can't be further reduced, and we know that this simplest quantity conforms to three spacial dimensions. Could it be said that energy is motion and motion is energy and there seems to be some geometrical property or properties of this thing called motion through 3 dimensions that results in all measurable configurations and dynamics in physics? We might find a general property of energy that solves the V^2 question and is also the basis for the differential relationship we find in the equations of Schrodinger and others, as well as wave behavior in general.

A possible best fit for the single trait for energy, (for many observable reasons we will elaborate) would be its tendency to be in the lowest possible energy state. The phenomenon of motion in 3 dimensions already insists on directionality as being inclusive, so the simplest path to "lowest energy state" would be a particular configuration of direction. Motion at it simplest is a one-dimensional thing. Regions with motion "head-on" would be the highest energy configuration.

Regions with motion in the same direction would be a lower energy condition etc. We must determine what trajectory(s) of energy would best minimize energy in a turbulent system like spacetime.

Since velocity is the fundamental expression of energy in spacetime, and energy seems to occupy all of 3-d space, a change in direction, (or an acceleration) in any region would thus represent a curvature between that region and an adjacent region. Since motion is one dimensional, a rotation of direction toward a neighbor's direction (head-on), would be an increase in energy between them corresponding to that curvature. Spacetime would seem somehow to tend to smooth out these curvatures to minimum energy. We are left with the problem of how a 3-D distribution of this 1-D force would play out and how the description so far could result in geometries or repeating paths of that responsive motion, that might in some way maintain regions of minimum energy (minimum curvature) in a self-sustaining observable way. Let's return to our basic equivalence to see how structure might arise.

What makes the distinction between the two sides of the equation $E=mc^2$? From the quark-motion to mass phenomenon, it could be said that mass either exists or does not exist based on a particular arrangement of motion, a motion, we must assume, of energy. What determines if there is mass or not mass and therefore energy or not energy? If spacetime tends to the lowest energy state and velocity equates to energy, why is energy and velocity only apparent in certain regions? What configuration of velocities across spacetime would make the great majority of it dark, with only the places with certain curvatures, (accelerations) visible?

If spacetime were somehow randomized in the arrangements of the directions of its velocities, at the smallest scale, minimizing accelerations would be accomplished by the most efficient curvature-minimizing distribution of otherwise random vector directions. How could areas of curvature feature sustained accelerations, given the tendency to the lowest energy state? The sustainable geometries of velocity that would accomplish this would somehow have to exploit this one trait of spacetime.

The kinetic energy formula of a moving thing in a straight line involves a velocity times a velocity. Since only one velocity truly exists observably, when traveling in a straight line, where finally does the other velocity come in? The missing velocity must be directly related to the intrinsic geometric energy-minimizing structures of observables or path of matter and its relationship to the vectors

in the rest of spacetime that are “not the particle”.

We will find that a quantity of structure made out of a 1-dimensional thing called motion is definable by a square of that thing both because it is opposed on all sides in 3d by adjacent motion-energy and because the geometry that most -minimizes that opposition is the perfect circle. Structures that are observable are based on paths of curvature minimizing planar circles, the modulations of which, (i.e. spacial overlappings), are described by a specific set of differential equations which predict all observables.

Circle Patterns

To jump in to how motion-energy in spacetime uses geometric paths to such great effect, we will refer again to one of the more interesting mysteries: time dilation. The idea that the measurement of space and time changes, depending on how fast you travel through spacetime, (or strength of field) and its relationship to curvature is at the heart of the modern relativistic description of physics. And the fact that any particle is an inherently a randomized periodic phenomenon that is broken into quantum clumps is at the heart of the quantum description of physics. Although it may seem overly simplistic, the notion of things being periodic and wavelength-clumpy and causing varying degrees of curvature will be the common theme between the two descriptions.

Einstein mathematically treated time as if it were a spacial dimension, the same as distance, in his calculation of the total energy of a particle. He represented time alongside x,y and z spacial components, (as a distance) by using the distance that light travels in the elapsed amount of time Xo=Ct. Although this might be thought of as a useful mathematical trick, we are going to take this as an implication that time is intimately related to energy traveling at the speed of light within the intrinsic structures of particles. We will assume differential geometry takes invariant motion and creates the distinction between space and time.

Even objects traveling at very slow speeds are mathematically tied to energy traveling at the speed of light in their rest masses. Time not only traverses physical distance but since time is one of the factors in four momentum calculations, time also has a momentum associated with it, just like motion in a relatively linear direction does. These points of evidence were inescapable artifacts of the math that resulted from Einstein’s rigorous analysis of how light

speed could always be measured as being the same rate, regardless of how fast a measuring tool was traveling, as it measured a light source, (a fact that will prove to be pivotal).

The speed of light is not an upper limit of velocity in the universe the inverse is true, that slower velocities are just psuedo-slower, being the result of looping geometric paths of the only speed that exists, namely c, the speed of oscillation of the Q units that make-up observable matter and energy. Like our track athlete running at 15 miles per hour, then deciding to run in a 2D helix or curly-q pattern, she moves the circle a little each time she completes a lap, instead of a keeping a perfect circle. Is she still running at 15 miles per hour or at the overall rate that her path itself is traveling each cycle?

How could the measurement of a length of time be physically comparable to a length of travel? How could events progress through time in the same way as they progress through space? Let's over-simplify again. If you take an old fashioned stopwatch with physical hands and drop it from a building, in mid-fall the hands will be traveling a certain distance in the down direction and a certain distance in the clockwise direction. In other words, energy-action is taking place as travel in a linear direction down and also in an angular direction, as the second hand sweeps.

The clock's time was able to cover distance in a circle which was measured alongside distance in a straight line. If the motion of a clock's hands seem to be too disconnected and oversimplified, the more accurate analogy of an electron's progress orbiting a nucleus or the progress of a quark in a circle-like random path inside a nucleon might be a closer fit. Let's try to apply the analogy in more detail.

We will need to take the idea of ticks of the clock to measure the number of steps that have elapsed as it falls and draw the comparison to literal spacial travel of time within mass, during the action of whatever mass is doing intrinsically, as it moves. What kind of spacial travel of energy could be taking place that doesn't count as any of the 3 Euclidean spacial dimensions but could still be calculated as a fourth dimension of spacial travel. How could momentum take place without any measurable travel accomplished in a straight line? Of course energy traveling in an angular direction and somehow the variation of its angular motion resulting in linear variation, would bridge the two concepts

Returning to our model with dark energy as a medium, we notice that to form a circular path, the vibration-esque kinetics in the medium would need to travel

repetitively over the same area of space at the speed of light. But when zoomed out, that overall shape the path forms would itself then have to somehow move more slowly than the speed of light.

The simplest path that would loop over the same ground, (so that the overall shape travels slower than the speed of light), is of course a simple circle. Under these conditions the circular path, as a whole in a rest mass would not only be traveling slower than c, it would be stationary. If we look at the idea of a field of randomly oscillating spacetime Q particles that are canceling each other out on average, making the vibration displacement zero with respect to any one path, we see the possibility that the vibration pressure could act as a kind of restoring force for waves in some way. In the way that gravity causes a crest in a water wave to sink back to sea level, the pressure of expansion would itself provide an underlying condition for waves. In that case, the tendency for energy to seek the path of least acceleration would qualify as the "expansion pressure", (again, with energy tending to lowest acceleration, as we will see, causing dilation/contraction of the periodics involved).

If we then add the idea of a minimum-energy-differential displacement wave traveling across/between the angular motion of the Q wavelengths, we are close to something workable. In order for the wave to be sustained like particles are, a wave of "pressure" would need to loop back onto itself, back to where it started, traveling from Q to Q within the structure, as a differential pressure between them. If dark energy is already moving with random angular motion, in what way would a predictable-periodic pressure wave of a fixed period affect the random vibrations of the Q, (in terms of acceleration/curvature)?

We may have raised more questions than we answered, but we are still officially in the brainstorming phase, so we will step back and diagram where we are. If we assume these circular motions have some effect within the random, and can form paths through spacetime as some act of being periodic geometries, there would need to be some relationship between one region of moving-spacetime and another region. There would need to be what we would call a force.

So far we have only assumed that energy exists everywhere and that it is the same as motion and that rate of motion is invariant. How would a force come into this? If forces make things move and things are made of force, how can both be true? The differential relationship of the motion itself and its geometry, (tending to lowest acceleration state) must be the cause of the "force". Lets just assume that somehow the motion itself has properties of a force based on some kind of geometric conditions and jump back to where we were and try to hammer this

out in context. We were saying that being a fixed periodic shape might have some effect in an environment with random periods of acceleration, (curvature, i.e. gradient).

Theoretically the loop would create a path of acceleration circling like a train around the loop on the random states of acceleration of the Q, maintaining a conserved quantity of energy around the loop, (assuming no losses, as "losses" would be subsequent wave properties). Because of the finite circumference of the loop, the overall vibration motion would be less-random than the surrounding vacuum, in an amount proportional to the circumference, (i.e. the average gradient would be lower in the region of the structured predictable-period reciprocation).

Each time a vibration was repeated in the direction around the loop structure, it would also predictably NOT be vibrating in the direction perpendicular to the path of the loop, by the same amount. The region of the loop would stand out from the general pressure of the randomized background vibrations in the surrounding area. What effect would it have on the state of the medium, (in the surrounding Q radially)?

The quick answer is that if there were some force via differential acting between Q, and this region of a stable circular loop existed, the Q involved would have a different sustained state of the force they exhibited. After all, the only factors we have to work with are the fact that a force exists where motion exists and geometry of that motion has something to do with its properties. We could assume the differential tendency would cause the force in the region of the structured group of Q to be repulsive or attractive with respect to the surrounding area.

Since mass tends to clump up, maybe an attractive force would be likely. Then again, if the force relationship is present everywhere, even in the vacuum, it might make more sense that mass is something different than the general state of force in the vacuum, so maybe it is an expansion force. The fact that spacetime is expanding might corroborate that line of logic. But again, the only thing we have allowed ourselves to work with is invariant motion and geometry, (e.g. vector trajectory).

Because we are brainstorming, lets assume relatively-differing angular motions can exist between adjacent Q, resulting in forces between them. We will take courage in the fact that macro acceleration is closely associated with force where F=ma. What would it even mean for there to be a force acting between

one chunk of energy rotating, next to another chunk of energy rotating? Again, since we only have invariant motion in a 2-D circle, and direction of that motion, we have to go with the the fact that the force would change the direction and/or the period of that angular motion but at the same time the force would also be caused by that direction or period. This simultaneous "force caused by angle" and "angle changed by force", is hinting at a differential equilibrium of some sort.

When we put that in the context of one Q in the middle, among many Q regions of energy, we only have the comparison between the trajectories of motion of the Q on the left of the middle-Q compared to the Q on the right of the middle. Somehow the force to either repel or attract must be based on this relative comparison of trajectory. At this point we can call it relative velocity, (from the standpoint of a fixed grid), even though each Q region is moving at an invariant velocity in its own local coordinate system in its plane of motion. The amount of intersection of their respective planes might correspond to the differential key we need. Since the force is based on the differential of trajectory between Q, in a way it could act as either a repulsive or an attractive force, or somehow both of those definitions. Either way we maybe hinting at a differential relationship physics is already familiar with.

So back to our group of Q that have formed a group-loop. If this mystery-force were based on equilibrium of relative velocity, the Q outside the group-loop, would be vibrating more in motions that are toward the direction of the group-loop, and less toward directions that are not. This is because the geometry of the group has altered what the "average" random period is (or acceleration is, as our equilibrium-force would suggest), compared to the vacuum.

In the vacuum, the pressure from this force would try to be distributed evenly, so any regular fixed period on a single plane will cause a reduction of overall pressure, relative to surrounding directions, (imagine the equilibrium balance in a venturi effect situation). The fact that a "loop" of this differential pressure acts in a tangential vector around the loop would mean that the motion of the Q would be predictably not radial to the loop. So the probability of vectors of motion toward the loop, (in the surrounding space) would increase and an increased trend of motion toward the loop would emerge in the random trajectories of the vacuum.

But the last sentence would turn out to be wrong, at least partially. But we are just brainstorming. Because won't the predictable period of our group have the side effect of vectors predictably pointing outward from the loop just as often as inward? But we will see that in a purely angular system, direction doesn't

matter, a predictable period matters, which is what the differential-satisfying geometry provides. The general state of acceleration in the region will be affected mathematically by this situation in a more subtle way. It is the regional state of the gradient of the periodic motion that matters and the effect it has on the periodic patterns of particles, as we will see.

The actual vector geometry of how a region of Q would maintain a stable periodic motion is one step more geometrically complex than this, (earning its reputation as a conundrum), but the general concept of the effect of a loop of acceleration differing from the random Q acceleration of spacetime holds true. The key will turn out to simply be that there is specific predictable distinction of period associated with the group-loop, and that distinction has vast implications. It will cause a second gradient, (or reduction of second gradient, in fact), of the relative velocity. Differing from the random vacuum, this structured-wave-group will have a second gradient that is non zero as an average over time.

The geometrical arrangement of the planes of angular motion that are in-phase will make a reliably greater instance of vectors of dark energy that are in periodic synchrony and so will be "traveling away from each other", instead of randomly having more head-on trajectories. Since the influence of this reliable period arrangement is structured within a finite group of Q that are in-phase, this gradient-alteration is diluted more as we move away from that group, and the probability that we would find this predictable second gradient would have a reduced amplitude, among the random acceleration, as we travel away from the particle radially. Before we get too deep into that math, lets step back and look at the specifics of the equilibrium relationship between Q, (i.e. the force), so we have a basis with which to go forward.

End of Section 2